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August 15, 2023

Mr. Sam Meng, Site Manager
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Subject: **Submittal of First Semi-Annual 2023 Groundwater Monitoring Report
January through June 2023
NuStar Vancouver Facility
Vancouver, Washington
File No. 19001-009-19/20**

Dear Mr. Meng:

Enclosed please find the *Semi-Annual Groundwater Monitoring Report: January through June 2023*. The report was prepared on behalf of NuStar Terminals Services, Inc. (NuStar) by GeoEngineers, Inc. (GeoEngineers) and presents data collected from January through June 2023.

If you have any questions or would like to discuss this further, please contact me at 503-807-3835.

Sincerely,
GeoEngineers, Inc.

A handwritten signature in blue ink that reads "Stephanie Bosze Salisbury".

Stephanie Bosze Salisbury, LG
Associate Geologist

SBS:jm

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**Semi-Annual
Groundwater Monitoring Report**

January through June 2023

NuStar Vancouver Facility

2565 NW Harborside Drive, Port of Vancouver
Vancouver, Washington

for

NuStar Terminals Services, Inc.

August 15, 2023



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NuStar Vancouver Facility
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August 15, 2023

Prepared for:

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1.0 INTRODUCTION

This semi-annual groundwater monitoring report was prepared by GeoEngineers, Inc. (GeoEngineers) on behalf of NuStar Terminals Services, Inc. (NuStar) for the NuStar Vancouver Facility (Facility) in Vancouver, Washington (Figure 1). This report presents the results of the groundwater monitoring activities completed at the Facility during first and second quarters of 2023. Additionally, the report includes a summary and evaluation of interim action monitoring data for the reporting period.

The Facility is located at the Port of Vancouver (POV) Terminal No. 2 in Vancouver, Washington (Figure 1). The Facility Site Plan is shown on Figure 2. The property address is 2565 NW Harborside Drive, Port of Vancouver, Vancouver, Washington 98660 (Latitude: N45° 38.26', Longitude: W122° 42.20'). The property is owned by the POV and leased by NuStar; the current extent of the leasehold is shown on Figure 2. The Facility is on the north shore of the Columbia River. Land adjacent to the Facility is industrial property also owned by the POV. The Facility is approximately 19 acres in size located on Clark County Tax Lot Numbers: 151979-000, 502010-002, 502010-000, and a portion of 502020-000, as well as a portion of the Washington Department of Natural Resources tideland area managed by the POV.

2.0 GROUNDWATER MONITORING FIELD ACTIVITIES

The groundwater monitoring was performed in general accordance with the *Groundwater Monitoring Plan* (GWMP; Ash Creek, 2008), which was approved by the Washington State Department of Ecology (Ecology) in a letter to NuStar dated July 30, 2009. The monitoring program for the first and second quarters of 2023 is summarized in Table 1. Two monitoring events were conducted during this period: the first quarter 2023 groundwater monitoring event was conducted from March 13 through 17, 2023. The second quarter 2023 monitoring event was conducted from June 12 through 15, 2023.

2.1. Water Level Measurements

First quarter 2023 groundwater levels were measured March 13, 2023, and second quarter groundwater levels were measured on June 12, 2023. The depth to groundwater was measured at Facility monitoring wells, multi-level groundwater monitoring (MGMS) wells and selected off-leasehold wells (MW-F, MW-14, MW-17, MW-23i, MW-25i, MW-26, MW-32s, MW-32i, S-1, and S-2). Monitoring well locations are shown on Figure 2.

Depth to groundwater and groundwater elevation data are summarized in Table 2. The wells are screened in three different groundwater zones: Shallow, Intermediate, and Deep as defined in the Remedial Investigation report for the Facility (Apex 2013).

2.2. Monitoring Well Sampling and Analysis

The sampling and analysis program for first and second quarters 2023 is summarized in Table 1. Groundwater monitoring data sheets for the sampling events are included in Appendix A. For quality assurance/quality control (QA/QC), field blanks and equipment blanks were prepared, and sample duplicates were collected from wells MW-7, MW-12, MW-19, and MGMS3-40 during the first and second quarters 2023 sampling events.

For both sampling events, the samples were uniquely labeled, stored in insulated coolers with ice, and transported under chain-of-custody protocol to Apex Laboratories of Tigard, Oregon, for laboratory analysis. Samples were analyzed for halogenated volatile organic compounds (HVOCs) by U.S. Environmental Protection Agency (EPA) Method 8260D. Groundwater analytical results for both events are shown in Table 3. Historical data are tabulated in Appendix B.

The terminal handled and distributed bulk fertilizer products, primarily urea but also mono-ammonium phosphate, continuously from 2014 to September 2020. The former contract with the fertilizer supplier has been terminated and it is unlikely fertilizer will be handled at the terminal in the future under a new contract. Urea cannot be directly measured in water but can be estimated by analysis of the primary urea constituents: ammonia, nitrate, and nitrite. To evaluate for urea in groundwater during the first and second quarters 2023 monitoring events, Facility monitoring wells were sampled for nitrate as nitrogen and nitrite as nitrogen by EPA Method 300.0 and ammonia as nitrogen by EPA Method 4500-NH3.

Samples from select wells were also analyzed for total organic carbon (TOC) and ethene, ethane, and methane to assist in evaluating remedial parameters. TOC was analyzed by Apex Laboratories using EPA Method 5310C. Apex Laboratories subcontracted to Air Technology Laboratories of City of Industry, California, using chain-of-custody protocols, for laboratory analysis of ethene, ethane, and methane.

3.0 GROUNDWATER ELEVATIONS

Groundwater elevations and estimated elevation contours for the Shallow and Intermediate Zone wells for the first quarter 2023 are shown on Figures 3 and 4, respectively. Groundwater elevations and estimated elevation contours for the Shallow and Intermediate Zone wells for the second quarter 2023 are shown on Figures 5 and 6, respectively.

3.1. First Quarter 2023

Shallow Zone. On March 13, 2023, depth-to-groundwater measurements were made at Shallow Zone monitoring wells in accordance with the groundwater monitoring plan provided in Table 1. Monitoring well Monitoring well MW-16 was not gauged during the first quarter gauging event on March 13, 2023 due to standing water overlying the vault. Monitoring well MW-16 was successfully gauged when it was sampled on March 15, 2023. The observed depths to groundwater in these wells ranged from 25.52 to 33.09 feet below the top of casing (BTOC), and the corresponding groundwater elevations in these wells ranged from 5.02 to 6.98 feet above mean sea level (MSL; Table 2).

During the first quarter 2023 monitoring event, gauging of the Shallow Zone wells was completed between 8:11 AM and 12:34 PM. During the gauging activities, the water level in the adjacent Columbia River increased by 0.18 foot. River stage data are based on the Columbia River Datum (CRD)¹

¹ Columbia River Datum (CRD) is the adopted fixed low water reference plane for this area. CRD is a U.S. Army Corps of Engineers non-tidal datum defined at distinct river miles relative to the North American Vertical Datum of 1988 (NAVD88) and is used as chart datum above river mile 23 on the Columbia River. Datums are computed using observations from the low river stages of the year, generally August through October due to the masking of the tidal signal from strong seasonal river runoff during other portions of the year. Depending on river flow, water levels can be significantly higher than CRD. As of 2014, the U.S. Army Corps of Engineers provided updated offsets for CRD that have been applied to this station.

and were obtained from the nearest National Oceanographic and Atmospheric Administration (NOAA) tide station (Station ID 9440083), which is located approximately 0.5 mile upstream of the Facility.

As shown in Table 2, groundwater elevations in the Shallow Zone were calculated to be an average of 0.34 feet higher in March 2023 than during the previous monitoring event in December 2022. During the first quarter 2023 gauging event, and generally consistent with previous gauging data, there were isolated groundwater highs in the area between wells MW-8 and MW-10 located in the northwest, and well MW-3 located in the east/southeast. With the exception of the eastern/northeastern corner of the Facility, groundwater flow is south toward the river. To the north of the well MW-3 area groundwater flow is to the north/northeast (Figure 3).

Intermediate Zone. On March 13, 2023, depth-to-groundwater measurements were made at Intermediate Zone monitoring wells in accordance with the groundwater monitoring plan provided in Table 1. Monitoring well MW-20i was not gauged during the first quarter gauging event on March 13, 2023 due to standing water overlying the vault. Monitoring well MW-20i was successfully gauged when it was sampled on March 15, 2023. Groundwater levels in Intermediate Zone wells were measured during a predicted tidal inflection to minimize the magnitude of tidal influence on water levels during the gauging event. Water levels were measured from Intermediate Zone wells between 10:44 AM and 12:32 PM on March 13, 2023. During the time interval in which Intermediate Zone wells were gauged, water levels in the adjacent Columbia River decreased by 0.69 foot.

During the March 13, 2023 water level measurements, the observed depths to groundwater in the Intermediate Zone wells ranged from 25.31 to 28.10 feet BTOC, with groundwater elevations ranging from 5.91 to 6.99 feet above MSL (Table 2). As shown in Table 2, groundwater elevations in the Intermediate Zone were calculated to be an average of 1.33 feet higher in March 2023 than during the previous monitoring event in December 2022. During the March 2023 gauging event, the Intermediate Zone groundwater gradient beneath the Facility was flat with a slight gradient south toward the river (Figure 4).

Deep Zone. Depth to groundwater was measured in well MW-24d, which is screened from 210 to 230 feet below ground surface (bgs), within the Troutdale Formation. Depth to water in well MW-24d was 27.51 feet BTOC, corresponding to an elevation of 6.40 feet above MSL. A groundwater potentiometric map was not prepared for Deep Zone groundwater.

3.2. Second Quarter 2023

Shallow Zone. On June 12, 2023, depth-to-groundwater measurements were made at Shallow Zone monitoring wells in accordance with the groundwater monitoring plan provided in Table 1. The observed depths to groundwater in these wells ranged from 24.27 to 30.40 feet BTOC, with groundwater elevations ranging from 5.04 to 9.48 feet above MSL (Table 2).

During the second quarter 2023 monitoring event, gauging of the Shallow Zone wells was completed between 8:14 AM and 1:22 PM. During the gauging activities, the water level in the adjacent Columbia River increased by a net of 0.37 foot. As shown in Table 2, groundwater elevations in June 2023 were calculated to be an average of 1.5 feet higher than during the previous gauging event in March 2023.

During the second quarter groundwater monitoring event there was a groundwater divide at the Facility, with the highest point of the divide near well MW-10 and the lowest point of the divide near MW-6. From the divide, groundwater flows either toward the river (south/southwest) at a gradient of approximately 0.005 ft/ft (feet per foot), or to the east/northeast at a gradient of approximately 0.004 ft/ft (as shown on Figure 5).

Intermediate Zone. During the June 12, 2023 gauging event, depth to groundwater was measured in Intermediate Zone wells between 8:47 AM and 10:37 AM. During this time period, water levels in the adjacent Columbia River decreased by a net 0.22 foot. The observed depths to groundwater in Intermediate Zone wells ranged from 26.31 to 28.41 feet BTOC, and groundwater elevations in these wells ranged from 4.30 to 6.02 feet above MSL (Table 2). As shown in Table 2, groundwater elevations on average were calculated to be an average of 0.72 feet lower in June 2023 than the previous monitoring event in March 2023. During the June 12, 2023 gauging event, intermediate groundwater flow beneath the Facility was flat with a very slight gradient toward the river (Figure 6).

Deep Zone. Depth to groundwater in Deep Zone well MW-24d was 28.12 feet BTOC, corresponding to an elevation of 5.79 feet above MSL (Table 2).

4.0 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Complete copies of the laboratory reports for the first and second quarters 2023 groundwater monitoring events, including the quality assurance evaluation report and chain-of-custody documentation, are included in Appendix C.

4.1. First Quarter 2023

The March 2023 monitoring program included the collection of groundwater samples from the wells listed in Table 1. Groundwater samples from these wells were analyzed for HVOCs, nitrate as nitrogen, nitrite as nitrogen, and ammonia as nitrogen. The HVOC and nitrate/nitrite/ammonia results for third quarter 2023 are summarized in Tables 3 and 4, respectively; HVOC data are shown on Figure 7, and nitrate and ammonia results are shown on Figure 8.

4.2. Second Quarter 2023

The June 2023 monitoring program included the collection of groundwater samples from the wells listed in Table 1.

The monitoring well samples were analyzed for HVOCs, nitrate as nitrogen, nitrite as nitrogen, and ammonia as nitrogen. The sample results for second quarter 2023 are summarized in Tables 3 and 4; HVOC data are shown on Figure 9, and nitrate and ammonia results are shown on Figure 10.

4.3. Evaluation of Results

HVOC concentration trend plots for each monitoring well are provided in Appendix D. Monitoring results demonstrate decreasing HVOC concentration trends in Shallow and Intermediate Zone groundwater in 29 of 33 monitoring wells. HVOC concentration trends were flat to moderately increasing for trichloroethene (TCE) and tetrachloroethene (PCE) in wells EX, MW-17, MW-19, and MGMS3-132. The concentrations of PCE and TCE in wells MW-17 and MGMS3-132 have consistently been variable and relatively low (i.e.,

PCE ranging from less than 1 microgram per liter [$\mu\text{g/L}$] to 16.3 $\mu\text{g/L}$ for MGMS3-132 and TCE ranging from less than the reporting limit of 0.5 $\mu\text{g/L}$ to 28.2 $\mu\text{g/L}$ for MW-17); therefore, it is difficult to identify a discernable concentration trend for the wells. The increasing HVOC trends may be the result of the conversion of chlorinated hydrocarbon mass from PCE to TCE during reductive dechlorination. A discussion of reductive dechlorination and total molar ethene mass is presented in Section 5.3.

Ammonia, nitrate, and nitrite results are provided in Table 4 and on Figures 8 and 10. The highest concentrations of ammonia and nitrate were generally found in the western areas of the leasehold, or to the immediate west of the NuStar leasehold, in Shallow Zone groundwater. The only exception being well MW-1, in which ammonia was elevated relative to the other monitoring wells in the area. It should be noted that the wells surrounding MW-1 (MGMS3, MW-5, and EW-1) each continue to have relatively low concentrations of ammonia and nitrate during the first half of 2023. Concentrations of ammonia and nitrate in the Intermediate Zone groundwater were more consistent throughout the Facility and were generally one to two orders of magnitude lower than concentrations in Shallow Zone groundwater.

Fertilizer products have historically been stored at the Facility, although the specific products and storage areas have changed over time. Historical fertilizer handling operations ceased in late August 2008. The Facility obtained a new contract in 2014, and, at that time, resumed fertilizer handling and distribution processes. This fertilizer contract continued until it was terminated, and the last shipment was received in September 2020. There is currently no active receiving, handling, or distribution of fertilizer products at the NuStar facility. Historical nitrate results are also provided in Table 4. For wells in which historical data are available, the concentrations of nitrate and ammonia in March and June 2023 are generally similar to or less than historical results. In accordance with the 2019 Agreed Order DE 15806, a Supplemental Remedial Investigation (SRI) was initiated in the first semi-annual 2021 reporting period to further assess the nature and extent of ammonia, nitrates, and nitrites in groundwater at the Facility. The results of the SRI groundwater investigation were submitted to Ecology in a Draft Phase I SRI Upland Soil and Groundwater Investigation Report in June 2023. More information on the SRI and additional proposed investigation is provided in Section 7.0.

5.0 INTERIM ACTION MEASURE ACTIVITIES

Several interim actions have been implemented at the Facility, as listed below.

- Between 2000 and 2005, a remediation system operated at the Facility that included: (1) a re-circulating system to treat groundwater, and (2) vapor extraction to treat soil. The interim action system pumped groundwater from extraction wells installed near the river, treated the pumped water with potassium permanganate, and then filtered and pumped the water into a series of injection wells along the railroad tracks. For soil, a soil vapor extraction (SVE) system withdrew soil vapors from wells IW-1, IN-2, IN-3, IN-4, EX-1, EX-3, EX-4, and EX-5. This SVE system was inactivated in 2005 because it no longer was removing significant HVOC mass.
- Bioremediation injections for remediation of Facility groundwater and the installation of an SVE system for the remediation of HVOCs in vadose-zone soils were completed in the spring/summer of 2008. These activities are herein referred to as the 2008 interim action. This SVE system has been operating since 2008.

- The SVE system was expanded, and additional bioremediation injections were completed during the summer of 2011, which is referred to herein as the 2011 interim action. Details of the 2008 and 2011 interim actions are provided in the Interim Action Installation Report (Ash Creek 2009b) and the 2011 Interim Action Evaluation Report (Ash Creek 2012), respectively.
- Additional bioremediation injections were completed in 2016 adjacent to the seawall at the Facility in accordance with the 2015 Interim Action Work Plan (Apex 2016). This work is referred to as the 2016 interim action. The Interim Action Summary Report (Apex 2017) describes the scope and preliminary results of the 2016 interim action.

The 2008, 2011, and 2016 interim actions and results to date are described in the following subsections.

5.1. Summary of 2008 and 2011 Interim Actions

The 2008 interim action consisted of an SVE system in the vadose zone and enhanced anaerobic bioremediation of the Shallow Zone groundwater. The 2008 enhanced bioremediation locations and the SVE system layout are shown in Appendix E. The 2008 SVE system removed approximately 3,150 pounds of HVOCs between startup in September 2008 and the expansion in 2011. The mass removal rate at startup in 2008 was 58.8 pounds per day (lbs/day). The removal rate decreased to an average of 1.7 lbs/day by the third quarter of 2011. A mass removal chart for the 2008 SVE system is provided in Appendix E.

A soil and groundwater investigation in 2010 indicated that the 2008 interim action had reduced HVOCs in vadose-zone soils by 90 percent for PCE and 98 percent for TCE and had reduced total molar ethene concentrations in source area groundwater by 77 percent (Ash Creek 2011). The investigation results were summarized in an appendix to the *2011 Interim Action Work Plan* (Work Plan; Ash Creek 2011) that was submitted to Ecology on March 25, 2011. The Work Plan included a proposal for the expansion of the SVE system to include 17 additional SVE well locations, additional bioremediation injections in the 2008 interim action area, and bioremediation injections in an expanded interim action area. On May 23, 2011, Ecology approved the Work Plan. The bioinjection activities were conducted from July 21 through August 31, 2011, and the SVE installation activities were conducted from August 2 through 5, 2011, and August 29 through October 3, 2011. The 2008 and 2011 bioremediation injection locations are shown on Figure 11.

The initial Facility SVE system installed in 2008, herein referred to as the 2008 SVE system, was comprised of 17 wells, divided among five branches, which were connected by a network of underground piping as shown on drawings provided in Appendix E. As part of the 2011 SVE system expansion, Branches 4 and 5 were disconnected from the other system branches and were connected to a new blower unit located approximately 150 feet to the northeast of the railroad tracks (Figure 13). The wells and piping associated with Branches 4 and 5 and the associated blower unit are herein referred to as the North System.

In August 2011, 17 additional SVE well pairs (for a total of 34 additional SVE wells) were installed within and to the south of Warehouse No. 2625 (a.k.a. the Butler Building), in general accordance with the Work Plan (Ash Creek 2011; Figure 13). For each well pair, one well is screened in vadose-zone soils from 10 to 15 feet bgs and the second well is screened in vadose-zone soils from 15 to 25 feet bgs. These 17 well pairs, along with the Branch 1 through 3 wells from the 2008 SVE system, are piped underground to

a blower unit located outside of the southeast corner of Warehouse No. 2625. These SVE wells, associated underground piping, and the blower unit are herein referred to as the South System.

5.2. Summary of 2016 Interim Action

NuStar and the POV submitted a joint Feasibility Study (FS) to Ecology in March 2014 (Apex and Parametrix 2014). To avoid potential delays in groundwater treatment while working through the FS and the associated regulatory approval process, NuStar proposed to implement a portion of the recommended remedial action for the NuStar source area as an interim action. The details of the proposed interim action were submitted to Ecology in an *Interim Action Work Plan* on September 15, 2015. After a 30-day public comment period from May 12 to June 10, 2016, the Work Plan was approved on June 14, 2016. The interim action consisted of bioremediation injections along the southern portion of the NuStar terminal near the seawall. Per Ecology's request, the interim action also included baseline sediment and surface water sampling in the Columbia River. Additionally, enhanced bioremediation injections were implemented in an isolated area to the northwest of the NuStar terminal (the Northwest [NW] Area), which has been less responsive to monitored natural attenuation than at the NuStar terminal. The NW Area bioremediation injections were completed as a joint project between NuStar and the POV.

The NW Area injections were completed in July 2016 and included the injection of 52,000 gallons of bioremediation oil substrate (EOSPRO, diluted with water) into the Shallow Zone groundwater through 30 boreholes in the vicinity of and between (NuStar) monitoring wells MW-14 and MW-26. Figure 12 illustrates the approximate boring locations in the NW Area. The same substrate material was injected at the NuStar terminal in August and September 2016 and included the injection of 100,000 gallons of EOSPRO (diluted with water) into 72 borings along the southern portion of the Facility, adjacent to the seawall. Figure 12 identifies the approximate locations of the injection borings near the NuStar seawall. In accordance with the approved *Interim Action Work Plan*, a summary of the groundwater injection and surface/water sampling activities was provided to Ecology in an *Interim Action Summary Report* on June 29, 2017 (Apex 2017). The report included the results of the baseline surface water and sediment sampling as well as the results of two quarters of post interim action groundwater monitoring. A brief evaluation of the groundwater monitoring results from the interim action area is summarized in Section 5.3 below.

5.3. Interim Action Monitoring and Evaluation

This section summarizes the scope and results of groundwater monitoring that has been performed to evaluate the effectiveness of interim actions. Effectiveness is evaluated by reviewing HVOC and ethene concentration trends and TOC concentrations in groundwater. Effectiveness of the SVE system is evaluated based on the mass removal rate.

5.3.1. Enhanced Bioremediation Injections

Groundwater samples collected from wells EX, MP-1, MW-7, MW-12, MW-13, MW-14, MW-19, MW-24i, MW-26, MGMS1-43, MGMS2-40, and MGMS3-43 during the first and second quarters 2023 sampling events were analyzed for TOC by EPA Method 5310D and ethene by Method RSK-175, to evaluate the performance of the bioremediation injections.

In addition to the laboratory analysis of groundwater samples, field measurements of oxidation-reduction potential (ORP) and dissolved oxygen (DO) were collected from the monitoring wells during the first and second quarters 2023 monitoring events. Table 5 shows the results of interim action groundwater monitoring from the February 2007 baseline event through the second quarter 2023 monitoring event. Wells MW-24i and MGMS2-40 are not located within the 2008 interim action injection area but are located within the footprint of the 2011 and 2016 interim action areas; therefore, interim action monitoring data for these wells are presented from the second quarter 2011 baseline event through the second quarter 2023. Wells MW-13, MW-14, MW-19, MW-26, MGMS-1, and MGMS-3 are not located within the 2008 or 2011 interim action areas but are within the 2016 interim action area; therefore, monitoring data for those wells are presented from September 2016 through June 2023.

A discussion of reductive dechlorination of HVOCs in groundwater from prior to the 2008 interim action through the second quarter 2023 is provided below.

5.3.1.1. HVOC Concentrations Evaluation

Bioremediation injections in the primary source area at the Facility were initiated in 2008 and expanded in 2011²; bioremediation injections along the riverbank and in the NW Area were completed in 2016. Additionally, seven injection boreholes were advanced in 2016 in the area of wells MP-1 and EX³, located on the western side of the (former) primary source area. The following paragraphs evaluate the results to date in each of these areas.

Primary Source Area. Concentration trend plots for PCE, TCE, total dichloroethene (DCE), and vinyl chloride (VC) in 2008/2011 interim action area wells EX, MGMS2-40, MP-1, and MW-7 are provided in Appendix F. HVOC data are included from the baseline monitoring event that was completed prior to the 2008 interim action (first quarter 2007; second quarter 2007 for well MGMS2-40) through June 2023. With the exception of well EX, concentrations of PCE and TCE have decreased in the interim action monitoring wells. The concentrations of PCE and TCE in wells MW-7 and MGMS2-40 have been reduced by more than 88 percent since the interim measures were initiated. The concentrations of PCE and TCE in well MP-1 have decreased by approximately 34 percent and 80 percent, respectively, between the February 2007 baseline event and the June 2023 monitoring event. The concentrations of PCE and TCE in well EX decreased by more than 99 percent between the February 2007 baseline event and the December 2018 monitoring event.

Monitoring well EX was identified as damaged during the first quarter of 2019 and was decommissioned during the third quarter 2019. The December 2018 sampling event was the last sampling event for well EX prior to the well decommissioning. In April 2021, a replacement monitoring well was installed adjacent to the abandoned well location. HVOC concentrations in samples collected from the replacement monitoring well EX between the second half of 2021 and June 2023 have been higher than the concentrations measured in the adjacent location during the last monitoring event in December 2018. This well will continue to be monitored to determine if concentrations trends are consistent with historical results from the abandoned well. Additional HVOC investigation is proposed for

² The description of the primary source area or “source area” is detailed in the Revised Remedial Investigation Report (Ash Creek 2009a); the location is identified on Figure 2 of this report.

³ Monitoring well EX has historically been referred to as EX-1 or EX. It is now referred to as EX.

this area as part of Phase II of the SRI and will provide more information about HVOC concentrations in the vicinity of well EX. More information on the additional investigation is provided in Section 7.0.

Another indicator of effective treatment of chlorinated ethenes is a decrease in the total molar chloroethene concentration (the molar concentration of PCE, TCE, DCE, and VC combined). The use of total molar concentrations allows an assessment of changes in the total number of related contaminant molecules as the reductive dechlorination process transitions from the relatively heavy PCE to the progressively lighter TCE, DCE, and VC. Molar concentration trend plots for the interim action wells are provided in Appendix F. Between the February 2007 baseline event and the June 2023 monitoring event, total molar concentrations in wells MP-1, MW-7 and MGMS2-40 decreased between 57 percent (well MP-1) to over 99 percent (well MW-7). Between the first sampling event in 2009 and the December 2018 monitoring event, total molar concentrations in well EX decreased over 99 percent. In the first nine samples collected from well EX (June 2021 to June 2023) after the replacement well was installed, the total molar ethene concentration in groundwater was higher in seven of the samples than February 2007 concentrations. The total molar concentrations in well EX during the June and September 2022 sampling events were lower than the 2007 baseline concentration. Concentration trends will continue to be evaluated in well EX. In addition, as discussed further in Section 7.0, NuStar is proposing additional soil and groundwater HVOC investigation at the Facility, likely during the fourth quarter 2023. The results will be used to evaluate current HVOC concentrations in the historical source areas and to further understand the remedial progress from interim actions conducted to date.

Riverbank Area. Wells MW-12, MW-13, MW-19, MGMS1-43, and MGMS3-40 are located within the 2016 riverbank interim action area and, therefore, are useful for evaluating the effectiveness of the 2016 interim action. Concentration trend plots for PCE, TCE, DCE, and VC in these wells are provided in Appendix F. As shown on the trend plots, monitoring results from the 2016 interim action area indicate reductions in concentrations of PCE and TCE of over 94 percent in groundwater from wells MW-12, MW-13, and MGMS3-40 after the 2016 enhanced bioremediation injections. For example, concentrations of PCE and TCE in well MW-13 in June 2016, prior to the injection event, were 2,470 and 1,820 µg/L, respectively. By June 2023, PCE and TCE were detected at 49.4 and 117 µg/L, respectively. DCE concentrations have also decreased. The DCE concentration in well MW-13 has been reduced by 74 percent since the 2016 enhanced bioremediation injections; concentrations of DCE in wells MGMS1-43 and MGMS3-40 have decreased by more than 80 percent since 2007 and 50 percent since 2016.

Unlike wells MW-12 and MW-13, HVOC concentrations in well MW-19 have not shown a discernable response to the 2016 oil injections. Well MW-19 is in an area of consistently flat groundwater gradient, and it appears, based on the TOC readings from this well (see Table 5), that the oil substrate did not reach the area of this well. However, the presence of VC in the groundwater samples from the well supports that reductive dechlorination is occurring near the well.

The first and second quarters 2023 results showed a continued decrease of ethene in most of the riverbank wells suggesting that the oil substrate is becoming depleted and enhanced reductive dechlorination has slowed significantly in response. Additional discussion of ethene production is provided in the sections below. Future quarterly monitoring will be utilized to further evaluate these concentration trends, both in the Shallow Zone source area as well as outside of the source area treatment zone and in Intermediate Zone groundwater.

Northwest Area. Wells MW-14 and MW-26 are located within the 2016 NW Area interim action area and, therefore, are useful for evaluating the effectiveness of the interim action in this area. Concentration trend plots for PCE, TCE, DCE, and VC in these wells are provided in Appendix F. Response to the 2016 interim action injections was delayed and reduced in these wells, likely due to the typically flat or north/northwest groundwater gradient slowing the spread of the oil substrate. However, average concentrations of PCE and TCE pre-2016 injections remain higher than average concentrations post-2016 injections for MW-14 and MW-26, indicating that although injections were not as effective in the NW Area, there still has been moderate success at decreasing concentrations. It should also be noted that the total molar ethene concentrations in both wells has continued to decrease, as shown on the trend plots in Appendix F.

Wells MW-14 and MW-26 are located on the periphery of the injection area, limiting their utility in monitoring the effectiveness of the injections. Continued quarterly groundwater monitoring will be conducted to further evaluate concentration trends. Additional soil and groundwater HVOC investigation is being proposed in the NW Area and will likely be conducted in the fourth quarter 2023. The additional data will provide updated information on the nature and extent of chlorinated HVOCs off site to the northwest of the NuStar leasehold.

5.3.1.2. Ethene Evaluation

Ethene is an end product of the reductive dechlorination process. The detection of ethene confirms the completion of the reductive dechlorination pathway and the destruction of the target HVOCs at the Facility. Ethene degrades quickly in most natural environments; therefore, observing increases in ethene concentration can be difficult. During the first semi-annual 2023 monitoring period, ethene was detected in three of the twelve 2016 interim action area monitoring wells sampled (MW-12, MW-13, and MGMS3-40). Further discussion of ethene results is provided below.

Primary Source Area. While the focus of the 2016 interim actions was not located in the area historically identified as the “primary source area,” there was some overlap between the 2008/2011 interim action injection areas and the 2016 interim action injection area, namely in the vicinity of wells MP-1 and EX. Concentrations of ethene in well MP-1 reached a maximum of 328 µg/L in March 2017, decreased to 83.2 µg/L in June 2017, and then decreased to below reporting limits (1.0 to 13 µg/L) in the samples collected since then (September 2017 through June 2023). These data suggest that the 2016 bioremediation substrate injected near well MP-1 was effective for stimulating reductive dechlorination; however, the mass of substrate may be diminished.

Ethene was detected in well EX during six consecutive sampling events following the 2016 interim actions, with the highest concentration measured in June 2018 (99.2 µg/L). In the September 2018 monitoring event, ethene was detected an order of magnitude lower (2.9 µg/L) and has not been detected in well EX during the subsequent eight sampling events. As described in Section 4.3, well EX was not sampled between December 2018 and June 2021; due to damage to the well, the well was decommissioned in September 2019 and a replacement well was installed adjacent to the former well on April 15, 2021.

Monitoring well MGMS2-40 is located near, but outside of, the 2016 interim action injection area, and within the footprint of the 2011 interim action injection area. Ethene concentrations in well MGMS2-40 increased in response to the 2011 injections and remained elevated, although with variability, through March 2018. Ethene was not detected in well MGMS2-40 in the July 2018 sample but was detected

during subsequent monitoring event samples through December 2020, at concentrations ranging from 1.4 to 78 µg/L. Ethene has not been detected (<1.0 µg/L) since the December 2020 monitoring event.

Riverbank Area. Prior to the 2016 interim action injections, ethene was not present in groundwater in wells located in the 2016 interim action area, including wells MW-12, MW-13, and MGMS3-40, as shown in Table 5. Since the completion of the 2016 interim action injections, ethene has been detected in all four 2016 interim action area wells. The presence of ethene suggests that the 2016 injections have successfully resulted in the complete reductive dechlorination of the PCE and TCE. A summary of the presence and persistence of ethene in each riverbank area interim action well is provided below; ethene concentrations are tabulated in Table 5:

- Ethene concentrations in well MW-12 increased from non-detect, prior to the 2016 interim action, to 75.2 µg/L in March 2017, and remained elevated between March 2017 and September 2017. Concentrations of ethene in well MW-12 have been variable since November 2017, with concentrations ranging from below reporting limits (ranging between 1.0 and 13.0 µg/L) up to 92 µg/L. The concentration of ethene in well MW-12 during this reporting period was 69 µg/L in March and 200 µg/L June. Note—the concentration of ethene in June 2023 was the highest since the interim action was initiated in September 2016.
- PCE and TCE concentrations in MW-13 have decreased significantly between September 2016 and June 2023 (from 5,090 µg/L and 951 µg/L, respectively, to 49.4 µg/L and 117 µg/L, respectively), but it was not until November 2017 that ethene was detected in the well. Beginning in November 2017, concentrations of ethene rose to a maximum concentration of 500 µg/L in July 2018 and then decreased to 7.1 µg/L by December 2018. Since December 2018, the concentrations of ethene in MW-13 have been variable ranging from below the reporting limit of 1.0 µg/L (multiple events) to 240 µg/L in September 2021. The ethene concentrations in MW-13 during March and June 2023 were 54 µg/L and 60 µg/L, respectively.
- Ethene was first detected in well MW-19 during the September 2017 monitoring event and was detected consistently until December 2019, with the highest concentration (271 µg/L) detected during the June 2018 sampling event. Concentrations have since decreased and have been below the reporting limit (1.0 µg/L) since the October 2020 sampling event, except for low detections during the June 2021, September 2021, and September 2022 sampling events (1.3, 1.4, and 1.3 µg/L, respectively). As previously stated, VC concentrations in groundwater samples collected from well MW-19 during the June 2018 monitoring event were the highest since the well was first sampled in 2002. Since then, VC has consistently been detected in well MW-19, but at variable concentrations (i.e., no discernable increasing or decreasing trend). Collectively, these data confirm reductive dechlorination around well MW-19 and that chlorinated HVOC mass is being degraded.
- Ethene was detected in well MGMS3-40 during the first monitoring event after the 2016 injections (December 2016) and has been detected during the subsequent monitoring events through June 2023, at concentrations ranging from 1.2 µg/L to 242 µg/L. The only exceptions were the December 2019 and December 2021 sampling events when concentrations of ethene were below the reporting limit (1.0 µg/L).

NW Area. Ethene concentrations in wells MW-14 and MW-26 have not been detected above the reporting limit (1.0 to 13 µg/L) since ethene monitoring was initiated in September 2016. As stated above, these

wells are located on the periphery of the injection area, limiting their utility in monitoring the effectiveness of the injections.

5.3.1.3. Total Organic Carbon Evaluation

The presence of elevated TOC indicates that the bioremediation injections have increased the electron donor carbon source needed to reductively dechlorinate the HVOCs present in groundwater at the Facility. While a baseline monitoring event was not conducted prior to the 2016 injection event, TOC data are available for wells MP-1 and MW-12 (riverbank area) for the event prior to the injections (June 2016) and the two events concurrent with and following the injections (September and December 2016). TOC was further analyzed between March 2017 and June 2023 at select wells. TOC results are tabulated in Table 5. A discussion of the TOC results is provided below.

Primary Source Area. Seven bioremediation injection points were located near well MP-1 during the 2016 interim action. In well MP-1, TOC values increased by over three orders of magnitude between June and September 2016, with concentrations remaining elevated during the December 2016 event. During the March 2017 event, the TOC values remained stable from the previous event; however, TOC values decreased in June 2017 by an order of magnitude and further decreased in September 2017 by another order of magnitude before remaining stable to slightly decreasing through June 2023. At well EX, the TOC concentration increased by two orders of magnitude following the 2016 interim action injections, then decreased an order of magnitude during the June 2017 event and remained relatively consistent, until the well was decommissioned, at concentrations ranging between 11 and 44 milligrams per liter (mg/L). When the replacement well was sampled for the first time in June 2021, the TOC concentration had decreased to 5.32 mg/L and has remained at similar levels since, ranging from 2.95 mg/L (March 2022) to 6.01 mg/L (September 2021). These results indicate utilization of the oil substrate in the dechlorination of HVOCs, supporting the significant decreases in HVOC concentrations observed following the 2016 bioremediation injections in this area.

Riverbank Area. The following describes TOC results in the riverbank portion of the 2016 interim action area (wells MW-12, MW-13, MW-19, MGMS3-40, and MGMS1-43).

- In groundwater collected from well MW-12, TOC concentrations increased by over three orders of magnitude between June and September 2016, with concentrations remaining elevated during the December 2016 monitoring event. Between December 2016 and March 2017, TOC concentrations in well MW-12 decreased by an order of magnitude and then gradually decreased another order of magnitude between June 2017 and June 2018. While there is seasonal variability in TOC concentrations in this well (with the most elevated concentrations typically in September), the overall TOC concentration in well MW-12 has decreased from July 2018 to June 2023.
- At well MW-13, TOC concentrations were elevated during the September 2016 sampling event, and then decreased by three orders of magnitude by the November 2017 event. Since November 2017, TOC concentrations in well MW-13 have steadily decreased through the June 2023 sampling event.
- At well MW-19, TOC values were low (one to two orders of magnitude below concentrations observed in wells MP-1 and MW-12) from September 2016 through November 2017, then increased by an order of magnitude during the March 2018 through September 2018 events. TOC concentrations decreased by up to an order of magnitude during most of 2019 and then increased again (between 14 and 40 µg/L) during the 2020 monitoring events. Since March 2021, the concentration of TOC in well MW-19 has remained fairly steady and below 10 µg/L.

- At well MGMS3-40, TOC concentrations increased during the September and December 2016 groundwater monitoring events, then decreased by an order of magnitude during the March 2017 event and have remained stable through June 2023.
- At well MGMS1-43, the TOC concentration in groundwater has remained relatively low and steady from September 2016 through June 2023 and does not appear to have been significantly influenced from the oil injections in 2016.

With the exception of well MGMS1-43, TOC concentrations in riverbank area wells indicate utilization of the oil substrate in the dechlorination of HVOCs, which is supported by decreasing HVOC concentrations in most riverbank area wells.

NW Area. In wells MW-14 and MW-26, TOC concentrations did not increase after the September 2016 injections. TOC levels in these wells have historically been low and stable. Concentrations of TOC in well MW-14 increased an order of magnitude, from 5.06 mg/L in September 2018 to 50 mg/L in December 2019 before decreasing to 4.22 mg/L in June 2020 and remained low and stable through the June 2023 sampling event (concentrations typically near or less than 3.0 mg/L).

Summary of Enhanced Bioremediation Results Following the 2016 Interim Action. The 2016 groundwater interim action was implemented in July through September 2016 and included over 72 bioremediation injections at the NuStar Facility and 30 bioremediation injections at the off-Facility NW Area. Since implementation, groundwater in the 2016 interim action area has been monitored for 20 quarters for indicators of reductive dechlorination. The results from the first and second quarters 2023 sampling events are consistent with previous events and indicate that reductive dechlorination is occurring. Specifically:

- Up to three orders of magnitude reduction of PCE and TCE concentrations have been observed between the September 2016 and June 2023 monitoring events in many of the 2016 interim action area wells.
- Observed trends in breakdown product concentrations are consistent with reductive dechlorination of chlorinated ethene compounds.
- After the 2016 injections, ethene was first detected in four riverbank interim action monitoring wells in March 2017. Detections of ethene in Facility wells have continued through June 2023, although concentrations are decreasing over time in most of the wells. TOC concentrations are also decreasing and are below 10 mg/L in the majority of wells, indicating that an additional injection event may be needed in the area to further reduce HVOC concentrations and achieve remediation goals. Additional HVOC investigation, proposed for the fourth quarter 2023, will aid in future HVOC remediation decisions.
- As identified above, wells MW-14 and MW-26 are located on the periphery of the injection area in the NW Area and provide limited utility in evaluating the effectiveness of the 2016 interim action in this area. However, HVOCs and total molar ethene concentrations in these wells have continued to decrease supporting that reductive dechlorination is occurring in this area.

5.3.2. SVE Systems—Monitoring and Mass Removal Evaluation

The following paragraphs summarize the monitoring and analytical results as well as the total HVOC mass removal for the North and South SVE Systems at the Facility. Field vapor measurements were collected

with a photoionization detector (PID). Effluent vapor samples from the SVE systems were collected into Summa™ canisters and submitted to Eurofins Air Toxics Inc. in Folsom, California, for analysis of HVOCs by EPA Method TO-15.

The North SVE System has been non-operational since May 2017 due to the blower motor failing. The rotor is locked and blown fuses were noted on two of the three legs. A replacement blower is required to return the North SVE system to operation. The terminal is planning modifications to the rail alignment at the Facility to accommodate modifications to one of its storage areas; part of the planned work will require the abandonment and potential relocation of several of the SVE wells in the North SVE system. As of June 2023, the modifications to the terminal infrastructure have not been initiated and the North SVE system remains non-operational.

Starting in May 2018, SVE monitoring events have occurred on a bi-monthly, rather than monthly, basis after it was deemed frequent enough to sufficiently maintain the system and quantify mass removal. The South SVE system monitoring events during the first semi-annual reporting period were conducted on January 16, March 13, and May 9, 2023. The North SVE System operational and analytical data are provided in Tables 6 and 7, respectively. As discussed above, the North SVE system was not operational during this reporting period; therefore, data are from the period prior to May 2017. South SVE System operational and analytical data are provided in Tables 8 and 9, respectively.

SVE System Mass Removal. The approximate HVOC mass removed by the North and South SVE Systems is presented in Tables 10 and 11 and on Figures 14 and 15, respectively. The North and South Systems have removed approximately 232 and 4,926 pounds of HVOCs, respectively, since startup in October 2011. Including the mass removed from the 2008 SVE System, the total mass removal by SVE at the Facility to date is approximately 8,339 pounds.

6.0 INFRASTRUCTURE MAINTENANCE

The following section describes maintenance and upgrades at the Facility.

6.1. SVE System

In November 2017, blue water was observed in the knockout drum for the South SVE system and has been observed intermittently since that time. Observation and maintenance of the SVE system to find the source of the blue water has been ongoing. As detailed in previous groundwater monitoring reports prepared for the Facility since 2017, the condition of the SVE system blower, wells, and piping has been regularly assessed to identify the cause of the observed effect on the knockout drum water. Investigations will continue to determine the source of the blue water.

During the January 16 and March 13, 2023 SVE system monitoring events, approximately 15 and 14 gallons of water were observed in the knockout drum and subsequently removed from the system, respectively. The water that was removed from the knockout drum during the January and March SVE system monitoring events was not blue. No blue water was observed in the knockout drum during the May 2023 SVE system monitoring event. Typically, the blue water is only observed from late autumn through early summer and is positively correlated with local precipitation.

During the second quarter 2023 groundwater monitoring event, the SVE system was not operating upon arrival at the Facility. The system was not restarted as the cause of the shutdown was unknown and could indicate an automated shutdown due to operation outside of normal parameters. The system will be inspected, repaired (if necessary), and restarted during the third quarter 2023.

6.2. SVE System Annual Well Inspection and Subsequent Maintenance

During the March 2023 groundwater monitoring event, a comprehensive annual well inspection was conducted by a licensed Washington driller to assess well maintenance, upgrades, or repairs that may be needed during the upcoming year. Note—this annual inspection was above and beyond the routine observations, maintenance, and occasional repairs conducted during routine quarterly monitoring. In addition to routine maintenance such as gasket cleaning, replacement of missing bolts, re-tapping bolt holes, replacement of degrading well caps, etc., the following proactive repairs were completed.

- Well MW-9 Located in NuStar rail ballast. The concrete and monument were removed and the area below the coupler was excavated. A new coupler and riser were installed and the original monument was concreted in place.
- Wells MW-23, S-1, MW-8, MW-20i, MW-21i-105 and MW-23i: The top of casing was positioned close to the underside of the monument. The casing was cut down 1 to 3 inches (as needed) and the cap was replaced.
- Wells MW-10, MW-14, MW-21i-40, S-2, MW-24i, MP-1 and EW-1: The casing couplers were replaced and new concrete was set using an appropriately sized Sonotube® form (either 4 or 6 inch diameter).

All wells repairs/upgrades were completed by a licensed Washington driller at GeoEngineers. The repairs involved only the upper casing or monuments and did not involve modifying the well seal. The landowner (the POV) was notified in advance of all well maintenance/repair activities. For the wells in which casing elevation was modified, the wells were resurveyed as noted in the section below.

6.3. Well Survey Activities

On May 25, 2023, a licensed Washington well surveyor with Mackay + Sposito resurveyed the top of casing elevations of select NuStar monitoring wells. The casings of wells MP-1, MW-24i, S-1, S-2, MW-23i, MW-10, MW-8, MW-21i-40, MW-20i, EW-1, MW-9 were modified during the well maintenance work described in Section 6.2, and thus required a new survey. In addition, the tops of casing elevation of the multi-port wells (MGMS1 MGMS2, and MGMS-3) were also resurveyed to verify the top of casing elevation for those wells. The updated tops of casing elevations are provided in Table 2. A copy of the well survey is provided in Appendix G.

7.0 FUTURE ACTIVITIES AND SUPPLEMENTAL REMEDIAL INVESTIGATION

Groundwater monitoring, conducted on a quarterly basis, and reporting on a semi-annual basis will continue in accordance with the *Groundwater Monitoring Plan* approved by Ecology in 2008 (Ash Creek 2008).

As noted in Section 6.1, the SVE system will be re-started once it can be inspected by a remediation contractor and repaired (if needed). Once restarted, the SVE system operations and maintenance will

continue bi-monthly in accordance with the schedule proposed in the 2011 *Interim Action Evaluation Report* (Ash Creek 2012).

In 2019, Ecology issued Agreed Order DE 15806 for a Supplemental Remedial Investigation for the presence of metals in site media due to operations at the adjacent Kinder Morgan Bulk Terminal and ammonia, nitrates, and nitrites due to fertilizer operations at NuStar. As a requirement of the Agreed Order, NuStar, the POV, and Kinder Morgan (the Parties) submitted a *Draft Supplemental Remedial Investigation Work Plan* (SRIWP) to Ecology in February 2020 (Cascadia 2020), proposing a stormwater, soil, groundwater, and sediment investigation to evaluate the nature and extent of metals and fertilizer constituents in site media. The Work Plan also included additional delineation of HVOCs in groundwater to the west of well MW-26 and of HVOCs in site sediment. The Parties responded to Ecology's comments and provided a revised Draft SRIWP to Ecology in June 2020. The Parties received additional comments from Ecology in July 2020. On December 18, 2020, a final SRIWP was submitted to Ecology and was approved by the agency on December 21, 2020. In accordance with the Order, implementation of the SRIWP was completed from March through May 2021. The POV conducted additional soil, groundwater, stormwater and riverbank investigation during the fourth quarter 2021 and first quarter 2022 as part of a Baseline Assessment.

The Baseline assessment was conducted to document environmental conditions in the Kinder Morgan operational areas at the time the Kinder Morgan lease ended on December 31, 2021 and prior to a new lessee, Metro Ports, taking over the leasehold and copper handling operations in January 2022.⁴ The results of the SRI have been presented to Ecology during online meetings during the first half of 2022 and the results of the sediment investigation were submitted to Ecology in a Phase I SRI Results Sediment Report on November 22, 2022. A *Draft Phase SRI Upland Soil and Groundwater Investigation* report was submitted to Ecology on June 9, 2023, documenting the soil and groundwater investigation conducted during 2021, the POV baseline assessment, and a work plan for additional (Phase II) upland and riverbank investigation. The proposed investigation includes additional delineation and source area evaluation for fertilizer constituents in Facility groundwater and additional HVOC investigation in soil and groundwater in the NW Area, historical source areas, and along the top of the riverbank. Implementation of the field work is tentatively scheduled for the fourth quarter 2023, upon Ecology approval of the proposed work scope.

The Parties will also submit a joint memorandum to Ecology during the third quarter 2023, documenting proposed screening levels for the contaminants of concern (COCs) identified in the *SRI Upland Results Report and Work Plan*.

8.0 REFERENCES

Apex Companies, LLC (Apex), 2013. *Final 2013 Remedial Investigation Report*. NuStar Terminals Services, Inc. Vancouver Terminal Vancouver, Washington. August 14, 2013.

⁴ It is our understanding that as of January 1, 2023, Vancouver Bulk Terminal (VBT) is now the operator of the bulk mineral storage facility located immediately to the north and west of the NuStar leasehold.

Apex, 2016. *2015 Interim Action Work Plan*. NuStar Vancouver Facility. Vancouver, Washington. April 15, 2016.

Apex, 2017. *Interim Action Summary Report*. NuStar Vancouver Facility. Vancouver, Washington. June 29, 2017.

Apex and Parametrix Inc., 2014. *Feasibility Study Report NuStar, Cadet, and Swan Manufacturing Company Sites*. March 14, 2014.

Ash Creek Associates, Inc. (Ash Creek), 2008. *Groundwater Monitoring Plan, NuStar Vancouver Facility, Vancouver, Washington*. May 1, 2008.

Ash Creek, 2009a. *Revised Remedial Investigation Report, NuStar Terminals Services, Inc. Vancouver Main Terminal*. October 1, 2009.

Ash Creek, 2009b. *Interim Action Installation Report*. NuStar Terminals Services, Inc., Vancouver Washington. May 5, 2009.

Ash Creek, 2011. *2011 Interim Action Work Plan NuStar Vancouver Facility, Vancouver, Washington*. March 25, 2011.

Ash Creek, 2012. *2011 Interim Action Evaluation Report*. NuStar Vancouver Facility, Vancouver, Washington. March 29, 2012.

Cascadia, 2020. *Draft Supplemental Remedial Investigation Work Plan NuStar Terminals Services, Inc. Vancouver Main Terminal, Vancouver, Washington*. February 14, 2020.

Table 1
Groundwater Monitoring Plan—First and Second Quarters 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Monitoring Program	Well ID	Groundwater Zone	Included Monitoring Wells		Notes
			First Quarter	Second Quarter	
Groundwater monitoring includes depth-to-water measurement.	MW-1	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-2	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-3	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-5	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-6	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-7	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-8	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-9	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-10	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-12	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-13	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-14	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-15	Shallow	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-16	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-17	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-18i	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-19	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-19i	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-20i	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-21i-40	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-21i-105	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-22i	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-23i	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-24i	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-24d	Deep	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-25i	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-26	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MW-30i	Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	
	MW-31i	Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	
	MW-32s	Shallow	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	MW-32i	Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	
	MGMS1-3(43)	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS1-2 (60)	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS1-1(110)	Lower Intermediate	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS2-4(40)	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS2-3 (60)	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS2-2(110)	Lower Intermediate	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS2-1(132)	Lower Intermediate	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS3-4(40)	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	MGMS3-3(60)	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
MGMS3-2(101)	Lower Intermediate	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
MGMS3-1(132)	Lower Intermediate	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
MW-E	Shallow	<input type="checkbox"/>	<input type="checkbox"/>		
MW-F	Shallow	<input type="checkbox"/>	<input type="checkbox"/>		
EW-1	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
EX	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
MP-1	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
MP-2	Shallow	<input type="checkbox"/>	<input type="checkbox"/>		
MP-3	Shallow	<input type="checkbox"/>	<input type="checkbox"/>		
MP-4	Shallow	<input type="checkbox"/>	<input type="checkbox"/>		
S-1	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
S-2	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Notes:

- = Included in sampling program represented in this report.
- = Not included in sampling program represented in this report; water level measurement only.
- Wells MW-E, MW-G, MW-30i, MW-31i, and MW-32i are sampled by the Port of Vancouver.

Table 2
Groundwater Elevation Data: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
<i>Groundwater Monitoring Wells</i>			
MW-1 (32.60)	9/12/2022	27.26	5.34
	12/5/2022	27.21	5.39
	3/13/2023	27.08	5.52
	6/12/2023	25.88	6.72
MW-2 (34.04)	9/12/2022	28.60	5.44
	12/5/2022	28.80	5.24
	3/13/2023	28.12	5.92
	6/12/2023	28.21	5.83
MW-3 (34.41)	9/12/2022	28.84	5.57
	12/5/2022	28.07	6.34
	3/13/2023	27.48	6.93
	6/12/2023	26.95	7.46
MW-5 (33.86)	9/12/2022	28.40	5.46
	12/5/2022	28.33	5.53
	3/13/2023	28.22	5.64
	6/12/2023	25.02	8.84
MW-6 (32.83)	9/12/2022	27.01	5.82
	12/5/2022	26.87	5.96
	3/13/2023	26.88	5.95
	6/12/2023	24.93	7.90
MW-7 (33.74)	9/12/2022	28.11	5.63
	12/5/2022	28.28	5.46
	3/13/2023	28.03	5.71
	6/12/2023	24.70	9.04
MW-8 (33.97) (33.69)	9/12/2022	27.33	6.64
	12/5/2022	27.90	6.07
	3/13/2023	26.99	6.98
	6/12/2023	24.32	9.37
MW-9 (33.86) (33.98)	9/12/2022	28.18	5.68
	12/5/2022	28.44	5.42
	3/13/2023	28.15	5.71
	6/12/2023	24.78	9.20
MW-10 (34.50) (34.37)	9/12/2022	27.21	7.29
	12/5/2022	28.23	6.27
	3/13/2023	27.92	6.58
	6/12/2023	24.89	9.48

Table 2
Groundwater Elevation Data: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-12 (31.43)	9/12/2022	26.10	5.33
	12/5/2022	25.76	5.67
	3/13/2023	26.03	5.40
	6/12/2023	24.70	6.73
MW-13 (33.15)	9/12/2022	27.61	5.54
	12/5/2022	27.63	5.52
	3/13/2023	27.56	5.59
	6/12/2023	25.38	7.77
MW-14 (33.79)	9/12/2022	28.12	5.67
	12/5/2022	28.45	5.34
	3/13/2023	28.21	5.58
	6/12/2023	27.76	6.03
MW-15 (39.22)	9/12/2022	32.95	6.27
	12/5/2022	33.16	6.06
	3/13/2023	33.09	6.13
	6/12/2023	30.40	8.82
MW-16 (33.05)	9/12/2022	27.77	5.28
	12/5/2022	27.90	5.15
	3/15/2023	28.84	4.21
	6/12/2023	26.64	6.41
MW-17 (32.65)	9/12/2022	26.77	5.88
	12/5/2022	26.89	5.76
	3/13/2023	26.54	6.11
	6/12/2023	27.61	5.04
MW-18i (33.40)	9/12/2022	27.80	5.60
	12/5/2022	28.38	5.02
	3/13/2023	26.97	6.43
	6/12/2023	27.44	5.96
MW-19 (33.59)	9/12/2022	28.04	5.55
	12/5/2022	28.12	5.47
	3/13/2023	27.97	5.62
	6/12/2023	25.33	8.26
MW-19i (33.62)	9/12/2022	27.95	5.67
	12/5/2022	28.67	4.95
	3/13/2023	27.17	6.45
	6/12/2023	27.78	5.84

Table 2
Groundwater Elevation Data: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-20i (33.14) (31.20)	9/12/2022	27.62	5.52
	12/5/2022	28.17	4.97
	3/13/2023	26.91	6.23
	6/12/2023	26.90	4.30
MW21i-40 (34.10) (33.66)	9/12/2022	28.54	5.56
	12/5/2022	29.04	5.06
	3/13/2023	27.11	6.99
	6/12/2023	27.65	6.01
MW-21i-105 (33.99)	9/12/2022	27.49	6.50
	12/5/2022	28.92	5.07
	3/13/2023	27.64	6.35
	6/12/2023	27.96	6.03
MW-22i (34.39)	9/12/2022	28.83	5.56
	12/5/2022	29.00	5.39
	3/13/2023	28.04	6.35
	6/12/2023	28.37	6.02
MW-23i (33.80) (33.64)	9/12/2022	28.07	5.73
	12/5/2022	28.46	5.34
	3/13/2023	27.25	6.55
	6/12/2023	27.74	5.90
MW-24i (33.47) (33.82)	9/12/2022	27.22	6.25
	12/5/2022	28.13	5.34
	3/13/2023	26.82	6.65
	6/12/2023	27.91	5.91
MW-25i (33.58)	9/12/2022	27.97	5.61
	12/5/2022	28.25	5.33
	3/13/2023	27.12	6.46
	6/12/2023	27.67	5.91
MW-26 (33.73)	9/12/2022	27.93	5.80
	12/5/2022	28.40	5.33
	3/13/2023	28.08	5.65
	6/12/2023	24.27	9.46
MW-24d (33.91)	9/12/2022	28.56	5.35
	12/5/2022	28.87	5.04
	3/13/2023	27.51	6.40
	6/12/2023	28.12	5.79

Table 2
Groundwater Elevation Data: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
EW-1 (31.07) (32.81)	9/12/2022	25.75	5.32
	12/5/2022	25.46	5.61
	3/13/2023	25.55	5.52
	6/12/2023	24.71	8.10
EX (33.24)	9/12/2022	27.74	5.50
	12/5/2022	27.82	5.42
	3/13/2023	27.67	5.57
	6/12/2023	24.82	8.42
MP-1 (33.30) (33.71)	9/12/2022	28.27	5.03
	12/5/2022	28.41	4.89
	3/13/2023	28.28	5.02
	6/12/2023	24.85	8.86
<i>Secor Interim Action Pilot Study Wells</i>			
S-1 (32.72) (32.69)	9/12/2022	27.04	5.68
	12/5/2022	27.47	5.25
	3/13/2023	26.28	6.44
	6/12/2023	26.91	5.78
S-2 (33.18) (32.90)	9/12/2022	27.82	5.36
	12/5/2022	28.19	4.99
	3/13/2023	26.74	6.44
	6/12/2023	27.09	5.81
<i>Multi-Level Monitoring Wells</i>			
MGMS1-3 (43)* (32.86) (32.96)	9/12/2022	27.68	5.18
	12/5/2022	27.81	5.05
	3/13/2023	27.01	5.85
	6/12/2023	25.65	7.31
MGMS1-2(60)* (32.86) (32.94)	9/12/2022	27.38	5.48
	12/5/2022	28.01	4.85
	3/13/2023	26.66	6.20
	6/12/2023	27.43	5.51
MGMS1-1(110)* (32.86) (32.93)	9/12/2022	27.46	5.40
	12/5/2022	28.01	4.85
	3/13/2023	26.61	6.25
	6/12/2023	27.42	5.51
MGMS2-4(40)* (32.59) (32.89)	9/12/2022	27.51	5.08
	12/5/2022	27.47	5.12
	3/13/2023	27.12	5.47
	6/12/2023	24.56	8.33

Table 2
Groundwater Elevation Data: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MGMS2-3(60)* (32.59) (32.93)	9/12/2022	27.41	5.18
	12/5/2022	27.97	4.62
	3/13/2023	26.68	5.91
	6/12/2023	27.46	5.47
MGMS2-2(110)* (32.59) (32.94)	9/12/2022	27.49	5.10
	12/5/2022	27.97	4.62
	3/13/2023	26.72	5.87
	6/12/2023	27.37	5.57
MGMS2-1(132)* (32.59) (32.93)	9/12/2022	27.47	5.12
	12/5/2022	27.97	4.62
	3/13/2023	26.66	5.93
	6/12/2023	27.37	5.56
MGMS3-4(40)* (31.65) (31.71)	9/12/2022	26.08	5.57
	12/5/2022	26.69	4.96
	3/13/2023	25.52	6.13
	6/12/2023	25.81	5.90
MGMS3-3(60)* (31.65) (31.69)	9/12/2022	26.11	5.54
	12/5/2022	26.69	4.96
	3/13/2023	25.31	6.34
	6/12/2023	26.31	5.38
MGMS3-2(101)* (31.65) (31.71)	9/12/2022	26.25	5.40
	12/5/2022	26.67	4.98
	3/13/2023	25.39	6.26
	6/12/2023	26.33	5.38
MGMS3-1(132)* (31.65) (31.73)	9/12/2022	25.99	5.66
	12/5/2022	26.67	4.98
	3/13/2023	25.39	6.26
	6/12/2023	26.32	5.41
<i>Port of Vancouver Wells</i>			
MW-30i (29.77)	03/27/17	11.42	18.35
	06/12/17	15.55	14.22
	09/25/17	26.36	3.41
	11/06/17	Well Abandoned	
MW-31i** (31.33)	6/13/2022	NM	NM
	9/12/2022	NM	NM
	12/5/2022	NM	NM
	3/13/2023	NM	NM

Table 2
Groundwater Elevation Data: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-32s (34.34)	9/12/2022	28.67	5.67
	12/5/2022	28.36	5.98
	3/13/2023	28.53	5.81
	6/12/2023	27.00	7.34
MW-32i (34.41)	9/12/2022	28.92	5.49
	12/5/2022	29.41	5.00
	3/13/2023	28.10	6.31
	6/12/2023	28.41	6.00
MW-E ** (30.64)	6/13/2022	NM	NM
	9/12/2022	NM	NM
	12/5/2022	NM	NM
	3/13/2023	NM	NM
MW-F (34.11)	9/12/2022	28.97	5.14
	12/5/2022	Below top of pump	NM
	3/13/2023	27.89	6.22
	6/12/2023	29.02	5.09

Notes:

1. TOC = Top of casing; BTOC = Below top of casing.
2. Utilizes survey information from June 2010 and June 2021 (for select wells resurveyed). NGVD29 datum (feet mean sea level).
3. * Water levels measurement points are located at the top of the plastic fittings mounted on the well covers.
4. NM = Not measured.
5. **The casing has been modified at Port of Vancouver well MW-E and MW-31i. The TOC elevation has not yet been re-surveyed, so groundwater elevation data for these wells may be inaccurate.
6. Wells that display two TOC elevations were resurveyed on May 25, 2023 prior to the 2nd quarter 2023 monitoring event.

Table 3
Groundwater Analytical Results: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		Concentrations in µg/L (ppb)										
MW-1	9/15/2022	6.41	<0.400	0.450	112.0	1.730	0.500	19.1	0.730	<0.500	16.60	8.68
	12/6/2022	4.37	<0.400	0.410	82.3	1.29	<0.500	30.3	0.560	<0.500	15.8	3.08
	3/17/2023	3.92	<0.400	0.510	68.7	1.07	<0.500	14.0	<0.400	<0.500	13.4	0.820
	6/14/2023	4.82	<0.400	0.540	75.9	1.23	0.530	11.2	<0.400	<0.500	13.9	2.05
MW-2	9/15/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/8/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/16/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/13/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-3	9/15/2022	2.720	<0.400	<0.400	41.9	<0.800	<1.00	107	1.78	<1.00	24.5	<0.800
	12/6/2022	1.13	<0.400	<0.400	31.4	1.23	<0.500	137	1.74	<0.500	29.5	<0.400
	3/16/2023	0.940	<0.400	<0.400	35.1	1.34	0.980	144	1.79	<0.500	31.7	<0.400
	6/13/2023	0.720	<0.400	<0.400	23.7	1.19	<0.600	136	1.77	<0.500	23.9	<0.400
MW-5	9/14/2022	0.430	<0.400	<0.400	2.7	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	1.8
	12/8/2022	<4.00	<4.00	<4.00	279	<4.00	<5.00	<4.00	<4.00	<5.00	<4.00	30.3
	3/15/2023	2.34	<0.400	<0.400	59.5	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	10.5
	6/15/2023	0.590	<0.400	<0.400	87.1	0.510	<0.500	<0.400	<0.400	<0.500	8.12	5.04
MW-6	9/15/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.540	<0.400	<0.500	<0.400	<0.400
	12/6/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-7	9/15/2022	1.26	<0.400	<0.400	31.3	<0.400	<0.500	30.9	<0.400	<0.500	13.0	0.66
	9/15/2022 DUP	1.33	<0.400	<0.400	32.2	<0.400	<0.500	36.7	<0.400	<0.500	15.6	0.62
	12/7/2022	4.22	<0.400	0.930	41.1	0.440	<0.500	118.0	0.570	<0.500	46.3	0.560
	12/7/2022 DUP	4.49	<0.400	1.070	43.3	0.500	<0.500	124	0.650	<0.500	48.5	0.540
	3/14/2023	1.97	<0.400	0.430	22.1	<0.400	<0.500	67.0	<0.400	<0.500	27.3	0.820
	3/14/2023 DUP	1.95	<0.400	0.460	22.6	<0.400	<0.500	63.4	<0.400	<0.500	27.8	0.800
	6/15/2023	<0.400	<0.400	<0.400	3.34	<0.400	<0.500	19.0	<0.400	<0.500	5.79	<0.400
	6/15/2023 DUP	<0.400	<0.400	<0.400	3.04	<0.400	<0.500	18.4	<0.400	<0.500	5.69	<0.400
MW-8	9/14/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.88	<0.400	<0.500	<0.400	<0.400
	12/7/2022	<0.400	<0.400	<0.400	0.75	<0.400	<0.500	3.20	<0.400	<0.500	<0.400	<0.400
	3/15/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.49	<0.400	<0.500	<0.400	<0.400
	6/13/2023	<0.400	<0.400	<0.400	3.43	<0.400	<0.500	2.83	<0.400	<0.500	<0.400	<0.400
MW-9	9/15/2022	<0.400	<0.400	<0.400	0.500	<0.400	<0.500	48.2	1.15	<0.500	12.4	<0.400
	12/7/2022	0.720	<0.400	<0.400	21.400	0.970	<0.500	172	3.26	<0.500	48.6	<0.400
	3/17/2023	0.990	<0.400	<0.400	40.2	2.17	<0.500	176	3.06	<0.500	66.6	0.720
	6/15/2023	2.01	<0.400	0.810	59.2	2.50	<0.500	175	1.90	<0.500	77.5	2.25
MW-10	9/14/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.55	<0.400	<0.500	1.66	<0.400
	12/8/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.66	<0.400	<0.500	1.90	<0.400
	3/15/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.40	<0.400	<0.500	2.09	<0.400
	6/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	9.89	<0.400	<0.500	4.93	<0.400
MW-12	9/14/2022	79.6	<0.400	10.2	2470	2.58	<0.500	0.850	<0.400	<0.500	11.6	2000
	9/14/2022 DUP	77.8	<0.400	9.41	2260	2.72	<0.500	0.750	<0.400	<0.500	10.0	1710
	12/8/2022	8.60	<0.400	0.73	165	0.530	<0.500	7.29	<0.400	<0.500	5.11	124
	12/8/2022 DUP	8.50	<0.400	0.73	161	0.510	<0.500	7.02	<0.400	<0.500	5.08	121
	3/16/2023	89.1	<0.400	2.23	563 CONT	1.35	<0.500	2.51	<0.400	<0.500	4.11	1210 CONT
	3/16/2023 DUP	88.3	<0.400	2.23	576	1.55	<0.500	2.43	<0.400	<0.500	4.06	1300
	6/14/2023	108	<4.00	<4.00	208	<10.0	<5.00	4.80	<4.00	<5.00	<4.00	1710
	6/14/23 DUP	109	<4.00	<4.00	204	<10.0	<5.00	4.10	<4.00	<5.00	<4.00	1680
MW-13	9/15/2022	29.8	<0.400	15.20	224	4.86	<0.500	4.10	<0.400	<0.500	15.7	764
	12/6/2022	2.94	<0.400	<0.400	5	<0.400	<0.500	3.40	<0.400	<0.500	4.5	14
	3/16/2023	22.3 Q-42	<0.400	8.08 Q-42	145	2.90	<0.500	0.680	<0.400	<0.500	1.19	268
	6/14/2023	26.1	<2.00	20.3	313	6.50	<2.50	49.4	<2.00	<2.50	117	426
MW-14	9/13/2022	6.760	<0.400	2.480	115.0	2.100	<0.500	109	0.800	<0.500	321.0	<0.400
	12/7/2022	1.10	<0.400	0.74	27.9	0.670	<0.500	59.6	<0.400	<0.500	108	<0.400
	3/15/2023	3.15	<0.400	1.57	58.8	1.59	<0.500	146	0.740	<0.500	223	<0.400
	6/13/2023	1.76	<0.400	0.860	27.5	0.760	<0.500	48.5	<0.400	<0.500	158	<0.400
MW-15	12/10/2021	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.583	<0.400	<0.500	<0.400	<0.400
	6/15/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.400	<0.400	<0.500	<0.400	<0.400
	12/5/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.470	<0.400	<0.500	<0.400	<0.400
	6/15/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.580	<0.400	<0.500	<0.400	<0.400
MW-16	9/14/2022	0.490	<0.400	0.480	84.1	<0.400	<0.500	113	0.570	<0.500	25.0	<0.400
	12/7/2022	<0.400	<0.400	<0.400	20.8	<0.400	<0.500	22.8	<0.400	<0.500	4.65	<0.400
	3/15/2023	<0.400	<0.400	<0.400	16.6	<0.400	<0.500	57.0	0.420	<0.500	7.52	<0.400
	6/15/2023	<0.400	<0.400	<0.400	27.1	<0.400	<0.500	56.1	0.430	<0.500	10.1	<0.400
MW-17	9/13/2022	<0.400	<0.400	<0.400	2.1	<0.400	<0.500	0.49	<0.400	<0.500	1.0	<0.400
	12/7/2022	0.440	<0.400	<0.400	27.4	<0.400	<0.500	5.98	<0.400	<0.500	11.4	<0.400
	3/15/2023	<0.400	<0.400	<0.400	4.61	<0.400	<0.500	1.33	<0.400	<0.500	3.13	<0.400
	6/13/2023	<0.400	<0.400	<0.400	2.15	<0.400	<0.500	0.990	<0.400	<0.500	1.90	<0.400
MW-18i	9/15/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.690	<0.400	<0.500	<0.400	<0.400
	12/7/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.770	<0.400	<0.500	<0.400	<0.400
	3/17/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.650	<0.400	<0.500	<0.400	<0.400
	6/15/2023	<0.400	<0.400	<0.400	0.750	<0.400	<0.500	0.970	<0.400	<0.500	<0.400	<0.400
MW-19	9/15/2022	17	<0.400	44.8	1,050	5.790	<0.500	6,010	48.2	<0.500	1,100	196
	9/15/2022 DUP	15	<0.400	42.6	898	5.980	<0.500	9,670	53.2	<0.500	1,600	156
	12/6/2022	69.0	<20.00	36.5	1,130	<20.0	<25.0	4,340	25.0	<25.0	1,390	36.5
	12/6/2022 DUP	74.5	<20.0	33.5	1,160	<20.0	<25.0	4,230	25.0	<25.0	1,360	39.5
	3/14/2023	21.0	<0.400	42.8	690	7.58	<0.500	5,770	34.1	<0.500	1,860	51.3
	3/14/2023 DUP	20.5	<2.00	36.2	697	12.6	<2.50	5,260	32			

Table 3
Groundwater Analytical Results: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		Concentrations in µg/L (ppb)										
MW-19i	9/14/2022	<0.400	<0.400	<0.400	0.890	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/7/2022	<0.400	<0.400	<0.400	0.570	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/14/2023	<0.400	<0.400	<0.400	1.13	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/14/2023	<0.400	<0.400	<0.400	0.690	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-20i	9/14/2022	<0.400	<0.400	<0.400	6.99	<0.400	<0.500	1.100	<0.400	<0.500	0.860	<0.400
	12/7/2022	<0.400	<0.400	<0.400	6.42	<0.400	<0.500	1.40	<0.400	<0.500	0.720	<0.400
	3/15/2023	<0.400	<0.400	<0.400	6.97	<0.400	<0.500	7.44	<0.400	<0.500	1.15	<0.400
	6/15/2023	<0.400	<0.400	<0.400	7.00	<0.400	<0.500	1.67	<0.400	<0.500	1.05	<0.400
MW-21i-105	9/15/2022	0.440	<0.400	<0.400	7.43	<0.400	<0.500	10.80	<0.400	<0.500	5.57	<0.400
	12/6/2022	0.880	<0.400	0.410	21.20	<0.400	<0.500	20.9	<0.400	<0.500	9.95	<0.400
	3/14/2023	<0.400 V-01	<0.400 V-01	<0.400 V-01	1.09 V-01	<0.400 V-01	<0.500 V-01	3.12 V-01	<0.400 V-01	<0.500 V-01	1.23 V-01	<0.400 V-01
	6/13/2023	0.700	<0.400	<0.400	13.3	<0.400	<0.500	20.9	<0.400	<0.500	11.0	<0.400
MW-21i-40	9/14/2022	1.68	<0.400	<0.400	34.8	0.420	<0.500	20.8	<0.400	<0.500	12.3	<0.400
	12/7/2022	1.03	<0.400	<0.400	22.0	<0.400	<0.500	16.9	<0.400	<0.500	8.4	<0.400
	3/15/2023	1.50	<0.400	<0.400	30.7	<0.400	<0.500	23.2	<0.400	<0.500	11.0	<0.400
	6/14/2023	1.69	<0.400	<0.400	34.9	0.410	<0.500	21.3	<0.400	<0.500	12.6	<0.400
MW-22i	9/14/2022	0.450	<0.400	<0.400	11.5	<0.400	<0.500	4.31	<0.400	<0.500	5.88	<0.400
	12/8/2022	0.520	<0.400	<0.400	16.3	<0.400	<0.500	3.35	<0.400	<0.500	6.04	<0.400
	3/16/2023	0.640	<0.400	<0.400	17.4	<0.400	<0.500	3.81	<0.400	<0.500	6.63	<0.400
	6/13/2023	0.510	<0.400	<0.400	12.3	<0.400	<0.500	6.04	<0.400	<0.500	6.15	<0.400
MW-23i	9/14/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/7/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.680	<0.400	<0.500	<0.400	<0.400
	3/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.520	<0.400	<0.500	<0.400	<0.400
	6/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.430	<0.400	<0.500	<0.400	<0.400
MW-24i	9/14/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/8/2022	1.07	<0.400	<0.400	15.5	<0.400	<0.500	38.6	<0.400	<0.500	9.46	<0.400
	3/15/2023	1.04	<0.400	<0.400	15.9	<0.400	<0.500	16.1	<0.400	<0.500	7.95	<0.400
	6/13/2023	0.850	<0.400	<0.400	14.3	<0.400	<0.500	9.97	<0.400	<0.500	5.21	<0.400
MW-24d	9/15/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/6/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/16/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-25i	9/14/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/8/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/15/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.410	<0.400	<0.500	<0.400	<0.400
MW-26	9/14/2022	2.40	<2.00	<2.00	31.9	<2.00	<2.50	88	<2.00	<2.50	151	<2.00
	12/8/2022	1.86	<0.800	<0.800	28.1	<0.800	<1.00	129.0	0.98	<1.00	156	<0.800
	3/15/2023	2.70	<2.00	<2.00	35.9	<2.00	<2.50	161	<2.00	<2.50	203	<2.00
	6/14/2023	3.50	<2.00	<2.00	43.7	<2.00	<2.50	141	<2.00	<2.50	219	3.05
MW-32s	3/9/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/15/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/17/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
EW-1	9/15/2022	<0.400	<0.400	<0.400	1.17	<0.400	<0.500	29.2	0.52	<0.500	7.36	<0.400
	12/8/2022	<0.400	<0.400	<0.400	1.68	<0.400	<0.500	23.2	0.400	<0.500	5.76	<0.400
	3/14/2023	<0.400	<0.400	<0.400	0.880	<0.400	<0.500	26.7	0.590	<0.500	7.81	<0.400
	6/14/2023	<0.400	<0.400	<0.400	0.730	<0.400	<0.500	19.3	0.410	<0.500	6.22	<0.400
S-1	9/13/2022	<0.400	<0.400	<0.400	3.30	<0.400	<0.500	1.59	<0.400	<0.500	1.44	<0.400
	12/7/2022	<0.400	<0.400	<0.400	0.98	<0.400	<0.500	1.68	<0.400	<0.500	1.14	<0.400
	3/16/2023	<0.400	<0.400	<0.400	0.450	<0.400	<0.500	0.870	<0.400	<0.500	0.460	<0.400
	6/14/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
S-2	9/13/2022	6.43	<0.400	<0.400	39.8	0.810	<0.500	<0.400	0.820	<0.500	2.06	<0.400
	12/7/2022	9.13	<0.400	<0.400	55.4	0.870	<0.500	<0.400	0.410	<0.500	3.05	<0.400
	3/14/2023	9.16	<0.400	<0.400	50.4	0.610	<0.500	<0.400	<0.400	<0.500	1.74	<0.400
	6/14/2023	5.99	<0.400	<0.400	36.2	0.510	<0.500	<0.400	0.650	<0.500	1.78	<0.400
MGMS1-3(43)	9/12/2022	124.0	<4.00	27.9	2,960	55.2	<5.00	193	<4.00	<5.00	471	176
	12/8/2022	104	<10.0	25.0	2,630	39.8	<12.5	175	<10.0	<12.5	385	41.2
	3/16/2023	113	<4.00	22.6	2,920	45.9	<5.00	161	<4.00	<5.00	428	42.6
	6/13/2023	104	<8.00	21.0	2,520	35.6	<10.0	133	<8.00	<10.0	370	141
MGMS1-2(60)	9/12/2022	1.29	<0.400	<0.400	16.0	<0.400	<0.500	20.9	<0.400	<0.500	9.74	<0.400
	12/8/2022	6.73	<0.400	<0.400	26.0	<0.400	<0.500	20.6	<0.400	<0.500	11.6	13.3
	3/16/2023	2.88	<0.400	<0.400	21.4	<0.400	<0.500	25.2	<0.400	<0.500	11.8	<0.400
	6/14/2023	1.03	<0.400	<0.400	14.9	<0.400	<0.500	18.4	<0.400	<0.500	11.3	<0.400
MGMS1-1(110)	12/7/2021	4.06	<0.400	<0.400	132	<0.400	<0.500	18.0	<0.400	<0.500	33.2	<0.400
	6/15/2022	2.17	<0.400	<0.400	70.7	<0.400	<0.500	14.2	<0.400	<0.500	19.1	<0.400
	12/8/2022	5.17	<0.400	0.590	154	0.660	<0.500	17.6	<0.400	<0.500	32.5	<0.400
	6/15/2023	3.94	<0.400	<0.400	122	0.490	<0.500	12.2	<0.400	<0.500	21.4	<0.400
MGMS2-4(40)	9/12/2022	16.2	<0.400	9.45	330	2.55	<0.500	271	0.960	<0.500	142	1.410
	12/6/2022	19.6	<0.400	9.63	297	2.58	<0.500	245	1.55	<0.500	153.0	0.400
	3/16/2023	17.7	<4.00	10.0	311	<4.00	<5.00	299	<4.00	<5.00	169	

Table 3
Groundwater Analytical Results: 2023
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		Concentrations in µg/L (ppb)										
MGMS2-2(110)	12/7/2021	<0.400	<0.400	<0.400	5.50	<0.400	<0.500	4.06	<0.400	<0.500	3.23	1.41
	06/14/2022	<0.400	<0.400	<0.400	3.51	<0.400	<0.500	3.86	<0.400	<0.500	2.29	0.820
	12/6/2022	0.590	<0.400	<0.400	17.6	<0.400	<0.500	3.48	<0.400	<0.500	3.83	3.65
	6/13/2023	<0.400	<0.400	<0.400	5.26	<0.400	<0.500	2.31	<0.400	<0.500	1.86	0.720
MGMS2-1(132)	12/7/2021	<0.400	<0.400	<0.400	7.65	<0.400	<0.500	3.47	<0.400	<0.500	3.40	2.12
	06/14/2022	<0.400	<0.400	<0.400	3.34	<0.400	<0.500	2.47	<0.400	<0.500	1.53	0.870
	12/6/2022	<0.400	<0.400	<0.400	5.72	<0.400	<0.500	3.30	<0.400	<0.500	2.11	0.980
	6/13/2023	<0.400	<0.400	<0.400	6.13	<0.400	<0.500	1.99	<0.400	<0.500	1.76	0.910
MGMS3-4(40)	9/14/2022	7.85	<2.00	<2.00	344	<2.00	<2.50	<2.00	<2.00	<2.50	<2.00	171.0
	9/14/2022 DUP	8.90	<2.00	<2.00	391	<2.00	<2.50	<2.00	<2.00	<2.50	<2.00	190.0
	12/6/2022	3.61	<0.400	<0.400	8.19	<0.400	<0.500	0.540	<0.400	<0.500	<0.400	58.5
	12/6/2022 DUP	3.78	<0.400	<0.400	7.94	<0.400	<0.500	1.02	<0.400	<0.500	<0.400	59.6
	3/16/2023	9.90	<4.00	<4.00	374	<4.00	<5.00	<4.00	<4.00	<5.00	<4.00	270
	3/16/2023 DUP	10.2	<4.00	<4.00	394	<4.00	<5.00	<4.00	<4.00	<5.00	<4.00	298
	6/15/2023	7.35	<0.400	<0.400	55.7	<0.400	<0.500	0.410	<0.400	<0.500	<0.400	90.1
6/15/2023 DUP	7.81	<0.400	<0.400	56.9	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	92.0	
MGMS3-3(60)	9/14/2022	0.450	<0.400	<0.400	15.30	<0.400	<0.500	2.51	<0.400	<0.500	2.620	0.430
	12/6/2022	<0.400	<0.400	<0.400	5.20	<0.400	<0.500	1.84	<0.400	<0.500	1.21	0.560
	3/16/2023	<0.400	<0.400	<0.400	19.3	<0.400	<0.500	2.73	<0.400	<0.500	2.92	<0.400
	6/15/2023	0.420	<0.400	<0.400	9.33	<0.400	<0.500	1.72	<0.400	<0.500	1.19	0.710
MGMS3-2(101)	12/10/2021	<0.400	<0.400	<0.400	1.480	<0.400	<0.500	3.49	<0.400	<0.500	1.920	<0.400
	06/14/2022	<0.400	<0.400	<0.400	3.46	<0.400	<0.500	6.31	<0.400	<0.500	3.61	<0.400
	12/6/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.52	<0.400	<0.500	0.460	<0.400
	6/15/2023	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.18	<0.400	<0.500	<0.400	<0.400
MGMS3-1(132)	12/10/2021	<0.400	<0.400	<0.400	4.86	<0.400	<0.500	7.30	<0.400	<0.500	5.35	<0.400
	06/14/2022	0.440	<0.400	<0.400	6.23	<0.400	<0.500	11.0	<0.400	<0.500	6.88	<0.400
	12/6/2022	<0.400	<0.400	<0.400	1.71	<0.400	<0.500	3.29	<0.400	<0.500	1.85	<0.400
	6/15/2023	<0.400	<0.400	<0.400	1.46	<0.400	<0.500	2.83	<0.400	<0.500	1.74	<0.400
EX*	9/14/2022	<20.0	<20.0	<20.0	466	<20.0	<25.0	2,340	<20.0	<25.0	224	24.50
	12/8/2022	<20.0	<20.0	<20.0	608	<20.0	<25.0	4,040	<20.0	<25.0	334	<20.0
	3/15/2023	<20.0	<20.0	<20.0	677	<20.0	<25.0	2,860	<20.0	<25.0	276	<20.0
	6/14/2023	<20.0	<20.0	<20.0	944	<20.0	<25.0	3,120	<20.0	<25.0	402	<20.0
MP-1	9/14/2022	<2.00	<2.00	<2.00	24.60	<2.00	<2.50	470	<2.00	<2.50	39.4	<2.00
	12/7/2022	<2.00	<2.00	<2.00	27.6	<2.00	<2.50	436	<2.00	<2.50	56.8	<2.00
	3/17/2023	<2.00	<2.00	<2.00	11.1	<2.00	<2.50	199	<2.00	<2.50	26.1	<2.00
	6/15/2023	3.30	<2.00	<2.00	65.9	<2.00	<2.50	1,000	2.85	<2.50	85.0	<2.00
MP-3	6/28/2018	5.24	<0.500	1.78	203	1.31	<0.500	398	1.82	<0.500	65.1	8.96
	9/27/2018	4.06	<0.400	3.52	187	1.60	<0.500	721	0.950	<0.500	148	0.730

Notes:

1. µg/L (ppb) = Micrograms per liter (parts per billion).
2. **Bold** values represent detected concentration of listed analyte.
3. < = Not detected at or above the specified laboratory method reporting limit (MRL).
4. Halogenated volatile organic compounds (HVOCs) analysis by U.S. Environmental Protection Agency (EPA) Method 8260B.
5. *This well was decommissioned during the third quarter 2019 and a replacement well was installed adjacent (offset 3 - 4 ft) in April 2021. Historically the well has been referred to as EX or EX-1.
6. V-01 = Sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
7. Q-42 = Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report)
8. CONT = The sample container provided for this analysis was not provided by Apex Laboratories, and has not been verified as part of the Quality System

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
EX	2/6/2007	26.7	108	0.49
	3/23/2009	14	43	0.54
	3/16/2010	3.4	89	0.71
	6/7/2011	–	150	<0.10
	12/9/2011	–	<0.50	<0.10
	3/21/2018	302	1.22	0.47
	6/28/2018	119	<0.10	<0.050
	9/24/2018	132	0.461	<0.250
	12/4/2018	117	24.1	<0.250
	6/17/2021	32.7	140	0.59
	9/16/2021	81.4	70.8	<0.250
	12/10/2021	29.6	85.6 H-01	<0.250 H-01
	3/8/2022	28.9	100	<0.250
	06/16/2022	93.6	87.6	<0.250
	9/14/2022	35.4	40	<0.250
	12/8/2022	77.1	77.6	<0.250
	3/15/2023	46.9	48.8	<0.250
6/14/2023	49.2	134	<0.250	
MW-1	11/9/2017	3.96	46.4	<1.0
	3/20/2018	6.20	1.84	<0.10
	7/1/2018	1.47	<0.10	<0.10
	9/25/2018	5.79	<0.250	<0.250
	12/4/2018	3.38	79.4	<0.250
	3/21/2019	22.0	2.8	<0.250
	6/5/2019	176	32.8	0.802
	9/27/2019	56.9	44.0	<0.250
	12/4/2019	112	134	<0.250
	3/10/2020	14.4	0.393	<0.250
	6/17/2020	38	7.45	<0.250
	10/7/2020	401	96.9	<0.250
	12/8/2020	417	71.9	<0.250
	3/4/2021	461	15.9	<0.250
	6/16/2021	323	62.6	<0.250
	9/16/2021	196	21.3	4.49
	12/9/2021	518	366	96.6
	3/8/2022	616	239	40.8
	06/15/2022	73.7	0.810	<0.250
	9/15/2022	363	94.5	2.6
12/6/2022	574	242	11.2	
3/17/2023	154	35.0	0.619 H-01	
6/14/2023	216	35.8	<0.250	
MW-2	11/6/2017	6.34	0.26	<0.10
	7/2/2018	9.85	<0.10	<0.10
	3/21/2019	11.0	<0.250	<0.250
	6/5/2019	9.86	<0.250	<0.250
	9/27/2019	9.82	<0.250	<0.250
	12/4/2019	9.72	<0.250	<0.250
	3/12/2020	9.04	<0.250	<0.250
	6/17/2020	10.9	<0.250	<0.250
	10/8/2020	9.48	<0.250	<0.250
	12/9/2020	9.78	<0.250	<0.250
	3/4/2021	8.75	<0.250	<0.250
	6/16/2021	9.31	<0.250	<0.250
	9/16/2021	9.62	<0.250	<0.250
	12/9/2021	17.2	<0.250	<0.250
	3/8/2022	9.08	<0.250	<0.250
	06/16/2022	12.6	<0.250	<0.250
	9/15/2022	12.80	<0.250	<0.250
	12/8/2022	9.21	<0.250	<0.250
	3/16/2023	9.65	<0.250	<0.250
6/13/2023	14.1	<0.250	<0.250	
MW-3	11/8/2017	1.68	2.7	<1.0
	3/20/2018	<0.40	19.7	<0.10
	7/2/2018	0.569	15.4	1.49
	9/26/2018	1.56	5.64	<0.250
	12/7/2018	1.18	10.2	<0.250
	3/20/2019	<0.0200	17.1	<0.250
	6/7/2019	<0.0200	15.1	<0.250
	9/27/2019	2.04	3.90	<0.250
	12/4/2019	0.212	11.5	<0.250
	3/10/2020	0.021	14.7	<0.250
	6/17/2020	<0.0200	7.92	<0.250
	10/7/2020	0.998	5.57	<0.250
	12/8/2020	<0.0200	9.16	<0.250
	3/4/2021	0.042	15.1	<0.250
	6/16/2021	0.023	9.06	<0.250
	9/14/2021	0.821	4.39	<0.250
	12/9/2021	<0.0200	8.23	<0.250
	3/9/2022	<0.0200	4.78	<0.250
	06/16/2022	0.123	0.437	<0.250
9/15/2022	0.071	2.68	<0.250	
12/6/2022	<0.0200	5.57	<0.250	
3/16/2023	<0.0200	<0.250	<0.250	
6/13/2023	0.0300	3.74	<0.250	
MW-5	11/7/2017	2.86	<0.10	<0.10
	3/21/2018	<0.05	2.63	<0.10
	6/29/2018	0.819	<0.10	<0.10
	9/27/2018	9.55	<0.250	<0.250
	12/7/2018	1.22	<0.250	<0.250
	3/26/2019	2.40	0.866	<0.250
	6/7/2019	2.94	<0.250	<0.250
	12/4/2019	0.570	<0.250	<0.250
	3/12/2020	0.114	<0.250	<0.250
	6/18/2020	0.114	<0.250	<0.250
	10/6/2020	9.20	<0.250	<0.250
	12/10/2020	0.294	<0.250	<0.250
	3/3/2021	0.543	4.64	<0.250
	6/16/2021	1.39	<0.250	<0.250
	9/15/2021	9.86	<0.250	<0.250
12/9/2021	0.722	<0.250	<0.250	
3/9/2022	1.12	<0.250	<0.250	
06/16/2022	3.86	<0.250	<0.250	

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MW-5 continued	9/14/2022	8.92	<0.250	<0.250
	12/8/2022	2.41	<0.250	<0.250
	3/15/2023	1.52	<0.250	<0.250
	6/15/2023	1.33	<0.250	<0.250
MW-6	11/7/2017	0.608	0.35	<0.10
	7/1/2018	4.17	<0.10	<0.10
	9/25/2018	4.30	<0.250	<0.250
	3/20/2019	5.17	0.738	<0.250
	6/5/2019	0.964	0.883	<0.250
	9/27/2019	6.36	<0.250	<0.250
	12/4/2019	2.18	<0.250	<0.250
	3/12/2020	9.42	<0.250	<0.250
	6/17/2020	1.87	<0.250	<0.250
	10/8/2020	3.14	<0.250	<0.250
	12/9/2020	2.67	0.315	<0.250
	3/4/2021	4.56	<0.250	<0.250
	6/16/2021	3.05	<0.250	<0.250
	9/15/2021	<0.0200	<0.250	<0.250
	12/9/2021	0.583	1.12	<0.250
	3/8/2022	1.77	<0.250	<0.250
	6/14/2022	0.893	<0.250	<0.250
	9/15/2022	11.0	<0.250	<0.250
	12/6/2022	0.725	<0.250	<0.250
	3/14/2023	2.18	<0.250 H-01	<0.250 H-01
6/14/2023	13.7	<0.250	<0.250	
MW-7	2/6/2007	3.00	60.7	< 0.100
	6/10/2008	4.89	67.5	0.1
	3/23/2009	11	56	<0.10
	3/16/2010	2.40	99	<0.50
	6/7/2011	-	140	<0.10
	12/9/2011	-	<0.50	<0.10
	11/7/2017	9.09	<0.10	<0.10
	3/21/2018	13.4	<0.10	<0.10
	3/21/2018 DUP	16.9	<0.10	<0.10
	6/29/2018	7.9	10.8	0.10
	9/27/2018	16.7	<0.250	<0.250
	12/7/2018	22.4	13.3	<0.250
	12/7/2018 DUP	22.1	13.5	<0.250
	3/20/2019	34.5	13.1	<0.250
	3/20/2019 DUP	33.7	13.4	<0.250
	6/5/2019	16.6	30.4	<0.250
	6/5/2019 DUP	17.0	30.3	<0.250
	9/26/2019	19.8	11.5	<0.250
	9/26/2019 DUP	20.3	11.5	<0.250
	12/3/2019	33.1	47.4	<0.250
	12/3/19 DUP	34.9	49.7	<0.250
	3/11/2020	6.89	18.7	<0.250
	3/11/2020 DUP	6.89	18.7	<0.250
	6/18/2020	5.21	27.6	<0.250
	6/18/2020 DUP	6.33	27.6	<0.250
	10/8/2020	14.5	1.92	<0.250
	10/8/2020 DUP	14.3	1.83	<0.250
	12/9/2020	34.5	88.6	<0.250
	12/9/2020 DUP	33.3	88.9	<0.250
	3/3/2021	5.94	10.6	<0.250
	3/3/2021 DUP	5.97	10.7	<0.250
	6/16/2021	16.1	94.9	<0.250
	6/16/2021 DUP	16.7	79.1	<0.250
	9/14/2021	11.6	14.4	<0.250
	9/14/2021 DUP	11.5	13.7	<0.250
	12/8/2021	34.3	130	<0.200
	12/8/2021 DUP	37.2	137	<0.250
	3/9/2022	10.9	39.6	<0.250
	3/9/2022 DUP	11.0	39.7	<0.250
	6/14/2022	0.0230	9.04	<0.250
6/14/2022 DUP	0.0320	8.72	<0.250	
9/15/2022	9.02	5.77	<0.250	
9/15/2022 DUP	6.45	5.88	<0.250	
12/7/2022	16.7	66.5	<0.250	
12/7/2022 DUP	17.3	56.6	<0.250	
3/14/2023	11.8 D	16.1 H-01, D	<0.250 H-01	
3/14/2023 DUP	7.52 D	10.3 H-01, D	<0.250 H-01	
6/15/2023	0.780	9.39	<0.250	
6/15/23 DUP	0.784	9.42	<0.250	
MW-8	6/10/2008	<0.0500	167	<0.1
	11/6/2017	<0.050	207	<0.10
	3/19/2018	<0.40	284	<0.10
	6/29/2018	<0.050	333	<0.10
	9/25/2018	<0.0200	235	<0.250
	12/7/2018	0.0230	260	<0.250
	3/22/2019	0.0350	544	<0.250
	6/3/2019	<0.0200	176	<0.250
	12/3/2019	<0.0200	276 E	<0.250
	3/11/2020	0.7320	311	<1.25
	6/17/2020	<0.0200	108 H-01	<0.250
	10/6/2020	<0.0200	248 H-01	<0.250
	12/10/2020	<0.0200	276	<0.250
	3/3/2021	<0.0200	317	<0.250
	6/16/2021	<0.0200	206	<1.25 R-04
	9/15/2021	<0.0200	248	<0.250
	12/13/2021	<0.0200	273	<0.250 R-04
	3/8/2022	<0.0200	212	<0.250
	06/15/2022	<0.0200	41	<0.250
	9/14/2022	<0.0200	204	<0.250
	12/7/2022	<0.0200	201	<0.250
	3/15/2023	<0.0200	220	<0.250
	6/13/2023	<0.0200	210	<0.250

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MW-9	9/21/2010	1.4	89	<0.10
	11/9/2017	17.4	559	<0.10
	3/21/2018	<0.050	230	<0.10
	6/29/2018	14.2	382	0.61
	9/27/2018	17.0	468	<0.250
	12/7/2018	5.60	311	<0.250
	3/20/2019	0.198	173	<0.250
	6/7/2019	0.022	125	<0.250
	9/26/2019	0.680	138	<0.250
	12/3/2019	0.618	101	<0.250
	3/11/2020	0.085	264	<0.250
	6/18/2020	<0.0200	128	<0.250
	10/8/2020	5.76	172	<0.250
	12/9/2020	11.1	302	<0.250
	3/3/2021	<0.0200	298	<0.250
	6/15/2021	0.026	156	<1.25 R-04
	9/14/2021	0.891	117	<0.250
	12/9/2021	0.063	113 H-01	<0.250 H-01
	3/8/2022	0.146	132	<0.250
	6/14/2022	13.2	35.2	<0.250
9/15/2022	<0.0200	156	<0.250	
12/7/2022	6.54	227	<0.250	
3/17/2023	14.5	329 H-01	<0.250	
6/15/2023	2.07	93.6	<0.250	
MW-10	11/6/2017	35.6	333	0.270
	6/29/2018	29.0	486	<0.10
	9/25/2018	37.2	413	<0.250
	9/25/2018 DUP	38.0	412	<0.250
	3/21/2019	45.0	412	<0.250
	6/6/2019	36.5	363	0.463 R-04
	9/25/2019	37.3	429	<0.5
	12/4/2019	36.6	460	<0.250
	3/11/2020	18.2	491	<1.25
	6/17/2020	13.2	489 H-01	<0.250 H-01
	10/8/2020	34.8	541	<0.250
	12/9/2020	37.7	515	<0.250
	3/4/2021	14.1	420	<0.250
	6/15/2021	17.0	430	<1.25 R-04
	9/15/2021	31.7	395	0.447
	12/9/2021	35.7	363	<1.25 R-04
	3/9/2022	7.91	384	<1.25 R-04
	06/15/2022	5.58	222	<0.250
	9/14/2022	15.9	408	<0.250
	12/8/2022	31.6	424	<0.250
3/15/2023	18.2	415	<0.250	
6/14/2023	2.66	327	<0.250	
MW-12	10/19/2010	-	59	-
	6/7/2011	-	1.1	<0.10
	12/7/2011	-	67	<0.10
	9/22/2015	110	47	-
	11/9/2017	55.4	0.57	<0.25
	3/20/2018	39.4	<0.10	<0.10
	3/20/2018 DUP	39.9	<0.10	<0.10
	7/1/2018	33.0	<0.10	<0.10
	9/25/2018	126	<0.250	<0.250
	9/25/2018 DUP	129	<0.250	<0.250
	12/4/2018	37.2	82.2	0.487
	12/4/2018 DUP	37.1	80.0	0.526
	3/20/2019	53.2	<0.250	<0.250
	3/20/2019 DUP	48.2	<0.250	<0.250
	6/5/2019	19.8	2.34	<0.250
	6/5/2019 DUP	22.4	2.32	<0.250
	9/26/2019	107	0.371	<0.250
	9/26/2019 DUP	122	0.383	<0.250
	12/4/2019	22.8	36.4	<0.250
	12/4/2019 DUP	20.2	35.6	<0.250
	3/11/2020	26.6	12.0	<0.250
	3/11/2020 DUP	25.6	11.9	<0.250
	6/18/2020	12.2	1.66	<0.250
	6/18/2020 DUP	12.3	1.61	<0.250
	10/7/2020	125	<0.250	<0.250
	10/7/2020 DUP	122	<0.250	<0.250
	12/8/2020	12.8	49.1	0.364
	12/8/2020 DUP	13.0	49.9	0.380
	3/5/2021	27.6	0.861	<0.250
	3/5/2021 DUP	28.2	0.920	<0.250
	6/16/2021	35.6	71.8	3.52
	6/16/2021 DUP	30.8	70.3	3.41
	9/14/2021	138	0.835	<0.250
9/14/2021 DUP	145	1.14	<0.250	
12/9/2021	4.51	14.3	<0.250	
12/9/2021 DUP	4.32	14.2	<0.250	
3/8/2022	27.2	72.1	<0.250	
3/8/2022 DUP	26.0	74 H-01	<0.250	
6/14/2022	2.29	2.20	<0.250	
6/14/2022 DUP	2.31	2.19	<0.250	
9/14/2022	175	<0.250	<0.250	
9/14/2022 DUP	218	<0.250	<0.250	
12/8/2022	32.7	162	<0.250	
12/8/2022 DUP	32.0	165	<0.250	
3/16/2023	139	<0.250	<0.250	
3/16/2023 DUP	151	<0.250	<0.250	
6/14/2023	98.2	<0.250	<0.250	
6/14/23 DUP	96.6	<0.250	<0.250	
MW-13	9/22/2015	48	135	-
	11/7/2017	35.0	0.52	<0.10
	3/20/2018	191	<0.10	<0.10
	7/1/2018	23.5	<0.10	<0.10
	9/25/2018	37.7	<0.250	<0.250
	12/5/2018	49.8	<0.250	<0.250
	3/19/2019	110	<0.250	<0.250
	6/6/2019	78.5	<0.250	<0.250
9/26/2019	76.2	<0.250	<0.250	

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MW-13 continued	12/3/2019	63.2	<0.250	<0.250
	3/10/2020	52.0	<0.250	<0.250
	6/18/2020	18.1	<0.250	<0.250
	10/7/2020	56.6	<0.250	<0.250
	12/8/2020	39.8	<0.250	<0.250
	3/4/2021	32.1	<0.250	<0.250
	6/15/2021	21.2	11.0	<0.250
	9/14/2021	50.4	<0.250	<0.250
	12/9/2021	12.5	9.11	<0.250
	3/9/2022	6.51	42.3	<0.250
	6/14/2022	1.97	5.25	<0.250
	9/15/2022	48.9	<0.250	<0.250
	12/6/2022	7.89	65.8	<0.250
	3/16/2023	32.1	<0.250 H-01	<0.250 H-01
6/14/2023	19.4	<0.250	<0.250	
MW-14	11/8/2017	34.7	50.3	<1.0
	3/20/2018	50.7	17.1	<0.10
	6/28/2018	31.6	104	<2.5
	9/26/2018	41.0	150	<0.250
	12/5/2018	53.7	75.5	<0.250
	3/19/2019	190	51.3	<0.250
	6/6/2019	33.9	28.6	0.958
	9/25/2019	29.6	145	<0.250
	12/4/2019	245	85.5	<0.250
	3/11/2020	32.0	137	<0.250
	6/17/2020	23.9	118 H-01	<0.250
	10/8/2020	32.5	305	<0.250
	12/9/2020	21.3	200	<0.250
	3/4/2021	15.9	258	<0.250
	6/15/2021	6.79	158	<1.25 R-04
	9/14/2021	17.6	364	0.00
	12/9/2021	17.6	155	<0.250
	3/8/2022	5.20	254 H-01	<0.250
	06/16/2022	0.372	174	<0.250
	9/13/2022	10.1	345	<0.250
12/7/2022	6.66	168	<0.250	
3/15/2023	8.69	299	<0.250	
6/13/2023	0.699	181	<0.250	
MW-15	11/6/2017	<0.050	9.78	<0.10
	7/2/2018	<0.050	6.06	<0.10
	6/6/2019	<0.0200	2.42	<0.250
	6/18/2020	<0.0200	1.34	<0.250
	12/10/2020	<0.0200	5.85	<0.250
	6/17/2021	<0.0200	5.38	<0.250
	12/10/2021	<0.0200	4.61 H-01	<0.250 H-01
	06/15/2022	<0.0200	0.634	<0.250
	12/5/2022	<0.0200	8.58	<0.250
	6/15/2023	<0.0200	5.13	<0.250
MW-16	11/6/2017	<0.050	9.95	<0.10
	3/19/2018	<0.40	15.7	<0.10
	7/2/2018	<0.050	19.4	<0.10
	9/25/2018	<0.0200	6.10	<0.250
	12/6/2018	<0.0200	10.2	<0.250
	3/22/2019	5.31	7.90	<0.250
	6/4/2019	<0.0200	8.58	<0.250
	9/25/2019	<0.0200	7.15	<0.250
	12/3/2019	<0.0200	7.93	<0.250
	3/11/2020	0.465	10.5	<0.250
	6/18/2020	<0.0200	2.44	<0.250
	10/7/2020	<0.0200	7.10	<0.250
	12/9/2020	<0.0200	9.58	<0.250
	3/3/2021	<0.0200	7.09	<0.250
	6/16/2021	0.022	8.66	<0.250
	9/15/2021	<0.0200	5.99	<0.250
	12/7/2021	<0.0200	13.0	<0.250
	3/9/2022	<0.0200	17.0	<0.250
06/16/2022	<0.0200	5.80	<0.250	
9/14/2022	<0.0200	5.28	<0.250	
12/7/2022	<0.0200	11.5	<0.250	
3/15/2023	<0.0200	25.8	<0.250	
6/15/2023	<0.0200	17.7	<0.250	
MW-17	11/8/2017	0.634	43.4	<1.0
	6/28/2018	<0.050	7.84	<0.10
	9/26/2018	2.13	0.760	<0.250
	3/19/2019	5.77	25.3	<0.250
	6/6/2019	0.119	24.7	<0.250
	9/26/2019	2.12	1.10	<0.250
	12/3/2019	0.353	15.9	<0.250
	3/10/2020	1.21	11.5	<0.250
	6/17/2020	<0.0200	10.6 H-01	<0.250
	10/7/2020	3.44	0.636	<0.250
	12/8/2020	0.481	24.3	<0.250
	3/3/2021	1.00	2.95	<0.250
	6/15/2021	0.146	28.1	<0.250
	9/14/2021	6.55	<0.250	<0.250
	12/8/2021	2.42	9.18	<0.250
	3/8/2022	0.0890	27.7	<0.250
	06/16/2022	<0.0200	0.763	<0.250
9/13/2022	5.84	<0.250	<0.250	
12/7/2022	3.39	34.1	<0.250	
3/15/2023	4.92	<0.250	<0.250	
6/13/2023	0.0290	0.337	<0.250	
MW-18i	6/10/2008	<0.0500	0.35	<0.1
	11/7/2017	<0.050	1.07	<0.10
	3/21/2018	<0.050	0.75	<0.10
	7/2/2018	<0.050	1.13	<0.10
	9/27/2018	<0.0200	1.00	<0.250
	12/6/2018	<0.0200	0.715	<0.250
	3/21/2019	<0.0200	0.509	<0.250
	6/3/2019	<0.0200	0.755	<0.250
	9/25/2019	<0.0200	0.831	<0.250
	12/3/2019	<0.0200	0.846	<0.250
	3/11/2020	<0.0200	0.445	<0.250

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MW-18i continued	6/17/2020	<0.0200	0.420	<0.250
	10/7/2020	<0.0200	0.415	<0.250
	12/9/2020	<0.0200	0.618	<0.250
	3/3/2021	<0.0200	0.528	<0.250
	6/17/2021	<0.0200	0.467	<0.250
	9/15/2021	<0.0200	0.422	<0.250
	12/9/2021	<0.0200	0.475	<0.250
	3/9/2022	<0.0200	0.415	<0.250
	06/16/2022	<0.0200	0.372	<0.250
	9/15/2022	<0.0200	0.561	<0.250
	12/7/2022	<0.0200	0.542	<0.250
	3/17/2023	<0.0200	<0.250	<0.250
	6/15/2023	<0.0200	0.765	<0.250
MW-19	10/19/2010	–	19	–
	9/22/2015	46	135	–
	11/9/2017	80	41	<1.0
	3/21/2018	150	47.8	<0.10
	3/21/2018 DUP	152	46.5	<0.10
	6/28/2018	194	<0.10	<0.10
	9/25/2018	122	120	<0.250
	9/25/2018 DUP	125	121	<0.250
	12/5/2018	188	118	<0.250
	12/5/2018 DUP	188	119	<0.250
	3/20/2019	242	195	<0.250
	3/20/2019 DUP	192	191	<0.250
	6/7/2019	145	34.8	1.06
	9/26/2019	113	232	<0.250
	9/26/2019 DUP	119	233	<0.250
	12/3/2019	131	129	<0.250
	12/3/2019 DUP	125	136	<0.250
	3/11/2020	109	213	<1.25
	3/11/2020 DUP	107	205	<1.25
	6/18/2020	88.0	30.8	<0.250
	6/18/2020 DUP	90.4	27.2	<0.250
	10/7/2020	187	224	<0.250
	10/7/2020 DUP	155	228	<0.250
	12/8/2020	180	147	<0.250
	12/8/2020 DUP	176	157	<0.250
	3/3/2021	156	137	<0.250
	3/3/2021 DUP	166	160	<0.250
	6/16/2021	115 D	152	<1.25 R-04
	6/16/2021 DUP	23.4 D	146	<1.25 R-04
	9/15/2021	111	150	<0.250
	9/15/2021 DUP	100	177	<0.250
	12/8/2021	104	89.5	<0.250
	12/8/2021 DUP	79.4	69.8	<0.250
3/9/2022	103	108	<1.25 R-04	
3/9/2022 DUP	105	102	<0.250	
6/14/2022	1.31	103	<0.250	
6/14/2022 DUP	1.10	104	<0.250	
9/15/2022	69.80	92.5	<0.250	
9/15/2022 DUP	75.4	102	<0.250	
12/6/2022	141	82.0	<0.250	
12/6/2022 DUP	142	76.7	<0.250	
3/14/2023	112	205 H-01	<0.250 H-01	
3/14/2023 DUP	123	211 H-01	<0.250 H-01	
6/14/2023	76.3	131	<0.250	
6/14/23 DUP	72.1	130	<0.250	
MW-19i	11/8/2017	0.236	<0.10	<0.10
	3/20/2018	<0.40	<0.10	<0.10
	7/2/2018	0.158	<0.10	<0.10
	9/27/2018	0.213	<0.250	<0.250
	12/6/2018	0.240	<0.250	<0.250
	3/25/2019	0.212	<0.250	<0.250
	6/3/2019	0.178	<0.250	<0.250
	12/4/2019	0.169	<0.250	<0.250
	3/12/2020	<0.0200	<0.250	<0.250
	6/18/2020	0.191	<0.250	<0.250
	10/7/2020	0.178	<0.250	<0.250
	12/10/2020	0.226	<0.250	<0.250
	3/3/2021	0.198	<0.250	<0.250
	6/17/2021	0.187	<0.250	<0.250
	9/15/2021	0.271	<0.250	<0.250
	12/7/2021	0.031	0.798	<0.250
	3/9/2022	0.220	<0.250	<0.250
06/16/2022	0.264	<0.250	<0.250	
9/14/2022	0.358	<0.250	<0.250	
12/7/2022	0.246	<0.250	<0.250	
3/14/2023	0.342	<0.250 H-01	<0.250 H-01	
6/14/2023	0.223	<0.250	<0.250	
MW-20i	11/7/2017	0.125	0.28	<0.10
	3/21/2018	1.01	1.06	<0.10
	7/2/2018	0.115	0.37	<0.10
	9/25/2018	0.244	1.11	<0.250
	12/6/2018	<0.0200	<0.250	<0.250
	3/22/2019	0.027	0.261	<0.250
	6/3/2019	0.353	1.77	<0.250
	9/25/2019	<0.0200	0.617	<0.250
	12/3/2019	0.030	1.84	<0.250
	3/11/2020	<0.0200	0.332	<0.250
	6/17/2020	<0.0200	0.585	<0.250
	10/7/2020	<0.0200	0.360	<0.250
	12/9/2020	0.176	0.643	<0.250
	3/2/2021	<0.0200	0.330	<0.250
	6/17/2021	<0.0200	<0.250	<0.250
	9/15/2021	0.028	0.367	<0.250
	12/9/2021	<0.200	0.260	<0.250
	3/9/2022	<0.0200	0.314	<0.250
	06/15/2022	<0.0200	0.258	<0.250
	9/14/2022	<0.0200	0.253	<0.250
12/7/2022	<0.0200	<0.250	<0.250	
3/15/2023	<0.0200	<0.250	<0.250	
6/15/2023	<0.0200	0.326	<0.250	

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MW-21i-40	6/10/2008	0.0594	<0.100	<0.100
	11/8/2017	<0.050	1.90	<1.0
	3/22/2018	0.071	1.70	<0.10
	6/29/2018	<0.050	5.12	<1.0
	9/27/2018	<0.0200	3.61	<0.250
	12/6/2018	<0.0200	3.16	<0.250
	3/21/2019	0.0360	3.41	<0.250
	6/3/2019	<0.0200	1.49	<0.250
	9/25/2019	<0.0200	3.49	<0.250
	12/3/2019	<0.0200	4.61	<0.250
	3/11/2020	<0.0200	2.90	<0.250
	6/17/2020	<0.0200	2.11	<0.250
	10/7/2020	<0.0200	5.67	<0.250
	12/9/2020	<0.0200	6.15	<0.250
	3/2/2021	0.117	3.70	<0.250
	6/16/2021	0.0620	5.77	<0.250
	9/15/2021	<0.0200	5.55	<0.250
	12/7/2021	<0.0200	4.64	<0.250
	3/8/2022	<0.0200	5.20	<0.250
	06/16/2022	<0.0200	3.40	<0.250
9/14/2022	0.027	4.87	<0.250	
12/7/2022	<0.0200	3.76	<0.250	
3/15/2023	<0.0200	4.76	<0.250	
6/14/2023	<0.0200	4.55	<0.250	
MW-21i-105	6/10/2008	0.0645	<0.100	<0.100
	11/8/2017	<0.050	1.6	<1.0
	3/22/2018	13.0	15.8	0.10
	6/29/2018	12.3	13.1	<0.10
	9/26/2018	0.409	0.759	<0.250
	12/6/2018	3.05	5.29	<0.250
	3/21/2019	49.6	0.755	<0.250
	6/6/2019	45.7	7.57	1.25
	9/25/2019	28.3	4.46	1.81
	12/4/2019	42.5	4.15	2.11
	3/12/2020	32.6	3.54	4.79
	6/18/2020	44.6	4.18	12.1
	10/8/2020	45.6	5.85	10.6
	12/9/2020	34.4	8.54	5.76
	3/4/2021	2.30	7.39	2.47
	6/15/2021	17.6	11.0	2.99
	9/15/2021	7.29	1.15	<0.250
	12/8/2021	2.34	9.42	<0.250
	3/9/2022	<0.0200	3.13	<0.250
	06/15/2022	3.02	0.868	<0.250
9/15/2022	1.67	1.87	<0.250	
12/6/2022	1.44	0.840	<0.250	
3/14/2023	0.101	2.61 H-01	<0.250 H-01	
6/13/2023	2.21	1.34	<0.250	
MW-22i	11/7/2017	0.354	<1.0	<1.0
	3/22/2018	1.25	0.63	<0.10
	6/29/2018	0.469	<1.0	<1.0
	9/26/2018	0.369	<0.250	<0.250
	12/5/2018	0.378	<0.250	<0.250
	3/21/2019	0.448	<0.250	<0.250
	6/6/2019	0.329	<0.250	<0.250
	9/25/2019	0.339	<0.250	<0.250
	12/4/2019	0.395	<0.250	<0.250
	3/12/2020	0.111	<0.250	<0.250
	6/18/2020	0.331	<0.250	<0.250
	10/8/2020	0.325	<0.250	<0.250
	12/9/2020	0.339	<0.250	<0.250
	3/4/2021	0.206	<0.250	<0.250
	6/15/2021	0.328	<0.250	<0.250
	9/15/2021	0.390	<0.250	<0.250
	12/8/2021	0.339	<0.250	<0.250
	3/9/2022	0.342	<0.250	<0.250
	06/15/2022	0.119	<0.250	<0.250
	9/14/2022	0.119	0.342	<0.250
12/8/2022	0.374	<0.250	<0.250	
3/16/2023	0.358	<0.250	<0.250	
6/13/2023	0.269	1.09	<0.250	
MW-23i	6/10/2008	<0.0500	0.440	<0.100
	11/8/2017	<0.0500	0.78	<0.100
	3/21/2018	<0.0500	0.72	<0.100
	6/28/2018	<0.0500	0.53	<0.100
	9/27/2018	<0.0200	1.04	<0.250
	12/6/2018	<0.0200	0.520	<0.250
	3/22/2019	<0.0200	0.592	<0.250
	6/3/2019	<0.0200	0.604	<0.250
	12/4/2019	<0.0200	0.534	<0.250
	3/12/2020	<0.0200	0.639	<0.250
	6/17/2020	<0.0200	0.372	<0.250
	10/7/2020	<0.0200	0.796	<0.250
	12/9/2020	<0.0200	0.667	<0.250
	3/2/2021	<0.0200	0.616	<0.250
	6/17/2021	0.0410	0.650	<0.250
	9/15/2021	<0.0200	1.07	<0.250
	12/9/2021	<0.0200	0.406 H-01	<0.250 H-01
	3/9/2022	<0.0200	0.680	<0.250
	06/15/2022	<0.0200	0.310	<0.250
	9/14/2022	<0.0200	1.08	<0.250
12/7/2022	<0.0200	0.990	<0.250	
3/14/2023	<0.0300 R-01	1.69 H-01	<0.250 H-01	
6/14/2023	<0.0200	1.35	<0.250	
MW-24i	6/7/2011	--	0.50	<0.10
	12/7/2011	--	1.60	<0.10
	11/9/2017	<0.050	3.09	<0.10
	3/21/2018	0.687	7.36	<0.10
	6/28/2018	<0.050	2.37	<0.050
	9/27/2018	<0.0200	7.56	<0.250
	12/4/2018	0.067	2.97	<0.250
	3/25/2019	0.020	4.07	<0.250
	6/7/2019	<0.0200	2.19	<0.250

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MW-24i continued	9/27/2019	0.116	<0.250	<0.250
	12/3/2019	<0.0200	2.86	<0.250
	3/12/2020	<0.0200	4.87	<0.250
	6/18/2020	<0.0200	2.70	<0.250
	10/9/2020	<0.0200	1.70	<0.250
	12/10/2020	<0.0200	9.40	<0.250
	3/3/2021	<0.0200	1.30	<0.250
	6/17/2021	0.026	5.43	<0.250
	9/14/2021	<0.0200	10.2	<0.250
	12/7/2021	<0.0200	0.784	<0.250
	3/8/2022	<0.0200	3.45	<0.250
	06/15/2022	<0.0200	0.431	<0.250
	9/14/2022	0.577	<0.250	<0.250
	12/8/2022	<0.0200	8.62	<0.250
	3/15/2023	<0.0200	6.22	<0.250
6/13/2023	<0.0200	4.01	<0.250	
MW-24d	11/6/2017	0.153	<0.10	<0.10
	3/20/2018	<0.40	<0.10	<0.10
	6/27/2018	0.160	<0.10	<0.050
	9/28/2018	0.145	<0.250	<0.250
	12/10/2018	0.993	<0.250	<0.250
	3/25/2019	0.147	<0.250	<0.250
	6/4/2019	0.131	<0.250	<0.250
	9/27/2019	0.050	3.76	<0.250
	12/3/2019	0.142	<0.250	<0.250
	3/12/2020	0.130	<0.250	<0.250
	6/18/2020	0.211	<0.250	<0.250
	10/9/2020	0.140	<0.250	<0.250
	3/3/2021	0.163	<0.250	<0.250
MW-24d continued	9/14/2021	0.110	<0.250	<0.250
	12/7/2021	0.121	<0.250	<0.250
	3/8/2022	0.124	<0.250	<0.250
	06/15/2022	0.115	<0.250	<0.250
	9/15/2022	0.140	<0.250	<0.250
	12/6/2022	0.341	<0.250	<0.250
	3/16/2023	0.123	<0.250	<0.250
6/14/2023	<0.0200	1.26	<0.250	
MW-25i	11/8/2017	0.138	0.53	<0.25
	3/21/2018	<0.050	0.40	<0.10
	6/29/2018	<0.050	0.27	<0.10
	9/27/2018	<0.0200	0.775	<0.250
	12/6/2018	<0.0200	0.541	<0.250
	3/22/2019	0.0250	0.0389	<0.250
	6/3/2019	<0.0200	0.383	<0.250
	9/25/2019	<0.0200	0.710	<0.250
	12/3/2019	<0.0200	0.405	<0.250
	3/12/2020	<0.0200	0.453	<0.250
	6/18/2020	<0.0200	0.357	<0.250
	10/7/2020	<0.0200	0.644	<0.250
	12/9/2020	<0.0200	0.485	<0.250
	3/2/2021	<0.0200	0.797	<0.250
	6/17/2021	<0.0200	0.675	<0.250
	9/15/2021	<0.0200	1.09	<0.250
	12/8/2021	<0.0200	0.426	<0.250
	3/8/2022	<0.0200	0.628	<0.250
	06/16/2022	<0.0200	<0.250	<0.250
9/14/2022	<0.0200	0.782	<0.250	
12/8/2022	<0.0200	0.903	<0.250	
3/15/2023	<0.0200	1.09	<0.250	
6/14/2023	<0.0200	1.59	<0.250	
MW-26	11/8/2017	34.1	101	<2.5
	3/20/2018	30.0	271	<0.25
	6/29/2018	22.4	213	<0.10
	9/24/2018	30.2	212	<0.250
	12/5/2018	35.3	152	<0.250
	3/22/2019	60.6	544	<0.250
	6/3/2019	41.3	476	<0.250
	9/26/2019	32.4	383	<0.500
	12/3/2019	24.7	279	<0.250
	3/11/2020	48.9	628	<1.25
	6/17/2020	42.9	573 H-01	<0.250 H-01
	10/7/2020	30.1	358	<0.250
	12/9/2020	41.1	484	<0.250
	3/4/2021	55.2	457	<0.250
	6/17/2021	55.3	583 H-01	<0.250
	9/15/2021	81.0	376	<0.250
	12/7/2021	91.6	479	<0.250
	12/7/2021 DUP	86.6	465	<0.250
	3/8/2022	49.1	348	<0.250
	06/15/2022	109	380	<0.250
	9/14/2022	80.8	321	<0.250
12/8/2022	118	349	<0.250	
3/15/2023	112	406	<0.250	
6/14/2023	66.8	306	<0.250	
MW-32s	11/10/2017	0.235	0.58	<0.10
	3/22/2018	<0.050	0.16	<0.10
	10/1/2018	<0.0200	<0.250	<0.250
	12/10/2018	0.069	1.81	<0.250
	3/25/2019	<0.0200	<0.250	<0.250
	9/26/2019	0.0630	<0.250	<0.25
	3/13/2020	<0.0200	<0.250	<0.250
	10/9/2020	<0.0200	<0.250	<0.250
	3/2/2021	<0.0200	<0.250	<0.250
	9/16/2021	<0.0200	<0.250	<0.250
	3/9/2022	<0.0200	<0.250	<0.250
	9/15/2022	<0.0200	<0.250	<0.250
	3/17/2023	<0.0200	<0.250	<0.250

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
EW-1	11/9/2017	<0.050	0.50	<0.10
	7/1/2018	<0.050	2.91	<0.10
	9/27/2018	<0.0200	0.686	<0.250
	3/25/2019	<0.0200	3.69	<0.250
	6/4/2019	<0.0200	3.42	<0.250
	12/4/2019	<0.0200	0.708	<0.250
	3/11/2020	<0.0200	2.56	<0.250
	6/17/2020	<0.0200	4.24	<0.250
	10/7/2020	<0.0200	1.46	<0.250
	12/9/2020	0.177	2.32	<0.250
	3/2/2021	<0.0200	25.3	<0.250
	6/16/2021	<0.0200	28.4	<0.250
	9/16/2021	<0.0200	2.48	<0.250
	12/7/2021	0.0210	3.62	<0.250
	3/8/2022	<0.0200	1.22	<0.250
	06/16/2022	<0.0200	<0.250	<0.250
	9/15/2022	<0.0200	3.23	<0.250
12/8/2022	<0.0200	1.24	<0.250	
3/14/2023	<0.0200	3.46 H-01	<0.250 H-01	
6/14/2023	<0.0200	4.09	<0.250	
S-1	11/8/2017	7.13	4.14	<0.10
	3/20/2018	35.5	11.4	0.24
	6/28/2018	<1.3	3.02	<0.10
	9/26/2018	0.259	3.03	<0.250
	12/5/2018	<0.0200	2.16	<0.250
	3/19/2019	0.846	3.35	<0.250
	6/5/2019	0.141	1.95	<0.250
	9/25/2019	<0.0200	3.72	<0.250
	12/4/2019	<0.0200	2.04	<0.250
	3/10/2020	<0.0200	1.08	<0.250
	6/17/2020	<0.0200	1.13	<0.250
	10/7/2020	<0.0200	1.86	<0.250
	12/8/2020	0.0210	1.40	<0.250
	3/3/2021	<0.0200	1.39	<0.250
	6/15/2021	<0.0200	1.54	<0.250
	9/14/2021	<0.0200	1.18	<0.250
	12/8/2021	0.0440	0.762	<0.250
	3/28/2022	<0.0200	1.94	<0.250
	6/15/2022	<0.0200	0.331	<0.250
	9/13/2022	<0.0200	2.51	<0.250
12/7/2022	<0.0200	2.00	<0.250	
3/16/2023	<0.0200	2.26	<0.250	
6/14/2023	<0.0200	0.705	<0.250	
S-2	11/8/2017	5.64	1.05	<0.10
	3/20/2018	6.1	1.25	<0.10
	6/28/2018	8.05	3.28	0.054
	9/26/2018	7.55	5.93	<0.250
	12/5/2018	7.76	<0.250	<0.250
	3/19/2019	25.6	3.23	0.259
	6/5/2019	6.06	<0.250	<0.250
	9/25/2019	0.691	1.77	<0.250
	12/4/2019	6.83	0.408	<0.250
	3/10/2020	6.96	0.906	<0.250
	6/17/2020	6.34	<0.250	<0.250
	10/7/2020	5.97	5.45	<0.250
	12/8/2020	6.85	<0.250	<0.250
	3/3/2021	5.61	<0.250	<0.250
	6/15/2021	5.56	<0.250	<0.250
	9/14/2021	7.03	4.60	<0.250
	12/8/2021	4.98	<0.250	<0.250
3/28/2022	4.82	<0.250	<0.250	
6/15/2022	4.75	<0.250	<0.250	
9/13/2022	5.12	6.67	<0.250	
12/7/2022	4.53	<0.250	<0.250	
3/14/2023	3.95	<0.250 H-01	<0.250 H-01	
6/14/2023	5.57	<0.250	<0.250	
MGMS1-3(43)	10/19/2010	-	390	-
	11/7/2017	217	120	<1.0
	3/22/2018	214	<0.10	<0.10
	7/1/2018	198	<0.10	<0.10
	9/28/2018	240	75.8	<0.250
	12/4/2018	246	30.6	<0.250
	3/26/2019	238	13.5	<0.250
	6/7/2019	209	<0.25	<0.250
	9/27/2019	233	84.1	<0.250
	12/4/2019	216	45.3	<0.250
	3/11/2020	199	12.3	<0.250
	6/16/2020	157	<0.250	<0.250
	10/6/2020	214	40.7	<0.250
	12/10/2020	190	10.8	<0.250
	3/4/2021	233	0.731	<0.250
	6/16/2021	188	0.398	<0.250
	9/14/2021	219	21.1	<0.250
	12/7/2021	175	<0.250	<0.250
	3/10/2022	271	1.27	<0.250
	06/15/2022	180	<0.250	<0.250
9/12/2022	209	32.5	<0.250	
12/8/2022	236	10.2	<0.250	
3/16/2023	199	25.2	<0.250 H-01	
6/13/2023	197	1.58 M-02	<0.250	
MGMS1-2(60)	11/7/2017	<0.050	1.91	<0.10
	3/22/2018	0.054	3.18	<0.10
	7/1/2018	<0.050	1.83	<0.10
	10/1/2018	<0.0200	3.65	<0.250
	12/4/2018	0.104	0.697	<0.250
	3/26/2019	<0.0200	1.39	<0.250
	6/7/2019	<0.0200	1.08	<0.250
	9/27/2019	<0.0200	2.58	<0.250
	12/4/2019	<0.0200	0.732	<0.250
	3/12/2020	<0.0200	3.25	<0.250
	6/16/2020	<0.0200	0.375	<0.250
10/6/2020	<0.0200	2.49 M-02	<0.250	

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MGMS1-2(60) continued	12/10/2020	<0.0200	1.46	<0.250
	3/4/2021	<0.0200	2.18	<0.250
	6/16/2021	<0.0200	0.908	<0.250
	9/14/2021	4.75	2.12	<0.250
	12/7/2021	<0.0200	0.638	<0.250
	3/10/2022	<0.0200	1.70	<0.250
	06/15/2022	<0.0200	0.257	<0.250
	9/12/2022	0.022	4.00	<0.250
	12/8/2022	1.95	2.60	<0.250
	3/16/2023	1.87	4.31	<0.250
6/14/2023	0.123	2.59	<0.250	
MGMS1-1(110)	11/7/2017	0.822	0.73	<0.10
	7/1/2018	0.134	0.11	<0.10
	10/1/2018	0.595	0.898	<0.250
	6/7/2019	0.179	0.533	<0.250
	12/4/2019	0.225	0.587	<0.250
	6/16/2020	0.211	0.856	<0.250
	12/8/2020	0.237	<0.250	<0.250
	6/16/2021	0.130	0.552	<0.250
	12/7/2021	0.0910	0.623	<0.250
	06/15/2022	0.034	0.444	<0.250
	12/8/2022	0.0710	0.280	<0.250
	6/15/2023	0.0370	<0.250	<0.250
	MGMS2-4(40)	9/21/2010	130	560
6/7/2011		-	200	<0.10
12/7/2011		-	8.0	<0.10
11/9/2017		87.1	<0.10	<0.10
3/22/2018		84.2	<0.10	<0.10
7/1/2018		83.6	0.76	<0.10
9/28/2018		85.2	9.38	<0.250
12/10/2018		80.7	<0.250	<0.250
3/25/2019		85.2	<0.250	<0.250
6/4/2019		78.7	<0.250	<0.250
9/27/2019		78.9	1.34	<0.250
12/4/2019		76.1	<0.250	<0.250
3/12/2020		74.9	<0.250	<0.250
6/16/2020		75.8	6.57	0.414
10/6/2020		80.8	6.08	0.253
12/8/2020		68.6	28.5	0.385
3/4/2021		115	3.23	<0.250
6/17/2021		60.9	<0.250	<0.250
9/16/2021		78.6	39.9	<0.250
12/7/2021		52.8	44.9	<0.250
3/10/2022		66.3	34.4	<0.250
06/14/2022		46.5	64.2	<0.250
9/12/2022		73.1	21.6	<0.250
12/6/2022	29.8	38.9	<0.250	
3/16/2023	57.3	44.8	<0.250	
6/13/2023	64.6	20.4	<0.250	
MGMS2-3(60)	11/9/2017	1.03	0.12	<0.10
	3/22/2018	0.153	0.68	<0.10
	7/1/2018	<0.050	0.77	<0.10
	12/10/2018	1.39	<0.250	<0.250
	3/25/2019	0.407	<0.250	<0.250
	6/4/2019	<0.0200	0.852	<0.250
	9/27/2019	0.719	<0.250	<0.250
	12/4/2019	1.15	<0.250	<0.250
	3/12/2020	0.0280	0.678	<0.250
	6/16/2020	0.0200	0.519	<0.250
	10/6/2020	0.306	<0.250	<0.250
	12/8/2020	0.136	0.558	<0.250
	3/4/2021	<0.0200	0.606	<0.250
	6/17/2021	<0.0200	0.59	<0.250
	9/16/2021	0.082	0.45	<0.250
	12/7/2021	0.996	<0.250	<0.250
	3/10/2022	<0.0200	0.613	<0.250
6/14/2022	<0.0200	0.486	<0.250	
9/12/2022	0.025	0.470	<0.250	
12/6/2022	<0.0200	0.594	<0.250	
3/16/2023	<0.0200	1.21	<0.250	
6/13/2023	<0.0200	0.999	<0.250	
MGMS2-2(110)	11/9/2017	<0.050	0.37	<0.10
	7/1/2018	0.050	0.28	<0.10
	9/28/2018	<0.0200	0.412	<0.250
	6/4/2019	<0.0200	0.402	<0.250
	12/4/2019	<0.0200	0.400	<0.250
	6/16/2020	<0.0200	0.317	<0.250
	12/8/2020	0.0230	0.333	<0.250
	6/17/2021	<0.0200	0.282	<0.250
	12/7/2021	<0.0200	0.376	<0.250
	6/14/2022	<0.0200	0.335	<0.250
	12/6/2022	<0.0200	<0.250	<0.250
6/13/2023	<0.0200	0.268	<0.250	
MGMS2-1(132)	11/9/2017	<0.050	<0.10	<0.10
	7/1/2018	<0.050	<0.10	<0.10
	9/28/2018	0.0500	<0.250	<0.250
	6/4/2019	<0.0200	<0.250	<0.250
	12/4/2019	<0.0200	<0.250	<0.250
	6/16/2020	<0.0200	<0.250	<0.250
	12/8/2020	0.0230	<0.250	<0.250
	6/17/2021	<0.0200	<0.250	<0.250
	12/7/2021	<0.0200	<0.250	<0.250
	6/14/2022	<0.0200	<0.250	<0.250
	12/6/2022	<0.0200	0.432	<0.250
6/13/2023	0.0240	<0.250	<0.250	
MGMS3-4(40)	9/22/2015	1.1	<.10	-
	11/10/2017	1.71	<0.10	<0.10
	3/22/2018	1.55	<0.10	<0.10
	7/1/2018	0.971	<0.10	<0.10
	9/28/2018	1.71	<0.250	<0.250
	9/28/2018 DUP	1.68	<0.250	<0.250
	12/10/2018	1.04	<0.250	<0.250
	3/26/2019	2.67	<0.250	<0.250
6/3/2019	1.31	<0.250	<0.250	

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MGMS3-4(40) continued	6/3/2019 DUP	1.32	<0.250	<0.250
	6/3/2019 DUP	1.32	<0.250	<0.250
	9/27/2019	1.14	<0.250	<0.250
	9/27/2019 DUP	1.26	<0.250	<0.250
	12/4/2019	0.906	<0.250	<0.250
	12/4/2019 DUP	0.918	<0.250	<0.250
	3/12/2020	2.09	<0.250	<0.250
	6/16/2020	0.784	<0.250	<0.250
	6/16/2020 DUP	0.789	<0.250	<0.250
	10/6/2020	1.68	<0.250	<0.250
	10/6/2020 DUP	1.64	<0.250	<0.250
	12/10/2020	1.73	<0.250	<0.250
	12/10/2020 DUP	1.76	<0.250	<0.250
	3/4/2021	2.35	<0.250	<0.250
	3/4/2021 DUP	2.30	<0.250	<0.250
	6/16/2021	2.33	<0.250	<0.250
	6/16/2021 DUP	2.35	<0.250	<0.250
	9/16/2021	1.24	<0.250	<0.250
	9/16/2021 DUP	1.24	<0.250	<0.250
	12/10/2021	1.30	<0.250 H-01	<0.250 H-01
	12/10/2021 DUP	1.31	<0.250 H-01	<0.250 H-01
	3/10/2022	2.72	<0.250	<0.250
	3/10/2022 DUP	2.79	<0.250	<0.250
	6/14/2022	2.25	<0.250	<0.250
	6/14/2022 DUP	2.21	<0.250	<0.250
	9/14/2022	3.45	<0.250	<0.250
9/14/2022 DUP	3.47	<0.250	<0.250	
12/6/2022	2.42	<0.250	<0.250	
12/6/2022 DUP	2.44	<0.250	<0.250	
3/16/2023	4.30	<0.250	<0.250	
3/16/2023 DUP	4.28	<0.250	<0.250	
6/15/2023	2.94	<0.250	<0.250	
6/15/23 DUP	2.95	<0.250	<0.250	
MGMS3-3(60)	11/10/2017	<0.050	<0.10	<0.10
	3/22/2018	0.272	0.39	<0.10
	7/1/2018	0.100	0.29	<0.10
	9/28/2018	<0.0200	0.393	<0.250
	12/10/2018	<0.0200	<0.250	<0.250
	3/26/2019	<0.0200	0.495	<0.250
	6/3/2019	<0.0200	0.371	<0.250
	9/27/2019	<0.0200	<0.250	<0.250
	12/4/2019	<0.0200	0.364	<0.250
	3/12/2020	<0.0200	0.257	<0.250
	6/16/2020	<0.0200	0.262	<0.250
	10/6/2020	<0.0200	0.296	<0.250
	12/10/2020	<0.0200	0.310	<0.250
	3/4/2021	<0.0200	0.376	<0.250
	6/16/2021	<0.0200	0.318	<0.250
	9/16/2021	0.0970	0.298	<0.250
	12/10/2021	<0.0200	0.307 H-01	<0.250 H-01
	3/10/2022	<0.0200	0.358	<0.250
	6/14/2022	<0.0200	<0.250	<0.250
	9/14/2022	<0.0200	0.488	<0.250
12/6/2022	<0.0200	0.429	<0.250	
3/16/2023	<0.0200	1.00 Q-42	<0.250	
6/15/2023	<0.0200	0.653	<0.250	
MGMS3-2(101)	11/10/2017	<0.050	0.48	<0.10
	7/1/2018	<0.050	0.43	<0.10
	9/28/2018	<0.0200	0.506	<0.250
	6/3/2019	<0.0200	0.467	<0.250
	12/4/2019	<0.0200	0.451	<0.250
	6/16/2020	<0.0200	0.370	<0.250
	12/10/2020	<0.0200	0.389	<0.250
	6/16/2021	<0.0200	0.352	<0.250
	12/10/2021	0.0620	0.357 H-01	<0.250 H-01
	6/14/2022	<0.0200	0.457	<0.250
	12/6/2022	<0.0200	0.371	<0.250
	6/15/2023	<0.0200	0.406	<0.250
	MGMS3-1(132)	11/10/2017	<0.050	0.52
7/1/2018		<0.050	0.46	<0.10
9/28/2018		<0.0200	0.468	<0.250
6/5/2019		<0.0200	0.560	<0.250
12/4/2019		<0.0200	0.629	<0.250
6/16/2020		<0.0200	0.591	<0.250
12/10/2020		<0.0200	0.412	<0.250
12/10/2021		0.0240	0.607 H-01	<0.250 H-01
6/14/2022		<0.0200	0.848	<0.250
12/6/2022		<0.0200	0.368	<0.250
6/15/2023		<0.0200	0.628	<0.250

Table 4
Groundwater Analytical Results—Ammonia, Nitrate, and Nitrite
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Ammonia (as Nitrogen)	Nitrate-Nitrogen	Nitrite-Nitrogen
		Concentrations in mg/L (ppm)		
MP-1	2/6/2007	42.4	247	0.18
	3/23/2009	35	210	1.2
	3/16/2010	37	990	0.76
	6/7/2011	-	160	<0.10
	12/9/2011	-	120	0.91
	11/9/2017	12.2	23.0	<0.50
	3/21/2018	7.13	37.8	<0.10
	6/28/2018	8.71	38.2	<0.10
	9/26/2018	10.9	113	<0.250
	12/4/2018	6.01	80.8	<0.250
	3/20/2019	7.05	77.6	<0.250
	6/7/2019	8.24	61.6	0.366
	9/26/2019	2.15	97.7	0.384
	12/3/2019	2.39	118	<0.250
	3/11/2020	8.82	110	<0.250
	6/17/2020	5.81	161 H-01	<0.250
	10/8/2020	5.22	115	<0.250
	12/9/2020	1.95	106	<0.250
	3/3/2021	6.68	140	<0.250
	6/16/2021	2.71	70.1	0.690
	9/16/2021	8.12	56.8	<0.250
	12/8/2021	0.735	53.9	0.434
	3/9/2022	2.58	43.9	<0.250
	6/14/2022	3.71	90.2	0.323
	9/14/2022	6.50	83.3	<0.250
	12/7/2022	1.47	76.7	0.345
3/17/2023	2.25	30.6	<0.250	
6/15/2023	4.60	90.7 H-01	<0.250	
MP-3	6/28/2018	18.8	138	0.42

Notes:

1. mg/L (ppm) = Milligrams per liter (parts per million).
2. **Bold** value represents detected concentration of listed analyte.
3. - = Not sampled or not analyzed.
4. < = Not detected at or above the specified laboratory method reporting limit (MRL).
5. Ammonia as nitrogen by Method 350.1.
6. Nitrate as nitrogen and nitrite as nitrogen by Method 300.0.
7. E = Estimated value.
8. H-01 = This sample was analyzed outside the recommended holding time.
9. M-02 = Due to matrix interference, this analyte cannot be accurately quantified. The reported result is estimated.
10. R-04 = Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis
11. D = Relative percent difference (RPD) between sample and duplicate is outside of the acceptable range of +/- 30%.
12. R-01 = The Reporting Limit for this analyte has been raised to account for matrix interference
13. H-01 = Analyzed outside the recommended holding time
14. Q-42 = Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (F

Table 5
Interim Action—Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry	Field Parameters	
		1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Tetrachloro ethene	1,1,1-Trichloro ethane	Trichloro ethene	Vinyl chloride	Ethene	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)
MW-7	2/6/2007	<100	<100	<100	<100	<100	31,500	<100	352	<100	N/A	<1.0	1.20	245.7
	12/16/2008	<50	<50	<50	130	<50	15,000	<50	450	<50	N/A	2.4	0.72	-103.2
	3/23/2009	<15.0	<0.50	<15.0	420	<15.0	3,300	<15.0	270	<15.0	N/A	6.7	0.69	-614.5
	6/18/2009	3.7	<3.0	<3.0	520	<3.0	890	5.2	350	<3.0	N/A	N/A	6.97	-16.4
	9/18/2009	9.8	<3.0	5.5	930	<3.0	2,600	10	250	<3.0	<1.0	4.1	0.59	121.7
	12/18/2009	6.7	<5.0	<5.0	330	<5.0	1,600	6.7	160	<5.0	<1.0	2.5	1.23	162.1
	3/16/2010	<2.0	<2.0	<2.0	180	<2.0	550	2.0	56	<2.0	<1.0	2.6	1.37	147.7
	6/17/2010	<1.5	<1.5	<1.5	360	<1.5	200	2.7	72	<1.5	<1.0	2.8	1.86	240.0
	9/23/2010	3.3	<3.0	<3.0	690	<3.0	750	3.5	110	4.8	<1.0	8.2	0.64	-483.4
	12/10/2010	1.8	<0.90	<0.90	94	<0.90	220	1.6	36	1.7	1.19	0.84	6.29	111.6
	3/11/2011	6.6	<0.90	1.6	150	0.91	420	5.1	82	9.3	7.76	1.10	6.65	132.3
	6/7/2011	4.8	<2.5	3.4	1,400	3.3	430	4.0	110	7.9	<1.0	4.7	0.45	108.6
	9/19/2011	<5.0	<5.0	<5.0	1,300	<5.0	410	<5.0	84	78	N/A	3,400	4.53	695.8
	12/9/2011	8.0	<5.0	6.9	3,400	6.8	200	<5.0	32	110	38.7	1,600	1.19	-117.5
	3/12/2012	9.2	<5.0	<5.0	1,600	<5.0	41	<5.0	8.6	600	71	1,000	2.97	96.8
	06/22/2012	9.0	<2.0	<2.0	500	<2.0	25	<2.0	5.2	290	130	790	6.28	-137.9
	9/14/2012	3.8	<0.50	0.54	180	0.70	28	<0.50	5.2	80	47	790	2.29	93.3
	12/14/2012	1.9	<0.50	<0.50	130	<0.50	11	<0.50	6.8	18	19.5	550	0.34	24.1
	3/15/2013	0.69	<0.50	<0.50	110	<0.50	1.6	<0.50	0.78	11	13.3	250	1.02	53.3
	6/14/2013	0.51	<0.50	<0.50	58	<0.50	1.6	<0.50	<0.50	16	5.86	220	0.29	47.9
	9/20/2013	1.5	<0.50	<0.50	56	<0.50	<0.50	<0.50	<0.50	10	18.6	270	0.45	-189.3
	12/16/2013	2.9	<0.50	<0.50	6.9	<0.50	0.51	<0.50	<0.50	9.1	5.0	250	0.44	-66.1
	3/24/2014	1.6	<0.50	<0.50	13	<0.50	9.8	<0.50	2.6	7.6	220	77	0.43	76.9
	6/25/2014	0.19	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	1.4	21.9	120	0.6	-90.5
	9/30/2014	2.7	<0.50	<0.50	4.5	<0.50	<0.50	<0.50	<0.50	9.8	<1.0	160	1.93	-112.0
	12/15/2014	4.5	<0.50	<0.50	16	<0.50	0.61	<0.50	1.5	21	<1.0	28.5	1.61	-34.0
	3/20/2015	1.0	<0.50	<0.50	8.4	<0.50	<0.50	<0.50	1.1	1.0	<6.2	23.5	1.19	-76.8
	6/17/2015	2.6	<0.50	<0.50	12	<0.50	1.2	<0.50	1.0	12.6	<10.0	46	0.81	-4.9
	9/23/2015	1.8	<0.50	<0.50	12.7	<0.50	4.5	<0.50	4.2	4.8	<10.0	40.6	0.87	-30.5
	12/8/2015	<0.50	<0.50	<0.50	4.1	<0.50	0.94	<0.50	1.7	1.9	<10.0	9.8	1.98	84.1
	6/17/2016	0.60	<0.50	<0.50	10.9	<0.50	0.69	<0.50	2.1	5.4	<10.0	18.9	1.67	-120.1
	9/29/2016	1.1	<0.50	<0.50	10.9	<0.50	<0.50	<0.50	6.0	5.5	N/A	N/A	0.96	164.1
	12/14/2016	<0.50	<0.50	<0.50	9.4	<0.50	0.78	<0.50	<0.50	1.0	N/A	N/A	1.13	5.6
	3/28/2017	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.73	<0.50	N/A	N/A	0.89	-25.4
	6/14/2017	<0.50	<1.0	<0.50	2.5	<0.50	<0.50	<0.50	0.55	2.5	<10.0	9.1	1.08	-60.5
	9/27/2017	<0.50	<1.0	<0.50	1.7	<0.50	2.6	<0.50	1.60	1.7	<10.0	7.8	1.75	110.2
	3/21/2018	0.495 J	<0.500	<0.500	17.6	<0.500	0.228 J	<0.500	2.86	4.93	<13.0	9.96	6.03	10.5
	6/29/2018	0.461 J	<0.500	<0.500	5.50	<0.500	9.89	<0.500	3.53	1.47	<10.0	5.0	0.56	187.5
	9/27/2018	1.23	<0.400	<0.400	8.48	<0.400	6.50	<0.400	10.8	2.08	N/A	N/A	1.21	-9.0
	12/7/2018	3.97	<0.400	0.472	17.7	<0.400	30.4	<0.400	18.1	1.62	N/A	N/A	1.89	18.5
	3/20/2019	1.87	<0.400	<0.400	22.2	<0.400	22.8	<0.400	10.8	0.605	<1.0	9.07	3.20	93.4
	6/5/2019	2.91	<0.400	0.559	20.2	<0.400	28.4	<0.400	12.7	1.15	<1.0	4.77	6.02	92.2
	9/26/2019	2.98	<0.400	0.672	21.0	<0.400	41.7	<0.400	17.9	0.420	N/A	N/A	0.67	182.9
	12/3/2019	4.61	<0.400	0.839	29.7	<0.400	66.1	<0.400	31.8	<0.400	<1.0	7.51	6.61	194.0
	3/11/2020	0.936	<0.400	<0.400	26.5	<0.400	47.4	<0.400	14.3	0.476	<1.0	5.98	3.39	109.1
	6/18/2020	0.850	<0.400	<0.400	11.1	<0.400	43.0	<0.400	10.1	<0.400	<1.0	5.10	1.03	230.9
	10/8/2020	1.97	<0.400	0.481	23.6	<0.400	50.2	<0.400	19.7	<0.400	<1.0	15.4	1.65	18.5
	12/9/2020	7.05	<0.400	1.41	56.3	0.552	108	<0.400	45.4	<0.400	<1.0	8.45	2.50	139.5
3/3/2021	<0.400	<0.400	1.28	20.0	<0.400	56.4	<0.400	22.4	<0.400	<1.0	4.53	2.79	103.9	
6/16/2021	0.927	<0.400	4.30	35.5	<0.400	78.0	<0.400	39.6	0.450	<1.0	8.63	2.55	195.0	
9/14/2021	2.11	<0.400	0.457	25.8	<0.400	47.6	<0.400	20.6	<0.400	<1.0	19.40	2.37	19.2	
12/8/2021	4.67	<0.400	0.870	39.1	<0.400	118	0.593	51.2	0.537	<1.0	9.16	0.35	159.5	
3/9/2022	3.24	<0.400	0.950	37.2	0.530	78.8	<0.400	38.2	1.20	<1.0	4.43	0.19	177.1	
6/14/2022	<0.400	<0.400	<0.400	3.76	<0.400	85.6	0.790	27.2	<0.400	<1.0	<1.00	5.32	166.3	
9/15/2022	1.26	<0.400	<0.400	31.3	<0.400	30.9	<0.500	13.0	0.660	<1.0	14.8	0.46	144.2	
12/7/2022	4.22	<0.400	0.930	41.1	0.440	118.0	0.570	46.3	0.560	<1.0	7.62	2.14	72.8	
3/14/2023	1.97	<0.400	0.460	22.6	<0.400	67.0	<0.400	27.8	0.820	<1.0	8.66	0.96	-290.9	
6/15/2023	<0.400	<0.400	<0.400	3.34	<0.400	19.0	<0.400	5.79	<0.400	<1.0	2.71	0.31	-537.2	
MP-1	2/6/2007	18.4	<5.0	<5.0	347	8.5	1,610	11.2	421	23.6	N/A	<1.00	0.39	208.9
	12/16/2008	<5.0	<5.0	<5.0	70	<5.0	1,600	10	230	<5.0	N/A	1.80	1.37	-78.5
	3/23/2009	6.0	<4.0	<4.0	89	<4.0	1,200	10	180	<4.0	N/A	2.0	1.05	127.3
	6/18/2009	4.3	<4.0	<4.0	43	<4.0	1,500	12	180	<4.0	N/A	N/A	3.65	-43.7
	9/18/2009	14	<4.0	<4.0	240	8.9	1,100	8.2	310	7.3	<1.0	1.50	0.48	99.7
	12/18/2009	<4.0	<4.0	<4.0	58	<4.0	1,000	7.1	180	<4.0	<1.0	1.60	0.78	155.3
	3/16/2010	22	<3.0	4.7	410	13	1,500	8.6	400	10	2.47	2.4	0.89	83.2
	6/17/2010	3.2	<3.0	<3.0	120	<3.0	800	5.4	140	<3.0	<1.0	2.4	3.22	228.3
	9/23/2010	<3.0	<3.0	<3.0	41	<3.0	730	4.0	120	<3.0	<1.0	2.0	0.53	-464.0
	12/10/2010	<3.0	<3.0	<3.0	27	<3.0	1,000	4.5	150	<3.0	<1.0	1.0	0.52	-4.6
	3/14/2011	7.1	<3.0	<3.0	150	<3.0	1,200	6.4	180	5.9	<0.0010	0.96	1.35	159.6
	6/7/2011	4.9	<2.5	<2.5	75	<2.5	640	3.3	130	<2.5	<1.0	1.6	0.52	48.9
	9/19/2011	2.4	<1.5	<1.5	4.1	<1.5	30	1.9	72	1.6	N/A	3.7	0.69	913.5
	12/9/2011	2.6	<2.5	<2.5	49	3.1	640	3.1	120	<2.5	3.28	8.3	0.83	-51.7
	3/9/2012	9.4	<1.5	2.8	440	6.3	490	3.5	140	21	15.9	16	0.23	77.7
	6/22/2012	5.6	<2.5	2.8	530	2.9	690	12	120	48	66.6	26	0.83	-51.7
	9/14/2012	4.0	<1.5	<1.5	170	2.2	340	2.0	83	4.5	16	23	0.43	98.2
	12/14/2012	2.0	<0.90	<0.90	170	1.7	230	1.0	48	1.8	21.1	18	0.28	-15.2
	3/15/2013	5.1	<0.90	0.94	140	2.5	230</							

Table 5
Interim Action—Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry		Field Parameters	
		1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Tetrachloro ethene	1,1,1-Trichloro ethane	Trichloro ethene	Vinyl chloride	Ethene	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential	
Concentrations in µg/L													(mg/L)	(mg/L)	(mV)
EX	2/6/2007	<10.0	<10.0	<10.0	68.2	<10.0	2,810	40	564	<10.0	N/A	1.45	0.24	164.8	
	12/16/2008	54	<15.0	<15.0	490	<15.0	4,500	71	830	<15.0	N/A	3.30	0.74	-174.5	
	3/23/2009	<5.0	<5.0	<5.0	50	<5.0	1,400	43	420	<5.0	N/A	3.0	0.47	68.8	
	6/18/2009	<0.50	<0.50	<0.50	4.2	<0.50	24	1.1	11	<0.50	N/A	N/A	0.37	-9.3	
	9/18/2009	4.1	<0.50	3.3	120	0.76	2,100	38	380	1.1	<1.0	4.9	0.60	109.0	
	12/18/2009	<2.5	<2.5	<2.5	5.6	<2.5	700	3.7	56	<2.5	55.6	1.8	2.13	170.1	
	3/16/2010	<0.50	<0.50	<0.50	20	<0.50	150	3.2	33	<0.50	<0.50	2.4	0.88	102.6	
	6/17/2010	0.97	<0.50	<0.50	92	<0.50	150	2.3	39	2.2	<1.0	3.3	0.84	239.5	
	9/23/2010	1.5	<0.50	1.6	90	0.53	2,400	20	220	1.8	<1.0	3.6	0.93	-521.6	
	12/21/2010	0.83	<0.50	0.59	30	<0.50	900	6.7	99	0.71	<1.0	<0.50	0.91	131.7	
	3/31/2011	8.2	<4.0	8.1	240	<4.0	6,800	110	910	5.1	1.91	1.9	-	-	
	6/7/2011	<4.0	<4.0	<4.0	140	<4.0	1,400	15	170	<4.0	<1.0	3.5	0.70	115.2	
	9/19/2011	7.9	<5.0	11	290	<5.0	4,100	73	460	14	N/A	560	0.63	907.9	
	12/9/2011	16	<5.0	19	12,000	9.3	<50	17	<50	140	11.4	320	1.23	-68.3	
	3/9/2012	5.0	<4.0	<4.0	1,400	8.6	33	<4.0	10	290	24.2	89	0.14	-33.6	
	6/22/2012	3.4	<0.50	0.68	170	1.3	3.0	0.59	1.1	120	150	110	1.23	-68.3	
	9/14/2012	1.5	<1.5	<1.5	320	<1.5	3.0	<1.5	<1.5	42	47.2	77	0.15	-29.5	
	12/14/2012	<0.50	<0.50	<0.50	26	<0.50	0.87	<0.50	<0.50	12	5.92	59	0.25	3.3	
	3/15/2013	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	4.4	<1.0	64	0.37	67.0	
	6/14/2013	<0.50	<0.50	<0.50	1.6	<0.50	0.79	<0.50	<0.50	<0.50	<1.0	12	0.54	158.8	
	9/20/2013	1.9	<0.50	0.54	71	0.68	4.1	<0.50	2.6	30	35.4	42	0.43	-175.4	
	12/16/2013	3.8	<0.50	<0.50	34	<0.50	2.0	<0.50	1.4	28	45.3	46	1.66	11.9	
	3/24/2014	0.80	<0.50	<0.50	30	<0.50	20	<0.50	7.5	11	91.1	35	0.51	158.7	
	6/23/2014	2.9	<0.50	1.1	160	0.97	29	<0.50	15	38	81.5	34	0.41	-50	
	9/30/2014	-	-	-	-	-	-	-	-	-	-	-	-	-	
	12/15/2014	<0.50	<0.50	<0.50	10	<0.50	22	<0.50	2.7	<0.50	<1.0	158	2.41	-52.2	
	3/19/2015	3.5	<0.50	2.1	690	1.9	170	2.5	56	2.8	<6.2	<5.0	1.05	18.2	
	6/18/2015	2.6	<0.50	2.6	420	1.6	186	0.88	42	3.2	<10.0	7.5	2.29	-35.2	
	9/22/2015	2.9	<0.50	3.7	543	2.6	302	0.65	61.9	24.4	<1.0	22.6	0.90	23.7	
	12/8/2015	<0.50	<0.50	<0.50	427	<0.50	94.4	<0.50	21.3	2.1	<1.0	7.5	-	-	
	3/8/2016	4.0	<1.2	2.9	1,160	3.6	274	5.0	71.1	13.3	<1.0	22	0.36	113.3	
	6/17/2016	<5.0	<5.0	<5.0	1,040	<5.0	592	<5.0	90.8	<5.0	<10.0	1.2	2.72	4.8	
	9/28/2016	4.6	<1.7	3.5	2,230	3.8	39.4	2.5	549	128	N/A	N/A	1.61	138.1	
	12/12/2016	<0.50	<0.50	<0.50	8.1	<0.50	4.3	<0.50	0.96	51.9	N/A	N/A	2.00	-24	
	3/28/2017	<0.50	<0.50	<0.50	5.2	<0.50	6.1	<0.50	1.9	<0.50	23.5	347	1.50	89.9	
	6/14/2017	10.7	<1.0	<0.50	11.7	0.56	9.5	<0.50	3.0	1.3	11.2	14.0	3.48	-12.4	
	9/26/2017	8.8	<1.0	<0.50	6.9	<0.50	0.82	<0.50	0.63	10.1	17.5	25.5	1.18	-140.5	
	3/21/2018	1.34	<0.500	<0.500	22.6	<0.500	1.48	<0.500	2.72	10.8	28.3	15.4	0.19	74.4	
	6/28/2018	4.55	<0.500	1.11	722	8.72	1.91	<0.500	0.758	424	99.2	43.6	0.39	-62.6	
	9/24/2018	1.42	<0.400	<0.400	3.38	0.751	3.07	<0.400	2.42	7.56	2.9	13.2	1.55	150.7	
12/4/2018	0.876	<0.400	<0.400	8.18	<0.400	6.35	<0.400	3.60	1.88	<1.0	11.0	5.80	-10.0		
6/17/2021	3.90	<0.400	4.55	415	2.33	4,570	12.4	322	22.2	<1.0	5.32	3.02	67.5		
9/16/2021	11.30	<0.400	7.65	739	6.50	2,940	7.80	380	20.6	<1.0	6.01	3.25	186.4		
12/10/2021	3.09	<0.400	3.73	198	1.55	4,900	10.6	268	6.76	<1.0	4.57	0.58	241.4		
3/8/2022	3.27	<0.400	4.40	224	1.74	6,930	19.8	321	9.00	<1.0	2.95	2.07	170.0		
6/16/2022	22.7	<2.00	7.80	412	8.50	1,590	<2.00	344	7.30	<1.0	3.52	7.41	137.9		
9/14/2022	<20.0	<20.0	<20.0	466	<20.0	2,340	<20.0	224	24.5	<1.0	4.29	1.16	180.9		
12/8/2022	<20.0	<20.0	<20.0	608	<20.0	4,040	<20.0	334	<20.0	<1.0	3.41	2.50	-0.6		
3/15/2023	<20.0	<20.0	<20.0	677	<20.0	2,860	<20.0	276	<20.0	<1.0	4.46	2.39	-48.0		
6/14/2023	<20.0	<20.0	<20.0	944	<20.0	3,120	<20.0	402	<20.0	<1.0	3.99	0.32	144.0		
MW-12	6/7/2011	1.8	<0.50	<0.50	59	1.0	53	0.70	25	<0.50	<1.0	0.94	3.16	110.4	
	9/19/2011	240	2.5	45	4,700	55	860	65	690	63	N/A	8.3	0.84	906.3	
	12/7/2011	130	1.3	28	2,900	33	520	34	380	40	6.15	59	1.00	109.0	
	3/12/2012	210	<15.0	44	3,800	45	770	48	540	46	<1.0	65	1	45.3	
	6/22/2012	100	<5.0	16	1,700	39	270	13	200	22	<1.0	56	0.66	117.1	
	9/14/2012	270	<15.0	58	5,400	73	1,100	76	730	84	<1.0	100	0.43	140.7	
	12/13/2012	1.0	<0.50	<0.50	62	0.97	38	0.53	23	<0.50	<1.0	4.9	1.07	128.6	
	3/15/2013	200	1.8	40	4,300	56	760	53	540	54	<1.0	95	0.62	117.3	
	6/13/2013	240	<15.0	39	4,800	53	610	46	500	59	<1.0	62	0.39	205.2	
	9/20/2013	170	1.6	37	3,400	49	510	37	400	50	<1.0	110	0.59	-10.7	
	12/16/2014	36	<2.5	7.6	800	10	150	5.8	110	9.8	<1.0	23	1.22	40.4	
	3/24/2014	110	0.77	18	1,900	25	180	8.6	170	47	<1.0	41	1.94	29.1	
	6/24/2014	14	<1.5	1.9	310	2.3	42	1.6	34	<1.5	<1.0	13	3.68	1.5	
	9/30/2014	190	<15.0	39	3,500	45	680	36	480	42	<1.0	93	6.09	47.1	
	12/11/2014	0.73	<0.50	<0.50	34	0.64	25	<0.50	15	<0.50	<1.0	1.9	0.65	-110.0	
	3/20/2015	102	<5.0	25	2,110	29	580	18	340	37	<6.2	4	0.89	75.7	
	6/19/2015	151	<10.0	28.2	2,570	25	514	23.6	356	31.1	<10.0	4.8	0.71	10.2	
	9/22/2015	120	<8.3	16.9	2,250	23.4	343	15.7	239	22.5	<1.0	4.4	1.06	65.3	
	12/8/2015	0.84	<0.50	<0.50	40.1	0.72	44.9	0.52	22	<0.50	<10.0	16.5	0.99	28.1	
	3/8/2016	79.9	<3.6	15.4	1,380	16.2	325	7.7	209	21.3	<10.0	5.5	0.71	62.2	
	6/16/2016	174	<8.4	29.9	3,310	31.6	314	12.8	288	52.3	<10.0	3.7	2.68	59.7	
	9/27/2016	44	<10.0	11.5	867	11.4	387	3.9	163	14.8	<10.0	5,240	0.98	252.5	
	12/14/2016	16.5	<10.0	4.7	744	2.3	62.3	<10.0	42.2	20.5	<10.0	1,930	0.46	-91.3	
	3/30/2017	11.4	<2.5	3.8	1,120	6.1	55.9	<2.5	29.6	28.3	75.2	490	2.92	-17.9	
	6/12/2017	14.0	<3.1	4.7	893 J	7.6	42.4	<3.1	18.1	48.4	120	530	0.91	-34.2	
	9/28/2017	19.5	<1.7	<1.7	457	5.4	<1.7	<1.7	47.7	16.0	243	243	1.19	-87.4	
	11/9/2017	4.5	<0.50	<0.50	22.2	1.6	<0.50	<0.50	49.1	<10.0	326 J	326 J	1.61	-119.0	
	3/20/2018	0.522	<0.500	<0.500	5.64	1.33	<0.500	<0.500	0.271 J	2.77	<13.0	89.1	8.95	-136.3	
	7/1/2018	0.913	<0.500	<0.500	4.02	1.57	0.304 J	<0.500	0.996	1.45	<10.0	66.0			

Table 5
Interim Action—Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry		Field Parameters	
		1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Tetrachloro ethene	1,1,1-Trichloro ethane	Trichloro ethene	Vinyl chloride	Ethene	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential	
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)	
MW-24I Continued	3/21/2018	1.42	<0.500	<0.500	13.5	<0.500	19.1	<0.500	10.2	<0.500	<13.0	0.734 BJ	0.95	129.6	
	6/28/2018	1.44	<0.500	<0.500	13.6	1.09	10.3	<0.500	5.93	<0.500	<10.0		2.69	129.9	
	9/27/2018	2.18	<0.400	<0.400	25.0	<0.400	24.8	<0.400	14.3	<0.400	N/A	N/A	1.67	106.3	
	12/4/2018	0.800	<0.400	<0.400	5.13	<0.400	10.2	<0.400	3.76	<0.400	N/A	N/A	5.24	-6.9	
	3/25/2019	0.888	<0.400	<0.400	8.46	<0.400	11.7	<0.400	5.91	<0.400	<1.0	<1.00	4.52	18.1	
	6/7/2019	0.601	<0.400	<0.400	4.99	<0.400	7.39	<0.400	3.55	<0.400	<1.0	<1.00	4.39	5.8	
	9/27/2019	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.0	<1.00	5.30	-252.2	
	12/3/2019	0.775	<0.400	<0.400	3.82	<0.400	8.78	<0.400	3.72	<0.400	<1.0	<1.00	3.09	1.3	
	3/12/2020	1.30	<0.400	<0.400	15.4	<0.400	17.0	<0.400	8.42	<0.400	<1.0	<1.00	7.57	66.9	
	6/18/2020	0.610	<0.400	<0.400	2.91	<0.400	6.24	<0.400	2.84	<0.400	<1.0	<1.00	7.63	-43.8	
	10/9/2020	<0.400	<0.400	<0.400	1.08	<0.400	1.35	<0.400	<0.400	<0.400	<1.0	<1.00	1.09	-63.2	
	12/10/2020	1.73	<0.400	<0.400	20.0	<0.400	29.7	<0.400	13.0	<0.400	N/A	N/A	9.37	77.2	
	3/3/2021	<0.400	<0.400	<0.400	0.505	<0.400	0.955	<0.400	<0.400	<0.400	<1.0	<1.00	6.41	22.2	
	6/17/2021	<0.400	<0.400	<0.400	0.989	<0.400	15.7	<0.400	8.00	<0.400	<1.0	<1.50	2.99	132.0	
	9/14/2021	<0.400	<0.400	<0.400	27.5	<0.400	36.7	<0.400	17.20	<0.400	N/A	<1.00	0.17	94.0	
	12/7/2021	<0.400	<0.400	<0.400	0.540	<0.400	2.22	<0.400	0.629	<0.400	<1.0	<1.00	5.32	38.7	
	3/8/2022	0.900	<0.400	<0.400	7.93	<0.400	13.2	<0.400	6.19	<0.400	<1.0	<1.00	5.54	57.9	
	6/15/2022	<0.400	<0.400	<0.400	0.430	<0.400	0.710	<0.400	<0.400	<0.400	<1.0	<1.00	8.95	47.7	
	9/14/2022	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.0	<1.00	0.56	66.6	
	12/8/2022	1.07	<0.400	<0.400	15.500	<0.400	38.6	<0.400	9.46	<0.400	<1.0	<1.00	1.85	4.8	
	3/15/2023	1.04	<0.400	<0.400	15.9	<0.400	16.1	<0.400	7.95	<0.400	<1.0	<1.00	0.00	222.0	
	6/13/2023	0.850	<0.400	<0.400	14.3	<0.400	9.97	<0.400	5.21	<0.400	<1.0	<1.00	2.91	169.1	
	MGMS2-40	6/7/2011	65	<15.0	30	1,600	17	4,400	57	1,400	48	<1.0	2.2	0.86	49.5
9/12/2011		44	<15.0	28	7,400	20	790	48	380	58	N/A	110	2.63	338.9	
12/7/2011		35	<15.0	<15.0	5,300	<15.0	61	<15.0	39	460	14.5	300	6.28	-137.9	
3/8/2012		38	<2.0	2.3	470	2.8	9.9	5.2	5.4	260	368	290	1.22	-73.6	
6/19/2012		53	<0.50	<0.50	20	1.3	7.2	<0.50	2.5	63	566	500	6.28	-137.9	
9/12/2012		39	<1.5	2.8	310	3.2	89	5.0	80	440	264	140	1.16	-40.1	
12/11/2012		4.8	<0.50	<0.50	33	1.3	10	<0.50	3.4	4.0	110	280	0.55	-82.3	
3/15/2013		28	<0.50	1.9	300	2.0	5.6	2.5	2.2	270	121	81	0.33	-24.3	
6/11/2013		8.3	<0.50	<0.50	7.9	<0.50	0.94	<0.50	<0.50	4.8	55.6	110	0.42	-116.7	
9/17/2013		28	<0.50	4.8	290	1.4	16	1.6	17	330	143	98	0.27	-209.9	
12/16/2013		9.7	<0.50	<0.50	8.4	<0.50	2.4	<0.50	1.4	3.4	33.3	110	1.19	-41.9	
3/24/2014		45	<0.50	2.9	84	<0.50	2.6	<0.50	1.8	270	930	120	1.06	-126.1	
6/26/2014		31	<0.50	10	88	0.84	21	<0.50	22	90	207	120	2.22	-23.7	
9/23/2014		30	<0.50	30	590	2.4	170	3.2	110	800	12.1	94	1.31	-119.0	
12/12/2014		35	<0.50	<0.50	10	<0.50	3.4	<0.50	2.3	18	34	7.9	1.41	-162.1	
3/20/2015		4.3	<0.50	3.9	47	<0.50	31	<0.50	22	17	8.1	8	20.02	-83.7	
6/19/2015		13.8	<0.50	1.3	53.8	<0.50	18.4	<0.50	12.8	48.3	33.7	11	13.5	-117.5	
9/25/2015		12.3	<0.50	4.2	105	0.61	67.4	0.92	45.9	57.8	<10.0	10.9	9.67	-145.1	
12/8/2015		13.5	<0.50	<0.50	7.2	<0.50	4.0	<0.50	2.8	3.3	22.8	7.9	6.14	-96.9	
3/8/2016		20.6	<0.50	1.6	36.0	<0.50	6.5	<0.50	6.2	36	63.7	7.4	5.52	-161.7	
6/17/2016		24.9	<0.50	26.4	744	2.8	223	3.1	146	227	31	3.8	1.60	-72.2	
9/29/2016		12.1	<0.50	<0.50	115	<0.50	33.3	<0.50	24.8	142	N/A	N/A	5.16	194.5	
12/16/2016		10.3	<0.50	<0.50	5.2	<0.50	2.6	<0.50	1.9	2.0	N/A	N/A	0.80	-28.1	
3/31/2017		57.6	<0.50	14.3	236	0.60	4.3	<0.50	14.4	235	N/A	N/A	0.68	-92.2	
6/15/2017		38.6	<0.50	3.5	46.2	<0.50	5.1	<0.50	4.9	98.9	128	7.0	1.29	-109.6	
9/29/2017		21.7	<1.0	6.8	195	0.74	41.5	0.67	31.3	428	47.4	6.4	1.03	-43.7	
11/9/2017		21.3	<0.50	0.86	61.6	0.52	13.2	<0.50	9.2	170	95.7	6.2	1.24	-113.3	
3/22/2018		25.9	<0.500	4.22	109	0.571	46.0	0.259 J	27.3	122	32.7	9.58	6.89	-112.9	
7/1/2018		12.7	<0.500	5.93	151	0.971	62.1	1.04	48.9	38.2	<10.0	5.2	3.15	-50.8	
9/28/2018		8.74	<0.800	1.44	140	<0.800	66.9	<0.800	43.3	106	3.6	5.91	1.50	97.3	
12/10/2018		20.9	<0.400	0.563	24.9	<0.400	18.7	<0.400	12.0	123	78	5.08	2.05	-111.4	
3/25/2019		26.6	<0.400	2.58	136	0.752	62.0	<0.400	35.9	155	26	4.61	0.97	151.7	
6/4/2019		28.2	<0.400	0.960	37.8	<0.400	14.6	<0.400	10.4	145	19	4.83	0.64	104.5	
9/27/2019		11.2	<0.400	0.729	73.8	<0.400	17.0	<0.400	13.1	101	1.4	4.76	7.37	-133.9	
12/4/2019		20.6	<0.400	0.778	40.5	<0.400	32.3	<0.400	17.9	65.4	4.2	5.01	4.39	-82.2	
3/12/2020		24.1	<0.400	2.73	105	0.641	86.3	0.453	43.3	134	2.1	5.13	8.14	-78.9	
6/16/2020		27.3	<0.400	1.25	85.0	<0.400	14.8	<0.400	9.09	138	6.1	4.13	0.93	177.2	
10/6/2020		19.1	<0.400	2.45	98.4	0.635	101	<0.400	56.2	148	3.8	5.15	1.17	28.8	
12/8/2020		17.8	<0.800	1.85	82.6	<0.800	41.0	<0.800	19.4	80.2	2.0	5.37	1.07	-19.5	
3/4/2021		3.83	<0.400	25.1	159	1.12	115	<0.400	59.9	72.5	<1.0	5.17	1.97	-19.5	
6/17/2021		3.25	<0.400	20.7	181	0.975	68.8	<0.400	35.6	66.3	<1.0	4.93	2.75	82.2	
9/16/2021		9.92	<4.00	1.40	98.7	0.734	42.2	<4.00	28.3	34.2	<1.0	4.82	4.14	18.9	
12/7/2021	22.7	<0.400	6.97	178	1.50	190	0.812	106	0.989	<1.0	5.84	0.59	60.5		
3/10/2022	21.8	<4.00	8.70	260	<4.00	155	<4.00	92.9	<4.00	<1.0	4.85	0.83	205.2		
6/14/2022	35.2	<2.00	7.20	209	<2.00	138	4.75	69.3	<2.00	<1.0	6.19	1.48	222.1		
9/12/2022	16.2	<0.400	9.45	330	2.55	271	0.960	142	1.41	<1.0	4.19	0.20	-15.4		
12/6/2022	19.6	<0.400	9.63	297	2.58	245	1.55	153	0.400	<1.0	4.20	0.61	44.5		
3/16/2023	17.7	<4.00	10.00	311	<4.00	299	<4.00	169	<4.00	<1.0	4.63	0.00	182		
6/13/2023	19.1	<0.800	8.50	352	2.64	173	1.02	121	121	<1.0	4.14	0.13	213.2		
MW-13	9/28/2016	<2.5	<2.5	<2.5	148	<2.5	5,090	<2.5	951	<2.5	<10.0	33,600	2.71	158.7	
	12/16/2016	<5.0	<5.0	<5.0	509	<5.0	1,020	<5.0	394	<5.0	<10.0	2,220	0.66	-111.4	
	3/30/2017	<5.0	<5.0	<5.0	101	<5.0	176	<5.0	57.6	<5.0	<10.0	341	4.36	-61.8	
	6/15/2017	<1.0	<1.0	1.2	272	1.6	97.7	<1.0	56.3	4.1	N/A	N/A	1.41	-105.7	
	9/27/2017	<1.0	<1.0												

Table 5
Interim Action—Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry	Field Parameters	
		1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Tetrachloro ethene	1,1,1-Trichloro ethane	Trichloro ethene	Vinyl chloride	Ethene	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)
MW-14 Continued	12/7/2022	1.10	<0.400	0.74	27.9	0.67	59.6	<0.400	108	<0.400	<1.0	2.69	2.00	119.8
	3/15/2023	3.15	<0.400	1.57	58.8	1.59	146	0.740	223	<0.400	<1.0	1.43	0.23	-371.9
	6/13/2023	1.76	<0.400	0.860	27.5	0.760	48.5	<0.400	158	<0.400	<1.0	1.68	0.34	-514.4
MW-19	9/26/2016	10.4	<5.0	11.0	235	<5.0	1,520	14.5	592	10.1	<10.0	1.9	3.27	174.4
	12/12/2016	78.7	<5.0	14.2	1,030	11.6	1,730	15.5	975	31.9	<10.0	8.1	9.22	175.2
	3/28/2017	214	<5.0	26.7	1,990	21.5	755	19.9	896	63.2	<10.0	4.8	2.5	35.8
	6/14/2017	41.8	<2.5	15.8	486	6.2	566	8.2	506	17.2	N/A	N/A	1.54	-22.7
	9/26/2017	11.1	<2.5	28.9	1,160	5.4	3,710	40.4	1,480	111	44.3	8.1	1.92	185.2
	11/9/2017	104	0.75 J	24.9	1,660	24.0	1,530	20.2	1,020	115	11.8	6.9	2.26	-75.2
	3/21/2018	59.0	0.225 J	31.4	2,430	11.2	1,250	17.0	1,340	413	32.3	29.9	1.43	135.6
	6/28/2018	81.6	<0.500	36.3	4190	18.4	177	11.7	191	799	271	58.2	2.18	-30.8
	9/25/2018	<0.400	<0.400	<0.400	1,960	<0.400	3,830	<0.400	2,270	116	9.8	16.8	1.30	57.4
	12/5/2018	91.8	0.453	39.3	1,750	18.4	3,090	21.8	1,490	79.0	2.1	10.5	5.11	-29.9
	3/20/2019	49.7	<8.00	39.5	1,910	13.9	2,970	23.7	2,090	75.8	2.1	19.1	4.26	108.6
	6/7/2019	108	<10.0	52.6	1,910	20.4	894	<10.0	793	80.8	2.9	9.34	0.72	61
	9/26/2019	41.9	<4.00	40.2	1,160	12.1	4,340	30.6	1,620	39.1	3.1	5.38	1.73	-172.4
	12/3/2019	57.4	<20.0	28.6	1,250	<20.0	1,670	<20.0	1,200	25.6	<1.0	6.88	6.52	205.1
	3/11/2020	35.4	<10.0	60.4	1,450	14.8	4,730	29.1	2,010	154	7.5	13.6	3.01	87.0
	6/18/2020	32.5	<20.0	27.5	956	5.60	1,080	9.40	697	96.3	5.0	40.1	3.12	162.1
	10/7/2020	46.9	<20.0	58.8	1,510	<20.0	8,110	39.0	2,920	53.8	<1.0	19.7	1.1	-83.5
	12/8/2020	70.8	<40.0	<40.0	1,330	<40.0	3,880	<40.0	1,210	117	<1.0	17.3	2.36	106.3
	3/3/2021	51.0	<0.4	41.4	1,120	11.4	4,470	27.8	1,880	53.6	<1.0	5.84	6.47	24.6
	6/16/2021	28.2	<10	58	1,260	15.1	4,770	22.5	1,190	80.8	1.3	7.63	2.95	391.7
	9/15/2021	19.6	<10.0	53.6	922	<10.0	6,790	60.8	2,540	45.1	1.4	4.94	1.49	32.9
12/8/2021	226	<40.0	86.0	3,690	<40.0	9,310	55.3	3,420	117	<1.0	5.48	0.33	155.3	
3/9/2022	71.0	<20.00	31.0	1,240	<20.0	3,500	20.5	942	33.0	<1.0	4.33	0.31	210.9	
6/14/2022	0.940	<0.400	<0.400	14.6	<0.400	46.2	<0.400	16.5	0.950	<1.0	2.20	4.56	195.4	
9/15/2022	16.8	<0.400	44.8	1050	5.79	6,010	48.2	1,100	196	1.30	5.18	0.41	226.4	
12/6/2022	69.0	<20.0	36.5	1,130	<20.0	4,340	25.0	1,390	36.5	<1.0	5.40	1.62	60.2	
3/14/2023	20.5	<2.00	36.2	767	12.6	5,260	32.2	1,840	45.8	<1.0	5.63	0.22	-332.1	
6/14/2023	30.0	<8.00	22.8	813	11.0	2,290	12.4	1,060	25.8	<1.0	3.85	0.34	-549.9	
MW-26	9/26/2016	3.9	<0.50	1.1	61.1	1.6	160	2.4	288	<0.50	N/A	N/A	1.64	236.7
	12/13/2016	8.9	<0.50	2.4	85.9	2.0	167	3.3	410	<0.50	<10.0	2.4	0.88	102.4
	3/29/2017	<0.50	<0.50	<0.50	170	<0.50	214	<0.50	452	<0.50	<10.0	1.3	1.34	165.2
	6/13/2017	6.7	<1.0	1.9	113	2.0	160	2.1	311 E, J	0.65	NA	N/A	3.80	74.6
	9/26/2017	5.1	<1.0	1.0	192	2.1	68.4	0.83	192	0.98	<10.0	7.1	5.56	77.3
	11/8/2017	4.8	<0.50	1.5	204	2.3	88.1	1.0	170	1.8	<10.0	5.9	1.75	99.8
	3/20/2018	4.85	<0.500	1.35	157	1.85	108	1.20	190	1.75	<13.0	5.84	7.28	156.4
	6/29/2018	5.05	<0.500	1.46	114	1.88	138	1.94	221	1.02	<10.0	3.9	0.88	224.6
	9/24/2018	4.24	<0.400	1.24	141	2.14	117	1.19	233	1.18	<1.0	5.13	4.17	152.8
	12/5/2018	3.02	<0.400	1.09	147	1.89	139	0.846	210	0.85	<1.0	<1.00	4.16	36.5
	3/22/2019	7.74	<0.800	2.18	142	3.18	139	2.09	383	<0.800	<1.0	3.48	1.12	100.2
	6/3/2019	5.75	<2.00	<2.00	92.2	2.35	148	2.10	336	<2.00	<1.0	2.76	5.68	69.1
	9/26/2019	5.14	<2.00	<2.00	104	2.6	133	<2.00	272	<2.00	<1.0	4.38	0.40	-6.1
	12/3/2019	2.63	<2.00	<2.00	95	<2.00	137	<2.00	216	<2.00	<1.0	5.56	3.12	49.2
	3/11/2020	3.65	<2.00	<2.00	59.7	<2.00	79.1	<2.00	205	<2.00	<1.0	3.72	10.81	72.3
	6/17/2020	5.16	<0.800	1.38	64.2	1.90	143	2.20	299	<0.800	N/A	N/A	2.19	-17.1
	10/7/2020	2.64	<2.00	<2.00	62.8	<2.00	118	<2.00	208	<2.00	<1.0	4.06	9.73	109.3
	12/9/2020	3.34	<2.00	<2.00	64.3	<2.00	147	<2.00	218	<2.00	<1.0	4.04	3.99	119.1
	3/4/2021	1.89	<0.4	5.92	89.4	2.39	151	2.04	320	<0.4	<1.0	2.87	1.97	141.5
	6/17/2021	1.43	<1.0	4.35	72.3	1.92	132	2.06	366	<1.0	<1.0	3.42	6.13	226.5
	9/15/2021	3.33	<2.00	<2.00	71.7	<2.00	162	<2.00	257	<2.00	<1.0	4.28	0.33	225
12/7/2021	2.74	<2.00	<2.00	43.5	<2.00	205	<2.00	255	<2.00	<1.0	2.63	0.76	219.2	
3/8/2022	2.56	<0.400	0.930	44.1	1.18	184	1.81	247	<0.400	<1.0	2.23	1.12	170.9	
6/15/2022	4.30	<2.00	<2.00	63.8	<2.00	283	2.40	362	<2.00	<1.0	1.23	3.13	143.6	
9/14/2022	2.40	<2.00	<2.00	31.9	<2.00	87.9	<2.00	151	<2.00	<1.0	1.63	7.53	265.3	
12/8/2022	1.86	<0.800	<0.800	28.1	<0.800	129	0.98	156	<0.800	<1.0	2.00	2.19	193.2	
3/15/2023	2.70	<2.00	<2.00	35.9	<2.00	161	<2.00	203	<2.00	<1.0	2.21	0.32	-347.1	
6/14/2023	3.50	<2.00	<2.00	43.7	<2.00	141	<2.00	219	3.05	<1.0	1.82	0.36	-509.8	
MGMS1-43	9/26/2016	81.9	<8.3	13.5	1,980	24.2	230	<8.3	366	52	<10.0	9.0	5.09	184.2
	12/16/2016	92.6	<8.4	9.5	1,810	20.1	64.1	<8.4	171	239	<10.0	6.2	6.06	-17.5
	3/31/2017	90.8	<8.4	12.5	1,430	15.2	45.8	<8.4	119	348	14.8	7.0	3.02	-40.7
	6/12/2017	173	<8.3	16.7	2,620	18.7	24.4	<8.3	116	681	N/A	N/A	1.17	-109.8
	9/29/2017	60.1	<2.5	6.9	901	12.9	70.7	<2.5	126	117	<10.0	6.1	8.73	90.7
	11/7/2017	153	<2.5	13.7	2,350 J	26.6	108	<2.5	211	181	<10.0	5.6	2.04	74.5
	3/22/2018	192	<0.500	18.0	2,450	34.9	80.1	0.780	278	236	<13.0	13.8	10.71	-11.7
	7/1/2018	116	<0.500	13.8	1,880	32.8	107	0.588	246	118	<10.0	7.5	3.48	-1.6
	9/28/2018	141	<8.00	27.8	3,150	47.4	252	<8.00	528	134	<1.0	5.52	1.98	97.4
	12/4/2018	148	<0.400	22.5	2,750	48.1	146	1.08	388	129	<1.0	6.06	8.31	-2.0
	3/26/2019	160	<8.00	22.3	3,210	42.2	145	<8.00	372	105	<1.0	5.58	0.96	-10.1
	6/7/2019	169	<8.00	26.5	3,090	40.8	115	<8.00	315	145	<1.0	6.73	1.24	-12.5
	9/27/2019	156	<8.00	30.5	3,240	53.9	212	<8.00	434	113	<1.0	6.32	0.42	-295.7
	12/4/2019	124	<8.00	17.5	2,860	40.9	162	<8.00	398	11.8	<1.0	5.60	6.76	-32.5
	3/11/2020	157	<10.0	29.7	3,230	60.4	228	<10.0	495	157	1.4	4.82	8.24	-40.1
	6/16/2020	114	<10.0	21.8	2,520	31.5	116	<10.0	264	152	3.4	6.56	1.3	166.4
	10/6/2020	124	<10.0	26.0	2,980	45.5	219	<10.0	507	48.2	<1.0	5.30	1.07	127.5
	12/10/2020	131	<20.0	<20.0	2,620									

Table 6
North SVE System—Operation Monitoring
 NuStar Vancouver Facility
 Vancouver, Washington

Date	Branch 4		Branch 5		Post Blower		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	
10/12/2011	0.0	-13.0	0.0	-12.0	7.2	0.1	--
11/2/2011	--*	-25.0	6.7	-25.0	--	--	--
11/17/2011	0.8	-16.0	6.9	-16.0	7.0	0.1	PID complications; Routinely reported error code. Potential moisture issues.
12/5/2011	--	--	--	--	--	--	System off on arrival and would not restart. Contractor identified electrical issues. Blower removed for replacement.
12/14/2011	--	--	--	--	--	--	System not operating, pending blower replacement. Blower reinstalled January 10, 2012.
1/23/2012	--	-15.0	6.5	-15.0	3.9	0.1	Water in sample port of Branch 4, could not get PID reading.
2/17/2012	0.1	-11.0	0.9	-11.0	2.9	1.0	--
3/22/2012	6.8	-12.0	5.4	-12.0	1.3	0.05	--
4/26/2012	1.3	-4.2	6.4	-4.0	1.0	0.05	--
5/23/2012	0.1	-3.4	3.2	-3.4	0.4	--	--
6/20/2012	0.0	-2.8	0.0	-2.7	0.1	0.2	--
7/24/2012	3.2	-3.2	9.2	-3.2	0.2	0.4	Used Rental PID.
8/22/2012	0.4	-2.4	1.0	-2.4	0.0	0.2	--
9/25/2012	0.1	-1.7	0.5	-1.7	0.0	0.2	Used ACA PID #3.
10/29/2012	--	--	--	--	--	--	System not operating.
11/26/2012	8.4	-4.0	9.2	-4.0	3.0	0.05	Used ACA PID #3.
12/21/2012	0.1	-0.63	0.0	-0.62	0.0	0.1	Used ACA PID #3.
1/24/2013	10.4	-0.45	0.0	-0.15	0.5	0.1	Used ACA PID #3.
2/28/2013	37.1	-0.22	2.1	-0.15	1.3	0.1	Used ACA PID #3.
3/25/2013	--	--	--	--	--	--	System not operating.
4/29/2013	--	--	--	--	--	--	System not operating.
5/24/2013	0.4	-23.0	0.1	-23.0	7.9	0.1	Used APEX PID #3.
6/25/2013	--	-20.0	--	-20.0	--	0.1	--
7/25/2013	6.6	-20.0	13.3	-20.0	6.1	0.1	Used APEX PID #3.
8/27/2013	1.9	-18.0	16.9	-18.0	6.8	0.1	Used APEX PID #3.
9/30/2013	0.0	-20.0	0.0	-20.0	2.1	0.1	Used APEX PID #3.
10/24/2013	1.3	-20.0	1.2	-20.0	2.3	0.1	Used APEX PID #3.
11/25/2013	0.3	-23.0	0.2	-23.0	1.1	0.1	Used APEX PID #3.
12/27/2013	1.0	-21.0	0.6	-21.0	2.6	0.1	Used APEX PID #1
1/29/2014	0.2	-20.0	0.1	-20.0	0.0	3.0	--
2/24/2014	2.4	-20.0	2.6	-20.0	2.6	9.0	Used APEX PID #3.
3/31/2014	0.3	-20.0	1.0	-20.0	0.2	1.0	Used APEX PID #4
4/29/2014	2.0	-20.0	1.4	-20.0	0.0	2.0	--
5/27/2014	2.0	-20.0	1.3	-20.0	0.9	2.0	--
7/3/2014	0.5	-20.0	0.3	-18.0	0.4	4.0	--
7/28/2014	4.0	-20.0	2.6	-19.0	0.1	3.0	Used APEX PID #3.
8/25/2014	--	-20.0	--	-19.0	3.7	3.5	Used APEX PID #3.
9/30/2014	2.1	-17.0	0.6	-17.0	1.7	--	--
10/27/2014	0.4	-26.0	1.4	-26.0	2.3	2.0	Used APEX PID #3.
11/25/2014	0.3	-21.0	1.5	-20.0	0.5	--	Used APEX PID #3.
12/29/2014	20.2	-25.0	32.1	-25.0	--	2.0	Used APEX PID #3.
1/26/2015	2.0	-25.0	3.2	-25.0	0.7	3.0	Used APEX PID #3. Knockout drum emptied.
2/26/2015	0.0	-22.0	0.0	-25.0	0.0	0.1	--
3/30/2015	0.0	-23.0	0.2	-27.0	0.0	0.4	Used APEX PID #3.
4/24/2015	0.0	-23.0	0.2	-27.0	0.0	0.4	--
5/28/2015	5.5	-26.0	4.8	-26.0	5.5	0.05	--
7/29/2015	7.5	-17.0	0.3	-17.0	0.5	0.10	Used APEX PID #3.
8/31/2015	0.0	-11.0	0.0	-10.0	0.9	0.05	Used APEX PID #3.
9/28/2015	0.6	-12.0	2.4	-12.0	1.8	0.00	Used APEX PID #3.
10/29/2015	0.5	-12.0	0.3	-13.0	2.9	1.00	Used APEX PID #3.
11/30/2015	0.0	-13.0	0.2	-13.0	0.0	2.00	Used APEX PID #3.
12/28/2015	0.0	-17.0	9.0	-18.0	0.0	0.10	Used APEX PID #3.
2/1/2016	30.4	-28.0	0.0	-25.0	2.6	3.00	Used APEX PID #3.
2/29/2016	0.0	-13.0	0.0	-13.0	0.0	0.10	Used APEX PID #3.
3/29/2016	0.0	-12.0	0.0	-12.0	0.0	0.20	Used APEX PID #3.
4/27/2016	0.2	-11.0	0.0	-5.0	0.0	1.00	Used APEX PID #3. North SVE system turned off.
5/25/2016	--	--	--	--	--	--	North SVE system intentionally turned off for approx . 60 days to evaluate system efficiency.
6/28/2016	20.4	-23.0	14.3	-23.0	0.9	0.10	Used APEX PID #3.
7/26/2016	0.0	-20.0	0.4	-20.0	0.6	1.20	Used APEX PID #3.
9/29/2016	1.0	-16.0	0.0	-15.0	0.0	0.10	Used APEX PID #3.
10/25/2016	0.4	-14.0	0.0	-14.0	0.0	0.10	Used APEX PID #3.
11/28/2016	0.0	-12.0	0.0	-12.0	0.0	0.10	Used APEX PID #3.
12/28/2016	0.0	-12.0	0.0	-12.0	0.0	0.10	Used APEX PID #3.
1/30/2017	0.0	-5.0	0.0	-5.0	0.0	0.10	Used APEX PID #3.
2/28/2017	12.5	-15.0	8.7	-14.0	1.0	0.10	--
3/28/2017	0.0	-20.0	0.0	-20.0	0.1	0.00	Used Mini Rae 3000.
4/24/2017	0.8	-20.0	0.0	-20.0	2.0	0.10	Used APEX PID #3.

Notes:

1. PID = photionization detector
2. PID readings in parts per million (ppm), calibrated to 100 ppm isobutylene.
3. Pressure readings in inches of water, measured with magnehelic gauge.
4. -- = Not available; branch not in use or no measurement collected during the site visit.
5. * = During the 11/2/2011 monitoring event, PID malfunctioned while monitoring Branch 4. Instrument readings would not stabilize.

Table 7
North SVE System–Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Sampling Location	Sample ID	Date	1,1,1-Trichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride
			Concentrations in µg/m ³								
System Effluent	North_EFF-20111012	10/12/2011	69	<16	160	<16	<14	9,500	16	700	<10
System Effluent	Post Blower_North_012312	1/23/2012	<170	<120	<120	<120	<110	16,000	<120	530	<79
System Effluent	North_Effluent_0121712	2/17/2012	<140	<100	<100	<100	<91	11,000	<99	300	<67
System Effluent	North_Effluent_032212	3/22/2012	<28	<54	<27	<27	<23	6,600	<25	140	<8.6
System Effluent	North_Effluent_062012	6/20/2012	<1.6	<3.2	<1.6	<1.6	5.3	250	<1.5	15	<0.51
System Effluent	North_Effluent_082212	8/22/2012	<1.6	<3.2	<1.6	<1.6	<1.4	140	<1.5	11	<0.51
System Effluent	North_Effluent_112612	11/26/2012	39	<14	52	<7.1	<6.2	22,000	<6.8	510	<4.6
System Effluent	North_Effluent_122112	12/21/2012	<31	<59	<30	<30	<26	3,500	<28	61	<19
System Effluent	North_Effluent_022813	2/28/2013	<36	<70	<35	<35	<31	4,400	<33	160	<22
System Effluent	SVE North	5/24/2013	<240	<170	280	<170	<380	23,000	<160	1,100	<110
System Effluent	SVE North	6/25/2013	76	<51	88	<51	<110	13,000	<49	730	<33
System Effluent	SVE North	8/27/2013	<150	<110	<110	<110	<230	17,000	<100	800	<69
System Effluent	SVE North Effluent	10/24/2013	<82	<60	<60	<60	<130	10,000	<57	570	<39
System Effluent	SVE North Effluent	12/27/2013	<44	<32	<32	<32	<69	7,000	<30	470	<20
System Effluent	SVE North Effluent	1/29/2014	<10	<40	22	<40	<87	1,300	<38	110	<26
System Effluent	SVE_North_Post Carbon	2/24/2014	55	<83	68	<41	<36	8,700	<39	760	<27
System Effluent	SVE North Post Carbon	3/5/2014	25	<39	29	<20	<17	4,600	<19	300	<13
System Effluent	VCP_North_Effluent	3/31/2014	19	<13	18	<13	<28	3,500	<12	200	<8.2
System Effluent	North_SVE_Effluent_042914	4/29/2014	22	<15	17	<15	<33	3,500	<14	220	<9.8
System Effluent	North_SVE_Effluent_052714	5/27/2014	<31	<23	<23	<23	<50	4,100	<22	280	<15
System Effluent	North_VCP_Effluent	7/3/2014	<23	<17	20	<17	<37	4,500	<16	290	<11
System Effluent	SVE North	7/28/2014	<120	<88	<88	<88	<190	7,200	<84	460	<22
System Effluent	North SVE	9/30/2014	<48	<35	48	<35	<76	7,300	<33	480	<22
System Effluent	SVE North Effluent	10/27/2014	<110	<80	<80	<80	<180	15,000	<76	410	<52
System Effluent	SVE North 11.25.14	11/25/2014	<39	<28	<28	<28	<62	7,100	<27	390	<18
System Effluent	SVENorth122914	12/29/2014	<140	<99	<99	<99	<220	15,000	<94	290	<64
System Effluent	SVE North	1/26/2015	16	<31	<16	<16	<14	1,500	<15	130	<10
System Effluent	SVE North	2/26/2015	<1.6	<3.2	<1.6	<1.6	<1.5	32	<1.5	<2.1	<1.0
System Effluent	SVE North	3/30/2015	15	<9.6	9.5	<4.8	<4.2	1,700	<4.6	130	<3.1
System Effluent	SVE N	4/24/2015	<8.5	<16	<8.2	<8.2	<7.2	550	<7.8	50	<5.3
System Effluent	SVE North	5/14/2015	<1.6	<3.2	<1.6	<1.6	<1.4	<2.7	<1.5	<2.1	<1.0
System Effluent	SVE North	5/28/2015	<3.8	<7.3	<3.6	<3.6	<3.2	360	3.6	8.0	<2.4
System Effluent	SVE North	7/29/2015	19	<33	21	<16	<14	2,000	<16	210	<11
System Effluent	SVE North	8/31/2015	65	<65	62	<33	<28	7,100	<31	600	<21
System Effluent	SVE North	9/28/2015	21	<22	<11	<11	<9.7	1,400	<11	190	<7.1
System Effluent	SVE North	10/29/2015	<56	<110	59	<55	<48	6,300	<52	550	<35
System Effluent	SVE_North_Effluent_113015	11/30/2015	<54	<140	<72	<72	<72	2,300	<72	86	<72
System Effluent	SVE_North_Effluent_122815	12/28/2015	<32	<62	<31	<31	<27	5,600	<30	110	<20
System Effluent	North_Effluent_020116	2/1/2016	<53	<100	<51	<51	<45	11,000	<48	150	<33
System Effluent	SVE_North_Effluent_022916	2/29/2016	30	<33	29	<16	<14	7,800	<16	160	<11
System Effluent	SVE_North_Effluent_032916	3/29/2016	19	<14	<7.2	<7.2	<6.3	920	<6.9	19	<4.7
System Effluent	North_Effluent	4/27/2016	<15	<29	<14	<14	<13	1,500	<14	75	<9.2
System Effluent	North_Effluent_62816	6/28/2016	<11	<22	<11	<13	<9.6	1,800	<10	83	<7.1
System Effluent	SVE-North-Effluent 72616	7/26/2016	<1.6	<3.2	<1.6	<1.6	<1.4	84	2.0	6	<1.0
System Effluent	SVE-North-Effluent 83016	8/30/2016	<0.30	<0.80	<0.40	<0.40	<0.40	54	<0.40	2	<0.40
System Effluent	SVE_North_Effluent_092916	9/29/2016	<1.6	<3.2	<1.6	<1.6	<1.4	15	<1.5	<2.1	<1.0
System Effluent	SVE_North_Effluent_102516	10/25/2016	<1.6	<3.2	<1.6	<1.6	<1.4	7.9	3.0	<2.1	<1.0
System Effluent	SVE_North_Effluent_112816	11/28/2016	<1.6	<3.2	<1.6	<1.6	<1.4	2.8	3.9	<2.1	<1.0
System Effluent	SVE_North_Effluent_122816	12/28/2016	<1.6	<3.2	<1.6	<1.6	<1.4	<2.7	1.7	<2.1	<1.0
System Effluent	SVE_North_Effluent_013017	1/30/2017	<1.6	<3.2	<1.6	<1.6	<1.4	<2.7	4.6	<2.1	<1.0
System Effluent	SVE_North_Effluent_022817	2/28/2017	<1.6	<3.2	<1.6	<1.6	<1.4	5.9	<1.5	<2.1	<1.0
System Effluent	SVE_North_Effluent_032817	3/28/2017	<1.6	<3.2	<1.6	<1.6	<1.4	3.2	2.9	<2.1	<1.0
System Effluent	SVE_North_Effluent	4/24/2017	<1.6	<3.2	<1.6	<1.6	<1.4	3.9	3.7	<2.1	<1.0

Notes:

1. µg/m³ = Micrograms per cubic meter.
2. Samples analyzed by Modified EPA Method TO-15.
3. Only analytes detected in at least one sample are presented in this table.
4. **Bold** value represents detected concentration of listed analyte.
5. < = Not detected at or above the specified laboratory method reporting limit (MRL).

Table 8
South SVE System—Operation Monitoring
 NuStar Vancouver Facility
 Vancouver, Washington

Date	Pre-Blower		Post Blower (Pre-Carbon)		Post Carbon 1		Post Carbon 2		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	
10/12/2011	-	-14.0	17.1	24.0	0	12.0	0.2	4.0	-
10/18/2011	-	-14.0	15.5	-	15.5	14.0	0.5	3.0	Pre-carbon, post blower tap is now covered by noise suppression panels.
11/2/2011	-	-15.0	18.2	26.0	0.0	26.0	2.0	7.0	-
11/17/2011	-	-18.0	8.9	27.0	--*	15.0	--*	6.8	-
12/5/2011	8.3	-18.0	10.7	39.0	0.0	19.0	2.2	6.1	System switch off upon arrival. System restarted. Monitoring event conducted approximately 3 hours after restart.
12/14/2011	11.8	-19.0	21.0	28.0	0.0	18.0	0.7	6.2	-
1/9/2012	7.3	-17.0	8.3	29.0	0.0	18.0	0.0	6.2	-
1/23/2012	7.0	-17.0	8.9	29.0	0.0	17.0	0.0	6.9	-
2/17/2012	6.0	-18.0	11.2	29.0	0.0	18.0	0.0	6.0	-
3/22/2012	13.3	-16.0	10.7	27.0	0.0	15.0	0.0	6.5	-
4/26/2012	10.3	-17.0	11.6	27.0	0.0	16.0	0.0	6.4	-
5/23/2012	10.4	-20.0	10.6	31.0	0.0	19.0	0.0	6.6	-
6/20/2012	7.3	-21.0	7.5	33.0	0.5	20.0	0.0	6.3	-
7/24/2012	19.8	-20.0	41.5	32.0	226.3	20.0	98.8	6.2	Used rental PID.
8/22/2012	8.0	-48.0	10.1	29.0	5.5	18.0	1.1	4.6	-
9/25/2012	10.0	-46.0	13.7	29.0	9.5	15.0	12.8	4.3	Used ACA PID #3.
10/29/2012	8.4	-34.0	18.6	47.0	0.3	28.0	12.9	4.3	Used ACA PID #3; Carbon change-out on 10/29/2012
11/26/2012	13.7	<-100	1.6	18.0	0.1	6.6	3.1	0.66	Used ACA PID #3.
12/21/2012	0.5	-107	0.5	17.0	0.0	6.1	0.0	0.49	Used ACA PID #3.
1/24/2013	5.1	-105	0.5	10.0	0.0	6.5	0.0	0.61	Used ACA PID #3.
2/28/2013	2.8	-105	0.1	18.0	0.0	7.0	0.0	0.60	Used ACA PID #3.
3/25/2013	8.4	-102	0.9	16.0	0.1	7.0	0.0	0.58	Used Apex PID #3
4/29/2013	0.2	-98	0.4	15.0	0.0	6.3	0.1	0.49	Used Apex PID #3
5/24/2013	41.0	-18	49.7	47.0	0.2	26	0.7	5.0	Used Apex PID #3
6/25/2013	-	-15	-	51.0	-	31	-	5.1	-
7/25/2013	12.3	-16	13.9	50.0	0.7	32	0.5	6.0	Used Apex PID #3
8/27/2013	13.2	-16	12.1	52.0	3.8	31	1.2	5.2	Used Apex PID #3
9/30/2013	5.2	-15	15.4	45.0	27.4	30	0.4	5.2	Used Apex PID #3
10/24/2013	3.1	-14	13.2	50.0	6.8	32	1.5	5.2	Used Apex PID #3
11/25/2013	1.4	-19	19.3	51.0	12.4	35	2.8	5.3	Used Apex PID #3
12/27/2013	0.3	-19	7.7	55.0	3.1	32	0.0	5.4	Used Apex PID #1
1/29/2014	2.4	-19	6.7	50.0	5.7	30	0.2	10.0	-
2/24/2014	7.7	-19	19.7	50.0	2.4	30	1.4	10.0	Used Apex PID #3
3/31/2014	2.6	-15	4.6	46.0	5.4	30	0.0	8.0	Used APEX PID #4
4/29/2014	2.0	-14	3.4	48.8	9.7	30	0.0	8.0	-
5/27/2014	3.5	-14	5.0	49.0	10.2	28	0.1	7.0	-
7/3/2014	1.6	-18	2.4	50.0	1.4	30	0.1	10.0	-
7/28/2014	8.5	-19	9.0	50.0	11.0	30	8.7	8.0	Used Apex PID #3
8/25/2014	4.6	-17	7.5	49.0	15.8	26	11.0	7.0	Used Apex PID #3
9/30/2014	0.5	-14	5.2	40.0	4.0	28	2.7	5.0	-
10/27/2014	-	-	-	-	-	-	-	-	System off upon arrival. Unable to turn back on.
11/3/2014	5.0	-20	23.0	50.0	13.1	20	14.6	8.0	Used Apex PID #3
11/25/2014	-	-	-	-	-	-	-	-	System off for drum replacement.
12/29/2014	-	-	-	-	-	-	-	-	System off.
1/26/2015	27.1	-25	34.6	20.0	1.0	17	0.0	10.0	Used Apex PID #3
2/26/2015	0.8	-20	12.9	30.0	0.2	19	0.1	8.0	-
3/30/2015	0.4	-20	14.2	29.0	0.1	20	0.1	8.0	Used Apex PID #3
4/24/2015	0.4	-20	14.2	29.0	0.1	20	0.1	8.0	-
5/28/2015	1.0	-20	57.5	28.0	63.6	17	33.0	7.0	-
7/29/2015	0.0	-16	14.1	25.0	9.6	14	1.2	5.0	Used Apex PID #3
8/31/2015	0.0	-20	1.2	26.0	6.9	14	1.8	6.0	Used Apex PID #3
9/28/2015	3.0	-20	7.4	26.0	3.8	16	1.1	6.0	Used Apex PID #3
10/29/2015	9.0	-22	11.2	27.0	7.6	16	0.2	8.0	Used Apex PID #3
11/30/2015	-	-18	7.0	30.0	33.6	18	0.4	6.0	Used Apex PID #3
12/28/2015	-	-18	12.5	29.0	1.3	18	0.4	8.0	Used Apex PID #3
2/1/2016	0.1	-24	0.3	19.0	9.2	16	0.0	7.0	Used Apex PID #3
2/29/2016	0.2	-18	25.2	30.0	8.5	17	2.3	6.0	Used Apex PID #3
3/29/2016	0.0	-19	54.0	28.0	13.2	16	3.4	7.0	Used Apex PID #3
4/27/2016	5.0	-28	32.0	50.0	21.3	0.2	22.3	1.0	Used Apex PID #3
5/25/2016	0.2	-100	0.3	3.0	23.2	2	9.7	0.6	Used Apex PID #3
6/28/2016	-	-	-	-	-	-	-	-	System shut down
7/26/2016	8.1	-20	30.4	30.0	26.2	20	18.1	10.0	Used Apex PID #3
9/29/2016	26.3	-18	27.4	28.0	36.7	16	35.7	6.0	Used Apex PID #3
10/25/2016	0.8	-18	13.3	30.0	58.0	18	7.7	8.0	Used Apex PID #3
11/28/2016	0.0	-22	70.1	30.0	78.0	18	54.2	8.0	Used Apex PID #3
12/28/2016	0.0	-100	0.0	2.0	0.4	1.0	1.0	1.0	Bleeder valve appears damaged. No sample collected. Turned system off prior to departure.
1/30/2017	0.0	-22	52.3	33.0	0.0	20.0	0.0	10.0	Used Apex PID #3
2/28/2017	-	-	-	-	-	-	-	-	No sample collected.
3/28/2017	-	-	-	-	-	-	-	-	System not working properly. Knock out drum valve was pulled down and sucking in ambient air. No sample collected.
4/24/2017	-	-	-	-	-	-	-	-	Could not get valve to operate properly. System pulling in ambient air.
7/31/2017	0.0	-18	31.8	31.0	31.2	18.0	27.2	8.0	Used Apex PID #3
8/28/2017	0.0	-18	75.0	32.0	60.0	18.0	50.1	9.0	-
9/25/2017	39.2	-18	32.7	30.0	19.7	18.0	20.6	7.5	Used Apex PID #3
10/26/2017	2.8	-22	27.7	30.0	19.0	18.0	17.4	7.0	Used Apex PID #3
11/29/2017	5.2	-20	68.0	30.0	54.0	18.0	56.0	7.0	-
12/21/2017	0.3	-20	12.4	30.0	6.7	18.0	5.6	8.0	Pre-Carbon was not sampled due to sampling canister malfunction.
1/22/2018	0.0	-20	13.6	30.0	10.2	18.0	7.2	7.0	Used Apex PID #3
2/28/2018	-	-20	-	30.0	-	18.0	-	7.0	PID was not within calibration and readings were not recorded.
3/29/2018	-	-20	19.0	31.0	28.0	19.0	19.0	8.0	Used Apex PID #3
4/24/2018	2.2	-20	26.8	31.0	29.2	19.0	18.8	8.0	Used Apex PID #3
5/16/2018	13.8	-20	26.6	30.0	40.2	18.0	26.8	8.0	-
7/23/2018	30.0	-18	34.5	29.0	37.5	17.0	37.3	7.0	-
11/7/2018	3.0	-18	22.9	30.0	20.7	17.0	19.3	6.0	-
1/4/2019	0.5	-24	27.3	28.0	23.4	16.0	22.4	6.0	Used Cascadia PID
3/8/2019	0.7	-24	19.2	28.0	12.1	16.0	12.4	6.0	Used Cascadia PID
5/7/2019	4.0	-20	33.0	29.0	25.4	17.0	25.8	7.0	Used Cascadia PID
7/8/2019	0.6	-21	33.6	29.0	26.1	17.0	27.1	7.0	Used Cascadia PID
9/9/2019	1.0	-21	29.7	29.0	27.1	17.0	22.8	6.0	Used Cascadia PID
11/4/2019	0.9	-21	31.6	29.0	18.1	12.0	16.2	6.0	Used Cascadia PID

Table 8
South SVE System—Operation Monitoring
 NuStar Vancouver Facility
 Vancouver, Washington

Date	Pre-Blower		Post Blower (Pre-Carbon)		Post Carbon 1		Post Carbon 2		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	
1/10/2020	0.1	-21	6.3	29.0	4.2	16.0	3.5	6.0	Used Cascadia PID
12/14/2020	0.6	-18	52.9	30.0	25.2	17.0	21.9	6.0	Used Cascadia PID
2/23/2021	0.1	-21	13.1	30.0	16.8	17.0	7.2	6.0	Used Cascadia PID
4/9/2021	0.0	-17	303.4	30.0	281.1	18.0	278.6	7.0	Used FEI miniRAE 30.00 PID
6/18/2021	0.2	-16	26.7	30.0	32.4	18.0	25.3	7.0	Used Cascadia PID
8/25/2021	0.0	-17	29.1	30.0	33.6	18.0	35.5	7.0	Used GeoEngineers PID
11/19/2021	0.0	-19	36.9	28.0	25.1	11.0	24.5	6.0	Used GeoEngineers PID
12/8/2021	0.0	-19	29.5	28.0	10.9	16.0	11.8	7.0	Used Cascadia PID. System was off on arrival. System ran for 15 minutes before readings were taken.
1/25/2022	0.0	-19	19.5	28.5	11.6	16.5	11.1	6.5	Used GeoEngineers PID
3/10/2022	0.0	-21	13.5	29.0	9.0	12.0	8.5	6.0	Used GeoEngineers PID
5/10/2022	0.0	-18	15.0	29.5	10.0	12.5	9.3	7.0	Used GeoEngineers PID
7/12/2022	0.0	-16	20.7	29.0	16.3	16.5	14.9	7.0	Used GeoEngineers PID
9/12/2022	0.0	-17	22.8	29.0	23.1	17.0	17.5	7.0	Used GeoEngineers PID
11/14/2022	0.0	-19	15.9	29.0	14.2	17.0	12.1	6.5	Used GeoEngineers PID
1/16/2023	0.0	-21	12.3	28.5	9.3	16.0	7.2	6.5	Used GeoEngineers PID
3/13/2023	0.0	-21	10.0	28.0	7.8	16.0	5.9	6.0	Used GeoEngineers PID
5/9/2023	0.0	-21	11.1	28.5	12.0	16.0	7.1	6.5	Used GeoEngineers PID

Notes:

1. PID = photoionization detector
2. PID readings in parts per million (ppm), calibrated to 100 ppm isobutylene.
3. Pressure readings in inches of water, measured with magnehelic gauge.
4. -- = Not available or not applicable.
5. Note Cascadia and GeoEngineers PID are the same equipment.

Table 9
South SVE System–Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	1,1,1-Trichloro-ethane	Trichloro-ethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m ³										
Pre Carbon	INF 1006	10/6/2011	<330	<320	470	<320	<280	40,000	<300	520	5,100	<210	<350
Post Carbon	EFF 1006	10/6/2011	<16	<16	390	<16	<14	<27	<15	140	50	<10	<17
Pre Carbon	Post Blower 110211	11/2/2011	<290	<280	430	<280	<250	26,000	<270	<390	2,100	<180	<310
Pre Carbon	SOUTHSVE_PRECARBON_121411	12/14/2011	<580	<570	620	<570	<500	54,000	<540	<780	2,800	<360	<620
Post Carbon	SOUTHSVE_POSTCARBON_121411	12/14/2011	<16	35	23	<16	17	1,600	<15	78	1,300	12	<17
Post Carbon	POST CARBON_SOUTH_012312	1/23/2012	<16	<16	<16	<16	<14	<27	<15	<22	<21	<10	<17
Pre Carbon	South_PreCarbon_021712	2/17/2012	<300	<300	460	<300	<260	28,000	<280	<410	1,200	<190	<330
Post Carbon	South_PostCarbon_021712	2/17/2102	<16	<16	<16	<16	<14	<27	<15	<22	<21	<17	<10
Pre Carbon	South Influent - 032212	3/22/2012	<190	<190	310	<95	<84	30,000	<91	99	960	<31	<100
Post Carbon	South Effluent - 032212	3/22/2012	<1.2	<3.2	<1.6	<1.6	4	<2.7	<1.5	<1.6	<2.1	6.4	<3.5
Pre Carbon	South_SVE_PRECARBON	4/26/2012	<210	<560	<280	<280	<240	32,000 S	<270	<290	640 S	<90	<610
Post Carbon	South_SVE_POSTCARBON	4/26/2012	<1.2	<3.2	<1.6	<1.6	4	<2.7	<1.5	<1.6	<2.1	2.4	<3.5
Pre Carbon	SOUTH_SVE_PRECARBON	5/23/2012	<100	<260	200	<130	<120	19,000	<130	<140	780	<43	<290
Post Carbon	South_SVE_PRECARBON	5/23/2012	<1.2	<3.2	<1.6	<1.6	3	<2.7	<1.5	<1.6	<2.1	3.7	<3.5
Pre Carbon	South_PreCarbon_062012	6/20/2012	<240	<630	360	<320	<280	35,000	<300	<330	1,400	<100	<1040
Post Carbon	South_PostCarbon_062012	6/20/2012	<0.30	<0.80	<0.40	<0.40	1.0	<0.40	<0.40	<0.30	<0.40	1.2	<1.2
Pre Carbon	South_PreCarbon_072412	7/24/2012	<150	<390	240	<200	<170	33,000	<190	<200	1,100	<63	<640
Post Carbon	South_PostCarbon_072412	7/24/2012	<1.2	11	<1.6	<1.6	3.0	<2.7	2.2	<1.6	<2.1	3.9	<5.2
Pre Carbon	South_PreCarbon_082212	8/22/2012	<250	<660	760	<330	<290	47,000	<310	<340	2,000	<110	1,080
Post Carbon	South_PostCarbon_082212	8/22/2012	<21	<55	<27	<27	<24	<47	<26	<28	<37	<8.8	<90
Pre Carbon	South_PreCarbon_092512	9/25/2012	<270	<700	500	<400	<310	50,000	<330	<360	1,900	<230	<770
Post Carbon	South_PostCarbon_092512	9/25/2012	13	18	1,200	11	5.7	<2.7	<1.5	<1.6	<2.1	6.2	<3.5
Pre Carbon	South_PreCarbon_102912	10/29/2012	<320	<850	440	<480	<370	60,000	<400	<440	2,200	<270	<930
Post Carbon	South_PostCarbon_102912	10/29/2012	<5.3	<14	<7	<7	<7	<7	<7	<7	<7	<7	<14
Pre Carbon	South_PreCarbon_112612	11/26/2012	<95	<250	<120	<120	<110	10,000	<120	<130	530	<80	<410
Post Carbon	South_PostCarbon_112612	11/26/2012	<2.7	<7.2	<3.6	<3.6	<3.6	<3.6	<3.6	<2.7	<3.6	<3.6	<10.8
Pre Carbon	South_PreCarbon_122112	12/21/2012	<71	<190	110	<93	<82	14,000	<89	<96	600	<60	<300
Post Carbon	South_PostCarbon_122112	12/21/2012	<1.2	<3.2	<1.6	<1.6	1.6	<2.7	<1.5	<1.6	<2.1	3.0	<5.2
Pre Carbon	South_PreCarbon_012413	1/24/2013	<9.2	<24	14	<12	<11	1,700	<11	<12	100	<7.8	<39
Post Carbon	South_PostCarbon_012413	1/24/2013	<1.2	<3.2	<1.6	<1.6	3.3	<2.7	<1.5	<1.6	<2.1	3.7	<5.2
Pre Carbon	South_PreCarbon_022813	2/28/2013	<5.9	<15	8.5	<7.7	<6.7	940	<7.3	<7.9	84	<5.0	<25.4
Post Carbon	South_PostCarbon_022813	2/28/2013	<1.2	<3.2	<1.6	<1.6	8.1	<2.7	<1.5	<1.6	<2.1	<1.0	<5.2
Pre Carbon	South_PreCarbon_032513	3/25/2013	<29	<75	<38	<38	<33	3,700	<36	<39	160	<24	<123
Post Carbon	South_PostCarbon_032513	3/25/2013	<1.2	<3.2	<1.6	<1.6	2.0	<2.7	<1.5	<1.6	<2.1	2.0	<5.2
Pre Carbon	SVE South Pre Carbon	4/29/2013	<6.3	<16	10	<8.2	<7.2	950	<7.8	<8.4	48	<5.3	<26.9
Post Carbon	SVE South Post Carbon	4/29/2013	<0.30	<0.80	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.40	0.93	<1.2
Pre Carbon	SVE South Pre Carbon	5/24/2013	<1,100	<1,100	2,400	<1,100	<2,400	240,000	<1,100	<1,500	8,400	<720	<4,300
Post Carbon	SVE South Post Carbon	5/24/2013	<0.81	<0.79	<0.79	<0.79	<1.7	<1.4	<0.75	<1.1	<1.1	<0.51	<3.1

Table 9
South SVE System–Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	1,1,1-Trichloro-ethane	Trichloro-ethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m ³										
Pre Carbon	SVE South Pre Carbon	6/25/2013	<150	<150	630	<150	<330	39,000	<140	<210	1,800	<97	<570
Post Carbon	SVE South Post Carbon	6/25/2013	<0.81	8.1	3.8	<0.79	5.6	<1.4	<0.75	<1.1	<1.1	3.1	<3.1
Pre Carbon	SVE South Pre Carbon	7/25/2013	<120	<120	380	<120	<260	22,000	<110	<160	1,200	<77	<460
Post Carbon	SVE South Post Carbon	7/25/2013	<0.81	17	65	2.1	3.4	<1.4	1.2	<1.1	<1.1	2.6	1.4
Pre Carbon	SVE South Pre Carbon	8/27/2013	<150	<150	520	<150	<330	28,000	<140	<210	1,500	<97	<580
Post Carbon	SVE South Post Carbon	8/27/2013	3.3	13	270	7.0	4.7	<2.7	<1.5	<2.2	<2.1	3.7	<6.0
Pre Carbon	SVE South Precarbon	9/30/2013	<110	<110	450	<110	<240	26,000	<110	<150	1,400	<72	<420
Pre Carbon	SVE South Pre Carbon	10/24/2013	<140	<140	430	<140	<310	27,000	<130	<190	1,100	<90	<530
Post Carbon	SVE South Post Carbon	10/24/2013	3.8	4.9	390	3.3	<5.2	4.3	<2.3	5.4	<3.2	2.6	<5.1
Pre Carbon	SVE South Pre Carbon	11/25/2013	<100	<98	250	<98	<220	21,000	<93	<140	840	<63	<380
Post Carbon	SVE South Post Carbon	11/25/2013	<2.8	4.1	250	<2.8	7.3	<4.8	<2.6	17	56	<1.8	<10.6
Pre Carbon	SVE South Pre Carbon	12/27/2013	<110	<110	270	<110	<240	20,000	<100	<150	900	<70	<420
Post Carbon	SVE South Post Carbon	12/27/2013	2.5	4.5	220	2.4	3.8	3.5	<1.1	6.8	62	<0.77	<4.6
Pre Carbon	SVE South Pre-Carbon	1/29/2014	<80	<79	260	<79	<170	20,000	<75	<110	800	<51	<306
Post Carbon	SVE South Post-Carbon	1/29/2014	4.5	7.2	330	4.8	<8.7	7.9	<3.8	13	98	3.1	<15.3
Pre Carbon	SVE_South_Pre_Carbon	2/24/2014	<190	<490	430	<240	240.0	34,000	600	<250	1,500	<160	<800
Post Carbon	SVE_South_Effluent	2/24/2014	<1.2	<3.2	41	<1.6	<1.4	<2.7	<1.5	<1.6	<2.1	<1.0	<5.2
Pre Carbon	SVE South Pre Carbon	3/5/2014	<110	<280	270	<140	<120	16,000	660	<140	660	<90	1,090
Post Carbon	SVE South Effluent	3/5/2014	3.7	<8.3	310	4.2	4.4	<7.1	<4.0	<4.3	21	<2.7	<13.7
Pre Carbon	VCP_South_Post_Blower	3/31/2014	<83	<82	260	<82	<180	20,000	<78	<110	630	<53	<309
Post Carbon	VCP_South_Effluent	3/31/2014	3.3	4.9	290	4.2	<4.3	<3.4	<1.9	3.3	21	1.4	<7.6
Pre Carbon	South_SVE_Postblower_042914	4/29/2014	<47	<46	180	<46	<100	13,000	<44	<63	550	<30	<180
Post Carbon	South_SVE_Effluent_042914	4/29/2014	5.1	5.0	540	<4.8	<11	<8.2	<4.6	<6.6	37	<3.1	<18.3
Pre Carbon	South_SVE_Postblower_052714	5/27/2014	<57	<55	160	<55	<120	12,000	<53	<76	490	<36	<201
Post Carbon	South_SVE_PostCarbon_052714	5/27/2014	5.0	<4.8	530	<4.8	<11	<8.2	<4.6	14	8.1	<3.1	<18.3
Pre Carbon	South_VCP_Post Blower	7/3/2014	<18	<18	56	<18	<45	2,800	<18	<18	150	<18	<63
Post Carbon	South_VCP_Post Carbon	7/3/2014	<16	<16	760	<16	<35	55	<15	430	3,200	<10	<60
Pre Carbon	SVE Pre Carbon	7/28/2014	<69	<67	200	<67	<150	15,000	<64	<93	750	<43	<254
Post Carbon	SVE Post Carbon	7/28/2014	<68	<67	270	<67	<150	13,000	<63	530	12,000	<43	<253
Pre Carbon	South SVE Pre Carbon	8/25/2014	<140	<130	340	<130	<290	20,000	<130	<180	1,100	<86	<520
Post Carbon	South SVE Post Carbon	8/25/2014	<140	<130	270	<130	<290	9,600	<130	<180	2,700	<86	<520
Pre Carbon	South SVE_Pre Carbon	9/30/2014	<110	<110	250	<110	<230	17,000	<100	<150	930	<69	<410
Post Carbon	South SVE_Post Carbon	9/30/2014	<130	<120	280	<120	<270	23,000	<120	<170	620	<80	<480
Pre Carbon	SVE South Post Blower	11/3/2014	<130	<130	320	<130	<280	24,000	<120	<170	1,100	<81	<490
Post Carbon	SVE South Post Carbon	11/3/2014	<81	<81	130	<81	<180	12,000	<77	<110	290	<52	<309
Pre Carbon	SVE South Pre Carbon	1/26/2015	<190	<500	420	<250	<220	21,000	240	<260	860	<160	<820
Post Carbon	SVE South Post Carbon	1/26/2015	<78	<200	<100	<100	<90	<170	190	<110	<140	<66	<330

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Sampling Location	Sample ID	Date	1,1-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	1,1,1-Trichloro-ethane	Trichloro-ethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m ³										
Pre Carbon	SVE South Pre Carbon	2/26/2015	<150	<390	260	<200	<170	18,000	280	<200	660	<130	<650
Post Carbon	SVE South Post Carbon	2/26/2015	<1.2	<3.2	<1.6	<1.6	3.2	<2.7	<1.5	<1.6	<2.1	2.5	<5.2
Pre Carbon	SVE South Pre Carbon	3/30/2015	<61	<160	200	<79	160	17,000	180	<82	570	<51	<257
Post Carbon	SVE South Post Carbon	3/30/2015	<1.2	<3.2	<1.6	<1.6	2.8	<2.7	2.7	<1.6	51	2.5	<5.2
Pre Carbon	SVE S Pre Carbon	4/24/2015	<37	<97	170	<49	<43	5,400	<46	<50	410	<31	<163
Post Carbon	SVE S Post Carbon	4/24/2015	<6.2	<16	<8.1	<8.1	<7.1	660	<7.7	<8.3	19	<5.2	18
Pre Carbon	SVE South Pre Carbon	5/28/2015	<60	<160	140	<79	92	8,000	240	<81	460	<51	<256
Post Carbon	SVE South Post Carbon	5/28/2015	<4.9	<13	<6.3	<6.3	<5.6	650	<6.0	<6.5	16	<4.1	22.1
Pre Carbon	SVE South Pre Carbon	7/29/2015	<65	<170	190	<85	<75	12,000	<81	<88	790	<55	<183
Post Carbon	SVE South Post Carbon	7/29/2015	10	<27	960	16	<12	440	<13	<14	<18	<8.7	<45
Pre Carbon	SVE South Pre Carbon	8/31/2015	<64	<170	160	<83	<73	12,000	<79	<86	780	<54	<171
Post Carbon	SVE South Post Carbon	8/31/2015	<21	<55	530	<27	<24	3,400	<26	<28	94	<18	<90
Pre Carbon	SVE South Pre Carbon	9/28/2015	<83	<220	170	<110	<94	9,900	<100	<110	660	<70	<360
Post Carbon	SVE South Post Carbon	9/28/2015	3.4	<6.0	340	3.6	<2.6	300	<2.8	39	59	<1.9	<9.8
Pre Carbon	SVE South Pre Carbon	10/29/2015	<130	<350	230	<170	<150	18,000	<170	<180	790	<110	<570
Post Carbon	SVE South Post Carbon	10/29/2015	4.2	5.2	340	4.5	2.6	26	<1.5	67	310	1.7	<5.2
Pre Carbon	SVE_South_Precarbon_113015	11/30/2015	<29	<77	54	<38	<38	3,000	<38	<29	300	<38	<77
Post Carbon	SVE_South_Postcarbon_113015	11/30/2015	<0.80	<0.80	27	0.60	<0.40	<0.40	<0.40	6	11	<0.40	<0.80
Pre Carbon	SVE_SOUTH_PRE CARBON_12/28/15	12/28/2015	<120	<320	180	<160	<140	35,000	<150	<170	1,200	<100	<530
Post Carbon	SVE_SOUTH_POST CARBON_12/28/15	12/28/2015	<1.2	<3.2	28	<1.6	<1.4	<2.7	1.5	2	6.5	<1.0	<4.2
Pre Carbon	SVE_SOUTH_PRE CARBON	2/1/2016	<8.6	<22	20	<11	<9.8	2,900	<11	14	120	<7.2	<37
Post Carbon	SVE_SOUTH_POST CARBON	2/1/2016	2.2	<3.2	160	2.90	<1.4	<2.7	<1.5	92	260	<1.0	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON	3/29/2016	<230	<610	710	<300	<270	71,000	<290	520	2,800	<200	<670
Post Carbon	SVE_SOUTH_POST CARBON	3/29/2016	<69	<180	490	<23	<79	9,300	<86	1500	9,300	<58	<200
Pre Carbon	SVE_SOUTH_PRE CARBON	4/27/2016	<6.4	<17	12	<8.4	<7.4	910	<8.0	<8.7	23	<5.4	<18
Post Carbon	SVE_SOUTH_POST CARBON	4/27/2016	<63	<160	180	<82	<72	11,000	<78	110	2,200	<53	<180
Pre Carbon	SVE_SOUTH_PRE CARBON	5/25/2016	<1.2	<3.2	4	<1.6	<1.4	550	2.9	3	22	<1.0	3.9
Post Carbon	SVE_SOUTH_POST CARBON	5/25/2016	<16	<41	2300	30.00	<18	14,000	<19	130	3,300	<13	<45
Pre Carbon	SVE_SOUTH_PRE CARBON	7/26/2016	<98	<260	340	<130	<110	18,000	<120	<130	970	<83	<420
Post Carbon	SVE_SOUTH_POST CARBON	7/26/2016	<78	<200	760	<120	<89	15,000	<97	220	1,400	<66	<330
Pre Carbon	SVE_SOUTH_PRE CARBON	8/30/2016	<86	<230	340	<110	<99	28,000	<110	<120	1,400	<73	<370
Post Carbon	SVE_SOUTH_POST CARBON	8/30/2016	<81	<210	370	<110	<93	19,000	<100	210	910	<68	<350
Pre Carbon	SVE_SOUTH_PRE CARBON	9/29/2016	<73	<190	340	<95	<83	25,000	<90	110	1,300	<61	<310
Post Carbon	SVE_SOUTH_POST CARBON	9/29/2016	<46	<120	410	<60	<53	14,000	<57	140	1,900	<39	<196

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Sampling Location	Sample ID	Date	1,1-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	1,1,1-Trichloro-ethane	Trichloro-ethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m³										
Pre Carbon	SVE-SOUTH_PRE CARBON_102516	10/25/2016	<150	<390	380	<190	<170	32,000	<180	<200	1,500	<120	<630
Post Carbon	SVE-SOUTH_POST CARBON_102516	10/25/2016	<100	<260	530	<130	<120	19,000	<130	180	2,700	<85	<430
Pre Carbon	SVE_SOUTH_PRE CARBON_112816	11/28/2016	<260	<670	420	<340	<290	52,000	<320	<350	2,100	<220	<1110
Post Carbon	SVE_SOUTH_POST CARBON_112816	11/28/2016	<79	<210	<100	<100	<90	18,000	<98	360	3,200	<66	<340
Pre Carbon	SVE_SOUTH_PRE CARBON_013017	1/30/2017	<260	<690	660	<340	<300	61,000	<330	400	2,400	<220	<1130
Post Carbon	SVE_SOUTH_POST CARBON_013017	1/30/2017	<1.2	<3.2	<1.6	<1.6	<1.4	24	1.8	<1.6	<2.1	<1.0	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_073117	7/31/2017	<100	<260	400	<130	<110	17,000	340	<130	1,000	<84	<430
Post Carbon	SVE_SOUTH_POST CARBON_073117	7/31/2017	<1.2	<3.2	<1.6	<1.6	2.4	6.5	8.2	<1.6	3.9	2.4	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_082817	8/28/2017	<60	<160	320	<79	<69	32,000	<75	90	1,100	<51	<256
Post Carbon	SVE_SOUTH_POST CARBON_082817	8/28/2017	<1.2	5.8	2	<1.6	2.4	160	2.3	<1.6	3.9	2.2	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_092517	9/25/2017	<21	<55	200	<27	<24	23,000	<26	45	460	<18	<90
Post Carbon	SVE_SOUTH_POST CARBON_092517	9/25/2017	<1.2	8.0	16	<1.6	5.3	6.8	<1.5	<1.6	<2.1	2.2	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_102617	10/26/2017	<40	<100	230	<52	<45	13,000	<49	64	700	<33	<167
Post Carbon	SVE_SOUTH_POST CARBON_102617	10/26/2017	2.0	15	98	2.1	1.6	9.7	<1.5	3.9	<2.1	1.5	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_112917	11/29/2017	<140	<370	280	<180	<160	22,000	<170	<190	820	<120	<600
Post Carbon	SVE_SOUTH_POST CARBON_112917	11/29/2017	3.8	8.5	220	4.0	<2.0	<4.0	<2.2	12	<3.2	2.5	<5.7
Pre Carbon	SVE_SOUTH_PRE CARBON_122117	12/21/2017	--	--	--	--	--	--	--	--	--	--	--
Post Carbon	SVE_SOUTH_POST CARBON_122117	12/21/2017	4.6	4.9	300	5.2	1.7	<2.7	<1.5	20	7.2	1.8	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_012218	1/22/2018	<110	<290	150	<150	<130	13,000	<140	<150	390	<95	<480
Post Carbon	SVE_SOUTH_POST CARBON_012218	1/22/2018	4.3	<6.5	380	<3.2	<2.8	8.1	<3.1	11	16	2.1	<10.6
Pre Carbon	SVE_SOUTH_PRE CARBON_022818	2/28/2018	<19	<49	200	<25	<22	13,000	<23	52	440	<16	<81
Post Carbon	SVE_SOUTH_POST CARBON_022818	2/28/2018	2.8	<3.2	300	4.0	<1.4	<2.7	<1.5	14	51	5.1	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_032918	3/29/2018	<23	<60	180	<30	<26	13,000	<28	46	470	<19	<98
Post Carbon	SVE_SOUTH_POST CARBON_032918	3/29/2018	4.2	5.2	500	7.4	1.5	7.8	<1.5	15	110	1.7	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_042418	4/24/2018	<69	<180	140	<90	<79	12,000	<86	<58	350	<58	<299
Post Carbon	SVE_SOUTH_POST CARBON_042418	4/24/2018	3.4	4.2	470	7.6	1.5	6.6	3.1	8.4	76	1.4	17.9
Pre Carbon	SVE_SOUTH_PRE CARBON_051618	5/16/2018	<50	<130	160	<65	<57	7,800	<62	<68	370	<42	<212
Post Carbon	SVE_SOUTH_POST CARBON_051618	5/16/2018	<4.7	<12	480	6.6	<0.97	<1.3	<0.75	7.1	33	<4	<19.7
Pre Carbon	SVE_South_72318-Pre Carbon	7/23/2018	<63	<170	170	<83	<73	18,000	<79	<85	770	<53	<271
Post Carbon	SVE_South_Post Carbon-72318	7/23/2018	<25	<65	230	<33	<29	8,300	<31	520	6,400	<21	<108
Pre Carbon	SVE_South_PreCarbon_110718	11/7/2018	<64	<170	310	<84	<74	31,000	<80	91	1,300	<54	<180
Post Carbon	SVE_South_PostCarbon_110718	11/7/2018	<1.2	<3.2	<1.6	<1.6	<1.4	15	<1.5	<1.6	<2.1	1.6	<3.5
Pre Carbon	SVE_South_PreCarbon_010419	1/4/2019	<64	<160	280	<82	<71	32,000	<77	84	920	<53	<180
Post Carbon	SVE_South_PostCarbon_010419	1/4/2019	<1.2	<3.2	<1.6	<1.6	2.1	<2.7	2.3	<1.6	<2.1	1.5	7.3
Pre Carbon	SVE_South_PreCarbon_030819	3/8/2019	<69	<180	180	<90	<79	21,000	<86	<93	570	<58	<200
Post Carbon	SVE_South_PostCarbon_030819	3/8/2019	<1.2	<3.2	<1.6	<1.6	1.8	5.5	<1.5	<1.6	<2.1	1.3	<3.5

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Sampling Location	Sample ID	Date	1,1-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	1,1,1-Trichloro-ethane	Trichloro-ethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m ³										
Pre Carbon	SVE_South_PreCarbon_050719	5/7/2019	<69	<180	140	<90	<79	17,000	<85	<93	450	<58	<200
Post Carbon	SVE_South_PostCarbon_050719	5/7/2019	<1.2	<3.2	9.9	<1.6	<1.4	1,300	13	3.0	31	<1.0	11.7
Pre Carbon	SVE_South_PreCarbon_070819	7/8/2019	<64	<170	100	<83	<73	16,000	<79	<86	530	<54	<180
Post Carbon	SVE_South_PostCarbon_070819	7/8/2019	<1.2	6.3	<1.6	<1.6	1.6	7.9	<1.5	<1.6	<2.1	<1.0	1.7
Pre Carbon	SVE_South_PreCarbon_090919	9/9/2019	<28	<74	120	<37	<32	15,000	<35	48	590	<24	<81
Post Carbon	SVE_South_PostCarbon_090919	9/9/2019	2.8	3.6	160	9.1	<1.4	<2.7	<1.5	<1.6	<2.1	<1.0	<3.5
Pre Carbon	SVE_South_PreCarbon_110419	11/4/2019	<33	<87	300	<43	<38	38,000	<41	87	990	<28	<95
Post Carbon	SVE_South_PostCarbon_110419	11/4/2019	2.2	<5.2	160	5.6	<2.3	<4.4	<2.5	<2.7	<3.5	3.2	<5.7
Pre Carbon	SVE_South_PreCarbon_011020	1/10/2020	<12	<31	110	<16	<14	9,200	<15	33	420	<10	<17
Post Carbon	SVE_South_PostCarbon_011020	1/10/2020	<1.7	<4.5	130	<2.3	<2.0	<3.9	<2.2	5.1	<3.1	<1.5	<5.0
Pre Carbon	SVE_South_PreCarbon_121420	12/14/2020	<62	<160	400	<82	160	32,000	130	100	1,300	<53	<180
Post Carbon	SVE_South_PostCarbon_121420	12/14/2020	2.3	<5.4	180	<2.7	<2.4	<4.6	<2.6	8.9	<3.6	<1.7	<5.9
Pre Carbon	SVE_South_PreCarbon_022321	2/23/2021	<35	<91	120	<46	<500	18,000	<43	<47	390	<29	<100
Post Carbon	SVE_South_PostCarbon_022321	2/23/2021	2.4	6.0	150	3.5	<27	<4.2	<2.3	7.0	36	<1.6	<5.4
Pre Carbon	SVE_South_PreCarbon_040921	4/9/2021	<13	<34	150	<17	<190	14,000	<16	32	450	<11	<38
Post Carbon	SVE_South_PostCarbon_040921	4/9/2021	5.0	<4.2	390	9.7	<23	<3.6	<2.0	7.1	41	<1.3	<4.6
Pre Carbon	SVE_South_PreCarbon_061721	6/17/2021	<11	<29	94	<15	<160	11,000	<14	31	380	<9.4	<32
Post Carbon	SVE_South_PostCarbon_061721	6/17/2021	<7.8	<20	400	<10	<110	340	<9.7	940	4,800	<6.6	<22
Pre Carbon	SVE_South_PreCarbon_082521	8/25/2021	<17	<46	86	<23	<250	12,000	<22	33	500	<15	<50
Post Carbon	SVE_South_PostCarbon_082521	8/25/2021	<12	<32	44	<16	<170	10,000	42	<16	180	<10	<35
Pre Carbon	SVE_South_PreCarbon_111921	11/19/2021	<22	<58	160	<29	<320	17,000	<27	52	620	<19	<63
Post Carbon	SVE_South_PostCarbon_120821*	12/8/2021*	<1.6	<4.3	<2.2	<2.2	<24	<3.7	<2.0	<2.2	<2.9	<1.4	<4.7
Pre Carbon	SVE_South_PreCarbon_012522	1/25/2022	<22	<59	100	<29	<320	16,000	<28	30 J	410	<19	<64
Post Carbon	SVE_South_PostCarbon_012522	1/25/2022	<1.7	<4.5	<2.2	<2.2	<25	<3.8	<2.1	<2.3	<3.0	<1.4	<4.9
Pre Carbon	SVE_South_PreCarbon_031022	3/10/2022	<13	<34	68	<17	<190	11,000	<16	25	320	<11	<38
Post Carbon	SVE_South_PostCarbon_031022	3/10/2022	<1.6	<4.3	<2.1	<2.1	<23	<3.7	<2.0	<2.2	<2.9	<1.4	<4.7
Pre Carbon	SVE_South_PreCarbon_051022	5/10/2022	<16	<42	78	<21	<230	12,000	<20	23	310	<14	<46
Post Carbon	SVE_South_PostCarbon_051022	5/10/2022	<4.4	<4.3	<2.2	<2.5	<24	<3.7	<2.1	<2.2	<2.9	<1.4	<4.8
Pre Carbon	SVE_South_PreCarbon_071222	7/12/2022	<64	<24	61	<32	<350	12,000	<30	<33	290	<21	<70
Post Carbon	SVE_South_PostCarbon_071222	7/12/2022	<1.8	<4.6	<2.3	<2.3	<25	<3.9	<2.2	<2.4	<3.1	<1.5	<5.0
Pre Carbon	PreCarbon_SVE_South_09122022	9/12/2022	<16	<41	64	<20	<220	11,000	<19	31	440	<13	<45
Post Carbon	PostCarbon_SVE_South_09122022	9/12/2022	4.1	<3.6	220	12.0	<20	<3.1	<1.7	<1.9	<2.4	<1.2	<4.0
Pre Carbon	PreCarbon_S_SVE_11142022	11/14/2022	<16	<42	18	<21	<230	1,800	<20	5.3	76	<14	<46
Post Carbon	PostCarbon_S_SVE_11142022	11/14/2022	<1.7	<4.4	31	<2.2	<24	<3.8	<2.1	1.3	<3.0	<1.4	<4.8
Pre Carbon	PreCarbon_SVE_South_011623	1/16/2023	<14	<37	71	<19	<200	10,000	<44	22	310	<12	<41
Post Carbon	PostCarbon_SVE_South_011623	1/16/2023	<1.6	<4.3	69	<2.1	<23	<3.6	<5.0	6.2	24	<1.4	<4.6
Pre Carbon	PreCarbon_South_SVE_03132023	3/13/2023	<14	<13	65	<13	<120	7,300	<25	19	290	<8.6	<29
Post Carbon	PostCarbon_South_SVE_03132023	3/13/2023	<2.7	<2.6	63	<2.6	<23	5.4	<5.0	5.8	36	<1.7	<2.9
Pre Carbon	PreCarbon_South_SVE_05092023	5/9/2023	<23	<22	50	<22	<200	10,000	<42	<31	220	<14	<49
Post Carbon	PostCarbon_South_SVE_05092023	5/9/2023	<2.6	<2.5	96	3.2	<22	<4.3	<4.8	<3.5	14	<1.6	<5.5

Notes:

1. µg/m³ = Micrograms per cubic meter.
2. Samples analyzed by Modified EPA Method TO-15.
3. Only analytes detected in at least one sample are presented in this table.
4. S = Surrogate recoveries were above acceptable recovery limits. Results may be biased high.
5. **Bold** values represents detected concentration of listed analyte.
6. – = Not sampled.
7. * = Due to a faulty sample container, the Post Carbon sample was not able to be collected on the same date as the Pre Carbon sample.

Table 10
North SVE System–HVOC Mass Removal
 NuStar Vancouver Facility
 Vancouver, Washington

Sample Date	Post-Blower Pressure (in water)	Air Flow Rate ⁽⁴⁾ (cfm)	Total HVOCs (mg/m ³)	HVOC Removal (lb/day)
10/12/2011	0.1	250	10.5	0.2
1/23/2012	0.1	361	16.5	0.5
2/17/2012	0.05	215	11.3	0.2
3/22/2012	–	210	6.7	0.1
6/20/2012	0.2	217.8	0.3	0.005
8/22/2012	0.2	216	0.2	0.003
11/26/2012	0.05	215	22.6	0.436
12/21/2012	0.1	215	3.6	0.069
2/28/2013	0.1	215	4.6	0.088
5/24/2013	0.1	215	24.4	0.471
6/25/2013	0.1	215	13.8	0.267
8/27/2013	0.1	215	17.8	0.344
10/24/2013	0.1	215	10.6	0.204
12/27/2013	0.1	215	7.5	0.144
1/29/2014	3.0	215	1.4	0.028
2/24/2014	9.0	215	9.5	0.184
3/31/2014	1.0	215	3.7	0.072
4/29/2014	2.0	215	3.7	0.072
5/27/2014	2.0	215	4.4	0.085
7/3/2014	4.0	215	4.8	0.093
7/28/2014	3.0	215	7.7	0.148
9/30/2014	–	215	7.8	0.151
10/27/2014	2.0	215	15.4	0.298
11/25/2014	–	215	7.5	0.145
12/29/2014	2.0	215	15.3	0.296
1/26/2015	3.0	215	1.6	0.032
2/26/2015	0.1	215	0.0	0.001
3/30/2015	0.4	215	1.8	0.036
4/24/2015	0.4	215	0.6	0.012
5/14/2015	–	215	0.0	0.000
5/28/2015	0.05	215	0.4	0.007
7/29/2015	0.10	215	2.2	0.043
8/31/2015	0.05	215	7.8	0.150
9/28/2015	0.00	215	1.6	0.031
10/29/2015	1.00	215	6.9	0.134
11/30/2015	2.00	215	2.4	0.046
12/28/2015	0.10	215	5.7	0.110
2/1/2016	3.00	215	11.2	0.215
2/29/2016	0.10	215	8.0	0.154
3/29/2016	0.20	215	0.9	0.018
4/27/2016	1.00	215	1.6	0.030
5/25/2016	–*	–*	–*	–*
6/28/2016	0.10	215	1.8830	0.036
7/26/2016	1.20	215	0.0916	0.00177
9/29/2016	0.10	215	0.0150	0.00029
10/25/2016	0.10	215	0.0109	0.000211
11/28/2016	0.10	215	0.0067	0.000129
12/28/2016	0.10	215	0.0017	0.0000329
1/30/2017	0.10	215	0.0046	0.0000889
2/28/2017	0.10	215	0.0059	0.000114
3/28/2017	0.10	215	0.0061	0.000118
4/24/2017	0.10	215	0.0076	0.000147

Table 10
North SVE System–HVOC Mass Removal
 NuStar Vancouver Facility
 Vancouver, Washington

Date	Activity	HVOC Removal Rate	Days of Operation	Approximate HVOCs Removed	Approximate Cumulative HVOCs Removed
		(lb/day)		(lbs)	(lbs)
10/10/2011	Startup	--	--	--	--
10/12/2011	Sample	0.2	37	9	9
1/23/2012	Sample	0.5	31	17	26
2/17/2012	Sample	0.2	25	6	32
3/22/2012	Sample	0.1	34	5	37
6/20/2012	Sample	0.005	90	1	38
8/22/2012	Sample	0.003	63	1	39
11/26/2012	Sample	0.436	66	29	68
12/21/2012	Sample	0.069	25	2	70
2/28/2013	Sample	0.088	69	7	77
5/24/2013	Sample	0.471	--	--	77
6/25/2013	Sample	0.267	32	9	86
8/27/2013	Sample	0.344	63	22	108
10/24/2013	Sample	0.204	58	12	120
12/27/2013	Sample	0.144	64	10	130
1/29/2014	Sample	0.028	33	1	131
2/24/2014	Sample	0.184	--	--	131
3/31/2014	Sample	0.072	35	3	134
4/29/2014	Sample	0.072	29	3	137
5/27/2014	Sample	0.085	28	3	140
7/3/2014	Sample	0.093	37	4	144
7/28/2014	Sample	0.148	25	4	148
9/30/2014	Sample	0.151	64	10	158
10/27/2014	Sample	0.298	27	9	167
11/25/2014	Sample	0.145	29	5	172
12/29/2014	Sample	0.296	34	11	183
1/26/2015	Sample	0.032	28	1	184
2/26/2015	Sample	0.001	31	1	185
3/30/2015	Sample	0.036	32	2	187
4/24/2015	Sample	0.012	25	1	188
5/14/2015	Sample	0.000	20	0	188
5/28/2015	Sample	0.007	14	1	189
6/30/2015	Estimate	0.007	33	1	190
6/30/2015	Estimate	0.000	0	0	190
7/29/2015	Sample	0.043	29	2	192
8/31/2015	Sample	0.150	33	5	197
9/28/2015	Sample	0.031	28	1	198
10/29/2015	Sample	0.134	31	5	203
11/30/2015	Sample	0.046	32	2	205
12/28/2015	Sample	0.110	28	4	209
2/1/2016	Sample	0.215	35	8	217
2/29/2016	Sample	0.154	28	5	222
3/29/2016	Sample	0.018	29	1	223
4/27/2016	Sample	0.030	29	1	224
5/25/2016	Sample	--*	28	--*	221
6/28/2016	Sample	0.0364	34	2	223
7/26/2016	Sample	0.00177	28	1	224
9/29/2016	Sample	0.00029	65	1	225
10/25/2016	Sample	0.000211	26	1	226
11/28/2016	Sample	0.000129	34	1	227
12/28/2016	Sample	0.0000329	30	1	228
1/30/2017	Sample	0.0000889	33	1	229
2/28/2017	Sample	0.000114	29	1	230
3/28/2017	Sample	0.000118	28	1	231
4/24/2017	Sample	0.000147	27	1	232

Notes:

- | | |
|---|--|
| 1. Air flow rate read from system gauge. | 6. lbs = pounds |
| 2. cfm = cubic feet per minute | 7. * = Not measured/sampled; system intentionally shut down to evaluate system efficiency. |
| 3. mg/m ³ = milligrams per cubic meter | 8. -- = Not measured/sampled. |
| 4. lb/day = pounds per day | |
| 5. HVOCs = halogenated volatile organic compounds | |

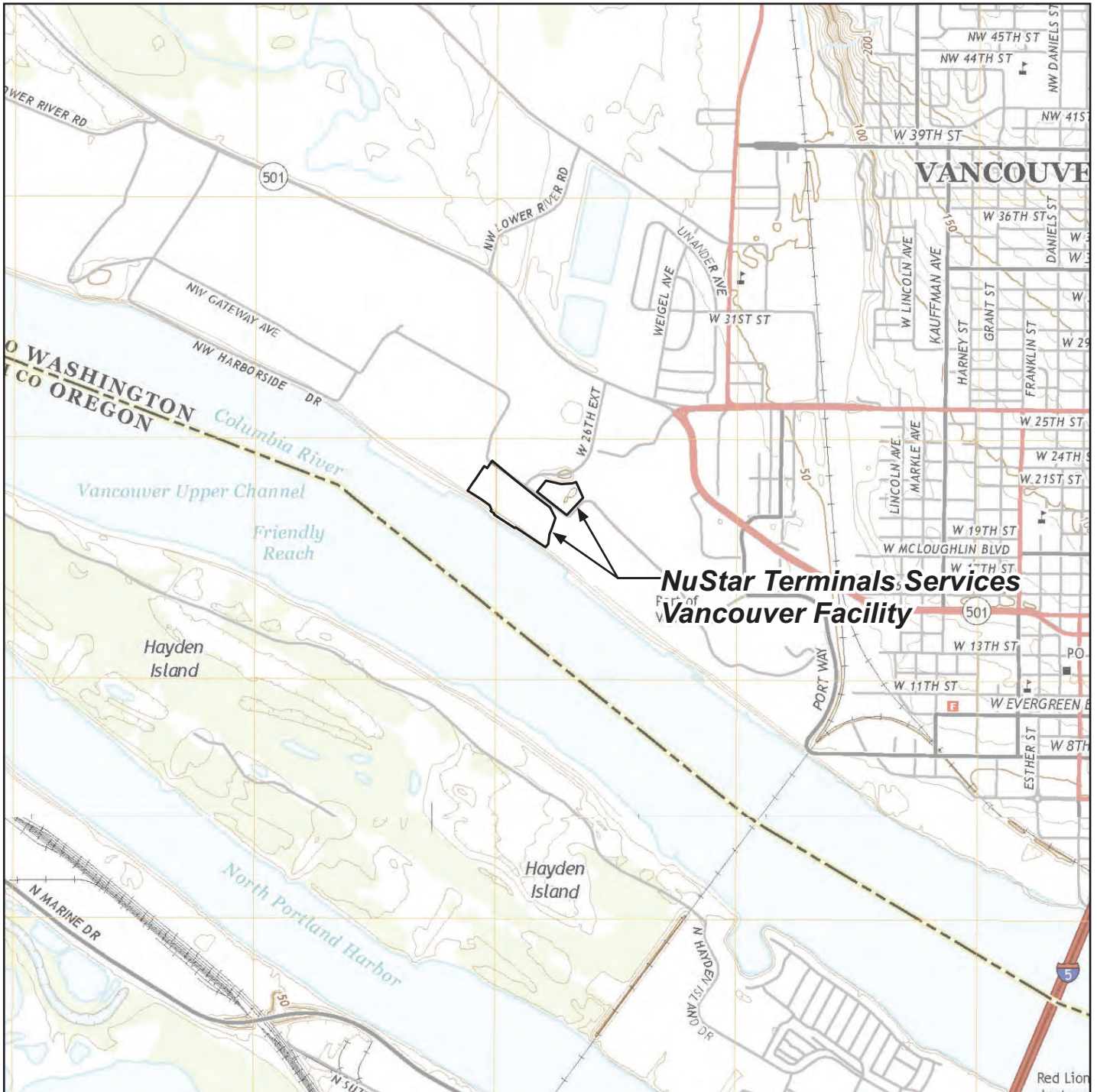
Table 11
South SVE System—HVOC Mass Removal
 NuStar Vancouver Facility
 Vancouver, Washington

Sample Date	Activity	Post-Blower Pressure (in water)	Air Flow Rate ⁽¹⁾ (cfm)	Total HVOCs (mg/m3)	HVOC Removal (lb/day)	Days of Operation	Approximate HVOCs Removed (lbs)	Approximate Cumulative HVOCs Removed (lbs)
10/6/2011	Startup	33.0	590	46	2.4	0.5	2	2
11/2/2011	Sample	27.0	590	29	1.5	27	41	43
12/14/2011	Sample	27.0	590	57	3.0	42	96	139
2/17/2012	Sample	29.0	— ⁶	30	1.6	65	151	290
3/22/2012	Sample	27.0	658	31	1.9	34	59	349
4/26/2012	Sample	27.0	—	0	0.0	35	33	382
5/23/2012	Sample	31.0	—	20	1.2	29	18	400
6/20/2012	Sample	33.0	—	37	2.2	28	47	447
7/24/2012	Sample	32.0	—	34	2.0	34	72	519
8/22/2012	Sample	29.0	—	51	3.0	29	74	593
9/25/2012	Sample	29.0	—	52	3.1	34	104	697
10/29/2012	Sample	47.0	—	63	3.7	34	116	813
11/26/2012	Sample	18.0	—	11	0.6	28	61	874
12/21/2012	Sample	17.0	—	15	0.9	25	19	893
1/24/2013	Sample	10.0	—	2	0.1	34	17	910
2/28/2013	Sample	18.0	—	1	0.1	35	3	913
3/25/2013	Sample	16.0	—	4	0.2	25	4	917
4/29/2013	Sample	15.0	—	1	0.1	35	6	923
5/24/2013	Sample	47.0	—	251	14.8	—	—	996
6/25/2013	Sample	51.0	—	41	2.5	32	277	1,273
7/25/2013	Sample	50.0	—	24	1.4	30	58	1,331
8/27/2013	Sample	52.0	—	30	1.8	33	53	1,384
9/30/2013	Sample	45.0	—	28	1.6	34	59	1,443
10/24/2013	Sample	50.0	—	29	1.7	24	41	1,484
11/25/2013	Sample	51.0	—	22	1.3	32	48	1,532
12/27/2013	Sample	55.0	—	21	1.3	32	41	1,573
1/29/2014	Sample	50.0	—	21	1.2	33	41	1,614
2/24/2014	Sample	50.0	—	37	2.2	—	—	1,614
3/31/2014	Sample	46.0	—	21	1.2	35	60	1,674
4/29/2014	Sample	48.8	—	14	0.8	29	30	1,704
5/27/2014	Sample	49.0	—	13	0.7	28	22	1,726
7/3/2014	Sample	50.0	—	3	0.2	37	18	1,744
7/28/2014	Sample	50.0	—	16	0.9	25	15	1,759
8/25/2014	Sample	49.0	—	21	1.2	28	31	1,790
9/30/2014	Sample	40.0	—	18	1.1	36	42	1,832
11/3/2014	Sample	50.0	—	25	1.5	30	39	1,871
12/31/2014	Estimated	—	—	—	—	22	33	1,904
1/26/2015	Sample	20.0	—	23	1.3	26	37	1,941
2/26/2015	Sample	30.0	—	19	1.1	31	39	1,980
3/30/2015	Sample	29.0	—	18	1.1	32	36	2,016
4/24/2015	Sample	29.0	—	6	0.4	25	18	2,034
5/28/2015	Sample	28.0	—	9	0.5	34	15	2,049
7/29/2015	Sample	25.0	—	13	0.8	62	41	2,090
8/31/2015	Sample	26.0	—	13	0.8	33	26	2,116
9/28/2015	Sample	26.0	—	11	0.6	28	20	2,136
10/29/2015	Sample	27.0	—	19	1.1	31	28	2,164
11/30/2015	Sample	30.0	—	3	0.2	32	22	2,186
12/28/2015	Sample	29.0	—	36	2.2	28	33	2,219
2/1/2016	Sample	19.0	—	3	0.2	35	41	2,260
2/29/2016	Sample	30.0	—	3	0.2	28	6	2,266
3/29/2016	Sample	28.0	—	75	4.4	29	67	2,333
4/27/2016	Sample	5.0	—	1	0.1	29	66	2,399
5/25/2016	Sample	3.0	—	1	0.03	28	2	2,401
6/28/2016	Sample	— *	— *	— *	— *	— *	— *	2,401
7/26/2016	Sample	30.0	—	19	1.1	62	36	2,437
9/29/2016	Sample	28.0	—	27	1.6	65	89	2,526
10/25/2016	Sample	30.0	—	34	2.0	26	47	2,573
11/28/2016	Sample	30.0	—	55	3.3	34	90	2,663
12/28/2016	No sample collected	2.0	—	—	—	—	—	2,663
1/30/2017	Sample	33.0	—	64	3.8	63	223	2,886
3/28/2017	**System Not Working Properly -- No Data or Samples**	—	—	—	—	—	—	2,886
9/25/2017	Sample	30.0	—	24	1.4	28	48	3,427
10/26/2017	Sample	30.0	—	14	0.8	31	35	3,462
11/29/2017	Sample	30.0	—	23	1.4	34	38	3,500
12/21/2017	Estimated (using November effluent data)	30.0	—	23	1.4	22	30	3,530
1/22/2018	Sample	30.0	—	14	0.8	32	36	3,566
2/28/2018	Sample	30.0	—	14	0.8	37	31	3,597
3/29/2018	Sample	31.0	—	14	0.8	29	24	3,621
4/24/2018	Sample	31.0	—	12	0.7	26	21	3,642
5/16/2018	Sample	30.0	—	8	0.5	22	14	3,656
7/23/2018	Sample	29.0	—	19	1.1	68	55	3,711
11/7/2018	Sample	30.0	—	33	1.9	107	164	3,875
1/4/2019	Sample	28.0	—	33	2.0	58	114	3,989
3/8/2019	Sample	28.0	—	22	1.3	63	103	4,092

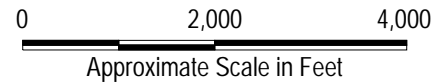
Table 11
South SVE System—HVOC Mass Removal
 NuStar Vancouver Facility
 Vancouver, Washington

Sample Date	Activity	Post-Blower Pressure (in water)	Air Flow Rate ⁽¹⁾ (cfm)	Total HVOCs (mg/m ³)	HVOC Removal (lb/day)	Days of Operation	Approximate HVOCs Removed (lbs)	Approximate Cumulative HVOCs Removed (lbs)
5/7/2019	Sample	29.0	--	18	1.0	60	70	4,162
7/8/2019	Sample	29.0	--	17	1.0	62	63	4,225
9/9/2019	Sample	29.0	--	16	0.9	63	61	4,286
11/4/2019	Sample	29.0	468	39	1.7	56	73	4,359
1/10/2020	Sample	29.0	468	10	0.4	67	70	4,429
12/14/2020	Sample	30.0	--	34	1.4	6	6	4,435
2/23/2021	Sample	30.0	--	19	0.8	71	79	4,514
4/9/2021	Sample	30.0	--	15	0.6	45	32	4,546
6/17/2021	Sample	30.0	--	12	0.5	69	38	4,584
8/25/2021	Sample	30.0	--	13	0.5	69	36	4,620
11/19/2021	Sample	28.0	--	18	0.8	86	56	4,676
1/25/2022	Sample	28.5	--	17	0.7	67	49	4,725
3/10/2022	Sample	29.0	--	11	0.5	44	26	4,751
5/10/2022	Sample	29.5	--	12	0.5	61	31	4,782
7/12/2022	Sample	29.0	--	12	0.5	63	33	4,815
9/12/2022	Sample	29.0	--	12	0.5	62	32	4,847
11/14/2022	Sample	29.0	--	2	0.1	63	18	4,865
1/16/2023	Sample	28.5	--	10	0.4	63	17	4,882
3/13/2023	Sample	28.0	--	8	0.3	56	22	4,904
5/9/2023	Sample	28.5	--	10	0.4	57	22	4,926 ¹¹

- Notes:**
1. Air flow rate read from system gauge.
 2. cfm = cubic feet per minute
 3. mg/m³ = Milligrams per cubic meter
 4. lb/day = pounds per day
 5. lbs = pounds
 6. Flow rate was not measured on dates with dashes (--). For calculations, rate is assumed to be the same as measured the date before.
 7. System was down during the October 27, 2014 monitoring event and was restarted on October 29, 2014. It is assumed that the system was down for a total of four days, although the exact
 8. * = system was off for part replacement.
 9. -- = Not measured/sampled.
 10. HVOCs = halogenated volatile organic compounds
 11. The last known time the system was operating was on the May 9, 2023 monitoring event. The system was assumed to be down between the May 9, 2023 monitoring event and the end of the semi-annual monitoring period. Therefore, the mass removed calculation may be slightly conservative.



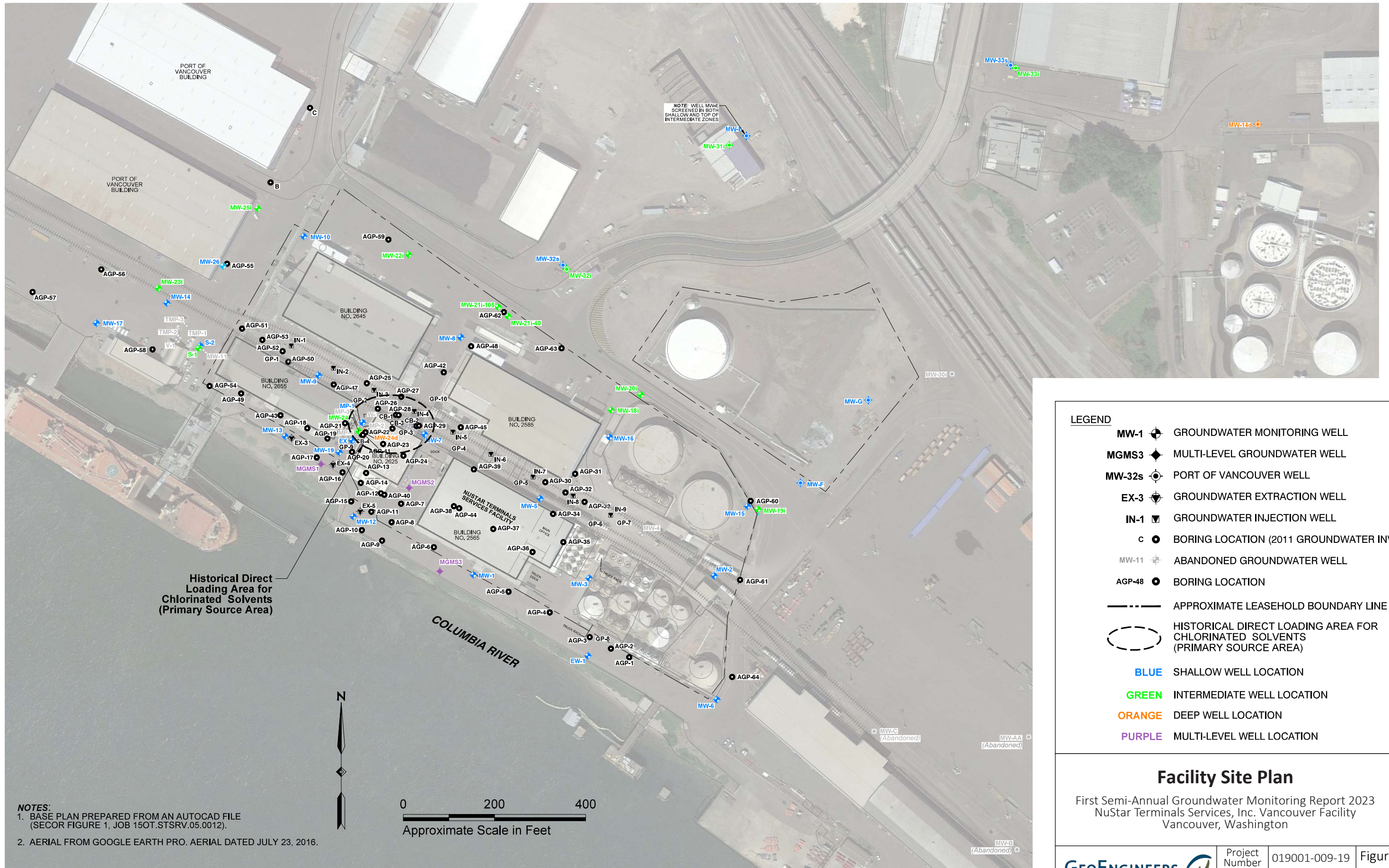
Note: Base map prepared from USGS 7.5-minute quadrangles of Vancouver, WA and Portland, OR-WA, dated 2014 as provided by USGS.gov.

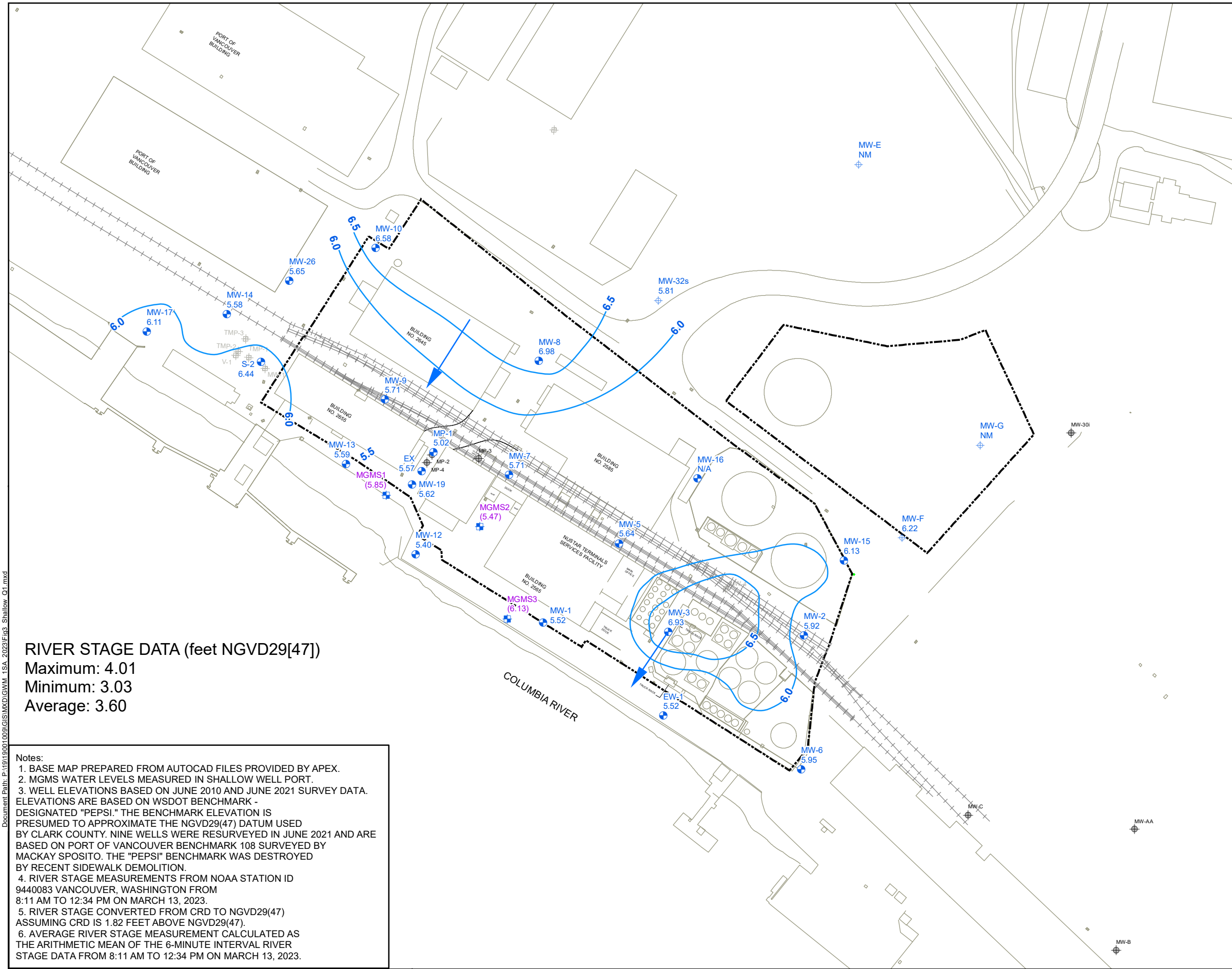


Facility Location Map

First Semi-Annual Groundwater Monitoring Report 2023
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

	Project Number	019001-009-19	Figure 1
	July 2023		



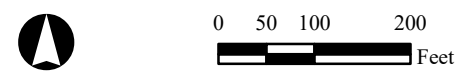


- Legend**
- Port of Vancouver Well
 - Multi-Level Groundwater Well
 - Monitoring Well
 - Historical Groundwater Extraction Well
 - Abandoned Groundwater Well
 - Groundwater Elevation Contour (Feet)
 - Approximate Property Line
- 6.13 - Groundwater Elevation in Feet
- (6.13) Wells designated with Parentheses Were Not Used in Contouring
- NM - Not Measured**
- NA - Water Elevation Data not Available**
- BLUE - Shallow Well Location**
- PURPLE - Multi Level Well Location**
- Groundwater Flow Direction

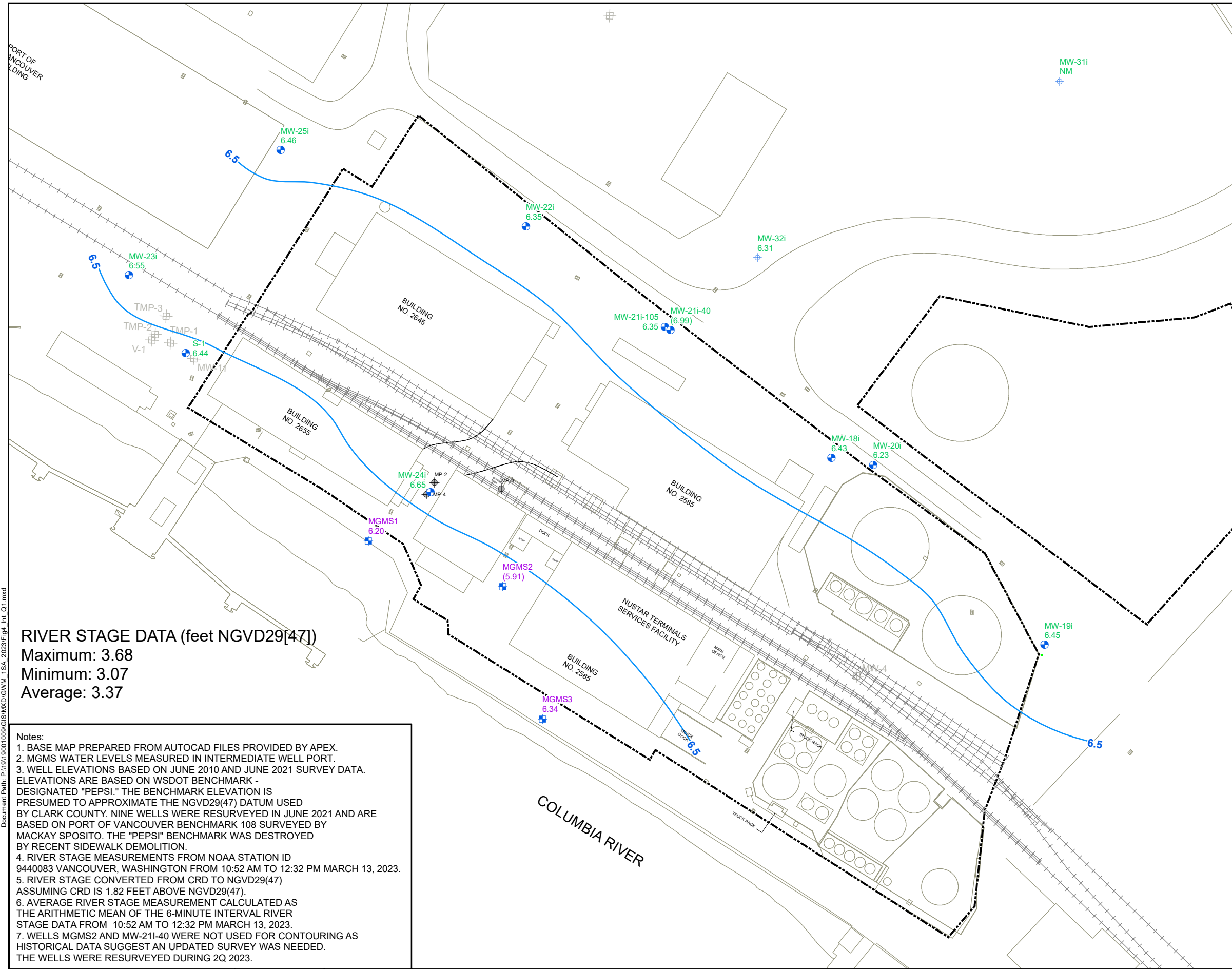
RIVER STAGE DATA (feet NGVD29[47])
 Maximum: 4.01
 Minimum: 3.03
 Average: 3.60

Notes:

1. BASE MAP PREPARED FROM AUTOCAD FILES PROVIDED BY APEX.
2. MGMS WATER LEVELS MEASURED IN SHALLOW WELL PORT.
3. WELL ELEVATIONS BASED ON JUNE 2010 AND JUNE 2021 SURVEY DATA. ELEVATIONS ARE BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI." THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY. NINE WELLS WERE RESURVEYED IN JUNE 2021 AND ARE BASED ON PORT OF VANCOUVER BENCHMARK 108 SURVEYED BY MACKAY SPOSITO. THE "PEPSI" BENCHMARK WAS DESTROYED BY RECENT SIDEWALK DEMOLITION.
4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 8:11 AM TO 12:34 PM ON MARCH 13, 2023.
5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET ABOVE NGVD29(47).
6. AVERAGE RIVER STAGE MEASUREMENT CALCULATED AS THE ARITHMETIC MEAN OF THE 6-MINUTE INTERVAL RIVER STAGE DATA FROM 8:11 AM TO 12:34 PM ON MARCH 13, 2023.



First Quarter--Shallow Groundwater (March 2023)
 First Semi-Annual Groundwater Monitoring Report 2023
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

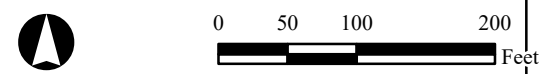


- Legend**
- Port of Vancouver Well
 - Multi-Level Groundwater Well
 - Monitoring Well
 - Historical Groundwater Extraction Well
 - Abandoned Groundwater Well
 - Groundwater Elevation Contour (Feet)
 - Approximate Property Line
 - 6.23 - Groundwater Elevation in Feet
 - (6.50) Wells designated with Parentheses Were Not Used in Contouring
 - NM - Not Measured
 - GREEN - Intermediate Well Location
 - PURPLE - Multi Level Well Location
 - Groundwater Flow Direction

RIVER STAGE DATA (feet NGVD29[47])
 Maximum: 3.68
 Minimum: 3.07
 Average: 3.37

Notes:

1. BASE MAP PREPARED FROM AUTOCAD FILES PROVIDED BY APEX.
2. MGMS WATER LEVELS MEASURED IN INTERMEDIATE WELL PORT.
3. WELL ELEVATIONS BASED ON JUNE 2010 AND JUNE 2021 SURVEY DATA. ELEVATIONS ARE BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI." THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY. NINE WELLS WERE RESURVEYED IN JUNE 2021 AND ARE BASED ON PORT OF VANCOUVER BENCHMARK 108 SURVEYED BY MACKAY SPOSITO. THE "PEPSI" BENCHMARK WAS DESTROYED BY RECENT SIDEWALK DEMOLITION.
4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 10:52 AM TO 12:32 PM MARCH 13, 2023.
5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET ABOVE NGVD29(47).
6. AVERAGE RIVER STAGE MEASUREMENT CALCULATED AS THE ARITHMETIC MEAN OF THE 6-MINUTE INTERVAL RIVER STAGE DATA FROM 10:52 AM TO 12:32 PM MARCH 13, 2023.
7. WELLS MGMS2 AND MW-21i-40 WERE NOT USED FOR CONTOURING AS HISTORICAL DATA SUGGEST AN UPDATED SURVEY WAS NEEDED. THE WELLS WERE RESURVEYED DURING 2Q 2023.



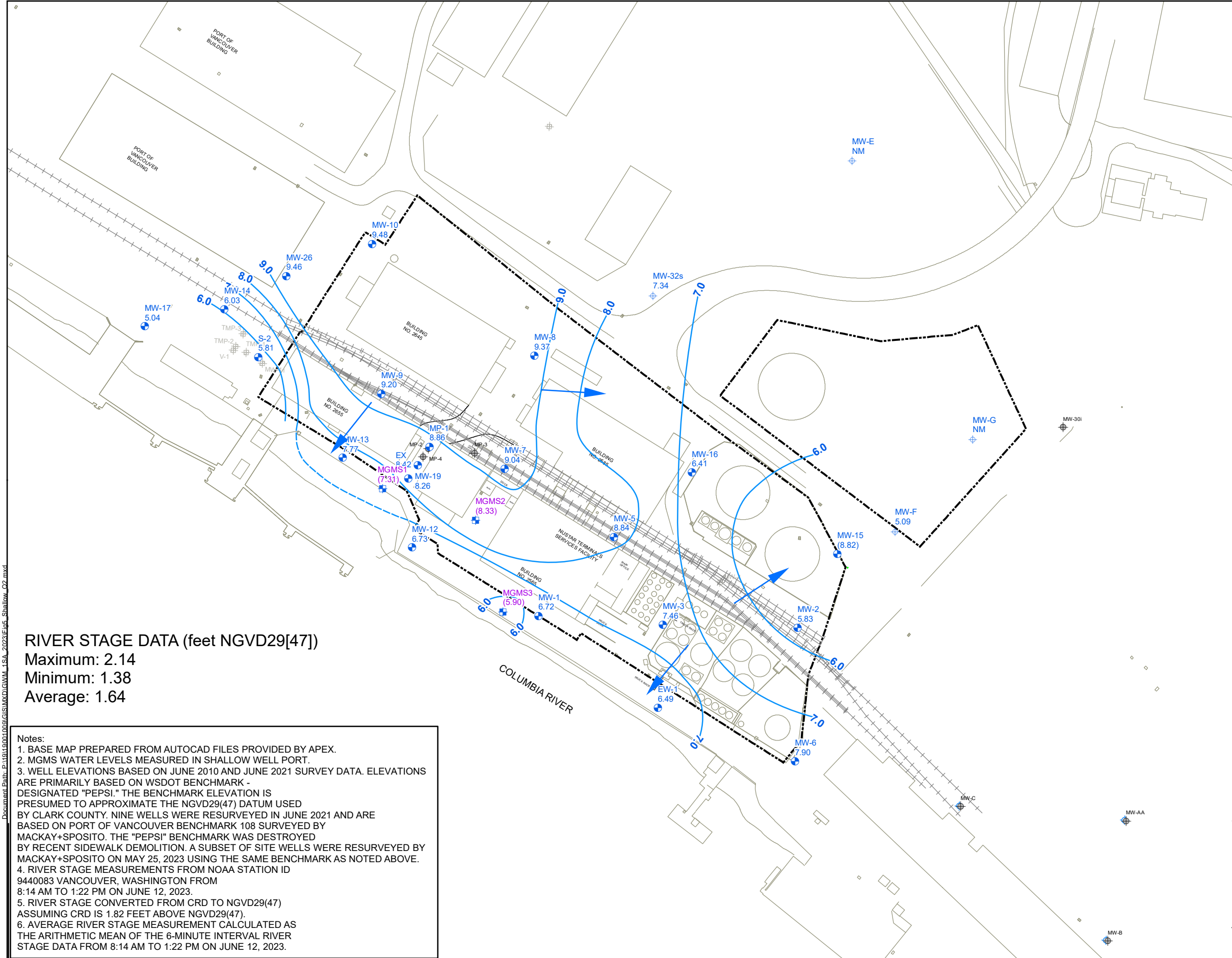
**First Quarter--Intermediate
(March 2023)**

First Semi-Annual Groundwater Monitoring Report 2023
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington



**Figure
4**

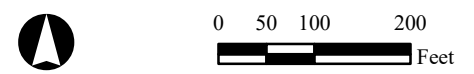
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- Legend**
- Port of Vancouver Well
 - Multi-Level Groundwater Well
 - Monitoring Well
 - Historical Groundwater Extraction Well
 - Abandoned Groundwater Well
 - Groundwater Elevation Contour (Feet)
 - Approximate Property Line
- 7.46 - Groundwater Elevation in Feet
- (5.90) Wells designated with Parentheses Were Not Used in Contouring
- NM** - Not Measured
- BLUE** - Shallow Well Location
- PURPLE** - Multi Level Well Location
- Groundwater Flow Direction

RIVER STAGE DATA (feet NGVD29[47])
 Maximum: 2.14
 Minimum: 1.38
 Average: 1.64

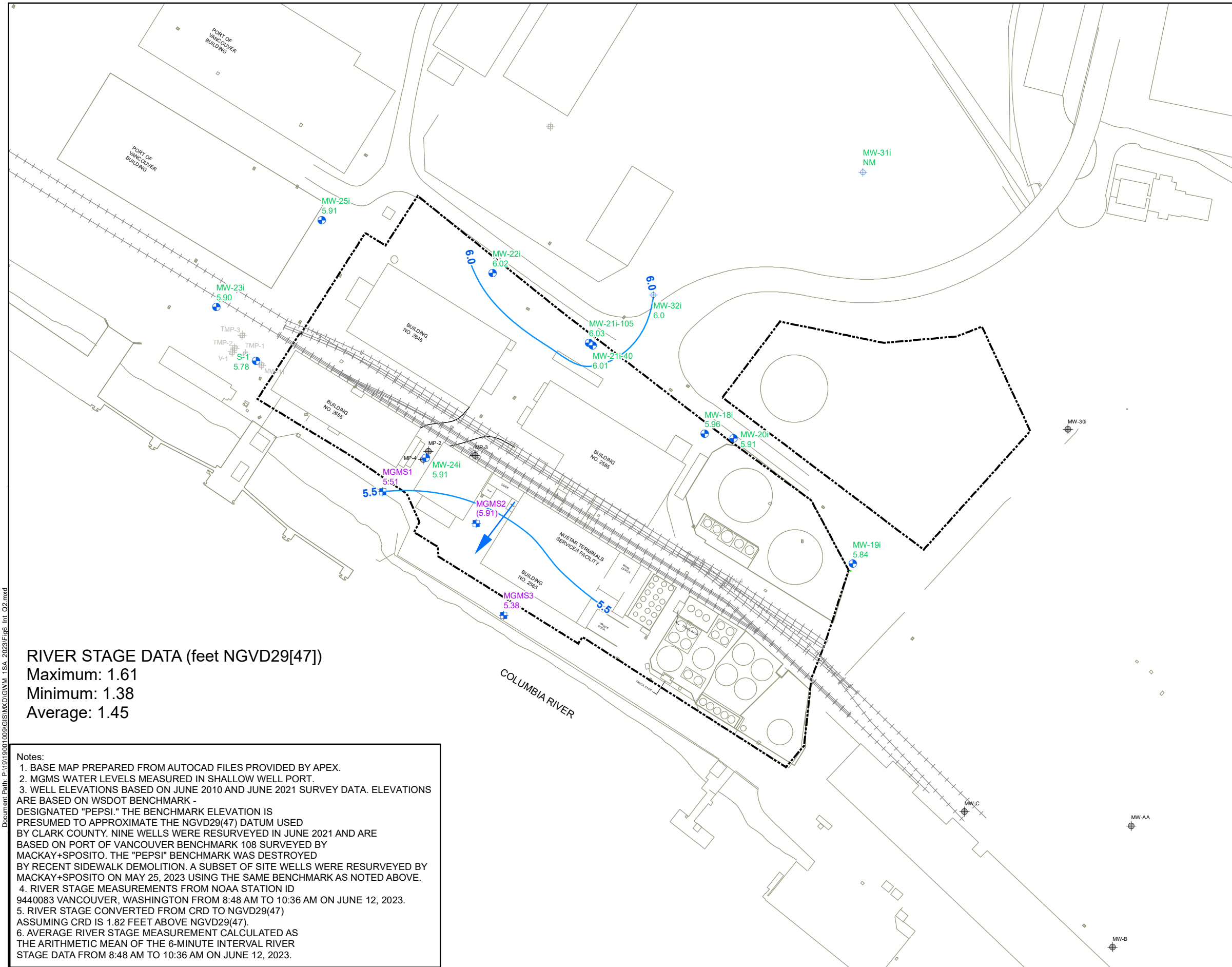
Notes:
 1. BASE MAP PREPARED FROM AUTOCAD FILES PROVIDED BY APEX.
 2. MGMS WATER LEVELS MEASURED IN SHALLOW WELL PORT.
 3. WELL ELEVATIONS BASED ON JUNE 2010 AND JUNE 2021 SURVEY DATA. ELEVATIONS ARE PRIMARILY BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI." THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY. NINE WELLS WERE RESURVEYED IN JUNE 2021 AND ARE BASED ON PORT OF VANCOUVER BENCHMARK 108 SURVEYED BY MACKAY+SPOSITO. THE "PEPSI" BENCHMARK WAS DESTROYED BY RECENT SIDEWALK DEMOLITION. A SUBSET OF SITE WELLS WERE RESURVEYED BY MACKAY+SPOSITO ON MAY 25, 2023 USING THE SAME BENCHMARK AS NOTED ABOVE.
 4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 8:14 AM TO 1:22 PM ON JUNE 12, 2023.
 5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET ABOVE NGVD29(47).
 6. AVERAGE RIVER STAGE MEASUREMENT CALCULATED AS THE ARITHMETIC MEAN OF THE 6-MINUTE INTERVAL RIVER STAGE DATA FROM 8:14 AM TO 1:22 PM ON JUNE 12, 2023.



Second Quarter--Shallow Groundwater (June 2023)

First Semi-Annual Groundwater Monitoring Report 2023
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

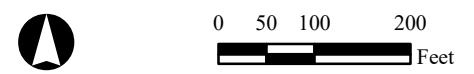




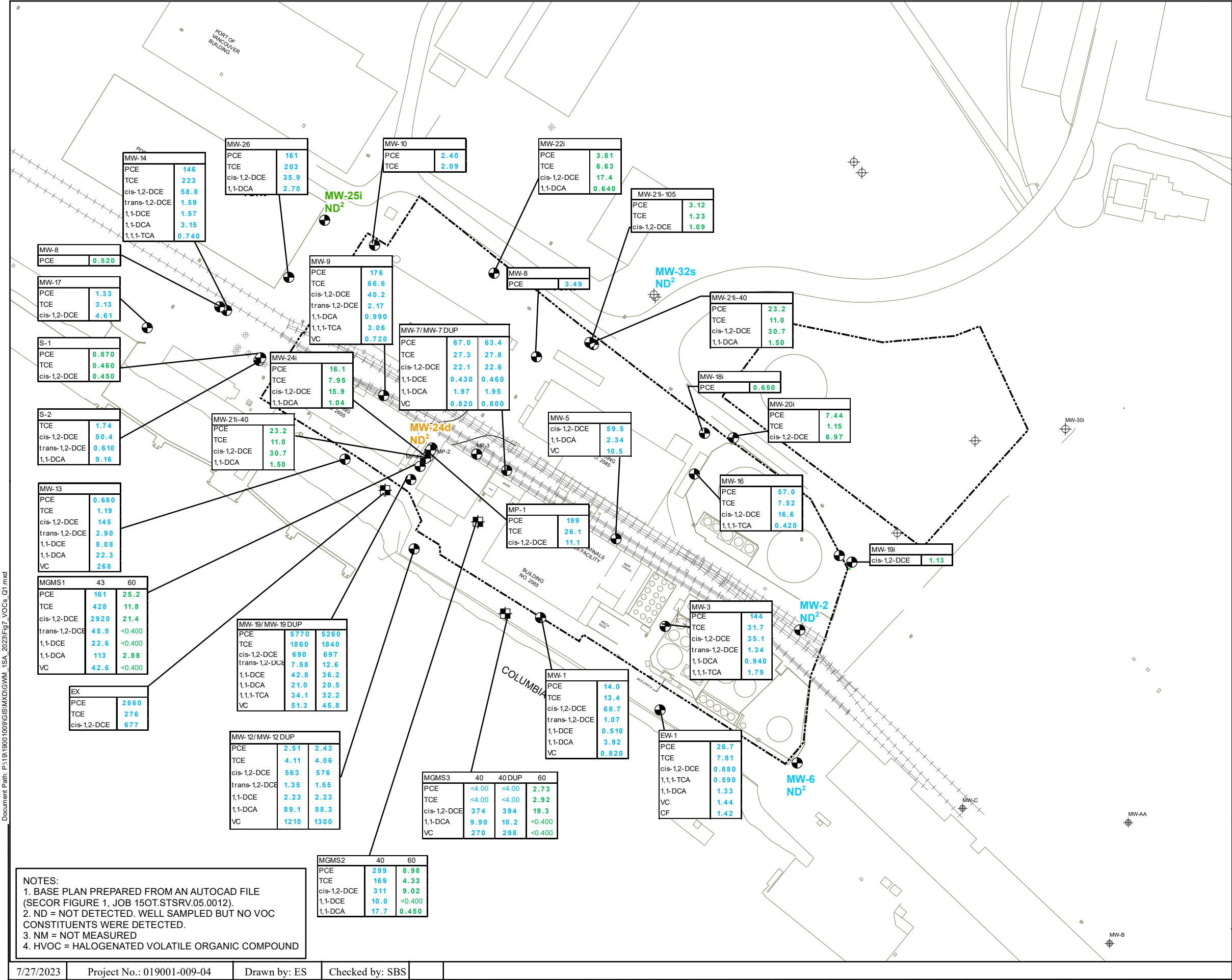
- Legend**
- Port of Vancouver Well
 - Multi-Level Groundwater Well
 - Monitoring Well
 - Historical Groundwater Extraction Well
 - Abandoned Groundwater Well
 - Approximate Property Line
 - 5.84** - Groundwater Elevation in Feet
 - NM** - Not Measured
 - GREEN** - Intermediate Well Location
 - PURPLE** - Multi Level Well Location
 - Groundwater Flow Direction

RIVER STAGE DATA (feet NGVD29[47])
 Maximum: 1.61
 Minimum: 1.38
 Average: 1.45

Notes:
 1. BASE MAP PREPARED FROM AUTOCAD FILES PROVIDED BY APEX.
 2. MGMS WATER LEVELS MEASURED IN SHALLOW WELL PORT.
 3. WELL ELEVATIONS BASED ON JUNE 2010 AND JUNE 2021 SURVEY DATA. ELEVATIONS ARE BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI." THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY. NINE WELLS WERE RESURVEYED IN JUNE 2021 AND ARE BASED ON PORT OF VANCOUVER BENCHMARK 108 SURVEYED BY MACKAY+SPOSITO. THE "PEPSI" BENCHMARK WAS DESTROYED BY RECENT SIDEWALK DEMOLITION. A SUBSET OF SITE WELLS WERE RESURVEYED BY MACKAY+SPOSITO ON MAY 25, 2023 USING THE SAME BENCHMARK AS NOTED ABOVE.
 4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 8:48 AM TO 10:36 AM ON JUNE 12, 2023.
 5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET ABOVE NGVD29(47).
 6. AVERAGE RIVER STAGE MEASUREMENT CALCULATED AS THE ARITHMETIC MEAN OF THE 6-MINUTE INTERVAL RIVER STAGE DATA FROM 8:48 AM TO 10:36 AM ON JUNE 12, 2023.



**Second Quarter--Intermediate
(June 2023)**
 First Semi-Annual Groundwater Monitoring Report 2023
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington



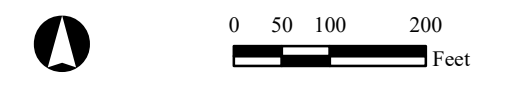
WELL IDENTIFICATION	DEPTH OF PORT SAMPLED (IF NOT SPECIFIED - SINGLE PORT WELL)	
	40	60
PCE	299	8.98
TCE	169	4.33
cis-1,2-DCE	311	9.02
1,1-DCE	10.0	<0.400
1,1-DCA	17.7	0.450
VC	<4.00	<0.400

CHEMICAL CONCENTRATION IN µg/L (ONLY DETECTED COMPOUNDS ARE SHOWN)

- Legend**
- ⊕ Port of Vancouver Well
 - ⊞ Multi-Level Groundwater Well
 - ⊙ Monitoring Well
 - ⊕ Historical Groundwater Extraction Well
 - ⊕ Abandoned Groundwater Well
 - Approximate Property Line

- BLUE** - Shallow Zone concentration data
- GREEN** - Intermediate Zone concentration data
- ORANGE** - Deep Zone concentration data

PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
cis-1,2-DCE	CIS-1,2-DICHLOROETHENE
trans-1,2-DCE	TRANS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
1,1-DCE	1,1-DICHLOROETHENE
1,1-DCA	1,1-DICHLOROETHANE
CF	CHLOROFORM
1,1,1-TCA	1,1,1-TRICHLOROETHANE
CA	CHLOROETHANE



HVOC Concentrations in Groundwater (March 2023)

First Semi-Annual Groundwater Monitoring Report 2023
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

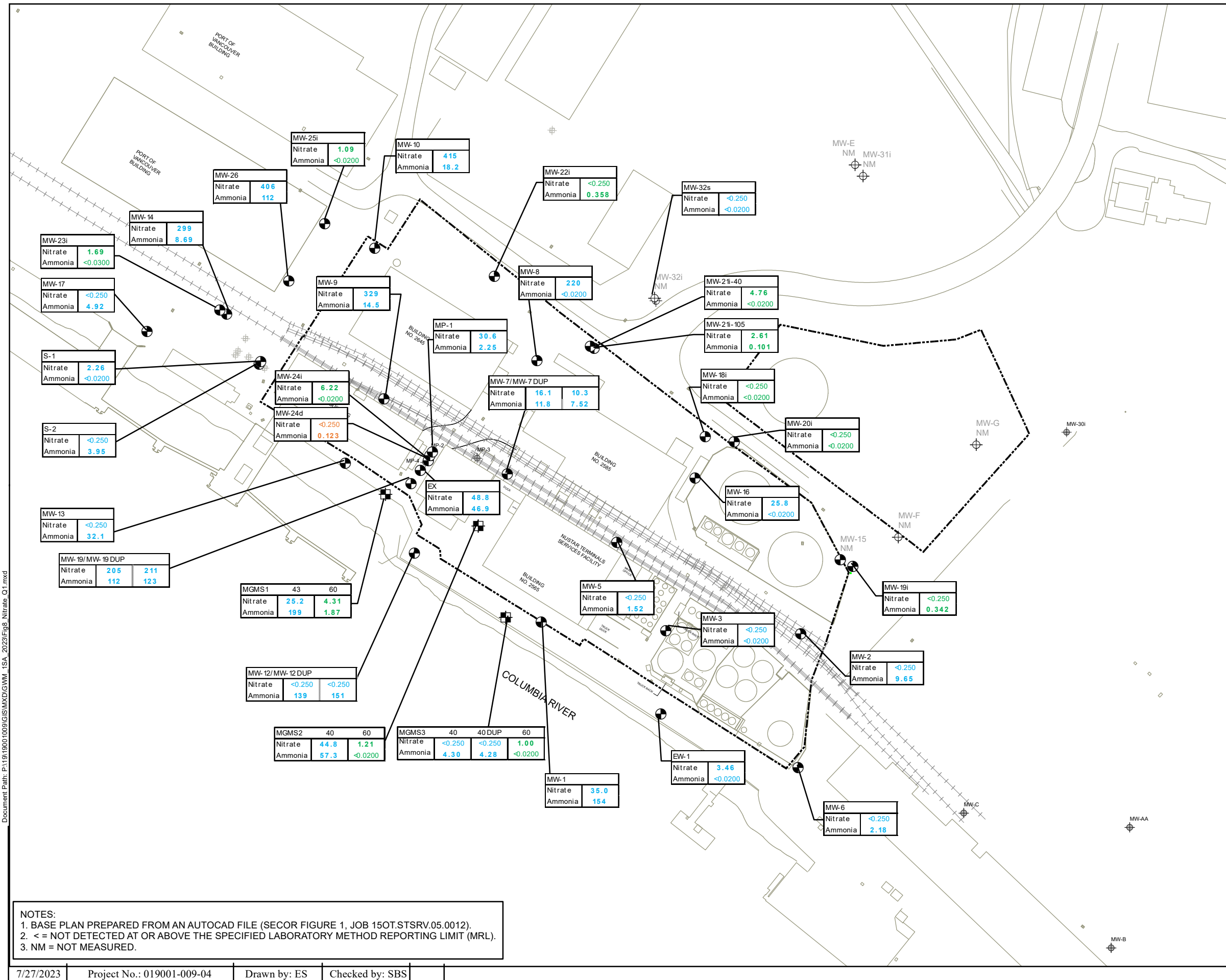
NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. ND = NOT DETECTED. WELL SAMPLED BUT NO VOC CONSTITUENTS WERE DETECTED.
3. NM = NOT MEASURED
4. HVOC = HALOGENATED VOLATILE ORGANIC COMPOUND

WELL IDENTIFICATION	DEPTH OF PORT SAMPLED (IF NOT SPECIFIED - SINGLE PORT WELL)	
	40	60
PCE	299	8.98
TCE	169	4.33
cis-1,2-DCE	311	9.02
1,1-DCE	10.0	<0.400
1,1-DCA	17.7	0.450

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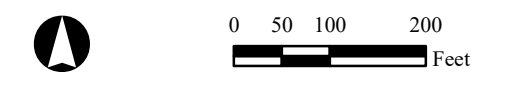


WELL IDENTIFICATION

MW-22i		
Nitrate	<0.250	NITRATE IN mg/L (AS NITROGEN METHOD 300.0)
Ammonia	0.342	AMMONIA IN mg/L (AS NITROGEN METHOD 350.1)

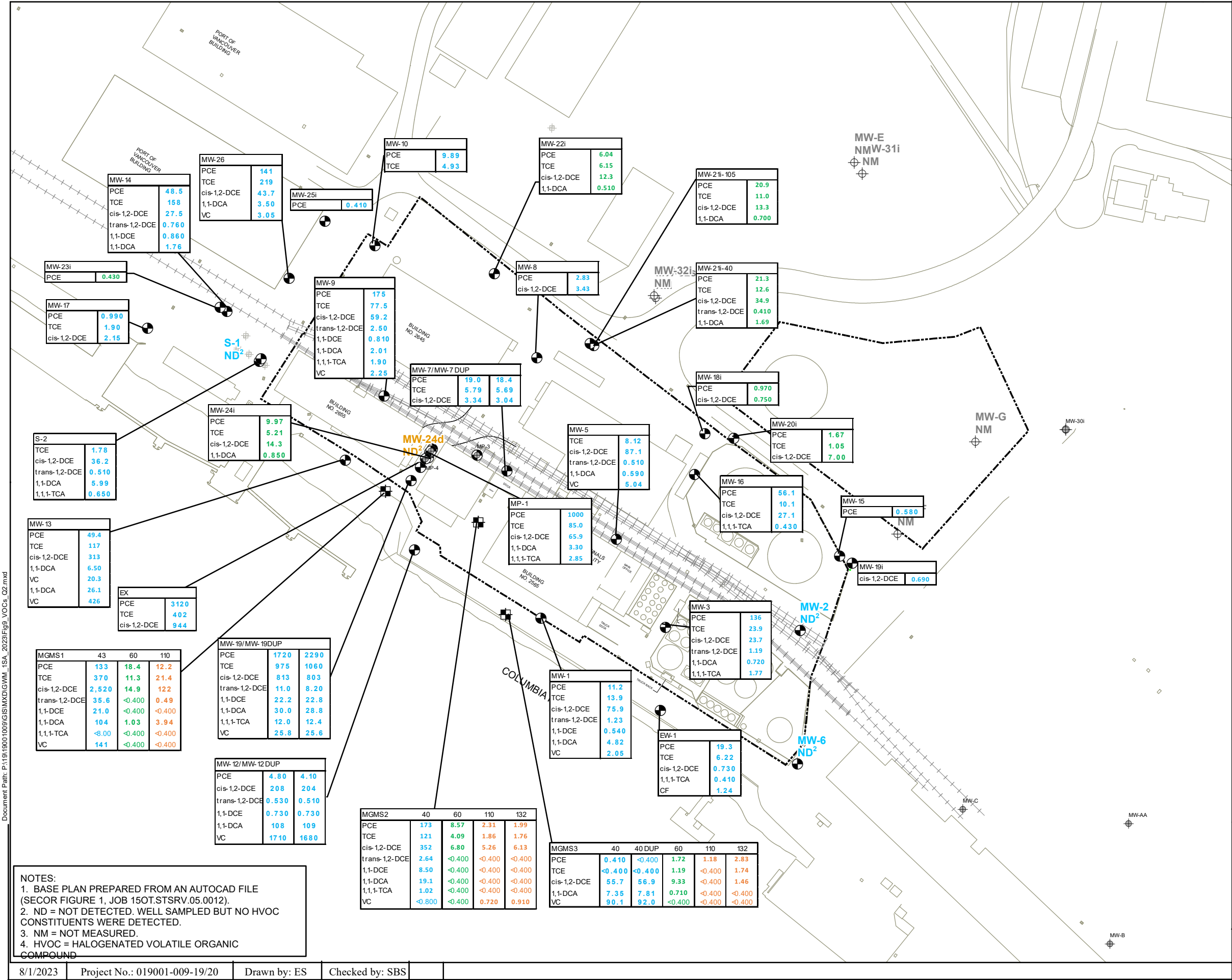
- Legend**
- ⊕ Port of Vancouver Well
 - ⊕ Multi-Level Groundwater Well
 - Monitoring Well
 - ⊕ Historical Groundwater Extraction Well
 - ⊕ Abandoned Groundwater Well
 - Approximate Property Line

BLUE - Shallow Zone concentration data
GREEN - Intermediate Zone concentration
ORANGE - Deep Zone concentration data



Nitrate and Ammonia Concentrations in Groundwater (March 2023)
 First Semi-Annual Groundwater Monitoring Report 2023
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

NOTES:
 1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECTOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. < = NOT DETECTED AT OR ABOVE THE SPECIFIED LABORATORY METHOD REPORTING LIMIT (MRL).
 3. NM = NOT MEASURED.



WELL IDENTIFICATION DEPTH OF PORT SAMPLED (IF NOT SPECIFIED - SINGLE PORT WELL)

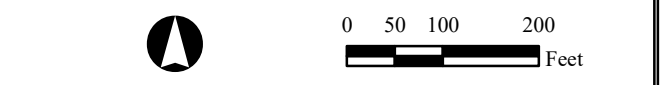
	43	60	110
PCE	133	18.4	12.2
TCE	370	11.3	21.4
cis-1,2-DCE	2,520	14.9	122
trans-1,2-DCE	35.6	<0.400	0.49
1,1-DCE	21	<0.400	<0.400
1,1-DCA	104	1.03	3.94
1,1,1-TCA	<8.00	<0.400	<0.400
VC	141	<0.400	<0.400

CHEMICAL CONCENTRATION IN µg/L (ONLY DETECTED COMPOUNDS ARE SHOWN)

- ANALYTE SAMPLED
- Legend**
- ⊕ Port of Vancouver Well
 - ⊕ Multi-Level Groundwater Well
 - ⊕ Monitoring Well
 - ⊕ Historical Groundwater Extraction Well
 - ⊕ Abandoned Groundwater Well
 - Approximate Property Line

- BLUE** - Shallow Zone concentration data
- GREEN** - Intermediate Zone concentration data
- ORANGE** - Deep Zone concentration data

PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
cis-1,2-DCE	CIS-1,2-DICHLOROETHENE
trans-1,2-DCE	TRANS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
1,1-DCE	1,1-DICHLOROETHENE
1,1-DCA	1,1-DICHLOROETHANE
CF	CHLOROFORM
1,1,1-TCA	1,1,1-TRICHLOROETHANE
CA	CHLOROETHANE



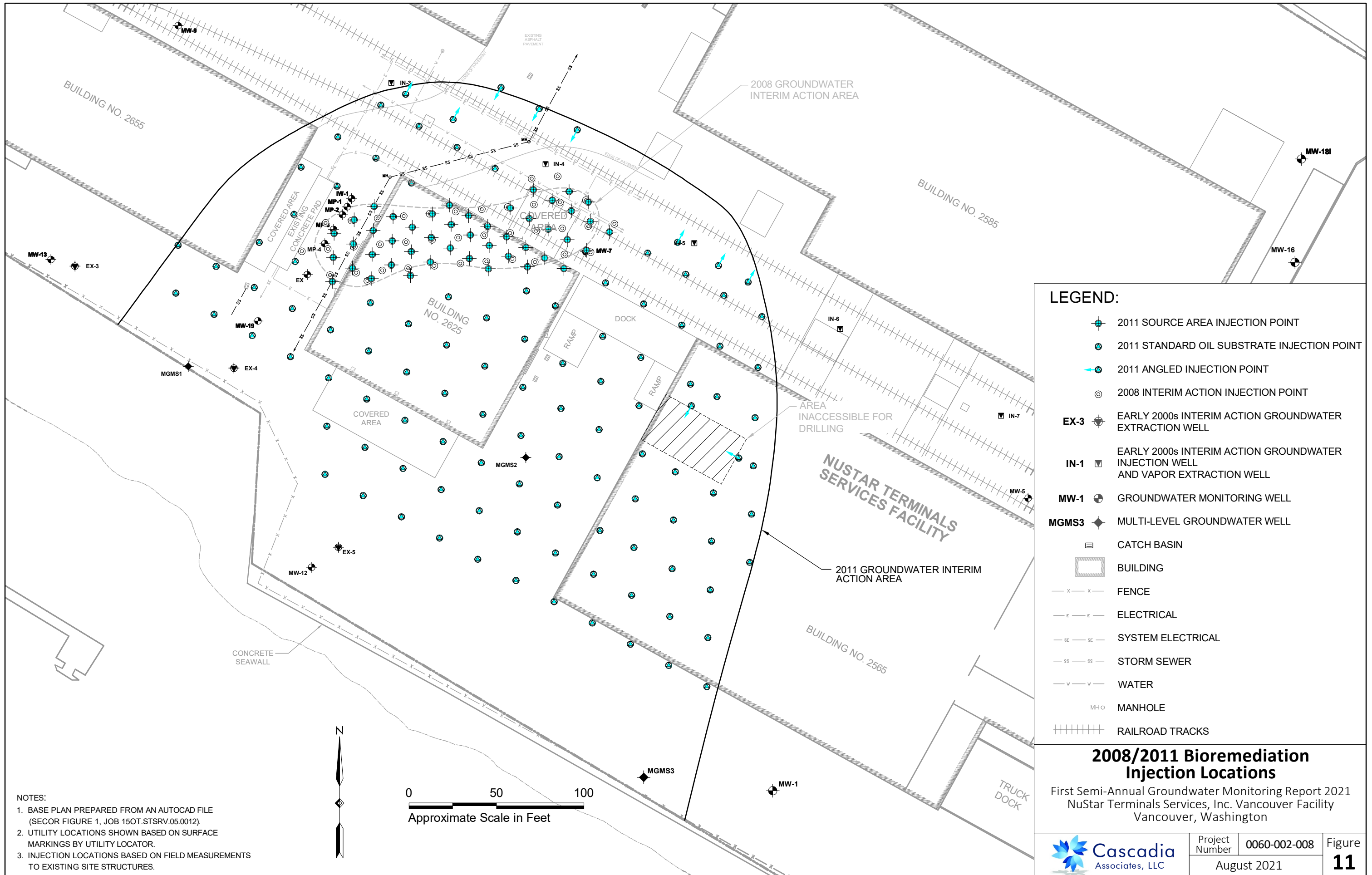
HVOC Concentrations in Groundwater (June 2023)

Fist Semi-Annual Groundwater Monitoring Report 2023
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. ND = NOT DETECTED. WELL SAMPLED BUT NO HVOC CONSTITUENTS WERE DETECTED.
3. NM = NOT MEASURED.
4. HVOC = HALOGENATED VOLATILE ORGANIC COMPOUND

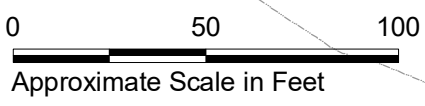
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NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.
3. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.





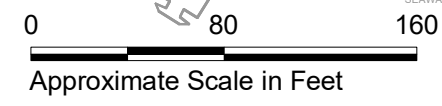
LEGEND:

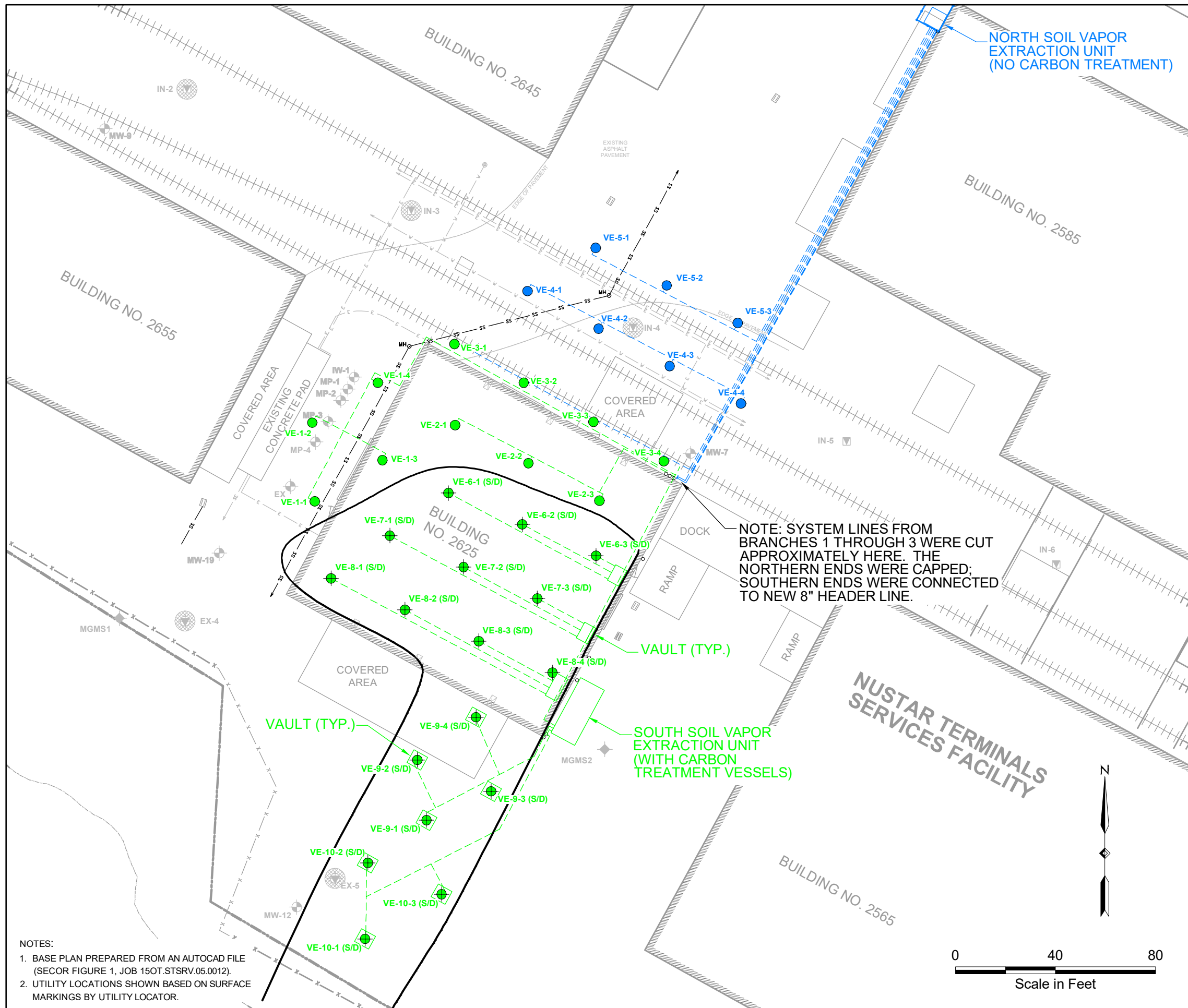
- ENHANCED BIOREMEDIATION INJECTION POINT
- EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- GROUNDWATER MONITORING WELL
- MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MANHOLE
- RAILROAD TRACKS

2016 Bioremediation Injection Locations
 First Semi-Annual Groundwater Monitoring Report 2021
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.
3. NORTHWEST AREA INJECTION POINT LOCATIONS ARE APPROXIMATE. NUSTAR SOURCE AREA LOCATIONS ARE BASED ON GPS COORDINATES AND HAVE BEEN MODIFIED SLIGHTLY FROM THE INTERIM ACTION WORK PLAN TO AVOID ENCOUNTERING BURIED INFRASTRUCTURE.



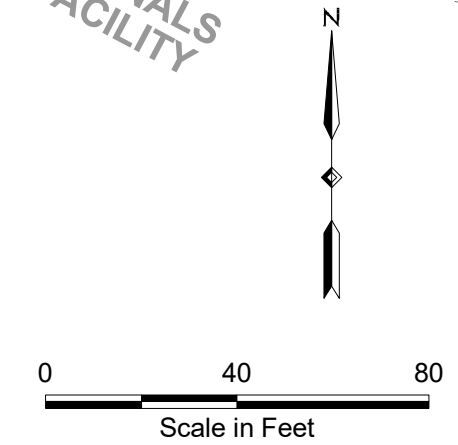


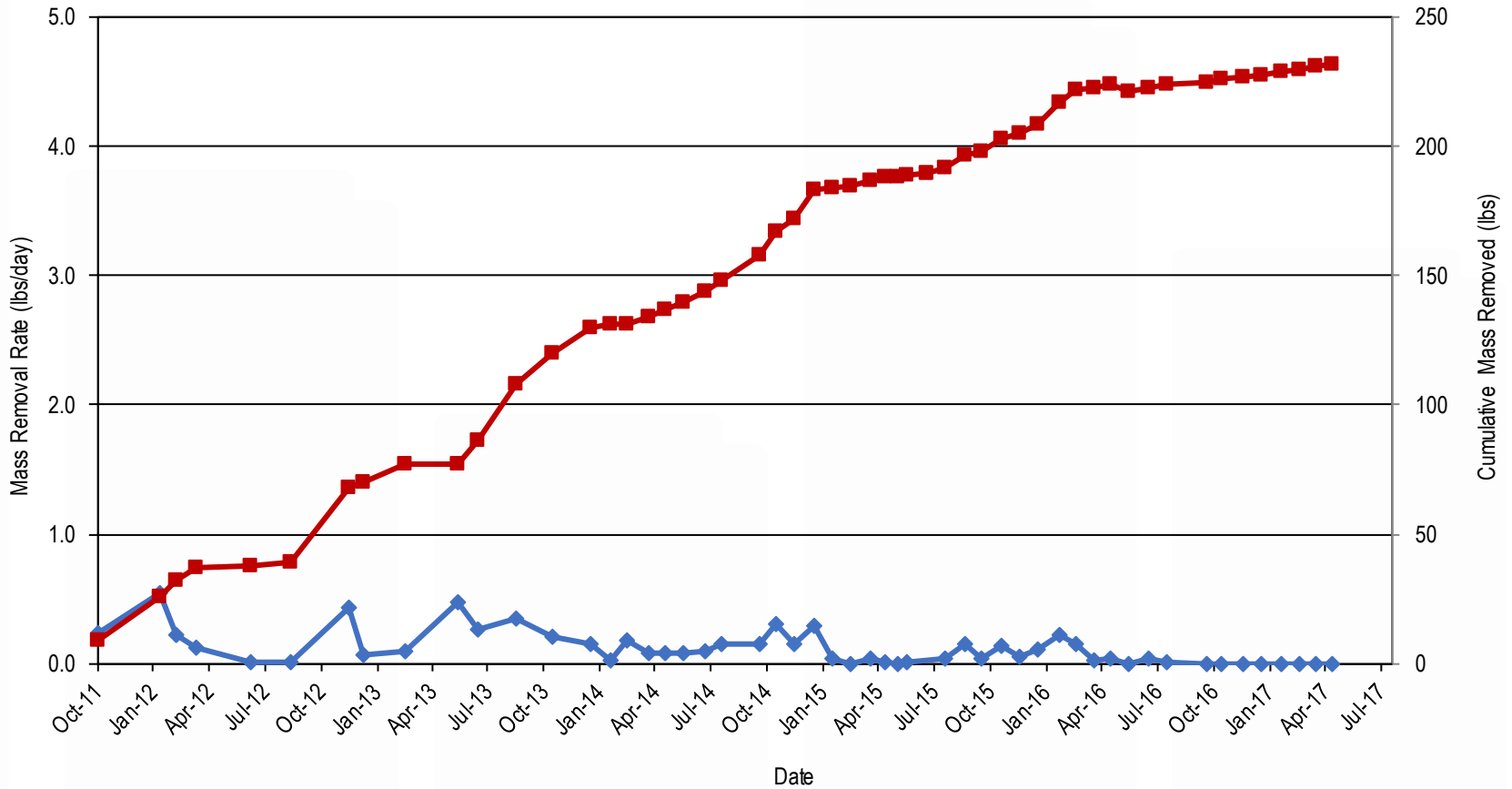
LEGEND:

- VE-6-2 (S/D) 2011 WELL PAIR LOCATION (SHALLOW SCREENED FROM 5-15 FEET BGS) (DEEP SCREENED 15-25 FEET BGS)
- VE-1-2 2008 INTERIM ACTION VAPOR EXTRACTION WELL LOCATION
- VAPOR EXTRACTION WELL (2000-2005)
- EX-3 EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- IN-1 EARLY 2000s INTERIM ACTION GROUNDWATER INJECTION WELL AND VAPOR EXTRACTION WELL
- MW-1 GROUNDWATER MONITORING WELL
- MGMS3 MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MANHOLE
- RAILROAD TRACKS
- UNDERGROUND SOIL VAPOR EXTRACTION (SVE) PIPING
- BLUE** NORTH VAPOR EXTRACTION UNIT
- GREEN** SOUTH VAPOR EXTRACTION UNIT

NOTE: SYSTEM LINES FROM BRANCHES 1 THROUGH 3 WERE CUT APPROXIMATELY HERE. THE NORTHERN ENDS WERE CAPPED; SOUTHERN ENDS WERE CONNECTED TO NEW 8" HEADER LINE.

NOTES:
 1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.





Legend:

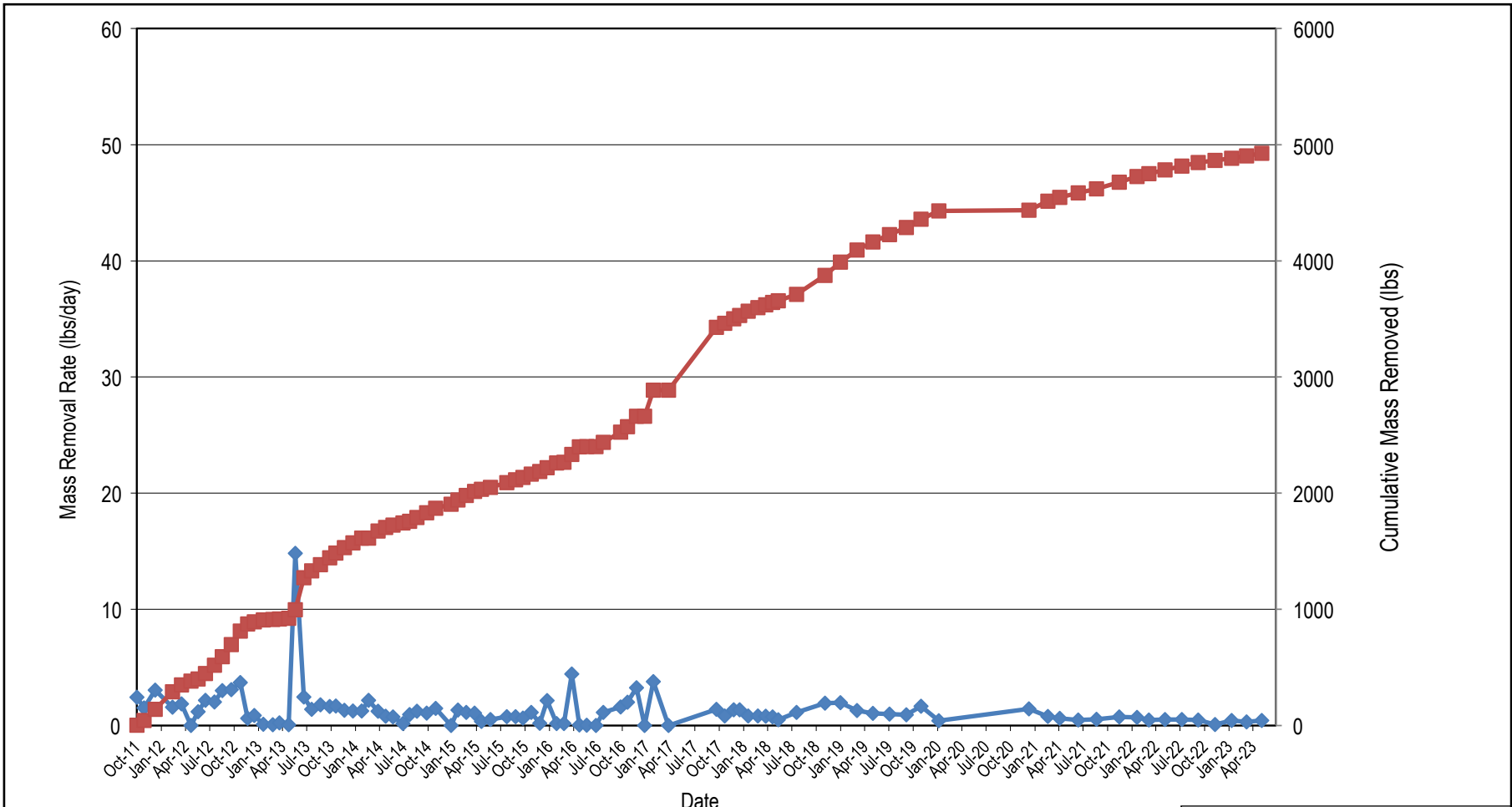
- ◆ Halogenated Volatile Organic Compound (HVOC) Removal Rate (lbs/day)
- Approximate Cumulative HVOCs Removed (lbs)

**North SVE System
HVOC Mass Removal**

First Semi-Annual Groundwater Monitoring Report 2023
NuStar Terminals, Inc. Vancouver Facility
Vancouver, Washington

GEOENGINEERS

Figure
14



Legend:

- ◆— Halogenated Volatile Organic Compound (HVOC) Removal Rate (lbs/day)
- Approximate Cumulative HVOCs Removed (lbs)

**South SVE System
HVOC Mass Removal**

First Semi-Annual Groundwater Monitoring Report 2023
NuStar Terminals, Inc. Vancouver Facility
Vancouver, Washington

APPENDIX A
Field Sampling Data Sheets

Project: Jan S SVE OKM

Date: 1/16/23

Client: Nustar Van Meir

Permit: 20629

Sampler: JP/CW

Calibrate PID (Y/N) Background reading 0.1 ppm

	Pre-Blower	Post-Blower	Post-C1	Post C-2
Pressure	-20.5	28.5	16.0	6.5
PID	0.0	12.3	8.6	7.2

9.3

Pre-Carbon Sample:

Name: PreCarbon-SVE-South-011623

Can P_i: -27.5

Can #: 661584

Can P_f: -6.5

Flow Meter #: 2221

Sampling Time: 0815

Post-Carbon Sample:

Name: PostCarbon-SVE-South-011623

Can P_i: -26.0

Can #: 2338

Can P_f: -5.0

Flow Meter #: 2140

Sampling Time: 0830

Blue Water?

Not blue, no odor.

Waste Volume/pH?

15 gallons

Restart System?

Yes

Project: S. SVE OKM
Client: ViaStar Van Meiri
Sampler: Jeff Pratt

Date: 3/13/23
Permit: 20686

Calibrate PID (Y/N) Yes, *JP* Pass

	Pre-Blower	Post-Blower	Post-C1	Post C-2
Pressure	-2.1	+6.28	16	6
PID	0.0	10.0	7.8	5.9

Pre-Carbon Sample:

Name: Pre Carbon - South - SUB-03132023 Can P_i: L-30

Can #: 6L1297 Can P_f: 7

Flow Meter #: 2221 Sampling Time: 1200

Post-Carbon Sample:

Name: Post Carbon - South - SUB-03132023 Can P_i: -27.5

Can #: 6L0397 Can P_f: -5

Flow Meter #: 2065 Sampling Time: 1215

Blue Water?

Yes, not blue. No odor.

Waste Volume/pH?

~14 gallons

Restart System?

Yes @ 1240.

Project: South SVE ORM

Date: 5/19/23

Client: Nustar Van Main

Permit: 20714

Sampler: Jeff Pratt

Calibrate PID (Y/N) JP Background = 0 ppm

	Pre-Blower	Post-Blower	Post-C1	Post C-2
Pressure	-2.1	28.5	16.0	6.5
PID	0.0	11.1	12.0	7.1

Pre-Carbon Sample:

Name: PreCarbon-South SVE-050923

Can P_i: L-30

Can #: D4123

Can P_f: -7.5

Flow Meter #: 2125

Sampling Time: 0745

Post-Carbon Sample:

Name: PostCarbon-South SVE-050923

Can P_i: -26.75

Can #: GL2128

Can P_f: -5.0

Flow Meter #: 2150

Sampling Time: 0755

Blue Water?

No.

Waste Volume/pH?

N/A

Restart System?

Yes

Project 1023 GUM
 Client Nustar Van Main
 Sampler JP/SR

Date 3/13/23
 Permit # 20686

Well ID	Time	DTP	DTW	Product Thickness	Notes		
MW-1	0811	—	27.08	—			
MW-2	0901	—	28.12	—			
MW-3	0836	—	27.48	—			
MW-5	1035	—	28.22	—			
MW-6	0853	—	26.88	—			
MW-7	1027	—	28.03	—	DTW is 28.03'		
MW-8	0921	—	26.99	—			
MW-9	1030	—	28.15	—			
MW-10	1017	—	27.42	—			
MW-12	0819	—	26.03	—			
MW-13	0902	—	27.56	—			
MW-14	0955	—	28.21	—			
MW-15	0944	—	33.09	—			
MW-16	—	—	—	Under large puddle, not accessible			
MW-17	1003		26.54	—			
MW-18i	1052		26.97	—			
MW-19	0832		27.97	—			
MW-19i	1047		27.17	—			
MW-20i	—	—	—	Under large puddle, not accessible			
MW-21i-40	1106	—	27.11	—			
MW-21i-105	1059	—	27.64	—			
MW-22i	1117	—	28.04	—			
MW-23i	1053	—	27.25	—			
MW-24i	1107	—	26.82	—			
MW-24d	1202	—	27.51	—			
MW-25i	1044	—	27.12	—			
MW-26	1010	—	28.08	—			
MW-30i							
MW-31i							
MW-32s	1112	—	28.53	—			
MW-32i	1115	—	28.10	—			

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-1	Job Number:	
Client:	Ny Star Van Main	Date:	3/17/23
Project:	1023 GWM	Sampler:	JP
Weather:	Clear	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	27.63	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Material & Type:	SB NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1000			27.63	0.25	7.56	15.9	1708	0.41	-352.7	Clear w
1003			27.48	0.30	7.58	15.3	1711	0.37	-363.4	Slight yellow
1006			-	0.50	7.64	15.6	1581	0.34	-367.9	Faint No visible particulates
1009			27.53	↓	7.69	15.6	1589	0.3	-378.9	↓
1012			-	↓	7.73	15.6	1633	0.30	-388.8	↓
1015			27.55	↓	7.75	15.7	1654	0.29	-377.7	↓

PURGING DATA

Sample ID:	MW-1	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apex	
Sample Time:	1015	Final Depth to Water:	27.53	Did Well Dewater:	1/6	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
① 250	-	NO ₂ /NO ₃				
① 250	H ₂ O ₂	NH ₃				
③ VOA	HCl	HVOCs				

NOTES/ADDITIONAL COMMENTS

Split w/ Anita

WELL MONITORING DATA SHEET

GEOENGINEERS



Well ID:	MW-2	Job Number:	
Client:	Mudster Veen Meer	Date:	3/16/22
Project:	1023 GMA	Sampler:	JP
Weather:	Clear	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2 1/4	Depth to Free Product:	
	Other: Under building	Well Depth:	28.11	Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	28.11	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Sampling Method:			Pump Intake Depth:		Tubing Material & Type:			
LF		LF			MS		SB			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1312			28.11	0.5	6.51	14.9	815	1.72	-244.8	Clear
1315			-	0.5	6.52	14.9	800	0.56	-303.2	Some haze
1318			29.02	0.25	6.54	14.8	823	0.37	-349.5	↓ Still particulate
1321			28.74	0.25	6.55	14.9	813	0.36	-302.1	
1324			28.61	0.25	6.56	14.9	824	0.37	-312.4	
1327			28.46	0.25	6.57	15.2	826	0.38	-314.6	

PURGING DATA

Sample ID:	MW-2	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apex
Sample Time:	1327	Final Depth to Water:	28.41	Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD
6 250	-	NO ₂ /NO ₃			
6 250	H ₂ SO ₄	NH ₃			
3 WDA	HCl	HVOCs			

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET



Well ID:	MW-5	Job Number:	-
Client:	ProStar Van Nuys	Date:	3/18/20
Project:	1023 GWM	Sampler:	SK
Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other:	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	28.14	Water Column Length:	-
Well Cap Lock Present:	Yes	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Bladder Pump	Pump Intake Depth:	MW Screen
Sampling Method:	Low Flow	Tubing Material & Type:	Ship Bond

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	NEW / DEDICATED	Clarity/Color Other Remarks
1053			28.14	0.20	6.06	18.22	1003	5.50	-34		Clear
1058			↓	0.20	6.43	19.15	1000	4.15	-49		
1059			↓	0.20	6.60	20.23	961	4.28	-60		
1102			↓	0.20	6.55	20.40	906	4.21	-52		
1105			↓	0.20	6.58	20.29	879	4.07	-59		
1108			↓	0.20	6.57	20.68	847	3.52	-53		
1111			↓	0.20	6.67	20.92	823	3.54	-56		
1114			↓	0.20	6.64	21.03	809	3.23	-48		
1117			↓	0.20	6.66	20.89	797	3.27	-47		

PURGING DATA

Sample ID:	MW-5	Sampling Flow Rate:	0.20	Analytical Laboratory:	APOL	
Sample Time:	1117	Final Depth to Water:	28.14	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3xVOA	HCl	HVOCs	-	-	-	-
250	H ₂ SO ₄	MVOCs	-	-	-	-
250	None	NO ₂ /NO ₃	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-6	Job Number:	-
Client:	Nustar Kamin	Date:	3/14/23
Project:	1223	Sampler:	SP
Weather:	Overcast	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other:	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	26.91	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BP				Pump Intake Depth:	MS				
Sampling Method:	low flow				Tubing Material & Type:	Split Bore				
										NEW / DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0807			26.91	0.5	6.14	12.9	1022	0.40	-161.9	Clear
0810			26.81	↓	6.12	12.8	832	0.41	-163.4	↓
0813			26.83	↓	6.06	12.8	786	0.39	-168.7	↓
0816			26.83	↓	6.06	12.8	730	0.37	-172.6	↓
0819			↓	↓	6.07	12.9	645	0.35	-181.9	↓
0822			↓	↓	6.06	13.0	526	0.33	-226.6	↓
0825			↓	↓	6.05	13.0	480.4	0.32	-234.2	↓
0828			↓	↓	6.05	13.0	471.6	0.32	-241.0	↓
0831			↓	↓	6.05	13.0	451.0	0.32	-251.8	↓

PURGING DATA

Sample ID:	MW-6	Sampling Flow Rate:	0.50	Analytical Laboratory:	Agco	
Sample Time:	0831	Final Depth to Water:	26.83	Did Well Dewater:	Yes	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(1) 250	-	Nitrate/Nitrite	-	-	-	-
(1) 250	H ₂ SO ₄	Ammonia	-	-	-	-
(3) VOA	HCl	HVOCs	-	-	-	-

NOTES/ADDITIONAL COMMENTS

SPLIT w/ ANTEA

WELL MONITORING DATA SHEET



Well ID:	MW-7	Job Number:	
Client:	NuStar Van Han	Date:	3/14/23
Project:	1023 GUM	Sampler:	JP
Weather:	Overcast	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	4"	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	Yes No	Depth to Water:	27.47	Water Column Length:	-
		Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	NL							
Sampling Method:	LF	Tubing Material & Type:	SB NEW / DEDICATED							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1031			27.47	0.50	6.45	11.7	647	3.14	-203.1	Clear
1034			28.04		6.42	12.0	754	1.74	-235.9	
1037					6.44	11.6	776	1.81	-233.4	
1040					6.43	10.7	746	1.40	-281.7	
1043					6.45	10.5	788	1.17	-286.4	
1046			28.04		6.45	10.4	793	0.96	-290.9	

PURGING DATA

Sample ID:	MW-7	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apex
Sample Time:	1046	Final Depth to Water:	23.12	Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
① 250	-	NH ₄ /NO ₃			MW-7 DUP
① 250	H ₂ SO ₄	Ammon			MW-7 DUP
③ 100 A	HCl	HVOS			MW-7 DUP
② 100 A	HCl	RSK/TOC			

NOTES/ADDITIONAL COMMENTS

Split w/ Anteq

WELL MONITORING DATA SHEET



Well ID:	MW-8	Job Number:	
Client:	MuStar Van Nain	Date:	3/15/23
Project:	1023 GWM	Sampler:	SK
Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: <u>Ugult</u>	Well Diameter:	4 1/2	Depth to Free Product:	-
Monument Condition:	<u>Good</u>	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	<input checked="" type="radio"/> Yes <input type="radio"/> No	Depth to Water:	27.51	Water Column Length:	-
Comments:		Screened Interval:	-	Purge Volume:	-

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	<u>Bladder Pump</u>	Pump Intake Depth:	<u>Mid-Screen</u>
Sampling Method:	<u>Low Flow</u>	Tubing Material & Type:	<u>Split Slip Bond</u> NEW / <u>DEDICATED</u>

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1258			27.51	0.20	7.90	12.30	1680	15.69	24	Clear ↓
1301			27.71	0.20	7.49	13.64	1890	9.92	23	
1304			27.72	0.20	7.42	13.66	1890	9.80	26	
1307			27.77	0.20	7.17	13.78	1910	9.43	85	
1310			28.83	0.20	6.99	13.88	1920	9.08	93	
1313			28.88	0.20	6.87	13.87	1920	8.79	95	
1316			28.91	0.20	6.81	14.13	1920	8.44	100	
1319			27.95	0.20	6.76	14.35	1920	8.21	103	
1322			27.97	0.20	6.67	14.52	1920	7.95	106	
1325			28.02	0.20	6.68	14.61	1920	7.77	108	
1328			28.04	0.20	6.64	14.60	1910	7.65	108	

PURGING DATA

Sample ID:	MW-8	Sampling Flow Rate:	0.20	Analytical Laboratory:	Apex	
Sample Time:	1328	Final Depth to Water:	28.04	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3X VOA	HCl	VOCs	-	-	-	-
1X250	H2SO4	NH3	-	-	-	-
250	None	NO3/NO2	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-9</u>	Job Number: _____
	Client: <u>Master Van Meer</u>	Date: <u>3/17/25</u>
	Project: <u>1023 GUM</u>	Sampler: <u>JP</u>
	Weather: <u>Clear</u>	Time In/Out: _____

WELL DATA

Monument Type: <u>Flush-mount/Stick-up</u>	Well Diameter: <u>4 1/2</u>	Depth to Free Product: <u>—</u>
Other: _____	Well Depth: <u>—</u>	Free Product Thickness: <u>—</u>
Monument Condition: <u>Good</u>	Depth to Water: <u>28.03</u>	Water Column Length: <u>—</u>
Well Cap Lock Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval: <u>—</u>	Purge Volume: <u>—</u>

Comments: _____

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>BP</u>		Pump Intake Depth: <u>MS</u>								
Sampling Method: <u>LF</u>		Tubing Material & Type: <u>SB</u>								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
<u>0900</u>			<u>28.03</u>	<u>0.50</u>	<u>5.77</u>	<u>12.5</u>	<u>2734</u>	<u>0.43</u>	<u>-187.6</u>	<u>Clear</u> ↓
<u>0903</u>			<u>27.98</u>	<u>0.50</u>	<u>5.82</u>	<u>12.8</u>	<u>2740</u>	<u>0.25</u>	<u>-252.4</u>	
<u>0906</u>			<u>27.94</u>	<u>0.50</u>	<u>5.80</u>	<u>12.9</u>	<u>2727</u>	<u>0.21</u>	<u>-281.9</u>	
<u>0909</u>			<u>27.94</u>	<u>0.50</u>	<u>5.82</u>	<u>12.9</u>	<u>2709</u>	<u>0.19</u>	<u>-302.0</u>	
<u>0912</u>			<u>27.93</u>	<u>0.50</u>	<u>5.83</u>	<u>13.0</u>	<u>2705</u>	<u>0.18</u>	<u>324.6</u>	
<u>0915</u>			<u>27.92</u>	<u>0.50</u>	<u>5.86</u>	<u>13.0</u>	<u>2709</u>	<u>0.18</u>	<u>-336.2</u>	
<u>0918</u>			<u>27.94</u>	<u>0.50</u>	<u>5.86</u>	<u>13.1</u>	<u>2706</u>	<u>0.18</u>	<u>-340.1</u>	

PURGING DATA

Sample ID: <u>MW-9</u>	Sampling Flow Rate: <u>0.56</u>	Analytical Laboratory: <u>Apex</u>
Sample Time: <u>0918</u>	Final Depth to Water: <u>27.74</u>	Did Well Dewater: <u>No</u>
No. of Containers/Type	Preservative	Analysis/Method
<u>①</u>	<u>NO₂/NO₃</u>	<u>—</u>
<u>②</u>	<u>NH₃</u>	<u>H₂O₄</u>
<u>③</u>	<u>HCl</u>	<u>HWCs</u>

NOTES/ADDITIONAL COMMENTS

Split w/ Antec

MW-10

WELL MONITORING DATA SHEET



Well ID:	MW-10	Job Number:	-
Client:	Nutter Van Dail	Date:	3/15/23
Project:	1023 G4/11	Sampler:	SP
Weather:	Rain/Overcast	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	4 1/4	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> No	Depth to Water:	28.21	Water Column Length:	-
		Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP LF				Pump Intake Depth:	MS				
Sampling Method:					Tubing Material & Type:	S13		NEW / DEDICATED		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1218			28.20	0.50	5.40	13.7	3600	0.94	-277.0	Clear
1221			28.21		5.42	13.8	3610	0.66	-291.9	
1224			↓	↓	5.44	14.0	3618	0.55	-313.7	
1227			↓	↓	5.46	13.8	3609	0.54	-310.6	
1230			↓	↓	5.48	13.8	3641	0.60	-306.3	

PURGING DATA

Sample ID:	MW-10	Sampling Flow Rate:	0.50	Analytical Laboratory:	SP	
Sample Time:	1230	Final Depth to Water:	28.22	Did Well Dewater:	Y/N	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
① 250	-	NO ₂ /NO ₃				
① 250	H ₂ SO ₄	NH ₄				
③ 1000s VOLs	HCl	HVOCs				

NOTES/ADDITIONAL COMMENTS

Spoke w/ Arthur

WELL MONITORING DATA SHEET



Well ID:	MW-12	Job Number:	
Client:	Mustang Vets Med	Date:	3/16/23
Project:	1423 GMM	Sampler:	SP
Weather:	Clear	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	4"	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:		Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	ISP				Pump Intake Depth:	MS				
Sampling Method:	LF				Tubing Material & Type:	SD		NEW / DEDICATED		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1056			-	0.50	6.77	13.5	2609	0.87	-218.4	Yellow tint
1059			26.23	↓	6.76	13.4	2622	0.41	-317.5	↓
1102			↓	↓	6.75	13.5	2615	0.30	-346.2	↓
1105			-	↓	6.76	13.4	2613	0.25	-352.9	↓
1108			26.52	↓	6.77	13.5	2605	0.18	-358.3	↓

PURGING DATA

Sample ID:	MW-12	Sampling Flow Rate:	0.50	Analytical Laboratory:	Aperx	
Sample Time:	1108	Final Depth to Water:	26.54	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
① 250	-	NO ₂ /NO ₃	---	---	---	MW-12 DUP
① 250	H ₂ SO ₄	NH ₃	---	---	---	MW-12 DUP
③ VOA	HCl	AO HVOCs	---	---	---	MW-12 DUP
② VOA	HCl	PJK/TA	---	---	---	---

NOTES/ADDITIONAL COMMENTS

Splot w/ Antea
Yellow tint in samples, NO visible particulate

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MW-13	Job Number:	
Client:	Ny Star Van Man	Date:	3/16/25
Project:	LO 23	Sampler:	JP
Weather:	Clear ~40°F	Time In/Out:	-

WELL DATA

Monument Type:	<input checked="" type="checkbox"/> Flush-mount/Stick-up	Well Diameter:	4" ¹¹	Depth to Free Product:	-
	<input type="checkbox"/> Other:	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	27.47	Water Column Length:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Material & Type:	S13

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
1000			27.47	0.60	6.62	13.4	1371	0.77	-246.8	Clear
1003			-	0.50	6.63	14.0	1347	0.24	-344.0	↓
1006			27.78	0.50	6.65	12.7	1344	0.23	-375.1	
1009			-	↓	6.65	12.4	1329	0.26	-361.8	
1012			28.12	↓	6.65	12.3	1329	0.29	-359.3	

PURGING DATA

Sample ID:	MW-13	Sampling Flow Rate:	0.50	Analytical Laboratory:	Aperx 16
Sample Time:	1012	Final Depth to Water:	28.83	Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD
1 250	-	NO ₂ /NO ₃			
1 250	H ₂ SO ₄	NH ₃			
5 VOA	HCl	RSK/HVOCs			

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET



Well ID:	MW-14	Job Number:	
Client:	Master Van Main	Date:	3/15/23
Project:	1923 GWM	Sampler:	JP
Weather:	Clear	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	4"	Depth to Free Product:	-
	Other:	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	28.21	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:		BP LF			Pump Intake Depth:		MS SB		NEW / DEDICATED	
Sampling Method:					Tubing Material & Type:					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0924			28.21	0.40	6.31	10.8	3150	3.69	-154.9	Clear
0927			28.20	0.40	6.32	12.5	2852	2.05	-257.5	↓
0930			28.20	↓	6.30	14.3	2819	0.35	-336.8	
0933			28.20	↓	6.31	14.6	2817	0.28	-360.3	
0936			↓	↓	6.31	14.6	2818	0.24	-367.2	
0939			↓	↓	6.32	14.7	2819	0.23	-371.9	
									-371.9	

PURGING DATA

Sample ID:	MW-14	Sampling Flow Rate:	0.40	Analytical Laboratory:	Apex
Sample Time:	0939	Final Depth to Water:	28.21	Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
(1) 250	-	NO ₂ /NO ₃			
(1) 250	H ₂ SO ₄	NH ₃			
(5) VOA	HCl	RSK/TOC/HICCS			

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET

GEOENGINEERS



Well ID:	MW-16	Job Number:	3115125
Client:	Nistar Van Main	Date:	JP
Project:	1023 GWM	Sampler:	JP
Weather:	Overcast	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	4 1/2	Depth to Free Product:	-
	Other: <i>Van H</i>	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	<i>Good</i>	Depth to Water:	28.84	Water Column Length:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		<i>BP</i>			Pump Intake Depth:		<i>MS</i>			
Sampling Method:		<i>LP</i>			Tubing Material & Type:		<i>SB</i>			
		NEW / DEDICATED								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1340			28.84	0.50	6.01	11.6	2918	3.68	-176.7	<i>Clear</i>
1343			↓	0.50	6.75	13.4	650	4.03	-278.0	↓
1346			↓	↓	6.69	13.3	590	0.44	-364.3	↓
1349			↓	↓	6.69	12.9	586	0.50	-362.8	↓
1352			↓	↓	6.69	12.9	586	0.44	-358.2	↓

PURGING DATA

Sample ID:	MW-16	Sampling Flow Rate:	0.50	Analytical Laboratory:	<i>Aqua</i>
Sample Time:	1352	Final Depth to Water:	28.84	Did Well Dewater:	<i>NO</i>
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD
① 250	-	<i>NO₂/NO₃</i>			
① 250	<i>H₂SO₄</i>	<i>NH₃</i>			
③ VOA	<i>HCl</i>	<i>HVOCs</i>			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-17	Job Number:	
Client:	Nashua Van Meter	Date:	3/15/23
Project:	1023 GWM	Sampler:	SP
Weather:	Clear	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	4"	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:		Free Product Thickness:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> No	Depth to Water:	26.55	Water Column Length:	-
Comments:		Screened Interval:	-	Purge Volume:	-

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP LF				Pump Intake Depth:	MS				
Sampling Method:					Tubing Material & Type:	SB		NEW / DEDICATED		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1025			26.55	0.40	6.81	13.7	1978	2.39	-221.7	Clear
1028			↓	↓	6.80	13.7	1542	0.63	-308.0	↓
1031			↓	↓	6.78	13.8	1528	0.34	-350.7	↓
1034			↓	↓	6.76	13.9	1524	0.28	-372.4	↓
1037			↓	↓	6.75	13.9	1521	0.28	-378.1	↓
1040			↓	↓	6.75	13.9	1524	0.25	-383.2	↓

PURGING DATA

Sample ID:	MW-17	Sampling Flow Rate:	0.40	Analytical Laboratory:	Aqua	
Sample Time:	1040	Final Depth to Water:	26.56	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
① 250	-	NO ₂ /NO ₃				
④ 250	H ₂ SO ₄	NH ₃				
③ VOA	HCl	HVOCs				

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-18i</u>	Job Number: <u>—</u>
	Client: <u>Master Van Noid</u>	Date: <u>3/17/23</u>
	Project: <u>1023 GWM</u>	Sampler: <u>SR</u>
	Weather: <u>Sun, 55°F</u>	Time In/Out: <u>—</u>

WELL DATA

Monument Type:	<u>Flush-mount</u> / Stick-up Other: <u>—</u>	Well Diameter: <u>2"</u>	Depth to Free Product: <u>—</u>
Monument Condition:	<u>Good</u>	Well Depth: <u>—</u>	Free Product Thickness: <u>—</u>
Well Cap Lock Present:	<u>Yes</u> No	Depth to Water: <u>28.31</u>	Water Column Length: <u>—</u>
Comments:		Screened Interval: <u>—</u>	Purge Volume: <u>—</u>

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>Bladder Pump</u>		Pump Intake Depth: <u>Mid-screen</u>								
Sampling Method: <u>Low Flow</u>		Tubing Material & Type: <u>Ship board</u>								
		NEW / DEDICATED								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
<u>0806</u>			<u>28.31</u>	<u>0.20</u>	<u>8.98</u>	<u>11.89</u>	<u>175</u>	<u>32.32</u>	<u>136</u>	↓ <u>Clear</u>
<u>0809</u>			<u>28.32</u>	<u>0.20</u>	<u>8.79</u>	<u>12.91</u>	<u>176</u>	<u>12.29</u>	<u>135</u>	
<u>0812</u>			<u>28.32</u>	<u>0.20</u>	<u>8.63</u>	<u>13.28</u>	<u>175</u>	<u>9.31</u>	<u>147</u>	
<u>0815</u>			↓	<u>0.20</u>	<u>8.45</u>	<u>13.31</u>	<u>175</u>	<u>7.94</u>	<u>144</u>	
<u>0818</u>			↓	↓	<u>8.40</u>	<u>13.30</u>	<u>175</u>	<u>7.14</u>	<u>153</u>	
<u>0821</u>			↓	↓	<u>8.41</u>	<u>13.32</u>	<u>173</u>	<u>6.55</u>	<u>142</u>	
<u>0824</u>			↓	↓	<u>8.40</u>	<u>13.32</u>	<u>174</u>	<u>5.56</u>	<u>154</u>	

PURGING DATA

Sample ID: <u>MW-18i</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>APL</u>				
Sample Time: <u>0824</u>	Final Depth to Water: <u>28.32</u>	Did Well Dewater: <u>NO</u>				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
<u>3xVOA</u>	<u>HCl</u>	<u>VOCS</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>250</u>	<u>H2SO4</u>	<u>NH3</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>250</u>	<u>NONE</u>	<u>NO3/NO2</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

NOTES/ADDITIONAL COMMENTS

DO sensor fault will eventually drop to zero (0).

WELL MONITORING DATA SHEET



Well ID:	MW-19	Job Number:	
Client:	Ne Star Ken Meis	Date:	3/14/23
Project:	1Q23 GWM	Sampler:	JP
Weather:	Overcast	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2 1/2	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	28.18	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP LF				Pump Intake Depth:	21.5				
Sampling Method:					Tubing Material & Type:	SB				
									NEW / DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1157			28.18	0.50	6.72	14.1	2993	1.00	-246.8	Clear
1200			28.15	0.50	6.80	13.8	3088	0.47	-296.1	
1203			28.15	↓	6.83	14.3	3033	0.32	-319.2	
1206			28.15	↓	6.84	14.4	2947	0.27	-329.5	
1209			28.15	↓	6.86	14.4	2953	0.22	-332.1	

PURGING DATA

Sample ID:	MW-19	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apex	
Sample Time:	1209	Final Depth to Water:	28.11	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
① 250	-	Nitrate/Nitrite				MW-19 DCP
① 250	H2O2	Ammonia				MW-19 DUP
③ VOA	HCl	HVOCs				MW-19 DUP
② VOA	HCl	RS4/10				

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET



Well ID:	MW-19i	Job Number:	-
Client:	Duster Van Meun	Date:	3/14/23
Project:	1023 GWT	Sampler:	SR
Weather:	Sunny 40°F	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	-	Depth to Free Product:	-
	Other:	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	25.83	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Bladder Pump			Pump Intake Depth:	Mid-screen					
Sampling Method:	Low Flow			Tubing Material & Type:	Skip Band					
							NEW / DEDICATED			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0814			25.83	0.20	5.93	7.20	360	14.11	129.0	Clear
0817			25.77	0.20	2.01	10.48	280	10.97	94.2	↓ Continued
0820			25.68	0.20	4.30	11.80	300	6.24	-71.0	
0830			25.69	0.20	4.63	11.70	364	2.79	-50.2	
0833			25.69	0.20	4.71	11.60	381	2.00	-103.7	
0836			25.68	0.20	4.72	11.70	406	1.42	-128.4	
0839			25.64	0.20	4.87	11.90	412	1.20	-159.0	
0842			25.60	0.20	4.93	12.00	432	1.00	-183.1	
0845			25.60	0.20	5.08	12.20	453	0.87	-200.1	
0848			25.56	0.20	5.18	12.20	463	0.74	-208.8	
0851			25.56	0.20	5.28	12.40	464	0.73	-214.4	
0854			25.56	0.20	5.48	12.40	466	0.89	-227.3	
0857			25.51	0.20	5.65	12.20	465	0.67	-240.9	
0900			25.49	0.20	5.95	11.80	465	0.66	-263.3	

PURGING DATA


Sample ID:	MW-19i	Sampling Flow Rate:	0.20	Analytical Laboratory:	Apex	
Sample Time:	0930	Final Depth to Water:	25.78	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x20A	HCl	VOCs	-	-	-	-
1x20B	H2SO4	NH3	-	-	-	-
1x20C	None	NO3/NO2	-	-	-	-

NOTES/ADDITIONAL COMMENTS

Water level rising.

2 of 2

WELL MONITORING DATA SHEET

	Well ID: <u>MW-19, Cont. In Use</u>	Job Number:
	Client: <u>[Redacted]</u>	Date:
	Project:	Sampler:
	Weather:	Time In/Out:

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	Depth to Free Product:
	Other:	Well Depth:	Free Product Thickness:
Monument Condition:		Depth to Water:	Water Column Length:
Well Cap Lock Present:	Yes No	Screened Interval:	Purge Volume:

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Pump Intake Depth:		NEW / DEDICATED						
Sampling Method:		Tubing Material & Type:								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0903			28.47	0.20	5.48	11.80	467	0.60	-271.8	Clear ↓
0906			28.45	0.20	6.31	12.80	467	0.58	-292.9	
0909			28.44	0.20	6.47	12.70	467	0.46	-307.5	
0912			28.40	0.20	6.60	12.70	467	0.44	-320.4	
0915			28.43	0.20	6.56	12.80	469	0.41	-328.8	
0918			28.43	0.20	6.80	13.00	465	0.41	-337.8	
0921			28.41	0.20	6.90	13.00	465	0.40	-350.7	
0924			28.35	0.20	6.96	13.00	467	0.40	-356.5	
0927			28.32	0.20	7.03	13.00	467	0.39	-362.1	
0930			28.32	0.20	7.06	13.00	467	0.38	-366.3	

PURGING DATA

Sample ID:	Sampling Flow Rate:	Analytical Laboratory:				
Sample Time:	Final Depth to Water:	Did Well Dewater:				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID

See page 1 of 2

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-20i</u>	Job Number: <u>—</u>
	Client: <u>Van Alun</u>	Date: <u>7/18/23</u>
	Project: <u>1025 SWP</u>	Sampler: <u>SR</u>
	Weather: <u>—</u>	Time In/Out: <u>—</u>

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter: <u>2"</u>	Depth to Free Product: <u>—</u>
	Other: <u>Vault</u>	Well Depth: <u>—</u>	Free Product Thickness: <u>—</u>
Monument Condition:	<u>Good</u>	Depth to Water: <u>26.91</u>	Water Column Length: <u>—</u>
Well Cap Lock Present:	<u>Yes</u> No	Screened Interval: <u>—</u>	Purge Volume: <u>—</u>

Comments: —

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>Bladder Pump</u>		Pump Intake Depth: <u>Mid screen</u>								
Sampling Method: <u>Low Flow</u>		Tubing Material & Type: <u>5/8" Bowt</u>								
		NEW / DEDICATED								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
<u>1356</u>			<u>26.91</u>	<u>0.30</u>	<u>6.74</u>	<u>13.64</u>	<u>6040</u>	<u>12.77</u>	<u>105</u>	<u>clear</u>
<u>1359</u>				<u>0.30</u>	<u>7.04</u>	<u>13.51</u>	<u>618</u>	<u>5.97</u>	<u>100</u>	
<u>1402</u>				<u>0.30</u>	<u>7.19</u>	<u>13.69</u>	<u>393</u>	<u>6.53</u>	<u>95</u>	
<u>1405</u>				<u>0.30</u>	<u>7.28</u>	<u>13.82</u>	<u>333</u>	<u>3.44</u>	<u>90</u>	
<u>1408</u>				<u>0.30</u>	<u>7.26</u>	<u>13.79</u>	<u>317</u>	<u>0.53</u>	<u>96</u>	
<u>1411</u>				<u>0.30</u>	<u>7.30</u>	<u>13.71</u>	<u>712</u>	<u>0.00</u>	<u>85</u>	
<u>1414</u>				<u>0.20</u>	<u>7.28</u>	<u>13.60</u>	<u>314</u>	<u>0.00</u>	<u>79</u>	
<u>1417</u>				<u>0.30</u>	<u>7.32</u>	<u>13.48</u>	<u>314</u>	<u>0.00</u>	<u>87</u>	

PURGING DATA

Sample ID: <u>MW-20i</u>	Sampling Flow Rate: <u>0.30</u>	Analytical Laboratory: <u>Accu</u>				
Sample Time: <u>1417</u>	Final Depth to Water: <u>26.91</u>	Did Well Dewater: <u>Yes</u>				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
<u>3x VOA</u>	<u>HCl</u>	<u>HVOCs</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>250</u>	<u>H₂SO₄</u>	<u>NH₃</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>250</u>	<u>None</u>	<u>NO₃/NO₂</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

NOTES/ADDITIONAL COMMENTS

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WELL MONITORING DATA SHEET



Well ID:	MW-21i-40	Job Number:	-
Client:	Muster On Main	Date:	2/15/23
Project:	Q23 GWM	Sampler:	SR
Weather:	Rain, 40% -	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other:	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	27.86	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Bladder Pump				Pump Intake Depth:	Mid screen					
Sampling Method:	Low Flow				Tubing Material & Type:	Ship		Bowl			NEW / DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color	Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
0756			27.83	0.20	8.09	13.81	274	10.50	-52		Clear ↓
0759			27.83	0.20	7.93	14.04	275	4.64	-49		
0802			27.83	0.20	7.68	13.96	339	0.72	-29		
0805			27.83	0.20	7.44	13.89	384	0.10	-28		
0808			27.83	0.20	7.35	13.84	363	0.00	-23		
0811			27.83	0.20	7.31	13.84	367	0.00	-18		
0814			27.73	0.20	7.33	13.81	368	0.00	-22		

PURGING DATA

Sample ID:	MW-21i-40	Sampling Flow Rate:	0.20	Analytical Laboratory:	Apex	
Sample Time:	0814	Final Depth to Water:	27.83	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3X VOA	HCl	SVOCs	-	-	-	-
250	H2SO4	NH3	-	-	-	-
250	None	NO3/NO2	-	-	-	✓

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-21i-10S	Job Number:	
Client:	NuStar Van Moan	Date:	3/14/23
Project:	1Q23 GUM	Sampler:	SP
Weather:	Clear	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other:	Well Diameter:	2"	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	Yes No	Depth to Water:	27.90	Water Column Length:	-
Comments:		Screened Interval:	-	Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	SP	Pump Intake Depth:	M
Sampling Method:	LF	Tubing Material & Type:	SB

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
0928			27.90	0.50	6.07	9.1	360.9	4.62	-194.2	Clear
0931			↓	↓	6.47	11.0	393.4	3.85	-195.4	↓
0934			↓	↓	6.53	11.0	395.4	2.63	-205.2	↓
0937			↓	↓	6.57	11.0	397.3	2.42	-206.1	↓
0940			↓	↓	6.61	11.0	396.7	2.39	-207.2	↓

PURGING DATA

Sample ID:	MW-21i-10S	Sampling Flow Rate:	0.50	Analytical Laboratory:	Amer
Sample Time:	0940	Final Depth to Water:	27.90	Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
① ZSO	-	Nitrate/Nitrite			
② ZSO	H2SO4	Ammonia			
③ VOA	HCl	HLOXs			

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET

GEOENGINEERS



Well ID:	MW-22i	Job Number:	
Client:	Master Van Meir	Date:	3/16/23
Project:	1023 GWM	Sampler:	SP
Weather:	Clear 35°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other:	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	29.09	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:		Bladder pump low flow			Pump Intake Depth:		Mid screen			
Sampling Method:					Tubing Material & Type:		Split barrel NEW / DEDICATED			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0901			29.09	0.40	6.58	11.3	217.4	1.82	-114.6	Clear
0904			↓	↓	6.42	11.3	343.1	0.77	-289.5	
0907			↓	↓	6.45	11.7	368.0	0.46	-342.6	
0910			29.10	↓	6.44	11.7	381.2	0.44	-347.4	
0913			29.10	↓	6.42	11.5	384.6	0.34	-360.5	

PURGING DATA

Sample ID:	MW-22i	Sampling Flow Rate:	0.70	Analytical Laboratory:	Apex
Sample Time:	0913	Final Depth to Water:	29.10	Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
0 250	-	NO ₂ /NO ₃			
0 250	H ₂ O ₂	NH ₄			
3 WA	HCl	HVOCs			

NOTES/ADDITIONAL COMMENTS

SPLIT W/ ANTEA

WELL MONITORING DATA SHEET



Well ID:	NW-231	Job Number:	-
Client:	MUSTA Van Meir	Date:	3/14/23
Project:	1023 GWH	Sampler:	SR
Weather:	Sunny, 40°F	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: <u>Ugalt</u>	Well Diameter:	2"	Depth to Free Product:	-
Monument Condition:	<u>Good</u>	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Depth to Water:	27.22	Water Column Length:	-
Comments:		Screened Interval:	-	Purge Volume:	-

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)	
Water height multipliers (gal):	1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	<u>Bladder Pump</u>	Pump Intake Depth:	<u>Mid = Screen</u>
Sampling Method:	<u>Low Flow</u>	Tubing Material & Type:	<u>SLT-band</u>

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
1007			27.22	0.20	12.22	11.45	313	12.48	-417.8	clear
1010			27.21	0.20	9.48	11.70	286	12.22	-411.3	
1013			27.21	0.20	12.09	13.20	271	11.01	-498.8	
1016			27.19	0.20	11.84	12.80	272	11.81	-499.5	
1019			27.18	0.20	12.99	13.10	280	9.89	-508.9	
1022			27.17	0.20	12.91	13.10	328	6.92	-496.1	
1025			27.16	0.20	12.63	13.10	353	8.20	-475.1	
1028			27.16	0.20	11.95	13.30	386	3.85	-445.2	
1031			27.15	0.20	10.41	13.70	390	3.31	-397.2	
1034			27.15	0.20	9.26	13.40	408	3.00	-367.4	
1037			27.14	0.20	8.23	13.60	406	2.91	-322.6	
1040			27.14	0.20	8.04	13.60	407	2.90	-315.1	
1043			27.14	0.20	8.00	13.70	405	2.88	-309.1	
1046			27.14	0.20	7.94	13.80	407	2.86	-308.0	

PURGING DATA

Sample ID:	NW-231	Sampling Flow Rate:	0.20	Analytical Laboratory:	<u>HR</u>
Sample Time:	1046	Final Depth to Water:	27.14	Did Well Dewater:	<u>No</u>

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3xVOA	HCl	VOCS	-	-	-	-
1x250	None	NO3/NO2	-	-	-	-
1x250	H2SO4	NH3	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-24i	Job Number:	-
Client:	NORVA Van Nam	Date:	3/15/23
Project:	1925 Awn	Sampler:	SR
Weather:		Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other: V _g HT	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Clear	Depth to Water:	27.48	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Bladder Pump				Pump Intake Depth:	Mid-Screen				
Sampling Method:	Low Flow				Tubing Material & Type:	5/16" Braided				
										NEW / DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0853			27.48	0.20	7.28	10.30	348	9.72	239	clear
0856			27.48	0.20	7.33	10.81	350	6.32	239	↓
0859			27.48	0.20	7.35	11.15	269	7.03	234	
0902			27.43	0.20	7.38	11.29	276	0.93	231	
0905			27.43	0.20	7.38	11.50	380	0.00	231	
0908			27.43	0.20	7.33	11.63	382	0.00	229	
0911			27.43	0.20	7.35	11.69	387	0.00	222	

PURGING DATA

Sample ID:	MW-24i	Sampling Flow Rate:	0.20	Analytical Laboratory:	AA	
Sample Time:	0911	Final Depth to Water:	27.43	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2X VOA	HCl	RSK/TOC	-	-	-	-
3X VOA	HCl	HVOCs	-	-	-	-
250	H ₂ SO ₄	NH ₃	-	-	-	-
250	None	NO ₂ /NO ₃	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>NW-24d</u>	Job Number: <u> </u>
	Client: <u>Nystr Van Man</u>	Date: <u>3/16/23</u>
	Project: <u>Q23 SWM</u>	Sampler: <u>SR</u>
	Weather: <u>Sun, 80°F</u>	Time In/Out: <u> </u>

WELL DATA

Monument Type: <u>Flush-mount/Stick-up</u> Other: <u> </u>	Well Diameter: <u>2"</u>	Depth to Free Product: <u> </u>
Monument Condition: <u>Good</u>	Well Depth: <u> </u>	Free Product Thickness: <u> </u>
Well Cap Lock Present: <u>Yes</u> No	Depth to Water: <u>28.16</u>	Water Column Length: <u> </u>
Screened Interval: <u> </u>	Purge Volume: <u> </u>	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>Bladder Pump</u>		Pump Intake Depth: <u>Mid-Screen</u>								
Sampling Method: <u>Low Flow</u>		Tubing Material & Type: <u>Skip-Bond</u>								
		NEW / <u>DEDICATED</u>								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					±0.1	±0.5 °C	±5%	±0.5 ppm	±20 mV	
<u>1327</u>			<u>28.16</u>	<u>0.20</u>	<u>7.66</u>	<u>16.13</u>	<u>354</u>	<u>7.31</u>	<u>-16</u>	<u>Clear</u>
<u>1330</u>			<u>28.16</u>	<u>0.20</u>	<u>7.74</u>	<u>15.24</u>	<u>358</u>	<u>0.67</u>	<u>-59</u>	
<u>1333</u>			↓	↓	<u>7.89</u>	<u>14.94</u>	<u>359</u>	<u>0.03</u>	<u>-85</u>	
<u>1336</u>			↓	↓	<u>8.07</u>	<u>14.70</u>	<u>358</u>	<u>0.00</u>	<u>-112</u>	
<u>1339</u>			↓	↓	<u>8.29</u>	<u>14.63</u>	<u>358</u>	<u>0.00</u>	<u>-119</u>	
<u>1342</u>			↓	↓	<u>8.19</u>	<u>14.57</u>	<u>357</u>	<u>0.00</u>	<u>-138</u>	
<u>1345</u>			↓	↓	<u>8.23</u>	<u>14.42</u>	<u>358</u>	<u>0.00</u>	<u>-134</u>	↓

PURGING DATA

Sample ID: <u>NW-24d</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>Apex</u>
Sample Time: <u>1345</u>	Final Depth to Water: <u>28.08</u>	Did Well Dewater: <u>No</u>
No. of Containers/Type	Preservative	Analysis/Method
<u>1</u> 250	<u>H2SO4</u>	<u>NH3</u>
<u>1</u> 250	<u>None</u>	<u>NO3/NO2</u>
<u>3</u> VOA	<u>HCl</u>	<u>VOCs</u>

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-25i	Job Number:	-
Client:	Nuclear Van Meer	Date:	5/15/23
Project:	1023 GUN	Sampler:	JP
Weather:	Overcast/Rain	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	
	Other:	Well Depth:	-	Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	27.20	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:	-	Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Material & Type:	SB NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1123			27.20	0.55	7.71	11.8	357.8	10.20	-156.3	Clear
1126			27.20	0.50	7.10	13.2	336.9	4.71	-249.8	
1129			↓	↓	6.94	13.1	349.3	1.50	-305.0	
1132			↓	↓	6.92	13.1	350.8	1.07	-325.6	
1135			↓	↓	6.40	13.0	353.5	0.73	-351.5	
1138			↓	↓	6.39	12.9	355.6	0.61	-360.7	
1141			↓	↓	6.39	12.9	356.8	0.55	-364.4	

PURGING DATA

Sample ID:	MW-25i	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apex	
Sample Time:	1141	Final Depth to Water:	27.22	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 250	-	NO ₂ /NO ₃				
1 250	H ₂ SO ₄	NH ₄				
3 VOA	HCl	H ₂ O ₂				

NOTES/ADDITIONAL COMMENTS

Split w/ Apex

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-26</u>	Job Number: <u> </u>
	Client: <u>Va Star</u>	Date: <u>3/15/23</u>
	Project: <u>Van Main 1Q23 GWM</u>	Sampler: <u>JP</u>
	Weather: <u>Rain</u>	Time In/Out: <u> </u>

WELL DATA

Monument Type:	Flush-mount/Stick-up <input checked="" type="checkbox"/>	Well Diameter: <u>2"</u>	Depth to Free Product: <u> </u>
	Other: <input type="checkbox"/>	Well Depth: <u> </u>	Free Product Thickness: <u> </u>
Monument Condition:	<u>Gravel</u>	Depth to Water: <u>23.03</u>	Water Column Length: <u> </u>
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval: <u> </u>	Purge Volume: <u> </u>

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>BP</u>		Pump Intake Depth: <u>MS</u>								
Sampling Method: <u>LF</u>		Tubing Material & Type: <u>SB</u>								
		NEW / DEDICATED								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
<u>0829</u>			<u>28.09</u>	<u>0.60</u>	<u>5.80</u>	<u>11.5</u>	<u>4472</u>	<u>4.74</u>	<u>-39.8</u>	↓ <u>Clear</u>
<u>0832</u>			<u>28.12</u>	<u>0.50</u>	<u>5.80</u>	<u>13.3</u>	<u>4483</u>	<u>0.90</u>	<u>-236.8</u>	
<u>0835</u>			<u>28.13</u>	<u>0.50</u>	<u>5.86</u>	<u>13.6</u>	<u>4187</u>	<u>0.61</u>	<u>-278.4</u>	
<u>0838</u>			<u>28.13</u>	<u>0.50</u>	<u>5.86</u>	<u>13.8</u>	<u>3914</u>	<u>0.42</u>	<u>-314.9</u>	
<u>0841</u>			<u>28.13</u>	<u>0.50</u>	<u>5.86</u>	<u>13.8</u>	<u>3852</u>	<u>0.36</u>	<u>-334.8</u>	
<u>0843</u>	<u>0844</u>		<u>28.13</u>	<u>0.50</u>	<u>5.40</u>	<u>13.8</u>	<u>3836</u>	<u>0.34</u>	<u>-338.2</u>	
<u>0846</u>	<u>0847</u>		<u>28.13</u>	<u>0.50</u>	<u>5.92</u>	<u>13.8</u>	<u>3918</u>	<u>0.32</u>	<u>-347.1</u>	

PURGING DATA

Sample ID: <u>MW-26</u>	Sampling Flow Rate: <u>0.50</u>	Analytical Laboratory: <u>Apex</u>				
Sample Time: <u>0847</u>	Final Depth to Water: <u>28.13</u>	Did Well Dewater: <u>No</u>				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
<u>① 250</u>	<u> </u>	<u>NO₂/NO₃</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>① 250</u>	<u>H₂SO₄</u>	<u>NH₃</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>⑤ VOA</u>	<u>HCl</u>	<u>RSk/TOC/HVOCs</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET

	Well ID: <u>NW-323</u>	Job Number: <u>-</u>
	Client: <u>NuStar Van Man</u>	Date: <u>3/12/23</u>
	Project: <u>1023 GWM</u>	Sampler: <u>SR</u>
	Weather: <u>-</u>	Time In/Out: <u>-</u>

WELL DATA

Monument Type:	Flush-mount/Stick-up <u>Other</u>	Well Diameter: <u>2"</u>	Depth to Free Product: <u>-</u>
Monument Condition:	<u>Good</u>	Well Depth: <u>-</u>	Free Product Thickness: <u>-</u>
Well Cap Lock Present:	Yes No <u>Portwell</u>	Depth to Water: <u>28.81</u>	Water Column Length: <u>-</u>
Comments:		Screened Interval: <u>-</u>	Purge Volume: <u>-</u>

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>Bladder Pump</u>	Pump Intake Depth: <u>mid-screen</u>
Sampling Method: <u>Low Flow</u>	Tubing Material & Type: <u>LDPE</u>

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
0903			28.81	0.20	7.72	14.20	750	1.94	180	Clean ↓
0906			29.31	0.20	7.47	14.59	753	0.77	184	
0909			29.80	0.20	7.28	14.79	772	0.56	181	
0912			30.02	0.20	7.20	14.81	793	0.38	185	
0915			30.46	0.20	7.14	14.84	778	0.00	184	
0918 0921			30.68	0.20	7.15	14.80	771	0.00	184	

PURGING DATA

Sample ID: <u>NW-323</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>Apex</u>				
Sample Time: <u>0918</u>	Final Depth to Water: <u>3612</u>	Did Well Dewater: <u>No</u>				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
250	None	NO ₃ /NO ₂	-	-	-	-
250	H ₂ SO ₄	NH ₃	-	-	-	-
3x VOA	HCl	HVOCs	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-32i</u>	Job Number: <u>-</u>
	Client: <u>North Van Min</u>	Date: <u>7/17/23</u>
	Project: <u>Q23 GWM</u>	Sampler: <u>SIR</u>
	Weather: <u>in 400F</u>	Time In/Out: <u>-</u>

WELL DATA

Monument Type:	Flush-mount / Stick-up <u>Other:</u>	Well Diameter: <u>2"</u>	Depth to Free Product: <u>-</u>
Monument Condition:	<u>Good</u>	Well Depth: <u>-</u>	Free Product Thickness: <u>-</u>
Well Cap Lock Present:	Yes No <u>Part well</u>	Depth to Water: <u>30.52</u>	Water Column Length: <u>-</u>
Comments:		Screened Interval: <u>-</u>	Purge Volume: <u>-</u>

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>Bladder Pump</u>	Pump Intake Depth: <u>Mid Screen</u>
Sampling Method: <u>Low Flow</u>	Tubing Material & Type: <u>LDPE</u>

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
0945			30.52	0.20	7.54	13.95	350	4.79	169	Clean ↓
0948			29.76	0.20	7.59	13.89	357	2.74	167	
0951			29.47	0.20	7.49	13.80	391	6.18	171	
0954			29.46	0.20	7.48	13.92	384	0.13	170	
0957			29.46	0.20	7.47	13.98	385	0.00	172	

PURGING DATA

Sample ID: <u>MW-32i</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>Apex</u>				
Sample Time: <u>0957</u>	Final Depth to Water: <u>29.48</u>	Did Well Dewater: <u>No</u>				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
250	H ₂ SO ₄	NH ₃	-	-	-	-
250	None	NO ₃ /NO ₂	-	-	-	-
5X VOA	HCl	HVOCs	-	-	-	-

NOTES/ADDITIONAL COMMENTS

DO sensor malfunction.

WELL MONITORING DATA SHEET



Well ID:	MGMSI-3(40)	Job Number:	-
Client:	Norstar Van Mwm	Date:	3/16/23
Project:	1023 GWM	Sampler:	SR
Weather:	-	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: MGMS	Well Diameter:	-	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	Yes No	Depth to Water:	27.42	Water Column Length:	-
		Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Peri Pump Low Flow				Pump Intake Depth:	MS				
Sampling Method:					Tubing Material & Type:	LDPE		NEW / DEDICATED		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (l/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0946			0.20	27.42	7.18	11.19	1820	8.18	176	Clear
0949				27.72	7.26	11.73	2140	4.27	176	
0952				27.74	7.33	12.09	2420	3.73	174	
0955					7.34	12.40	2470	3.42	173	
0958					7.36	12.51	2540	1.94	172	
1001					7.37	12.82	2550	1.64	171	
1004					7.38	12.98	2580	0.88	169	
1007					7.39	13.04	2590	0.81	168	
1010					7.39	13.07	2600	0.78	167	

PURGING DATA

Sample ID:	MGMSI-3(40)	Sampling Flow Rate:	0.20	Analytical Laboratory:	APEN	
Sample Time:	1010	Final Depth to Water:	27.74	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2xVOA	HCl	R&K	-	-	-	-
3xVOA	HCl	VOCS	-	-	-	-
250	H ₂ SO ₄	NH ₃	-	-	-	-
250	None	NO ₃ /NO ₂	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MGMSJ-2 (60)	Job Number:	-
Client:	NuStar Van Marm	Date:	3/16/23
Project:	1223 GWM	Sampler:	SK
Weather:	S.M., 40°F	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: MGMS Vault	Well Diameter:	-	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	Yes No	Depth to Water:	27.36	Water Column Length:	-
		Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Bitter Pump (Peri)		Pump Intake Depth:		Mid-Screen		NEW / DEDICATED		
Sampling Method:		Low Flow		Tubing Material & Type:		LPE				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1032			27.36	0.22	7.87	13.81	1030	8.02	133	Clear
1035			27.36	0.22	8.10	13.85	573	1.81	126	↓
1038			27.36	0.21	8.12	13.78	434	1.24	126	
1041				0.21	8.07	13.96	399	0.98	125	
1044					8.00	14.05	389	0.87	125	
1047					7.94	14.06	384	0.80	125	
1050					7.88	14.21	380	0.70	125	
1053					7.83	14.26	380	0.63	124	
1056					7.80	14.41	383	0.55	124	

PURGING DATA

Sample ID:	MGMSJ-2 (60)	Sampling Flow Rate:	0.21	Analytical Laboratory:	APEX	
Sample Time:	1056	Final Depth to Water:	27.36	Did Well Dewater:	Yes	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 200ml	HCl	VOCs	-	-	-	-
1 x 250	H ₂ SO ₄	NH ₃	-	-	-	-
1 x 250	None	NO ₃ /NO ₂	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MAMS2-4 (40)</u>	Job Number: <u>7</u>
	Client: <u>USTR Vancouver</u>	Date: <u>3/16/23</u>
	Project: <u>1023 CUM</u>	Sampler: <u>SR</u>
	Weather: <u>Sunny, WINDS 32°F</u>	Time In/Out: <u>-</u>

WELL DATA

Monument Type: <u>Flush-mount/Stick-up</u> Other: <u>MALS</u>	Well Diameter: <u>-</u>	Depth to Free Product: <u>-</u>
Monument Condition: <u>Good</u>	Well Depth: <u>-</u>	Free Product Thickness: <u>-</u>
Well Cap Lock Present: <u>Yes</u> No	Depth to Water: <u>26.14</u>	Water Column Length: <u>-</u>
	Screened Interval: <u>-</u>	Purge Volume: <u>-</u>

Comments: _____

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>Peri Pump</u>				Pump Intake Depth: <u>Mid screen</u>				NEW / <u>DEDICATED</u>			
Sampling Method: <u>Low Flow</u>				Tubing Material & Type: <u>LDPE</u>							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
0807			27.54	0.18	7.25	11.51	1850	18.44	184	clear	
0810			27.89	0.15	7.35	11.84	1860	2.95	184	↓	
0813			27.92	0.15	7.39	11.60	1870	0.64	183		
0816			27.92	0.15	7.41	11.70	1830	0.00	183		
0819			↓	0.15	7.43	11.77	1820	0.00	182		
0822			↓	↓	7.44	11.66	1870	0.00	182		

PURGING DATA

Sample ID: <u>MAMS2-4 (40)</u>	Sampling Flow Rate: <u>0.15</u>	Analytical Laboratory: <u>Apex</u>				
Sample Time: <u>0822</u>	Final Depth to Water: <u>27.92</u>	Did Well Dewater: <u>No</u>				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2X VOA	HCl	RSK	-	-	-	-
3X VOA	HCl	HVOLS	-	-	-	-
1X 250	H ₂ SO ₄	NH ₃	-	-	-	-
1X 250	None	NO ₂ /NO ₃	-	-	-	-

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MGMS-3 (60)	Job Number:	—
Client:	WStar Van Man	Date:	7/10/23
Project:	1223 GWM	Sampler:	SR
Weather:	Sun, 400F	Time In/Out:	—

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	Good	Depth to Water:	27.82	Water Column Length:	—
Well Cap Lock Present:	Yes No	Screened Interval:	—	Purge Volume:	~

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Peri Pump	Pump Intake Depth:	Mid screen
Sampling Method:	Low Flow	Tubing Material & Type:	LDPE
			NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0850			27.82	0.12	7.97	10.54	645	3.34	159	Clear
0853			↓	↓	8.03	10.58	445	0.00	155	↓
0856					8.01	10.67	381	0.00	154	
0859					7.98	10.42	360	0.00	153	
0902					7.92	10.46	339	0.06	153	
0905					7.88	10.36	334	0.00	153	
0908					7.84	10.50	350	0.00	153	

PURGING DATA

Sample ID:	MGMS-3 (60)	Sampling Flow Rate:	0.12	Analytical Laboratory:	Apex	
Sample Time:	0908	Final Depth to Water:	27.82	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3X VOA	HCl	HVOCs	—	—	—	—
250	H ₂ SO ₄	NH ₃	—	—	—	—
250	None	NO ₃ /NO ₂	—	—	—	—

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MGMS3-4 (40)	Job Number:	-
Client:	NuStar Van Moyn	Date:	3/16/23
Project:	1023 GWM	Sampler:	SR
Weather:	Sunny 50°F	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: MGMS	Well Diameter:	-	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	Yes No	Depth to Water:	26.11	Water Column Length:	-
Comments:		Screened Interval:	-	Purge Volume:	-

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Peri Pump	Pump Intake Depth:	1.1 - Screen							
Sampling Method:	Low Flow	Tubing Material & Type:	LDPE							
			NEW / DEDICATED							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1118			26.11	0.20	7.51	15.48	465	7.70	-60	clear
1122			↓	0.20	7.47	15.30	490	6.17	-92	↓
1126			↓	0.20	7.48	15.24	493	5.31	-105	↓
1130			↓	0.20	7.48	15.28	493	4.87	-110	↓
1134			↓	0.20	7.48	15.32	492	4.64	-116	↓
1138			↓	0.20	7.48	15.38	492	4.27	-119	↓
1142			↓	0.20	7.48	15.47	491	3.89	-121	↓
1146			↓	0.20	7.47	15.47	490	3.43	-122	↓
1150			↓	0.20	7.47	15.39	493	0.89	-124	↓

PURGING DATA

Sample ID:	MGMS3-4 (40)	Sampling Flow Rate:	0.20	Analytical Laboratory:	Apex	
Sample Time:	1150	Final Depth to Water:	26.11	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2X VOA	HCl	RSK	-	-	-	-
6X VOA	HCl	VOCs	-	-	-	MGMS3-4(40) DUP
2X 250	H2SO4	NH3	-	-	-	↓
2X 250	None	NO3/NO2	-	-	-	↓

NOTES/ADDITIONAL COMMENTS

A DO responded to movement of probe, suspected faulty, ignored.
RSK, DUP

WELL MONITORING DATA SHEET



Well ID:	MGMS-3 (60)	Job Number:	
Client:	Nuclear Vat Plant	Date:	3/18/23
Project:	1073 GWM	Sampler:	SR
Weather:	Sunny, OFF	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: MGMS	Well Diameter:	—	Depth to Free Product:	—
Monument Condition:	Good	Well Depth:	—	Free Product Thickness:	—
Well Cap Lock Present:	Yes No	Depth to Water:	28.52	Water Column Length:	—
Comments:		Screened Interval:	—	Purge Volume:	—

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Peri Pump	Pump Intake Depth:	Mid screen							
Sampling Method:	Low Flow	Tubing Material & Type:	LDPE							
			NEW / DEDICATED							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1210			25.52	0.20	7.60	17.96	251	11.18	-75	Clear
1223			25.52	0.20	7.68	16.76	242	8.40	-68	
1226			↓	0.20	7.60	16.71	242	7.72	-56	↓
1229				0.20	7.59	16.81	247	7.79	-53	
1232				↓	7.59	16.89	254	6.97	-51	
1235				↓	7.68	16.53	268	6.50	-49	
1238				↓	7.67	16.59	275	6.12	-45	↓

PURGING DATA

Sample ID:	MGMS-3 (60)	Sampling Flow Rate:	0.20	Analytical Laboratory:	Agon	
Sample Time:	1238	Final Depth to Water:	28.52	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2000A	HCl	VOCs	—	—	—	—
250	H ₂ SO ₄	NH ₃	—	—	—	—
250	None	NO ₃ /NO ₂	—	—	—	—

NOTES/ADDITIONAL COMMENTS

DO instrument issue, will always eventually go to zero

WELL MONITORING DATA SHEET



Well ID:	EW-1	Job Number:	
Client:	Ho. Star Van Nam	Date:	3/14/23
Project:	10223 W/M	Sampler:	SR
Weather:	Sun, 50°F	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Ugly	Well Diameter:	2"	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	Yes No	Depth to Water:	25.08	Water Column Length:	-
		Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Bladder Pump	Pump Intake Depth:	1st Screen
Sampling Method:	Low Flow	Tubing Material & Type:	Shp Bond

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	NEW / DEDICATED	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
1433			25.08	0.20	9.78	16.46	315	7.50	195		Clear
1436			25.11	0.20	9.03	15.61	324	5.66	203		
1439			25.08	0.20	8.62	15.40	329	5.14	228		
1442			25.08	0.20	8.36	15.27	328	5.03	214		
1445			25.08	0.20	8.15	15.26	326	5.03	212		
1448			25.08	0.20	8.00	15.39	326	5.11	213		
1451			25.08	0.20	7.83	15.56	324	4.87	214		
1454			25.08	0.20	7.75	15.57	323	4.97	211		
1457			25.08	0.20	7.73	15.52	325	5.10	211		

PURGING DATA

Sample ID:	EW-1	Sampling Flow Rate:	0.20	Analytical Laboratory:	APEN
Sample Time:	1457	Final Depth to Water:	25.08	Did Well Dewater:	No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3X10A	HCl	VOCs	-	-	-	-
1X2FO	H2PO4	NH3	-	-	-	-
280	None	NO3/NO2	-	-	-	-

NOTES/ADDITIONAL COMMENTS

Well and sample are EX

WELL MONITORING DATA SHEET

	Well ID:	EX-T	Job Number:	-
	Client:	NuStar - Portland Terminal - 1/4" 1/4" in	Date:	3/15/23
	Project:	15A2023 GWM Event 1023	Sampler:	SK
	Weather:	-	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: <u>Veget</u>	Well Diameter:	2"	Depth to Free Product:	-
Monument Condition:	<u>Good</u>	Well Depth:	-	Free Product Thickness:	-
Well Cap Lock Present:	Yes <input checked="" type="checkbox"/> No	Depth to Water:	27.63	Water Column Length:	-
Screened Interval:	-	Purge Volume:	-		

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: Bladder Pump
 Sampling Method: Low Flow
 Pump Intake Depth: 1st Screen
 Tubing Material & Type: Ship Band
 NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1103			27.63	0.20	6.68	15.81	1000	7.29	-44	Clear
1156			27.63	0.20	6.86	14.63	1290	4.79	-61	↓
1159				0.20	7.12	13.70	1520	3.16	-69	
1202				0.20	7.38	13.10	1550	2.68	-69	
1205				0.20	7.44	12.68	1480	2.49	-66	
1208				0.20	7.48	12.45	1410	2.55	-64	
1211				0.20	7.51	12.29	1350	2.41	-58	
1214				0.20	7.58	12.30	1310	2.37	-54	
1217				0.20	7.58	12.40	1290	2.39	-48	

PURGING DATA

Sample ID:	EX-T	Sampling Flow Rate:	0.20	Analytical Laboratory:	Aggr	
Sample Time:	1217	Final Depth to Water:	27.63	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2X VOA	HCl	RSK				
3X VOA	HCl	LNOCs				
250	H2SO4	Urb				
250	None	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

3/17/23

	Well ID:	MP-1	Job Number:	
	Client:	Nu Star Van Main	Date:	3/16/23 JP
	Project:	1023 GWM	Sampler:	JP
	Weather:	Clear - 40°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	24	Depth to Free Product:	---
	Other:	Well Depth:	---	Free Product Thickness:	---
Monument Condition:	Good	Depth to Water:	28.42	Water Column Length:	---
Well Cap Lock Present:	Yes No	Screened Interval:	---	Purge Volume:	---

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MJ
Sampling Method:	S LF	Tubing Material & Type:	SB
			NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0746										
0756			28.42	0.30	6.85	12.4	542	0.68	-98.3	Clear
0759			28.23	↓	6.86	12.2	550	0.66	-176.8	
0802			28.23		6.85	12.2	572	0.65	-183.4	
0805			28.21		6.92	12.0	541	0.55	-214.6	
0808			28.26	↓	6.93	12.0	529	0.58	-227.8	
0811			28.20	↓	6.93	12.0	528	0.59	-230.2	↓

PURGING DATA

Sample ID:	MP-1	Sampling Flow Rate:	0.30	Analytical Laboratory:	Apex
Sample Time:	0811	Final Depth to Water:	28.18	Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID


①	---	NO ₂ /NO ₃			
②	H ₂ SO ₄	NH ₃			
⑤	HCl	RSU/HVOCs			

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

3-16-23

WELL MONITORING DATA SHEET

	Well ID:	S-1	Job Number:	
	Client:	NuStar Van Main	Date:	3/16/23
	Project:	1023 GWM	Sampler:	Jeff Paul
	Weather:	Clear ~40°F	Time In/Out:	-

WELL DATA

Monument Type:	Flugh-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other: Vault	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	27.57 28.57	Water Column Length:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> No	Screened Interval:	-	Purge Volume:	-

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Sampling Method:		Pump Intake Depth:		Tubing Material & Type:		NEW / DEDICATED		
BP		LF		MS		SB				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0754		27.57	28.57	0.40	7.28	11.1	0.8	10.25	-125.2	Clear
0757			27.57		7.24	6.7	2589	11.02	-113.2	
0800			↓	↓	7.40	6.5	2628	9.32	-113.7	
0803			↓	↓	7.17	9.3	216.1	2.18	-111.4	
0806			↓	↓	6.40	11.0	188.5	1.14	-125.4	
0809			↓	↓	6.84	11.4	192.2	1.04	-126.3	
0812			↓	↓	6.83	11.4	2024	0.97	-136.8	↓

PURGING DATA

Sample ID:	S-1	Sampling Flow Rate:	0.40	Analytical Laboratory:	Apex	
Sample Time:	0812	Final Depth to Water:	27.56	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
① 250	-	NO ₂ /NO ₃				
① 250	H ₂ O ₂	NH ₃				
③ VOA	HCl	HVOCs				

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET



Well ID:	S-2	Job Number:	
Client:	NuStar Van Main	Date:	3/14/23
Project:	1623 GWM	Sampler:	SP
Weather:	Overcast	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	21"	Depth to Free Product:	
Monument Condition:	Good	Well Depth:	26.98'	Free Product Thickness:	
Well Cap Lock Present:	Yes No	Depth to Water:	26.98'	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Sampling Method:		Pump Intake Depth:		Tubing Material & Type:		NEW / DEDICATED		
PDP		LF		MS		SB		NEW / DEDICATED		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1357			26.98	0.50	7.54	14.2	2120	2120	-221.7	Clear Orange
1400				↓			1882	7.01	-205.5	
1400				↓	7.52	15.8	1882	8.25	-205.6	
1403			27.09	0.50	6.51	14.1	2063	0.77	-247.0	
1406				↓	6.51	13.9	2067	0.29	-356.2	
1409				↓	6.52	13.9	2052	0.23	-366.5	
1412				↓	6.53	13.9	2045	0.20	-373.4	Orange

PURGING DATA

Sample ID:	S-2	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apex	
Sample Time:	1412	Final Depth to Water:	27.11	Did Well Dewater:	NA	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
① 250	—	Nitrate/Nitrite				
① 250	H ₂ SO ₄	Ammonia				
③ VOA	HCl	HVOCs				

NOTES/ADDITIONAL COMMENTS

Split w/ Antec
 Orange sediment visible in samples

Project 2623 GWM
 Client Master Van Meir
 Sampler JP

Date 6/13/23
 PI# 20724

Well ID	Time	DTP	DTW	Product Thickness	Notes			
MW-1	0814	-	25.88	-				
MW-2	1244		28.21					
MW-3	1250		26.95					
MW-5	1322		25.02					
MW-6	1300		24.93					
MW-7	1110		24.70					
MW-8	1219		24.32					
MW-9	1116		24.78					
MW-10	1212		24.89					
MW-12	0819		24.70					
MW-13	0826		25.38					
MW-14	0843		27.76					
MW-15	1224		30.40					
MW-16	1307		26.64					
MW-17	0836		27.61					
MW-18i	0932		27.44					
MW-19	1138		25.33					
MW-19i	0956		27.78					
MW-20i	0936		26.90					
MW-21i-40	0915		27.65					
MW-21i-105	0411		28.34	77	27.96			
MW-22i	0905		28.37					
MW-23i	0947		24.74	27.71				
MW-24i	1009		27.91					
MW-24d	1127		28.12					
MW-25i	0857		27.67					
MW-26	1154		24.27					
MW-30i								
MW-31i								
MW-32s	0943		27.00					
MW-32i	0941		25.91					

Tide inflection @ 0930

WELL MONITORING DATA SHEET



Well ID:	MW-1	Job Number:	
Client:	NS Van Nuys	Date:	6-14-23
Project:	2623	Sampler:	SP
Weather:	Cloudy ~78F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other:	Well Diameter:	211	Depth to Free Product:	
Monument Condition:	Good	Well Depth:		Free Product Thickness:	
Well Cap Lock Present:	Yes No	Depth to Water:	26.44	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP	Pump Intake Depth:	
Sampling Method:	LP	Tubing Material & Type:	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	

14										
1347			26.44	0.50	8.13	18.2	2057	0.85	-233.8	Clear
1350		26.33	27	0.40	8.13	18.1	2053	0.63	-298.6	
1353			26.33	0.30	8.12	18.3	2045	0.57	-438.2	
1356			↓	↓	8.07	18.1	2046	0.49	-490.1	
1359			↓	↓	8.02	18.0	2043	0.44	-495.5	
1402			↓	↓	7.99	17.7	2043	0.37	-511.1	

PURGING DATA

Sample ID:	MW-1	Sampling Flow Rate:	0.30	Analytical Laboratory:	Apex	
Sample Time:	1402	Final Depth to Water:	26.31	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 VOA	HCl	HVOCs				
1 BSB	H ₂ SO ₄	MH ₃				
1 250		NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET



Well ID:	MW-2	Job Number:	
Client:		Date:	6/13/23
Project:		Sampler:	SP
Weather:	Clear, 70°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	29.98	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LP	Tubing Material & Type:	BP NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0931			28.98	0.25	6.93	15.4	829	0.48	-405.2	Clear
0934			28.09	↓	6.84	16.2	834	0.46	-439.5	↓
0937			28.09	↓	6.86	16.4	836	0.44	-448.0	↓
0940			↓	↓	6.85	16.4	839	0.37	-461.6	↓
0943			↓	↓	6.85	16.5	839	0.31	-465.6	↓

PURGING DATA

Sample ID:	MW-2	Sampling Flow Rate:	0.25	Analytical Laboratory:	Apex	
Sample Time:	0943	Final Depth to Water:	28.88	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
③ VOA	HCl	HVOCs				
① 250	H ₂ SO ₄	NH ₃				
① 200	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-3	Job Number:	
Client:	Master Van Noy	Date:	6/13/23
Project:	2623	Sampler:	JP
Weather:	Overcast ~ 65°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	2"	Depth to Free Product:	
Monument Condition:	Good	Well Depth:		Free Product Thickness:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes No	Depth to Water:	26.17	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Sampling Method:		Pump Intake Depth:		Tubing Material & Type:		NEW / DEDICATED		Clarity/Color Other Remarks
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1021			26.17	0.25	7.08	18.3	449.5	6.53	-188.3	Clear
1024			26.24	0.25	6.97	15.9	413.0	3.76	-218.7	
1027					6.94	15.2	371.0	4.97	-269.8	
1030			26.21		6.92	14.8	326.7	5.82	-314.9	
1033			26.21		6.89	14.8	325.1	5.89	-321.3	
1036			26.23		6.87	14.9	322.1	6.14	-328.9	

PURGING DATA


Sample ID:	MW-3	Sampling Flow Rate:	0.25	Analytical Laboratory:	MSD
Sample Time:	1036	Final Depth to Water:	26.19	Did Well Dewater:	Yes
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD
3 VOA	HCl	HLOCs			
1 250	Phos	NH3			
1 250	-	NO2/NO3			

NOTES/ADDITIONAL COMMENTS

Orange tint in samples

MW-5

WELL MONITORING DATA SHEET

	Well ID:	MW-5	Job Number:	
	Client:	NS Van Meir	Date:	6.15.23
	Project:	2223	Sampler:	JR
	Weather:	Overcast ~65°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	25.64	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Material & Type:	SB

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
1031			25.64	0.30	6.83	20.2	454.0	1.48	-381.5	Clear
1034			25.62	↓	6.78	20.8	443.5	0.54	-469.0	↓
1037			25.60	↓	6.68	20.9	444.2	0.44	-479.2	↓
1040			25.60	↓	6.66	21.0	445.0	0.37	-487.0	↓
1043			25.60	↓	6.65	21.0	446.4	0.35	-490.6	↓
									-490.6	

PURGING DATA

Sample ID:	MW-5	Sampling Flow Rate:	0.30	Analytical Laboratory:	Apex	
Sample Time:	1043	Final Depth to Water:	25.57	Did Well Dewater:	✓	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
③ VOA	HCl	HVOCs				
① 250	M-2004	NH ₃				
① 250	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-6</u>	Job Number:	Date: <u>6-14-23</u>
	Client: <u>US Van Mail</u>	Sampler: <u>SP</u>	
	Project: <u>2023</u>	Time In/Out:	
	Weather: <u>Overcast ~ 70°F</u>		

WELL DATA			
Monument Type:	Flush-mount/Stick-up <input checked="" type="checkbox"/> Other: _____	Well Diameter: <u>24</u>	Depth to Free Product: _____
Monument Condition:	<u>Good</u>	Well Depth: _____	Free Product Thickness: _____
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Depth to Water: <u>25.25</u>	Water Column Length: _____
Comments:	Screened Interval: _____ Purge Volume: _____		

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA										
Purge Method:		Pump Intake Depth:								
Sampling Method:		Tubing Material & Type:							NEW / DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1307			25.25	0.40	6.45	15.7	907	2.31	-214.9	Clear ↓
1310			25.20	0.40	6.92	15.3	931	1.05	-346.8	
1317			25.20	↓	6.90	14.9	911	0.49	-478.2	
1316			↓	↓	6.82	15.1	873	0.35	-523.1	
1319			↓	↓	6.79	15.3	861	0.32	-528.7	
1322			↓	↓	6.78	15.2	841	0.30	-539.1	

PURGING DATA							
Sample ID:	<u>MW-6</u>	Sampling Flow Rate:	<u>0.40</u>	Analytical Laboratory:			APG
Sample Time:	<u>1322</u>	Final Depth to Water:	<u>25.19</u>	Did Well Dewater:			
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) VDA	HCl	HLOGS	_____	_____	_____	_____	
(1) 256	H ₂ SO ₄	NH ₃	_____	_____	_____	_____	
(1) 250	-	NO ₂ /NO ₃	_____	_____	_____	_____	

NOTES/ADDITIONAL COMMENTS

Split w/ Anter

WELL MONITORING DATA SHEET

	Well ID:	MW-7	Job Number:	
	Client:		Date:	6-15-23
	Project:		Sampler:	
	Weather:	Overcast ~60°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: vault	Well Diameter:	4"	Depth to Free Product:	
Monument Condition:	Good	Well Depth:		Free Product Thickness:	
Well Cap Lock Present:	es No	Depth to Water:	25.31	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		130 LF		Pump Intake Depth:		MS		NEW / DEDICATED			
Sampling Method:		130 LF		Tubing Material & Type:		130					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color	Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
0819			25.31	0.25	7.27	14.5	275.5	1.79	-387.1		Clear
0822			25.33	0.30	6.72	14.4	227.2	0.63	-493.8		
0825					6.55	14.5	224.8	0.45	-523.5		
0828					6.49	14.6	224.0	0.35	-527.0		
0831			25.31		6.72	14.6	224.1	0.31	-538.2		
0834			25.31		6.44	14.6	224.0	0.31	-537.2		

PURGING DATA

Sample ID:	MW-7	Sampling Flow Rate:	0.20	Analytical Laboratory:	per	
Sample Time:	0834	Final Depth to Water:	25.40	Did Well Dewater:		
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3	HCl	HVOCs/RSH/TC				
1	HCl	HVOCs				MW-7 DUP
1	H2SO4	NH3				MW-7 DUP
1	H2SO4	NH3				MW-7 DUP
1	-	NH2/NO3				MW-7 DUP
1	-	NH2/NO3				MW-7 DUP

NOTES/ADDITIONAL COMMENTS

Spl. it w/ Antea

WELL MONITORING DATA SHEET



Well ID:	MW-9	Job Number:	
Client:	NS Van Man	Date:	6-15-23
Project:	2023	Sampler:	J
Weather:	Overcast ~ 65°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	4"	Depth to Free Product:	
Other:		Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	25.19	Water Column Length:	
Well Cap Lock Present:	(Yes) No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LP	Tubing Material & Type:	SB

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
0917			25.18	0.50	6.02	13.5	963	6.34	-167.0	Clear
0920			25.20	0.35	5.92	13.5	922	5.72	-194.9	
0923			25.21		5.93	13.4	903	5.39	-203.6	
0926			25.26		5.90	13.4	893	5.20	-220.2	
0929					5.84	13.4	883	4.90	-234.4	
0932					5.83	13.4	883	4.94	-233.6	
0935			25.27		5.82	13.4	875	5.11	-237.6	

PURGING DATA

Sample ID:	MW-9	Sampling Flow Rate:	0.35	Analytical Laboratory:	Apex
Sample Time:	0935	Final Depth to Water:	25.29	Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
(3) VOA	HCl	HLOCs			
(1) 250	H ₂ SO ₄	NH ₃			
(1) 250	-	NO ₂ /NO ₃			

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	ML-10	Job Number:	
Client:	NS Van Man	Date:	6-14-23
Project:	2023	Sampler:	JR
Weather:	Overcast ~ 70°F	Time In/ ut:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	4"	Depth to Free Product:	
Monument Condition:	Good	Well Depth:		Free Product Thickness:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Depth to Water:	25.20	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	LP	Pump Intake Depth:	MS
Sampling Method:	LP	Tubing Material & Type:	BSP
			NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1228			25.20	0.40	4.71	17.5	3298	2.65	-233.7	Clear
1231			25.31	0.35	4.67	16.1	3389	1.90	-234.0	↓
1234			25.40		4.66	16.1	3382	1.75	-247.6	↓
1237					4.62	16.1	3380	1.67	-251.6	↓
1240					4.59	16.0	3386	1.60	-258.2	↓

PURGING DATA


Sample ID:	ML-10	Sampling Flow Rate:	0.35	Analytical Laboratory:	Apex	
Sample Time:	1240	Final Depth to Water:		Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID

3) VOA	HCl	HVOCs				
1) 250	H ₂ SO ₄	NH ₃				
1) 250	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

Spt w/ Anal

WELL MONITORING DATA SHEET

	Well ID:	MW-12	Job Number:	
	Client:		Date:	6/19/27
	Project:		Sampler:	SP
	Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	4"	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:		Depth to Water:	24.79	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Sampling Method:		Pump Intake Depth:		Tubing Material & Type:		NEW / <u>DEDICATED</u>		Clarity/Color Other Remarks
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0729			24.78	0.40	7.11	14.7	2183	1.50	-4430	Slight grey ↓
0732			24.83	0.30	7.08	14.7	2170	0.94	-4879	
0735			24.93	↓	7.02	14.8	2170	0.96	-515.0	
0738			25.02	↓	7.07	15.1	2159	0.73	-5023	
0741			25.16	↓	7.04	14.9	2140	0.61	-513.9	

PURGING DATA

Sample ID:	MW-12	Sampling Flow Rate:	0.30	Analytical Laboratory:	Apex	
Sample Time:	0741	Final Depth to Water:	25.19	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
⑤ VOA	HCL	HVOCs/RSK/OC				
③ VOA	HCL	HVOCs			MW-12 DUP	
① 250	-	NO ₂ /NO ₃				
① ↓	-	NH ₃				
① ↓	H ₂ SO ₄	NO ₂ /NO ₃			MW-12 DUP	
① ↓	H ₂ SO ₄	NH ₃			MW-12 DUP	

NOTES/ADDITIONAL COMMENTS

Split w/ Antea.

WELL MONITORING DATA SHEET



Well ID:	MW-13	Job Number:	
Client:	NS Van Mar	Date:	6/14/23
Project:	2223	Sampler:	JR
Weather:	Overcast ~60°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	4" I	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	25.52	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	LF	Pump Intake Depth:	NS
Sampling Method:	LF	Tubing Material & Type:	NSP
			NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0828			25.52	0.40	7.40	16.4	1119	4.42	-318.4	Clear
0831			25.71	0.25	7.16	15.6	1175	1.15	-424.2	
0834			25.87	0.25	7.10	16.4	1174	0.70	-453	
0837			25.93		7.06	15.9	1167	0.57	-462.9	
0840					7.03	15.8	1149	0.47	-492.4	
0843			25.98		7.01	15.8	1138	0.45	-498.7	
0846			26.04		7.01	15.8	1134	0.45	-507.7	

PURGING DATA

Sample ID:	MW-13	Sampling Flow Rate:	0.25	Analytical Laboratory:	Agri	
Sample Time:	0846	Final Depth to Water:	26.24	Did Well Dewater:	Yes	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(5) VWA	HCl	HVOCs/R54/TCE				
(1) 250	H2SO4	NH3				
(1) 250	-	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

(7) Split w/ Antea

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MW-14	Job Number:	
Client:		Date:	6/13/23
Project:		Sampler:	
Weather:	Overcast ~75°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	()
	Other: <u>Good</u>	Well Depth:		Free Product Thickness:	()
Monument Condition:		Depth to Water:	24.94	Water Column Length:	()
Well Cap Lock Present:	(es) No	Screened Interval:		Purge Volume:	()

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Material & Type:	BP

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
1200			24.94	0.20	7.07	22.5	2240	0.26	-275.8	Clear
1209			↓	0.30	6.74	20.5	2067	3.05	-341.2	↓
1212			↓	0.30	6.66	18.2	2013	1.36	-382.4	
1215			24.94	0.30	6.59	17.6	2002	0.58	-462.4	
1218			↓	↓	6.58	17.5	2000	0.47	-457.6	
1221			↓	↓	6.57	17.5	2000	0.46	-489.2	
1224			↓	↓	6.59	17.6	2002	0.36	-509.8	
1227			↓	↓	6.59	17.6	2003	0.35	-511.2	
1230			↓	↓	6.61	17.7	1496	0.34	-54.4	

PURGING DATA

Sample ID:	MW-14	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apex	
Sample Time:	1230	Final Depth to Water:	24.94	Did Well Dewater:	1/8	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(5) LWA	HCl	HUES/RS/WT				
(1) 250	H ₂ SO ₄	NH ₃				
(1) 250	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: MW-16	Job Number: -
	Client: NUSTAR HARBOUR	Date: 6-15-23
	Project: 2022 GYM	Sampler: NP
	Weather: SUN, 70°	Time In/Out: -

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter: 4"	Depth to Free Product: -
	Other: Vault	Well Depth:	Free Product Thickness: -
Monument Condition:	Good	Depth to Water: 26.61	Water Column Length:
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes No	Screened Interval:	Purge Volume:

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: Bladder		Pump Intake Depth: PROMOTE 110								
Sampling Method: LOW FLOW		Tubing Material & Type: LDPE								
		NEW / <u>DEDICATED</u>								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
10:30	INF	INF	26.75	0.2	6.48	16.1	515	2.43	199.7	Clear
10:33	0.2	0.2	26.76	↓	6.53	15.6	509	2.12	207.4	↓
10:36	0.2	0.4	26.77	↓	6.53	15.3	508	1.82	211.9	↓
10:39	0.2	0.6	26.79	↓	6.61	15.2	507	1.74	213.8	↓

PURGING DATA

Sample ID: MW-16	Sampling Flow Rate: 0.2	Analytical Laboratory: APER ID
Sample Time: 1040	Final Depth to Water: 26.79	Did Well Dewater: ID
No. of Containers/Type	Preservative	Analysis/Method
1 x 250		
1 x 250	H2SO4	
3 x 50	HCl	

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID: MW-17	Job Number:
Client:	Date:
Project:	Sampler:
Weather:	Time In/Out:

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	Depth to Free Product:
Monument Condition:	Good	Well Depth:	Free Product Thickness:
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes No	Depth to Water: 24.77	Water Column Length:
Comments:		Screened Interval:	Purge Volume:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Pump Intake Depth:		NEW / DEDICATED						
Sampling Method:		Tubing Material & Type:								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
11/16			24.77	0.30	6.71	15.0	451.6	0.63	-465.6	Clear
11/19			↓	0.30	6.70	14.6	446.7	0.38	-514.3	↓
11/22			↓	0.30	6.70	15.4	447.3	0.33	-519.2	↓
11/25			↓	0.30	6.70	15.2	455.3	0.32	-538.5	↓
11/28			↓	↓	6.71	15.3	454.1	0.30	-559.2	↓
11/31			↓	↓	6.71	15.4	454.9	0.30	-549.4	↓

PURGING DATA

Sample ID: MW-17	Sampling Flow Rate: 0.30	Analytical Laboratory:	7/10			
Sample Time: 11/31	Final Depth to Water:	Did Well Dewater:				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
③ 10A	HCl	HCl				
① 250	H ₂ SO ₄	NH ₄				
① 250	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-19	Job Number:	
Client:	MS Van M... 2023	Date:	5-14-23
Project:	2023	Sampler:	SP
Weather:	Overcast ~ 70°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	24	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	24	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:	25.97	Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	NEW / DEDICATED	
										ORP (mV)	Clarity/Color Other Remarks
1425			25.97	0.25	7.50	20.1	2140	4.20	-228		Clear
1428			25.82		7.31	18.2	2083	1.43	-319.5		
1431			↓		7.21	17.6	2114	0.49	-500.0		
1434			↓		7.19	17.9	2109	0.44	-515.9		
1437			↓		7.18	18.1	2089	0.34	-538.9		
1440			25.80		7.17	18.0	2069	0.35	-555.4		
1443			↓		7.16	17.9	2055	0.34	-548.9		

PURGING DATA

Sample ID:	MW-19	Sampling Flow Rate:	0.25	Analytical Laboratory:	
Sample Time:	1443	Final Depth to Water:	25.78	Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
① VOA	HCl	HVOCs/RSW/TEX	—		
② VOA	HCl	HVOCs	—		MW-19 DUP
③ 250	H ₂ SO ₄	NH ₃	—		
④ ↓	H ₂ SO ₄	NH ₃	—		MW-19 DUP
⑤ ↓	—	NO ₂ /NO ₃	—		
⑥ ↓	—	NO ₂ /NO ₃	—		MW-19 DUP

NOTES/ADDITIONAL COMMENTS

Split w/ Auteda

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MW-191	Job Number:	-
Client:	MUSTAR VANCOUVER	Date:	6.14.23
Project:	2023 GWM	Sampler:	NP
Weather:	OVERCAST, 70°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount /Stick-up Other:	Well Diameter:		Depth to Free Product:	
Monument Condition:	GOOD	Well Depth:		Free Product Thickness:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes No	Depth to Water:	27.98	Water Column Length:	
		Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BRADDER	Pump Intake Depth:	PRE-MEASURED
Sampling Method:	LOW-FLOW	Tubing Material & Type:	LAPE NEW DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
12:42	INT	INT	27.99	0.2	7.60	22.0	615	7.12	91.7	clear
12:45	0.2	0.2	27.99		7.84	21.5	279.0	9.49	173.9	
12:48	0.15	0.35	27.99		7.50	20.4	171.6	8.12	158.8	
12:51	0.15	0.5	27.99		7.42	20.4	168.8	7.03	170.1	
12:54	0.15	0.65	27.99		7.36	19.8	164.0	6.84	184.9	
12:57	0.2	0.85	28.00		7.30	19.2	171.3	6.56	191.3	
13:00	0.15	1.0	28.00		7.21	19.0	179.2	5.77	200.3	
13:03	0.15	1.15	28.00		7.06	18.9	208.6	4.64	205.7	
13:06	0.15	1.30	28.00		7.02	18.4	247.4	4.43	211.3	
13:09	0.2	1.5	28.00		6.96	18.3	262.0	1.34	200.5	
13:12	0.15	1.65	28.00		6.95	18.2	265.4	0.93	39.0	
13:15	0.15	1.80	28.00		6.95	18.3	267.6	0.75	66.1	
13:18	0.2	2.00	28.00		6.95	18.5	272.8	0.62	78.8	
13:21	0.15	2.15	28.00		6.95	18.7	277.2	0.63	83.9	

PURGING DATA

Sample ID:	MW-191	Sampling Flow Rate:	0.2	Analytical Laboratory:	APEX	
Sample Time:	13:25	Final Depth to Water:	27.99	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 x 250 ml		NO ₂ / NO ₃				
1 x 250 ml	H ₂ SO ₄	NH ₃				
3 x 50 ml	HCl	HVOC				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-20i</u>	Job Number: <u>-</u>
	Client: <u>Vistar Vancouver</u>	Date: <u>6-15-23</u>
	Project: <u>2022 GWR</u>	Sampler: <u>NP</u>
	Weather: <u>sun, 60°</u>	Time In/Out: <u>-</u>

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter: <u>2"</u>	Depth to Free Product: <u>-</u>
	Other: <u>vault</u>	Well Depth:	Free Product Thickness: <u>-</u>
Monument Condition:	<u>Good</u>	Depth to Water: <u>26.34</u>	Water Column Length:
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:	Purge Volume:

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: <u>Bladder</u>		Pump Intake Depth: <u>Premeasured</u>								
Sampling Method: <u>LOW-FLOW</u>		Tubing Material & Type: <u>LDPE</u>								
		NEW / DEDICATED								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
7:50	Int	Int	26.35	0.2	7.74	16.0	247.6	10.11	212.8	Clear
7:53	0.2	0.2	26.36	↓	6.88	15.2	248.3	2.88	250.7	↓
7:56	0.15	0.35	26.36	↓	6.82	15.2	249.6	1.05	250.5	↓
7:59	0.15	0.5	26.36	↓	6.80	15.2	249.4	0.81	247.3	↓
8:02	0.2	0.7	26.36	↓	6.81	15.1	249.0	0.87	243.8	↓

PURGING DATA

Sample ID: <u>MW-20i</u>	Sampling Flow Rate: <u>0.2</u>	Analytical Laboratory: <u>Apex</u>
Sample Time: <u>8:05</u>	Final Depth to Water: <u>26.35</u>	Did Well Dewater: <u>NO</u>
No. of Containers/Type	Preservative	Analysis/Method
<u>1 x 250 ml</u>		
<u>1 x 250 ml</u>	<u>H₂SO₄</u>	
<u>3 x 50 ml</u>	<u>HCl</u>	

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID: MSM1 (110) MW-21.-40	Job Number: -
Client: NUSTAR VANCOUVER	Date: 6-14-23
Project: 2022 GUM	Sampler: MP
Weather: OVERCAST, 60°	Time In/Out: -

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter: 2"	Depth to Free Product: -
	Other: UAVIT	Well Depth:	Free Product Thickness: -
Monument Condition: Good		Depth to Water: 27.37	Water Column Length:
Well Cap Lock Present: <input checked="" type="radio"/> Yes <input type="radio"/> No		Screened Interval:	Purge Volume:

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method: Bladder	Pump Intake Depth: PREMEASURED									
Sampling Method: LOW-FLOW	Tubing Material & Type: LDPE									
NEW / DEDICATED										
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	gal	gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
8:44	INT	INT	27.38	0.2	6.79	16.5	267.3	3.51	164.0	CLAR
8:47	0.2	0.2	27.40	↓	6.66	16.2	268.1	1.13	167.8	↓
8:50	0.2	0.4	27.40	↓	6.67	16.1	270.6	0.79	168.8	↓
8:53	0.2	0.6	27.40	↓	6.70	16.0	273.5	0.59	169.5	↓
8:56	0.15	0.75	27.41	↓	6.72	16.0	274.4	0.46	170.5	↓

PURGING DATA

Sample ID: MW-21.-40	Sampling Flow Rate: 0.2	Analytical Laboratory: APPX				
Sample Time: 9:00	Final Depth to Water: 27.40	Did Well Dewater: NO				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 x 250 ml		NO ₂ / NO ₃				
1 x 250 ml	H ₂ SO ₄	NH ₃				
3 x 50 ml	HCl	H ₂ O ₂				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-21-105	Job Number:	
Client:	NJ Van Morn	Date:	6/3/23
Project:	2823	Sampler:	SP
Weather:	Clear ~ 75°F	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	21	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	27.89	Water Column Length:	
Well Cap Lock Present:	(Yes) No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MJ	NEW / DEDICATED
Sampling Method:	LF	Tubing Material & Type:	BP	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
1423			27.89	0.35	8.42	20.6	339.8	9.47	-199.8	Clear
1426			27.87		8.03	20.1	268.7	11.22	-289.6	
1429			27.87		7.89	19.7	294.6	8.41	-296.4	
1432			↓		7.85	19.6	204.3	7.31	-299.3	
1435			↓		7.82	19.4	311.3	5.13	-320.3	
1438			27.87		7.81	18.4	327.5	3.75	-340.3	
1441			27.86		7.78	18.0	323.7	2.21	-370.1	
1444			↓		7.77	18.0	327.6	2.01	-388.9	
1447			↓		7.77	18.0	332.7	1.78	-402.8	
1450			↓		7.77	17.9	336.6	1.48	-411.4	
1453			↓		7.77	17.1	341.2	1.36	-417.8	

PURGING DATA

Sample ID:	MW-21-105	Sampling Flow Rate:	0.35	Analytical Laboratory:	Apex	
Sample Time:	1453	Final Depth to Water:	27.82	Did Well Dewater:	16	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(3) VOA	HCl	HVOCs				
(1) 250	H2SO4	NH3				
(1) 250	-	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MW-22</u>	Job Number: <u>6113/27</u>
	Client: _____	Date: <u>6/13/27</u>
	Project: _____	Sampler: _____
	Weather: <u>Clear ~ 65°F</u>	Time In/Out: _____

WELL DATA

Monument Type:	Flush-mount/Stick-up <u>Stick-up</u>	Well Diameter: <u>2"</u>	Depth to Free Product: _____
	Other: _____	Well Depth: _____	Free Product Thickness: _____
Monument Condition:	<u>Good</u>	Depth to Water: <u>28.17</u>	Water Column Length: _____
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval: _____	Purge Volume: _____

Comments: _____

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Sampling Method:			Pump Intake Depth:		NEW / DEDICATED			
<u>LP</u>		<u>LP</u>			<u>MS</u>		<u>BP</u>			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0815	<u>0915</u>		<u>28.17</u>	<u>0.30</u>	<u>7.72</u>	<u>28.1</u>	<u>0.2</u>	<u>8.42</u>	<u>+27.5</u>	<u>Clear</u>
0818			<u>28.17</u>	↓	<u>7.93</u>	<u>20.9</u>	<u>452.0</u>	<u>8.33</u>	<u>+239.3</u>	
					<u>6.91</u>				<u>-315.5</u>	
0821			<u>28.17</u>	↓	<u>6.81</u>	<u>17.2</u>	<u>314.2</u>	<u>1.80</u>	<u>-299.9</u>	
0824			<u>28.17</u>	↓	<u>6.64</u>	<u>16.8</u>	<u>310.2</u>	<u>0.85</u>	<u>-362.7</u>	
0827			↓	↓	<u>6.60</u>	<u>16.7</u>	<u>308.6</u>	<u>0.59</u>	<u>-409.9</u>	
0830			↓	↓	<u>6.60</u>	<u>16.7</u>	<u>308.2</u>	<u>0.55</u>	<u>-415.6</u>	
0833			↓	↓	<u>6.59</u>	<u>16.7</u>	<u>309.9</u>	<u>0.50</u>	<u>-426.2</u>	
0836			↓	↓	<u>6.58</u>	<u>16.7</u>	<u>314.6</u>	<u>0.49</u>	<u>-429.2</u>	

PURGING DATA

Sample ID: <u>MW-22</u>	Sampling Flow Rate: <u>0.30</u>	Analytical Laboratory: <u>Apex</u>				
Sample Time: <u>0836</u>	Final Depth to Water: <u>28.17</u>	Did Well Dewater: <u>1/16</u>				
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
<u>3</u> <u>VVA</u>	<u>HCl</u>	<u>HVOCs</u>	_____	_____	_____	_____
<u>1</u> <u>250</u>	<u>H₂SO₄</u>	<u>NH₃</u>	_____	_____	_____	_____
<u>1</u> <u>250</u>	<u>---</u>	<u>NO₂/NO₃</u>	_____	_____	_____	_____

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-25i	Job Number:	-
Client:	NiStar Vancouver	Date:	6/14/23
Project:	2022 GWM	Sampler:	MP
Weather:	Overcast, 60°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other: <u>ugit</u>	Well Depth:		Free Product Thickness:	-
Monument Condition:	<u>Good</u>	Depth to Water:	27.54	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	<u>Bioret</u>	Pump Intake Depth:	<u>Not measured</u>
Sampling Method:	<u>low-flow</u>	Tubing Material & Type:	<u>LDPE</u>

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal									
9:31	1.14	1.14	27.59	0.2	7.30	17.1	234.1	8.37	150.6	Clear
9:34	0.2	0.2	27.60		7.11	16.6	177.7	6.87	189.3	
9:37	0.2	0.4	27.60		7.00	16.5	219.2	4.58	209.4	
9:40	0.2	0.6	27.63		6.96	16.5	243.4	3.69	214.5	
9:43	0.15	0.75	27.63		6.96	16.9	251.4	3.38	219.6	
9:46	0.15	0.9	27.64		6.96	16.8	252.4	3.20	220.1	
9:49	0.15	1.05	27.65		6.96	16.7	252.0	3.12	221.3	

PURGING DATA

Sample ID:	MW-25i	Sampling Flow Rate:	0.2	Analytical Laboratory:	Appx
Sample Time:	9:50	Final Depth to Water:	27.59	Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
1 x 250 ml		NO ₂ /NO ₃			
1 x 250 ml	H ₂ SO ₄	NH ₃			
3 x 50 ml	HCl	HVOC			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-21 MW-24i	Job Number:	-
Client:	Nustar Vancouver	Date:	6-13-23
Project:	2222 GULF	Sampler:	NP
Weather:	Sun, 75°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	-
	Other: UGHT	Well Depth:		Free Product Thickness:	-
Monument Condition:	GOOD	Depth to Water:	27.47	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Bladder			Pump Intake Depth:		Premeasured			
Sampling Method:		LOW-FLOW			Tubing Material & Type:		LDPE			
										NEW / DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
14:49	Int	Int	27.48	0.2	7.07	22.6	670	9.06	159.0	Clear
14:52	0.2	0.2	27.48	↓	7.30	20.5	321.7	9.99	184.0	↓
14:55	0.2	0.4	27.48		7.00	20.0	293.1	6.98	197.4	
14:58	0.2	0.6	27.48		6.85	20.2	297.7	4.00	189.9	
15:01	0.2	0.8	27.48		6.85	19.9	298.0	3.00	182.1	
15:04	0.2	1.0	27.48		6.83	19.5	295.0	2.96	173.1	
15:07	0.2	1.2	27.48		6.84	19.5	295.6	2.91	167.1	

PURGING DATA

Sample ID:	MW-24i	Sampling Flow Rate:	0.2	Analytical Laboratory:	APER
Sample Time:	15:10	Final Depth to Water:	27.47	Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
1 x 250					
1 x 250	H ₂ SO ₄				
3 x 50	HCl				
2 x 50	HCl	ESK/TOC			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MW-24D	Job Number:	-
Client:	Nustar Vancouver	Date:	6-14-23
Project:	2022 GUM	Sampler:	NP
Weather:	Overcast, 8°	Time In/Out:	-

WELL DATA

Monument Type:	<u>Flush-mount/Stick-up</u> Other:	Well Diameter:	2"	Depth to Free Product:	-
Monument Condition:	Good	Well Depth:		Free Product Thickness:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes No	Depth to Water:	27.93	Water Column Length:	
		Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Bladder LOW-FLOW				Pump Intake Depth:	From casing				
Sampling Method:					Tubing Material & Type:	LDPE				
										NEW <input checked="" type="checkbox"/> DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
10:35	Int	Int	28.14	0.2	7.66	17.0	303.2	6.57	157.7	clear
10:38	0.2	0.2	28.14		7.62	16.5	299.2	5.77	176.5	
10:41	0.2	0.4	28.14		7.60	16.6	298.6	4.82	190.5	
10:44	0.2	0.6	28.14		7.62	16.5	298.9	4.65	200.3	
10:47	0.15	0.75	28.14		7.58	16.5	299.0	4.26	205.1	
10:50	0.2	0.95	28.15		7.58	16.5	298.8	3.97	208.6	
10:53	0.2	1.15	28.16	↓	7.58	16.5	299.1	3.87	209.3	↓

PURGING DATA

Sample ID:	MW-24D	Sampling Flow Rate:	0.2	Analytical Laboratory:	Apex
Sample Time:	10:55	Final Depth to Water:	28.15	Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
1 x 250 ml		NO ₂ /NO ₃			
1 x 250 ml	H ₂ SO ₄	NH ₃			
3 x 50 ml	HCl	HVOC			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MW-25i	Job Number:	
Client:	NS Van Meir	Date:	6.14.23
Project:	2023	Sampler:	SP
Weather:	Overcast ~ 70°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	27.90	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="radio"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Material & Type:	13'

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
1141			27.90	0.25	8.07	19.9	24.6	10.39	-227.4	Clear
1144			↓	↓	7.48	17.2	252.6	7.97	-223.9	↓
1147			↓	↓	7.40	16.0	314.9	4.04	-282.5	↓
1150			↓	↓	7.35	15.3	221.8	2.55	-316.8	↓
1153			↓	↓	7.32	15.3	320.1	2.29	-331.9	↓
1156		27.92	↓	↓	7.31	15.3	320.9	2.22	-334.3	↓
1159			↓	↓	7.20	15.2	321.8	2.13	-345.1	↓

PURGING DATA

Sample ID:	MW-25i	Sampling Flow Rate:	0.25	Analytical Laboratory:	Apex	
Sample Time:	1159	Final Depth to Water:	27.96	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(3) VOA	HCl	HVOCs				
(1) 250	H ₂ SO ₄	NH ₃				
(1) 250	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

Spdnt w/ Auted

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MW-26	Job Number:	
Client:	MS Van Ness	Date:	6-14-23
Project:	2023	Sampler:	SP
Weather:	Overcast; ~65°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stack-up	Well Diameter:	2"	Depth to Free Product	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	24.66	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	DP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Material & Type:	BP
			NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1049			24.66	0.45	6.37	15.8	5148	3.37	-269.6	Clear
1052			24.66	0.35	6.45	15.4	5234	1.21	-368	
1055			↓	0.30	6.49	15.4	5192	0.75	-411.7	
1058			↓		6.46	15.5	5018	0.49	-461.6	
1101			↓		6.43	15.5	4280	0.39	-490.6	
1104			↓		6.44	15.5	4186	0.38	-498.0	
1107			↓		6.44	15.5	4042	0.37	-501.5	
1110			↓		6.39	15.6	4057	0.36	-509.8	

PURGING DATA

Sample ID:	MW-26	Sampling Flow Rate:	0.20	Analytical Laboratory:	Ames
Sample Time:	1110	Final Depth to Water:	24.66	Did Well Dewater:	MS
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID

(5) VOA	HCl	HVOCs/RSK/TOC			
(1) 250	H ₂ SO ₄	NH ₃			
(1) 250	-	NO ₂ /NO ₃			

NOTES/ADDITIONAL COMMENTS

Split w/ Antea

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID: <u>MGMS1-1(110)</u>	Job Number:	
	Client:	Date: <u>6-15-28</u>	
	Project:	Sampler: <u>JP</u>	
	Weather:	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	Depth to Free Product
	Other: <u>UGV 14</u>	Well Depth:	Free Product Thickness
Monument Condition:	<u>Good</u>	Depth to Water: <u>27.30</u>	Water Column Length:
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:	Purge Volume:

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		<u>PCP</u>			Pump Intake Depth:		<u>Remeasured</u>			
Sampling Method:		<u>low flow</u>			Tubing Material & Type:		<u>LDPE</u>		NEW <input type="checkbox"/> DEDICATED <input checked="" type="checkbox"/>	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5°C	+/-5%	+/-0.5 ppm	+/-20 mV	
11:22	1A	1A	27.35	0.2	6.73	17.1	228.8	0.85	163.9	Clear
11:25	0.2	0.2	27.37	↓	7.03	16.9	191.7	0.32	158.1	↓
11:28	0.2	0.4	27.39	↓	7.06	17.1	192.5	0.33	155.1	↓
11:31	0.2	0.6	27.42	↓	7.20	16.7	193.1	0.17	147.6	↓
11:34	0.2	0.8	27.44	↓	7.22	16.6	189.3	0.17	141.1	↓
11:37	0.2	1.0	27.45	↓	7.26	16.8	189.5	0.16	136.8	↓

PURGING DATA

Sample ID:	<u>MGMS1-1(110)</u>	Sampling Flow Rate:	<u>0.2</u>	Analytical Laboratory:	<u>APPX</u>
Sample Time:	<u>1140</u>	Final Depth to Water:	<u>27.46</u>	Did Well Dewater:	<u>NO</u>
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
<u>1 x 250</u>					
<u>1 x 250</u>	<u>H₂SO₄</u>				
<u>3 x 50</u>	<u>HCl</u>				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MGM51-2(60)	Job Number:	-
Client:	Mustar Vancouver	Date:	6.14.23
Project:	2022 GWM	Sampler:	JP
Weather:	overcast 60°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	-
	Other: Vault	Well Depth:		Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	26.67	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Peri			Pump Intake Depth:	Pre Measured					
Sampling Method:	LOW-FLOW			Tubing Material & Type:	LDPE			NEW / <u>BEDICATED</u>		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
7:36	Int	Int	26.67	0.2	6.99	15.2	215.5	1.72	187.0	Clear
7:39	0.2	0.2	26.71	↓	7.03	14.7	210.6	0.55	193.1	↓
7:42	0.15	0.35	26.71	↓	7.07	14.7	214.0	0.38	193.8	↓
7:45	0.15	0.5	26.71	↓	7.09	14.6	217.1	0.32	194.1	↓

PURGING DATA

Sample ID:	MGM51-2(60)	Sampling Flow Rate:	0.2	Analytical Laboratory:	Aper	
Sample Time:	7:50	Final Depth to Water:	26.73	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 X 250 ml		NO ₂ /NO ₃				
1 X 250 ml	H ₂ SO ₄	NH ₃				
3 X 50 ml	HCl	HVOC				

NOTES/ADDITIONAL COMMENTS

Peri Pump died in the middle of filling 250ml H₂SO₄ Preserved
 put sample on ice, wait 5 minutes, fill rest of 250ml H₂SO₄ (last bottle)
 to fill

WELL MONITORING DATA SHEET



Well ID:	MGM51-3(43)	Job Number:	~
Client:	Musfal Vancouver	Date:	6.13.23
Project:	2022 GWM	Sampler:	NP
Weather:	overcast 70°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	-
	Other: vault	Well Depth:		Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	26.18	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		PAI		Pump Intake Depth:		Pre Measured		NEW		DEDICATED	
Sampling Method:		LOW-FLOW		Tubing Material & Type:		LDPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks	
	600	600			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
12:26	INT	INT	26.08	0.2	6.83	18.1	2051	0.51	59.4	clear	
12:29	0.2	0.2	26.02	↓	6.83	18.1	2072	0.36	69.6	↓	
12:32	0.2	0.4	26.08	↓	6.83	18.2	2066	0.33	76.4	↓	
12:35	0.2	0.6	26.08	↓	6.84	18.5	2116	0.31	78.6	↓	

PURGING DATA

Sample ID:	MGM51-3(43)	Sampling Flow Rate:	0.2	Analytical Laboratory:	APEX	
Sample Time:	12:40	Final Depth to Water:	26.08	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 x 250 ML						
1 x 250 ML	H ₂ SO ₄					
3 x 50 ML	HCl					
2 x 50 ML	HCl	RSK/TOC				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MGMS2-1(132)	Job Number:	-
Client:	Nustar Vancouver	Date:	6-13-23
Project:	2022 GWM	Sampler:	AD
Weather:	OVERCAST 65	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	-
	Other: VAULT	Well Depth:	27.41	Free Product Thickness:	-
Monument Condition:	GOOD	Depth to Water:		Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	PERI	Pump Intake Depth:	PRE-PRESSURED
Sampling Method:	IDW-FLOW	Tubing Material & Type:	LDPE NEW DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	6.41	6.41			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
11:26	INT	INT	27.46	0.25	6.57	19.3	212.9	7.57	16.8	clear
11:29	0.2	0.2	27.47		6.72	19.1	213.2	6.73	-12.1	
11:32	0.2	0.4	27.47		7.26	18.8	214.0	5.01	-61.7	
11:35	0.2	0.6	27.48		7.38	18.9	214.7	4.78	-74.6	
11:38	0.2	0.8	27.48		7.40	18.8	212.7	4.58	-81.9	
11:41	0.2	1.0	27.48		7.45	18.9	211.1	3.98	-84.3	
11:44	0.2	1.2	27.48		7.44	18.7	210.2	3.84	-84.0	
11:47	0.25	1.35	27.48		7.44	19.0	213.2	0.21	-85.4	
11:50	0.15	1.5	27.48		7.47	18.7	213.6	0.20	-86.2	
11:53	0.15	1.65	27.48	↓	7.47	18.7	211.4	0.20	-86.0	

PURGING DATA

Sample ID:	MGMS2-1(132)	Sampling Flow Rate:	0.25	Analytical Laboratory:	Apex
Sample Time:	11:55	Final Depth to Water:	27.48	Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
1 x 250 ml					
1 x 250 ml	H ₂ SO ₄				
3 x 50 ml	HCl				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MGMS2-2(110)	Job Number:	-
Client:	Nustar Vancouver	Date:	6.13.25
Project:	2022 GWM	Sampler:	MP
Weather:	Overcast 60°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	-
	Other: Vault	Well Depth:		Free Product Thickness:	-
Monument Condition:		Depth to Water:	27.22	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Per Pump			Pump Intake Depth:		Pre-measured			
Sampling Method:		Low-flow			Tubing Material & Type:		LDPE		NEW / <input checked="" type="checkbox"/> BICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	gal	gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
10:57	Int	Int	27.40	0.2	6.72	18.3	199.2	4.65	93.7	clear
11:00	0.2	0.2	27.42	↓	7.21	17.9	198.5	3.79	64.4	↓
11:03	0.2	0.4	27.42		7.30	17.9	195.8	3.38	65.3	
11:06	0.2	0.6	27.42		7.34	18.0	196.8	3.16	69.3	
11:09	0.2	0.8	27.42		7.35	18.3	198.6	2.92	750	

PURGING DATA

Sample ID:	MGMS2-2(110)	Sampling Flow Rate:	0.2	Analytical Laboratory:	Apex
Sample Time:	11:10	Final Depth to Water:	27.43	Did Well Dewater:	10
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
1 x 250 ml					
1 x 250 ml	H ₂ SO ₄				
3 x 50 ml	HCl	HA MP			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	M6MSZ-3(60)	Job Number:	-
Client:	NUGTAR VANCOUVER	Date:	6-13-23
Project:	2022 GWM	Sampler:	NP
Weather:	overcast 55°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	-
	Other: Vault	Well Depth:		Free Product Thickness:	-
Monument Condition:		Depth to Water:	27.17	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		PPC			Pump Intake Depth:		PREMEASURED			
Sampling Method:		LOW-FLOW			Tubing Material & Type:		LDPE		NEW DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
9:23	INT	INT	27.22	0.2	6.96	16.8	257.7	6.39	107.8	clear
9:26	0.25	0.25	27.23	↓	6.83	16.5	227.5	6.23	139.6	↓
9:29	0.15	0.4	27.23	↓	6.95	16.3	224.9	6.14	157.3	↓
9:32	0.25	0.65	27.23	↓	6.96	16.3	223.1	5.97	169.8	↓
9:35	0.15	0.65	27.23	↓	6.96	16.4	222.1	5.80	175.6	↓

PURGING DATA

Sample ID:	M6MSZ-3(60)	Sampling Flow Rate:	0.2	Analytical Laboratory:	Apex	
Sample Time:	9:40	Final Depth to Water:	27.23	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 x 250 ml						
1 x 250 ml	H ₂ SO ₄					
3 x 50	HCl	DOC → NP				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MGM52-4(40)	Job Number:	
Client:	Niestar Van Man	Date:	6-13-22
Project:	2023 GWM	Sampler:	MP
Weather:	overcast	Time In/Out:	-

WELL DATA

Monument Type:	<input checked="" type="checkbox"/> Flush-mount/Stick-up Other: vault	Well Diameter:		Depth to Free Product:	-
Monument Condition:		Well Depth:		Free Product Thickness:	-
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Depth to Water:	24.61	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	PCD			Pump Intake Depth:	Pie measured					
Sampling Method:	LOW FLOW			Tubing Material & Type:	LOPE				NEW	<input checked="" type="checkbox"/> DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	6.01				+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
8:50	Int	Int	25.45	0.2	6.92	16.6	1327	0.24	252.9	clear
8:53	0.25	0.25	25.44	↓	6.93	17.4	1329	0.21	228.2	↓
8:56	0.25	0.5	25.44	↓	6.94	18.1	1403	0.15	222.9	↓
8:59	0.15	0.65	25.44	↓	6.97	19.0	1399	0.13	215.7	↓
9:02	0.15	0.80	25.44	↓	6.93	17.8	1396	0.13	213.2	↓

PURGING DATA

Sample ID:	MGM52-4(40)	Sampling Flow Rate:	0.2	Analytical Laboratory:	Apex	
Sample Time:	9:05	Final Depth to Water:	25.45	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 x 250 ml						
1 x 250 ml	H ₂ SO ₄					
3 x 50 ml	HCl	VOC ^W				
2 x 50 ml	HCl	RSK/TOL				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS	Well ID:	MGMS3-1(132)	Job Number:	
	Client:		Date:	6-15-23
	Project:		Sampler:	NP
	Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: <u>well</u>	Well Diameter:	Well Depth:	Depth to Free Product:	
Monument Condition:	<u>GOOD</u>	Depth to Water:	<u>26.79</u>	Free Product Thickness:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:		Water Column Length:	
Comments:					

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		<u>Per. LOW-FLOW</u>			Pump Intake Depth:		<u>PREMEASURED</u>			
Sampling Method:					Tubing Material & Type:		<u>LDPE</u>		NEW <input checked="" type="checkbox"/> DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	<u>gal</u>	<u>gal</u>			<u>+/-0.1</u>	<u>+/-0.5 °C</u>	<u>+/-5%</u>	<u>+/-0.5 ppm</u>	<u>+/-20 mV</u>	
12:01	<u>0.2</u>	<u>0.2</u>	<u>26.40</u>	<u>0.2</u>	<u>7.12</u>	<u>16.8</u>	<u>182.2</u>	<u>0.38</u>	<u>-42.2</u>	<u>clear</u>
12:04	<u>0.2</u>	<u>0.2</u>	<u>26.40</u>	<u> </u>	<u>7.51</u>	<u>16.6</u>	<u>192.2</u>	<u>0.77</u>	<u>-49.3</u>	<u> </u>
12:07	<u>0.2</u>	<u>0.4</u>	<u>26.40</u>	<u> </u>	<u>7.50</u>	<u>16.3</u>	<u>191.2</u>	<u>0.89</u>	<u>-34.7</u>	<u> </u>
12:10	<u>0.2</u>	<u>0.6</u>	<u>26.40</u>	<u> </u>	<u>7.50</u>	<u>16.2</u>	<u>196.2</u>	<u>0.88</u>	<u>-20.2</u>	<u> </u>
12:13	<u>0.2</u>	<u>0.8</u>	<u>26.43</u>	<u> </u>	<u>7.54</u>	<u>16.2</u>	<u>190.5</u>	<u>0.89</u>	<u>-8.0</u>	
12:16	<u>0.2</u>	<u>1.0</u>	<u>26.44</u>	<u>↓</u>	<u>7.55</u>	<u>16.4</u>	<u>194.2</u>	<u>0.89</u>	<u>-1.2</u>	

PURGING DATA

Sample ID:	MGMS3-1(132)	Sampling Flow Rate:	0.2	Analytical Laboratory:	AP&A
Sample Time:	12:20	Final Depth to Water:	26.44	Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
1 x 250					
1 x 250	H ₂ SO ₄				
3 x 50 ml	HCl				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MGM53-2(101)	Job Number:	
Client:		Date:	6-15-23
Project:		Sampler:	MP
Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	
	Other: Vault	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	26.39	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Peri	Pump Intake Depth:	Pre-measured
Sampling Method:	LOW-FLOW	Tubing Material & Type:	LDPE

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
12:34	5.14	5.14	26.40	0.2	7.03	17.0	171.5	0.44	-2.2	Clear
12:37	0.2	0.2	26.41		7.32	16.3	168.5	1.08	-4.0	
12:40	0.2	0.4	26.42		7.45	16.0	168.9	1.20	9.7	
12:43	0.2	0.6	26.42		7.40	16.0	168.8	1.19	20.4	
12:46	0.2	0.8	26.43		7.39	15.9	166.7	1.16	28.8	

PURGING DATA

Sample ID:	MGM53-2(10)	Sampling Flow Rate:	0.2	Analytical Laboratory:	APPR
Sample Time:	1250	Final Depth to Water:	26.43	Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD
1 x 250					
1 x 250	H2SO4				
1 x 250					
3 x 50 ml	HCl				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	MGMS 3-3(60)	Job Number:	
Client:		Date:	6-15-23
Project:		Sampler:	NP
Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	
	Other: Vault	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	26.42	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="radio"/> Yes <input type="radio"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	PA, LOW-FLOW				Pump Intake Depth:	Pre-measured				
Sampling Method:					Tubing Material & Type:	LDPE		NEW	DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1300	Int	Int	26.42	0.2	6.99	16.7	179.7	1.35	31.6	clear
1304	0.2	0.2	26.43		7.05	16.4	183.6	2.28	9.2	
1307	0.2	0.4	26.43		7.00	16.0	183.0	2.32	22.8	
1310	0.2	0.6	26.44		7.01	15.9	184.8	2.34	26.8	
1313	0.2	0.8	26.44	↓	7.01	16.3	190.3	2.52	29.8	

PURGING DATA

Sample ID:	MGMS 3-3(60)	Sampling Flow Rate:	0.2	Analytical Laboratory:	APEX	
Sample Time:	1315	Final Depth to Water:	26.44	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 x 250 ml						
1 x 250 ml	H ₂ SO ₄					
3 x 50 ml	HCl					

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS 

Well ID:	MP-1	Job Number:	
Client:	NJ Van Man	Date:	6-15-23
Project:	2823	Sampler:	SP
Weather:	Clear 260°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	
	Other:	Well Depth:		Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	25.47	Water Column Length:	
Well Cap Lock Present:	Yes <input checked="" type="checkbox"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Purge Method:	BP	Pump Intake Depth:	NJ
Sampling Method:	LF	Tubing Material & Type:	RP
			NEW / <u>DEDICATED</u>

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					±0.1	±0.5 °C	±5%	±0.5 ppm	±20 mV	
0728			25.47	0.30	7.55	14.0	977	2.93	-356.0	Clear
0731			25.43		7.42	14.1	1022	1.32	-415.0	
0734			↓		7.37	14.1	1015	1.13	-482.2	
0737			↓		7.31	14.0	1020	0.96	-55	
									-457.7	
0740			25.43		7.27	14.1	1036	0.82	-477.4	
0743			↓		7.26	14.1	1046	0.72	-488.5	
0746			↓		7.25	14.1	1053	0.67	-495.2	

PURGING DATA

Sample ID:	MP-1	Sampling Flow Rate:	0.50	Analytical Laboratory:	Apert	
Sample Time:	0746	Final Depth to Water:	24.41	Did Well Dewater:	1/2	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(5) VOA	HCl	HVOCs/RSL/OC				
(1) ZBO	H ₂ O ₂	1/1 ₂				
(1) ZSO	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

(7) Split w/ Anter

WELL MONITORING DATA SHEET

	Well ID: <u>EW-1</u>	Job Number: <u> </u>
	Client: <u>Nustar Vancouver</u>	Date: <u>6-14-23</u>
	Project: <u>2023 GWH</u>	Sampler: <u>MP</u>
	Weather: <u>SUN 75°</u>	Time In/Out: <u> </u>

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2'	Depth to Free Product:	
	Other: <u>Vault</u>	Well Depth:		Free Product Thickness:	
Monument Condition:	<u>Good</u>	Depth to Water:	<u>24.85</u>	Water Column Length:	
Well Cap Lock Present:	<input checked="" type="radio"/> Yes <input type="radio"/> No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		<u>Bladder</u>			Pump Intake Depth:		<u>pre measured</u>			
Sampling Method:		<u>low-flow</u>			Tubing Material & Type:		<u>LDPE</u>			
								NEW / <u>DEDICATED</u>		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
14:09	1.14	1.14	24.85	0.2	6.62	18.5	243.3	6.55	181.8	clear
14:12	0.2	0.2	24.85	↓	6.73	19.8	250.3	6.81	200.2	↓
14:15	0.15	0.35	24.85	↓	6.71	20.8	253.8	6.29	214.9	↓
14:18	0.15	0.5	24.85	↓	6.72	20.7	254.8	6.17	224.9	↓
14:21	0.2	0.7	24.85	↓	6.70	21.0	255.9	6.16	230.6	↓

PURGING DATA

Sample ID:	EW-1	Sampling Flow Rate:	0.2	Analytical Laboratory:	Apex	
Sample Time:	1425	Final Depth to Water:	27.84	Did Well Dewater:	NO	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1 x 250 ml		NO ₂ /NO ₃				
1 x 250 ml	H ₂ SO ₄	NH ₃				
3 x 50 ml	PCl	HVOCs				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	EX	Job Number:	-
Client:	Nistar Vancouver	Date:	6.14.25
Project:	2022 GWM	Sampler:	ND
Weather:	Overcast, 70°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:		Depth to Free Product:	-
	Other: Vault	Well Depth:		Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	25.10	Water Column Length:	
Well Cap Lock Present:	Yes No	Screened Interval:		Purge Volume:	

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:	Bladder	Pump Intake Depth:	From surface
Sampling Method:	LOW-FLOW	Tubing Material & Type:	LDPE NEW <u>DEDICATED</u>

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
	Gal	Gal			±0.1	±0.5 °C	±5%	±0.5 ppm	±20 mV	
11:35	Int	Int	25.18	0.25	7.11	17.2	1699	1.60	140.7	clear
11:36	0.2	0.2	25.18	↓	7.12	16.9	1723	0.50	140.3	↓
11:39	0.15	0.35	25.18	↓	7.13	16.8	1705	0.40	147.5	↓
11:42	0.15	0.5	25.18	↓	7.15	16.7	1673	0.37	144.0	↓

PURGING DATA

Sample ID:	EX	Sampling Flow Rate:	0.2	Analytical Laboratory:	Apex
Sample Time:	11:45	Final Depth to Water:	25.16	Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
1 x 250 ml		NO ₂ /NO ₃			
1 x 250 ml	H ₂ SO ₄	NH ₃			
3 x 50 ml	HCl	HVOC			
2 x 50 ml	HCl	RSK/TOC			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET



Well ID:	S-1	Job Number:	-
Client:		Date:	6-14-25
Project:		Sampler:	JP
Weather:	Overcast, 75°F	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: <i>Stunt</i>	Well Diameter:	2"	Depth to Free Product:	
Monument Condition:	<i>Good</i>	Well Depth:		Free Product Thickness:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Depth to Water:	26.73	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters
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PURGING DATA

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks	NEW / DEDICATED	
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV			
1001			26.73	0.40	8.30	17.9	233.8	8.55	-232.3	<i>Clear</i>		
1004				0.30	7.82	17.4	257.1	8.12	-212.9			
1007			26.74	0.30	7.58	16.9	184.5	7.68	-222.9			
1010				↓	7.38	14.9	177.6	7.31	-207.1			
1013			26.78	↓	7.38	14.8	178.7	4.23	-214.5			
1016			26.78	0.35	7.37	15.1	174.4	1.37	-224.3			
1019				↓	7.39	15.2	178.8	1.12	-231.8			
1022				↓	7.34	15.2	178.9	0.97	-233.8		↓	


PURGING DATA

Sample ID:	S-1	Sampling Flow Rate:	0.35	Analytical Laboratory:	<i>Antec</i>	
Sample Time:	1022	Final Depth to Water:	26.82	Did Well Dewater:	<i>16</i>	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
③ VOA	HCl	HVOCs				
① 250	H ₂ SO ₄	NH ₃				
① 250	-	NO ₂ /NO _x				

NOTES/ADDITIONAL COMMENTS

Split w/ Antec

WELL MONITORING DATA SHEET

	Well ID:	S-2	Job Number:	
	Client:	NS Van Ness	Date:	6/14/23
	Project:	2023	Sampler:	SP
	Weather:	Overcast 26° F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:		Depth to Free Product:	
Monument Condition:	Good	Well Depth:		Free Product Thickness:	
Well Cap Lock Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Depth to Water:	26.83	Water Column Length:	
Comments:		Screened Interval:		Purge Volume:	

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):
 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters

PURGING DATA

Purge Method:		Sampling Method:		Pump Intake Depth:		Tubing Material & Type:		NEW / DEDICATED		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0916			26.85	0.35	7.27	16.3	1697	6.27	-2120	Slight particle
0919			26.96	0.30	6.91	14.8	1966	2.19	-2984	No tint.
0922			26.98		6.83	14.6	1984	0.58	-426.6	
0925			↓	↓	6.77	14.7	1993	0.32	-536.9	
0928			↓	↓	6.76	14.8	1974	0.30	-545.9	
0931			↓	↓	6.78	14.9	1993	0.27	-557.1	

PURGING DATA

Sample ID:	S-2	Sampling Flow Rate:	0.30	Analytical Laboratory:	Apex	
Sample Time:	0921	Final Depth to Water:	27.83	Did Well Dewater:	16	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
③ VOA	HCl	HUOG				
① 250	H ₂ SO ₄	NH ₃				
① 250	-	NO ₂ /NO ₃				

NOTES/ADDITIONAL COMMENTS

Split w/ Anita

APPENDIX B
Historical Groundwater Analytical Data

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-1	11/17/1993	-	500	-	-	<250	<250	-	14,000	-	-	750	<250	-	1,400	<500
	9/1/1995	<250	<500	<250	<250	<250	<250	<250	13,000	<250	<250	620	<250	-	890	610
	9/24/1996	<5	<20	<2	<2	54	<2	8.4	11,000	83	17	2,600	68	-	1,800	420
	12/2/1996	0.8	<0.50	<0.50	<0.20	6.7	<0.50	0.3	1,500	4.4	<0.20	1,200	7.3	-	310	1.6
	11/12/1997	<125	<250	<125	<125	<125	<125	<125	11,600	<125	<125	6,330	<125	-	2,880	<250
	8/11/1999	<50	<250	<25	<250	43.1	<25	<25	8,590	86	<25	2,520	52.5	-	1,210	408
	11/16/1999	<50	<125	<25	<50	38	<25	<25	6,250	47.5	<25	2,400	28	-	829	148
	2/29/2000	<100	<500	<50	<50	<50	<50	<50	6,720	60.9	<50	1,370	<100	-	590	438
	6/27/2000	<100	<500	<50	<50	<50	<50	<50	6,480	65.1	<50	1,780	<100	-	795	284
	8/31/2000	<100	<500	<50	<50	<50	<50	<50	5,160	<50	<50	1,960	<100	-	720	<50
	11/30/2000	<20	<100	<10	<10	15	<10	<10	1,550	12.7	<10	660	<20	-	234	<10
	2/27/2001	<100	<100	<50	<50	<50	<50	<50	4,990	<50	<50	1,140	<100	-	440	190
	5/29/2001	<50	<250	<25	<25	<25	<25	<25	4,050	<25	<25	1,040	<50	-	407	91
	9/25/2001	<50	<50	<50	<50	<50	<50	<50	5,000	<50	<50	890	<50	-	440	240
	12/17/2001	<2	<10	<1	<1	<1	<1	<1	109	1.26	<1	164	<2	-	42.9	<1
	3/19/2002	<50	<25	<25	<50	35	<25	<25	4,120	35	<25	710	<25	-	349	170
	5/30/2002	<10	<5	<5	<10	10.8	<5	<5	1,140	6.6	<5	307	<5	-	101	22.3
	11/8/2002	<20	<10	<10	<20	22.8	<10	<10	1,980	20.2	<10	367	<10	-	174	14.4
	5/30/2003	<20	<10	<10	<20	21.2	<10	<10	2,180	<10	<10	1,200	14.2	-	340	22.6
	11/2/2004	<20	<10	<10	<20	22.4	<10	<10	2,130	23.6	<10	335	<10	-	169	22.8
	11/16/2004	<12	<12	<12	<12	15	<12	<12	1,300	<12	<12	310	<12	-	130	<12
	5/18/2005	<5	<2.5	<2.5	<5	12	<2.5	<2.5	773	14.1	<2.5	193	<2.5	-	87.6	3.8
	5/23/2007	<10	<10	<10	<10	15.5	<10	<10	1,110	<10	<10	58.5	<10	-	45.4	11.7
	9/11/2007	<50	<25	<25	<50	<25	<25	<25	916	<25	<25	34	<25	-	34	62.5
	12/13/2007	<10	<5	<5	<10	9.7	<5	<5	526	5	<5	81.9	<5	-	45.4	8.8
	3/5/2008	<1	<0.500	<0.500	<1	16.1	<0.500	1.66	826	9.18	2.3	49.7	0.88	<0.500	45.6	58.8
	9/19/2008	<20	<10	<10	<20	20.4	<10	<10	633	<10	<10	108	<10	<10	74.8	<10
	12/10/2008	<2.5	<2.5	<2.5	<2.5	15	<2.5	<2.5	570	6.2	<2.5	28	<2.5	<2.5	25	48
	3/27/2009	<2.5	<2.5	<2.5	<2.5	17	<0.50	<2.5	580	5.7	<2.5	39	<2.5	<2.5	42	4.4
	6/17/2009	<0.90	<0.90	<0.90	<0.90	6.3	<0.90	<0.90	310	3.6	0.99	21	<0.90	<0.90	14	9.7
	9/18/2009	<0.80	<0.80	<0.80	<0.80	19	<0.80	<0.80	590	4.2	1.9	29	<0.80		27	8.1
	12/17/2009	<0.50	<0.50	<0.50	<0.50	4.8	<0.50	<0.50	170	0.72	0.67	53	0.53	<0.50	26	<0.50
	3/19/2010	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	0.61	300	3.6	1.4	22	<0.50	<0.50	21	26
	6/15/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.6	<0.50	<0.50	22	<0.50	<0.50	6.6	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-1 (continued)	9/23/2010	<0.90	<0.90	<0.90	<0.90	12	<0.90	<0.90	380	3.4	1.6	25	<0.90	<0.90	27	7.1
	12/9/2010	<1.5	<1.5	<1.5	<1.5	7.1	1.5	<1.5	250	2.2	<1.5	25	<1.5	<1.5	17	8
	3/10/2011	<1.5	<1.5	<1.5	<1.5	7.5	<1.5	<1.5	250	3	<1.5	16	<1.5	<1.5	16	18
	6/9/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	<0.5	11	<0.5	<0.5	3.4	<0.5
	9/19/2011	<1.5	<1.5	<1.5	<1.5	12	<1.5	<1.5	300	3.2	<1.5	5.2	<1.5	<1.5	13	30
	12/9/2011	<1.5	<1.5	<1.5	<1.5	11	<1.5	<1.5	260	2.9	<1.5	6.2	<1.5	<1.5	8.4	40
	3/9/2012	<0.50	<0.50	<0.50	<0.50	7.8	<0.50	<0.50	200	2.4	1	3.1	<0.50	<0.50	9.5	19
	6/22/2012	<0.5	<0.5	<0.5	<0.5	4.8	<0.5	<0.5	140	1.7	0.53	17	<0.5	<0.5	13	14
	9/13/2012	<1.5	<1.5	<1.5	<1.5	10	<1.5	<1.5	260	2.4	<1.5	<1.5	<1.5	<1.5	7	25
	12/13/2012	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	47	0.64	<0.50	26	<0.50	<0.50	14	<0.50
	3/15/2013	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	140	1.6	0.8	0.83	<0.50	<0.50	6	0.98
	6/13/2013	<0.50	<0.50	<0.50	<0.50	7.2	<0.50	<0.50	130	1.9	0.63	1.1	<0.50	<0.50	2.4	28
	9/19/2013	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	180	1.6	1	3.2	<0.50	<0.50	5.6	0.92
	12/16/2013	<0.50	<0.50	<0.50	<0.50	7.8	<0.50	<0.50	110	1.8	<0.50	8.5	<0.50	<0.50	5.9	13
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.1	<0.50	<0.50	10	<0.50	<0.50	4.3	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.6	45	1	<0.50	<0.50	<0.50	<0.50	0.65	5.9
	9/30/2014	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	170	1.3	0.83	12	<0.50	<0.50	9.7	3.3
	12/11/2014	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	30	<0.50	<0.50	17	<0.50	<0.50	9.4	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	6.2	<0.50	<0.50	47.4	0.67	<0.50	1.1	<0.50	<0.50	1.9	<5
	6/17/2015	<0.50	<0.50	<0.50	<0.50	9.5	<0.50	<0.50	75	0.8	<0.50	4.3	<0.50	<0.50	4.6	4.9
	9/24/2015	<0.50	<0.50	<0.50	<0.50	8.4	<0.50	<0.50	39.1	0.65	<0.50	2.8	<0.50	<0.50	2.4	32.7
	12/8/2015	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	25.2	<0.50	<0.50	18	<0.50	<0.50	8.9	<0.50
	3/7/2016	<0.50	<2	<5	<0.50	4.4	<0.50	<0.50	51.9	<0.50	<0.50	18	<0.50	<0.50	10.3	0.57
	6/15/2016	<0.50	<2	<0.50	<0.50	3.7	<0.50	<0.50	13.1	<0.50	<0.50	0.67	<0.50	<0.50	1.2	5.3
	9/27/2016	<0.50	<2	<0.50	<0.50	8.6	<0.50	<0.50	25.2	<0.50	<0.50	2.3	<0.50	<0.50	3.1	23.9
	12/16/2016	<0.50	<2	<0.50	<0.50	3.4	<0.50	<0.50	22.5	<0.50	<0.50	8	<0.50	<0.50	5.8	0.86
	3/30/2017	<0.50	<2	<0.50	<0.50	<0.5	<0.5	<0.50	1.6	<0.50	<0.50	4.6	<0.50	<0.50	1.6	<0.50
	6/12/2017	<2.0	<2.0	<0.50	<0.50	2.1	<1.0	<0.50	9.9	<0.50	<0.50	4.4	<0.50	<0.50	3.1	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	6.8	<1.0	<0.50	6.7	<0.50	<0.50	1.5	<0.50	<0.50	1.6	22.6
	11/9/2017	<2.0	<2.0	<0.50	<0.50	5.00	<0.50	<0.50	22.80	<0.50	<0.50	9.50	<0.50	<0.50	6.50	1.1
3/20/2018	<0.500	<2.50	<0.500	<0.500	4.84	<0.500	<0.500	6.13	<0.500	0.322 J	2.49	<0.500	<0.500	2.06	<0.500	
7/1/2018	<0.500	<2.50	<0.500	<0.500	6.70	<0.500	0.204 J	16.1	0.303 J	0.427 J	0.530	<0.500	<0.500	1.63	10.5	
9/25/2018	<1.00	<5.00	<1.00	<1.00	7.33	<0.400	0.740	44.9	0.610	0.510	4.24	<0.400	<0.500	8.09	3.19	
12/4/2018	<1.00	<5.00	<1.00	<1.00	4.73	<0.400	<0.400	22.7	<0.400	<0.500	15.700	<0.400	<0.500	9.04	2.57	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-1 (continued)	3/21/2019	<1.00	<5.00	<1.00	<1.00	4.37	<0.400	0.780	28.5	0.530	<0.500	2.78	<0.400	<0.500	6.65	0.400
	6/5/2019	<1.00	<5.00	<1.00	<1.00	2.54	<0.400	<0.400	27.6	0.481	<0.500	12.9	<0.400	<0.500	8.43	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	8.66	<0.400	0.57	106	1.78	0.703	19.1	0.45	<0.500	18.4	2.97
	12/4/2019	<1.00	<5.00	<1.00	<1.00	3.22	<0.400	<0.400	26.6	0.494	<0.500	10.6	<0.400	<0.500	7.39	0.67
	3/10/2020	<1.00	<5.00	<1.00	<1.00	4.45	<0.400	<0.400	13.4	<0.400	<0.500	5.96	<0.400	<0.500	5.22	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	2.95	<0.400	0.42	23.5	0.520	<0.500	12.1	<0.400	<0.500	7.75	0.46
	10/7/2020	<1.00	<5.00	<1.00	<1.00	6.45	<0.400	<0.400	104	1.41	<0.500	26.4	<0.400	<0.500	22.2	1.80
	12/8/2020	<2.00	<5.00	<1.00	<1.00	5.47	<0.400	0.512	62.6	0.968	<0.500	19.0	<0.400	<0.500	12.3	1.42
	3/4/2021	<1.00	<5.00	<1.00	<1.00	3.38	<0.400	<0.400	37.2	0.608	<0.500	6.44	<0.400	<0.500	6.6	1.76
	6/16/2021	<1.00	<5.00	<1.00	<1.00	4.76	<0.400	0.624	75.8	0.892	<0.500	9.95	<0.400	<0.500	14.2	2.05
	9/15/2021	<1.00	<5.00	<1.00	<1.00	5.06	<0.400	0.465	69.8	0.878	<0.500	7.3	<0.400	<0.500	8.69	3.2
	12/9/2021	<1.00	<5.00	<1.00	<1.00	1.51	<0.400	<0.400	24.9	0.446	<0.500	16.8	<0.400	<0.500	6.84	1.56
	3/8/2022	<1.00	<5.00	<1.00	<1.00	1.33	<0.400	<0.400	20.9	0.420	<0.500	16.1	<0.400	<0.500	6.92	1.44
	06/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.800	<0.400	<0.500	4.93	<0.400	<0.500	1.09	<0.400
	9/15/2022	<1.00	<5.00	<1.00	<1.00	6.41	<0.400	0.45	112	1.73	0.5	19.1	0.73	<0.500	16.6	8.68
12/6/2022	<1.00	<5.00	<1.00	<1.00	4.37	<0.400	0.41	82.3	1.29	<0.500	30.3	0.56	<0.500	15.8	3.08	
MW-2	11/17/1993	-	51	-	-	12	<0.50	-	10	-	-	<0.50	<0.50	-	<0.50	<0.10
	9/1/1995	<0.50	16	<0.50	<0.20	8.2	<0.50	<0.50	2.5	<0.50	<0.50	<0.50	<0.50	-	<0.50	2.2
	9/24/1996	<0.50	19	<0.20	<0.20	9.6	0.5	<0.20	9.4	<0.20	<0.20	<0.20	<0.50	-	0.3	5.1
	12/2/1996	<0.50	8.8	<0.50	<0.20	6.9	0.6	<0.20	11	<1	<0.20	<0.50	<1	-	<0.30	7.2
	11/13/1997	<0.50	<1	<0.50	<0.50	5.32	0.571	<0.50	7.9	<0.50	<0.50	<0.50	<0.50	-	<0.50	<1
	8/11/1999	<1	18.3	<0.50	<0.50	6.38	<0.50	<0.50	20	<0.50	<0.50	<0.50	<1	-	10.4	1.64
	2/29/2000	<1	16	<0.50	<0.50	5.68	<0.50	<0.50	23.5	<0.50	<0.50	<0.50	<1	-	4.52	1.21
	6/27/2000	<1	18.3	<0.50	<0.50	5.34	<0.50	1.27	23.4	<0.50	<0.50	12.8	<1	-	16.6	<0.50
	5/30/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	-	<0.50	<0.50
	5/30/2002	<1	1.68	<0.50	<1	2.65	<0.50	<0.50	0.51	<0.50	<0.50	0.61	<0.50	-	<0.50	<0.50
	11/8/2002	<1	10.4	<0.50	<1	3.13	<0.50	<0.50	1.84	<0.50	<0.50	1.05	<0.50	-	0.98	<0.50
	5/30/2003	<1	3.64	<0.50	<1	1.95	<0.50	<0.50	0.59	<0.50	<0.50	6.6	<0.50	-	1.13	<0.50
	9/12/2007	<1	5.9	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	3/7/2008	<1	7.86	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.5	<0.500	<0.500	<0.500	<0.500
	9/18/2008	<1	5.93	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
3/24/2009	<0.50	4.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/16/2009	<0.50	5.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	0.85	<0.50	
3/19/2010	<0.50	5.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-2 (continued)	9/23/2010	<0.5	3.8	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	3/9/2011	<0.50	4.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/16/2011	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2012	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/13/2012	<0.50	3.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/14/2013	<0.50	3.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/19/2013	<0.50	2.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/30/2014	<0.50	2.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2015	<0.50	0.96	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/23/2015	<0.50	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/7/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/29/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/2/2018	<0.500	3.0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	9/25/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/21/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/5/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/5/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	10/8/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/9/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/4/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
3/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
06/16/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
9/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
12/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-3	11/17/1993	-	210	-	-	27	4	-	240	-	-	190	20	-	97	130
	9/1/1995	<50	<100	<50	<50	<50	<50	<50	2,700	<50	<50	1,300	<50	-	140	730
	9/24/1996	<5	<20	7.9	<2	12	<2	<2	1,100	9.5	4	1,800	21	-	330	82
	12/2/1996	<50	<50	<50	<20	<30	<50	<20	650	<100	<20	2,100	<100	-	470	<50
	11/12/1997	<25	<50	<25	<25	<25	<25	<25	464	<25	<25	2,000	<25	-	241	<50
	8/11/1999	<20	<100	<10	<10	<10	<10	<10	500	<10	<10	1,760	25.4	-	247	<10
	11/16/1999	<20	<50	<10	<20	14	<10	<10	628	15.2	<10	700	<10	-	132	<10
	2/29/2000	<20	<100	<10	<10	<10	<10	<10	473	<10	<10	1,890	25.4	-	356	<10
	6/27/2000	<20	<100	<10	<10	<10	<10	<10	410	<10	10.2	1,460	<20	-	241	<10
	8/31/2000	<20	<100	<10	<10	52.2	<10	<10	2,580	25.5	<10	399	<20	-	100	171
	11/30/2000	<5	<25	<2.5	<2.5	13.3	<2.5	<2.5	374	3.73	<2.5	366	<5	-	80.3	3.1
	2/27/2001	<5	<25	3.64	<2.5	5.78	<2.5	<2.5	153	<2.5	2.5	358	<5	-	76.1	<2.5
	5/29/2001	<5	<25	2.8	<2.5	<2.5	<2.5	<2.5	112	<2.5	<2.5	647	5.12	-	93.3	<2.5
	9/25/2001	<1.3	3.1	2.4	<1.3	10	2	<1.3	210	3	1.7	550	7.2	-	90	4.9
	12/17/2001	<10	<50	<5	<5	<5	<5	<5	164	<5	<5	826	16.9	-	155	<5
	3/19/2002	<5	<2.5	2.75	<5	<2.5	<2.5	<2.5	138	4.1	<2.5	758	9.6	-	107	<2.5
	5/30/2002	<10	7.8	<5	<10	27.8	<5	<5	1,380	42.6	6	302	11.5	-	55.1	96.7
	11/8/2002	<5	15	<2.5	<5	29.4	3.55	<2.5	399	9.05	5.7	359	5.8	-	67.1	19.4
	5/30/2003	<5	<2.5	6.45	<5	<2.5	<2.5	<2.5	50.1	3.65	<2.5	706	4.95	-	72.6	<2.5
	11/16/2004	<10	<5	<5	<10	15	<5	<5	440	5.9	<5	270	<5	-	72	<5
	3/23/2005	<2	2.26	4.16 B	<2	8.92	<1	<1	246	8.4	2.86	329	5.04	-	71.9	3.84
	5/18/2005	<2	<1	3.86	<2	5.74	<1	<1	188	4.72	3.02	304	5.06	-	88.5	<1
	5/23/2007	<2	<2	<2	<2	<2	<2	<2	110	6.3	<2	349	4.54	-	70.6	<2
	9/11/2007	<5	9.95	14.4	<5	43	6.1	<2.50	950	28.2	12	601	31	-	223	6.1
	12/12/2007	<10	<5	<5	<10	<5	<5	<5	95.7	<5	<5	254	<5	-	63.2	<5
	3/6/2008	<1	<0.500	2.10 J	<1	1.32	<0.500	<0.500	127	8.49	2.37	144	5.66	<0.500	94.7	<0.500
	9/19/2008	<5	3.7	2.65 J	<5	10.6	<2.50	<2.50	187	5.85	2.95	283	6.6	<2.50	75	<2.50
	12/10/2008	<0.90	1.5	1.9	<0.90	5.3	1.2	<0.90	120	4.3	1.5	200	3.8	<0.90	54	<0.90
	3/26/2009	<0.50	<0.50	1.4	<0.50	1.6	<0.50	<0.50	83	4.3	1.2	180	3.6	<0.50	46	<0.50
	6/17/2009	<0.50	<0.50	1.1	<0.50	0.89	<0.50	<0.50	76	4.7	0.71	190	3.4	<0.50	49	<0.50
	9/18/2009	<0.50	<0.50	3.3	<0.50	10	<0.50	<0.50	180	6.2	2.2	270	7.3	<0.50	62	1.2
	12/17/2009	<0.90	<0.90	0.96	<0.90	<0.90	<0.90	<0.90	50	3.2	<0.90	180	3.2	<0.90	47	<0.90
	3/19/2010	<0.90	<0.90	1 BE	<0.90	<0.90	<0.90	<0.90	77	5.4	<0.90	280	4.1	<0.90	49	<0.90
	6/16/2010	<0.50	<0.50	2.3	<0.50	1.6	0.9	<0.50	42	1.7	<0.50	180	1.9	<0.50	30	<0.50
	9/23/2010	<0.5	<0.5	2.8 BE	<0.5	0.56	<0.5	<0.5	75	4.4	0.51	220	3	<0.5	39	<0.5

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 NuStar Vancouver Facility
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-3	12/9/2010	<0.5	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	39	3.4	<0.5	210	3	<0.5	35	<0.5
(continued)	3/10/2011	<0.50	<0.50	5.4	<0.50	<0.50	<0.50	<0.50	8.9	1.1	<0.50	110	1.6	<0.50	15	<0.50
	6/10/2011	<0.5	<0.5	1.6	<0.5	2.2	0.76	<0.5	36	1.1	0.54	99	1.6	<0.5	30	<0.5
	9/16/2011	<0.50	<0.50	2	<0.50	3	0.59	<0.50	70	1.7	0.91	130	2.4	<0.50	31	<0.50
	12/9/2011	<0.50	<0.50	2.2	<0.50	2.9	0.54	<0.50	62	1.6	0.83	190	2.6	<0.50	45	<0.50
	3/12/2012	<0.50	<0.50	2.4	<0.50	0.83	<0.50	<0.50	52	2.8	1	140	3.1	<0.50	45	<0.50
	6/21/2012	<0.5	<0.5	2.3	<0.5	0.9	<0.5	<0.5	45	2.7	0.56	170	2.7	<0.5	37	<0.5
	9/13/2012	<0.50	<0.50	1.7	<0.50	4.1	<0.50	<0.50	100	2.1	1.4	140	3.3	<0.50	45	<0.50
	12/13/2012	<0.50	<0.50	1.3	<0.50	0.78	<0.50	<0.50	27	1.6	<0.50	170	2	<0.50	36	<0.50
	3/14/2013	<0.50	<0.50	1.8	<0.50	1	<0.50	<0.50	64	2.5	1.4	160	3.2	<0.50	53	<0.50
	6/14/2013	<0.90	<0.90	1.4	<0.90	1.1	<0.90	<0.90	68	3.1	1.3	210	3.3	<0.90	48	<0.90
	9/19/2013	<0.50	<0.50	1.1	<0.50	1.1	<0.50	<0.50	99	1.5	1.4	86	1.7	<0.50	30	<0.50
	12/16/2013	<0.50	<0.50	1.4	<0.50	1.3	<0.50	<0.50	47	2.1	0.81	170	2.4	<0.50	38	<0.50
	3/21/2014	<0.50	<0.50	1.3	<0.50	0.64	<0.50	<0.50	27	1.6	<0.50	150	2	<0.50	30	<0.50
	6/24/2014	<0.50	0.86	0.86	<0.50	1.4	<0.50	<0.50	65	3.2	1.3	180	3.2	<0.50	44	<0.50
	9/30/2014	<0.50	<0.50	1	<0.50	6.7	0.7	<0.50	110	2.1	1.3	180	2.8	<0.50	47	<0.50
	12/11/2014	<0.50	<0.50	1.2	<0.50	0.8	<0.50	<0.50	28	1.7	<0.50	150	2.2	<0.50	37	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/15/2015	<0.50	<0.50	0.86	<0.50	1.1	<0.50	<0.50	49	2	0.88	160	2.8	<0.50	44	<0.50
	12/9/2015	<0.50	<0.50	0.66	<0.50	4.9	<0.50	<0.50	72	1.8	1.1	145	1.8	<0.50	33.6	<0.50
	3/7/2016	<0.50	<2	0.76	<0.50	2.2	<0.50	<0.50	61.8	2.5	1.3	199	3.6	<0.50	45.1	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	50.2	0.82	<0.50	49.5	0.77	<0.50	17.4	<0.50
	9/30/2016	<0.50	<2	0.67	<0.50	8.2	0.73	<0.50	95.3	1.5	1.6	145	2	<0.50	40.1	<0.50
	12/16/2016	<0.50	<2	0.52	<0.50	1.1	<0.50	<0.50	26.8	0.9	0.57	86.2	1.2	<0.50	23.9	<0.50
	3/29/2017	<0.50	<2	<0.50	<0.50	7.1	1.3	<0.50	77.9	1.2	<0.50	67.6	0.64	<0.50	20.2	2.5
	6/14/2017	<2.0	<2.0	1.0	<0.50	2.1	<1.0	<0.50	39.0	1.5	<0.50	163	1.7	<0.50	30.4	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	5.6	<1.0	<0.50	73.3	1.3	<0.50	127	1.5	<0.50	29.5	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	5.0	<0.50	<0.50	59.5	0.6	<0.50	67	0.6	<0.50	16.1	0.7
	3/20/2018	<0.500	<2.50	0.380 J	<0.500	2.0	0.144 J	<0.500	77.8	2.2	1.99	194	3.4	<0.500	48.6	<0.500
	7/2/2018	<0.500	<2.50	0.439 J	<0.500	<0.500	3.2	<0.500	64.5	1.6	1.07	180	2.6	<0.500	43.1	<0.500
	9/26/2018	<1.00	<5.00	<1.00	<1.00	6.41	<0.400	<0.400	75.6	0.73	1.18	145	1.18	<0.500	36.3	<0.400
	12/7/2018	<2.00	<10.0	<2.00	<2.00	3.1	<0.800	<0.800	44.2	1.0	<1.00	96	1.0	<1.00	27.8	<0.800
	3/20/2019	<1.00	<5.00	<1.00	<1.00	0.930	<0.400	<0.400	37.5	1.16	1.03	112	1.55	<0.500	33.2	<0.400
	6/7/2019	<1.00	<5.00	1.02	<1.00	1.22	<0.400	<0.400	41.6	1.99	0.708	195	2.62	<0.500	39.8	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	7.00	0.47	<0.400	72.3	1.25	1.32	130	1.7	<0.500	32.9	<0.400

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-3 (continued)	12/4/2019	<1.00	<5.00	<1.00	<1.00	1.54	<0.400	<0.400	36.5	1.07	0.634	136	1.33	<0.500	36.4	<0.400
	3/10/2020	<1.00	<5.00	<1.00	<1.00	1.77	<0.400	<0.400	48.9	1.97	1.03	192	2.74	<0.500	50.9	<0.400
	6/17/2020	<2.00	<10.0	<2.00	<2.00	<0.800	<0.400	<0.400	18.6	1.16	<1.00	115	1.38	<1.00	22.8	<0.800
	10/7/2020	<1.00	<5.00	<1.00	<1.00	5.30	<0.400	<0.400	62.9	1.02	1.10	169	1.57	<0.500	32.6	<0.400
	12/8/2020	<10.0	<25.0	<5.00	<5.00	<2.00	<2.00	<2.00	29.7	<2.00	<2.50	145	<2.00	<2.50	36.1	<2.00
	3/4/2021	<1.00	<5.00	<1.00	<1.00	1.13	<0.400	<0.400	41.8	1.65	1.06	182	2.65	<0.500	46.7	<0.400
	6/16/2021	<2.50	<12.5	<2.50	<2.50	<1.00	<1.00	<1.00	31.5	1.44	<1.25	145	1.86	<1.25	36.3	<1.00
	9/14/2021	<1.00	<5.00	<1.00	<1.00	5.07	<0.400	<0.400	63.2	1.120	1.04	117	1.60	<0.500	33.1	<0.400
	12/9/2021	<1.00	<5.00	<1.00	<1.00	0.719	<0.400	<0.400	24.6	1.310	<0.500	183	2.50	<0.500	42.5	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	0.980	<0.400	<0.400	30.9	1.19	0.640	137	1.47	<0.500	29.3	<0.400
	06/16/2022	<1.00	<5.00	<1.00	<1.00	1.73	<0.400	<0.400	38.4	0.500	0.600	116	1.20	<0.500	28.6	<0.400
	9/15/2022	<2.00	<10.0	<2.00	<2.00	2.72	<0.400	<0.400	41.9	<0.500	<1.00	107	1.8	<1.00	24.5	<0.500
	12/6/2022	<1.00	<5.00	<1.00	<1.00	1.13	<0.400	<0.400	31.4	1.23	<0.500	137	1.74	<0.500	29.5	<0.400
MW-4	11/17/1993	-	850	-	-	12	<50	-	20	-	-	40	<50	-	5.4	<10
	9/1/1995	<5	340	<5	<5	5.2	<50	<5	14	<5	<5	<50	<50	-	<50	30
	9/24/1996	<0.50	300	<0.20	<0.20	7.1	1.4	<0.20	3.2	<0.20	1	0.5	<0.50	-	0.8	4.7
	12/2/1996	<0.50	310	<0.50	0.3	3.8	1	<0.20	19	<1	0.3	<0.50	<1	-	<0.30	39
	11/13/1997	<0.50	252	<0.50	<0.50	4.22	1.23	<0.50	6.91	<0.50	0.688	<0.50	<0.50	-	<0.50	<1
	8/11/1999	<2	144	<1	<1	1.21	<1	<1	<1	<1	<1	3.6	<2	-	<1	<1
	11/16/1999	<1	26.3	<0.50	<1	2.3	<0.50	<0.50	4.18	<0.50	<0.50	1.2	<0.50	-	0.88	2.07
	2/29/2000	<2	119	<1	<1	2.84	<1	<1	4.1	<1	<1	<1	<2	-	<1	5.72
	6/28/2000	<5	59.4	<2.5	<2.5	3.89	<2.5	<2.5	2.5	<2.5	<2.5	<2.5	<5	-	<2.5	<2.5
7/5/2000	Well Abandoned															
MW-5	11/17/1993	-	1,900	-	-	<25	<25	-	100	-	-	1,200	<25	-	52	<50
	9/1/1995	<1	<2	<1	<2	<1	<1	<1	1,300	<1	<1	60,000	<1	-	<1	<2
	9/24/1996	<5	140	<2	<2	35	<2	7.5	2,600	80	5.3	16,000	64	-	670	370
	12/2/1996	71	<50	<50	27	<30	<50	<20	5,600	<100	<20	27,000	110	-	1,700	340
	11/12/1997	<500	<1	<500	<500	<500	<500	<500	<500	<500	<500	28,000	<500	-	1,250	<1
	8/11/1999	<200	<1	<100	<100	<100	<100	<100	1,750	<100	<100	25,100	<200	-	862	238
	2/29/2000	<100	<500	<50	<50	<50	<50	<50	126	<50	<50	5,250	<100	-	135	<50
	8/31/2000	<50	<250	<25	<25	41.4	<25	<25	1,860	<25	<25	5,660	<50	-	347	280
	11/30/2000	<50	<250	<25	<25	27.3	<25	<25	3,850	26.8	<25	6,150	<50	-	511	189
	2/27/2001	<50	<250	<25	<25	<25	<25	<25	1,370	<25	<25	7,350	<50	-	445	127
	5/30/2001	<50	<250	<25	<25	<25	<25	<25	2,410	<25	<25	5,560	<50	-	439	129

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		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-5	9/25/2001	<25	200	<25	<25	34	<25	<25	1,800	<25	<25	2,200	<25	-	180	180
(continued)	12/17/2001	<100	<500	<50	<50	<50	<50	<50	1,480	<50	<50	10,100	<100	-	646	<50
	3/19/2002	<50	<25	<25	<50	<25	<25	<25	360	<25	<25	4,640	<25	-	221	114
	5/29/2002	<50	46	<25	<50	<25	<25	<25	916	<25	<25	4,330	<25	-	238	39.5
	8/29/2002	<50	<25	<25	<50	<25	<25	<25	1,160	<25	<25	4,090	<25	-	288	310
	11/8/2002	<5	178	<2.5	<5	8.3	<2.5	<2.5	385	3.25	<2.5	603	<2.5	-	63.4	66
	1/23/2003	<50	<25	<25	<50	<25	<25	<25	582	<25	<25	4,090	<25	-	349	<25
	5/30/2003	<10	14.1	<5	<10	<5	<5	<5	382	<5	<5	1,450	7.9	-	140	67
	11/10/2003	<1	84.2	<1	<1	1.06	<1	<1	90.7	<1	<1	161	<1	-	30.8	9.42
	1/26/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5/4/2004	<20	<20	<20	<20	<20	<20	<20	432	<20	<20	2,440	<20	-	178	188
	8/17/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11/2/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11/16/2004	<50	<50	<50	<50	<50	<50	<50	6,300	<50	<50	1,800	<50	-	370	990
	3/23/2005	<20	<10	<10	<20	26.2	<10	<10	2,350	27.6	<10	511	<10	-	147	604
	5/18/2005	<5	<2.5	<2.5	<5	9.25	<2.5	6.45	817	10.2	<2.5	611	<2.5	-	156	329
	8/18/2005	<5	5.15	<2.50	<5	14.4	<2.50	<2.50	397	4.7	<2.50	169 B	<2.50	-	81.8	278
	11/15/2005	<20	<10	<10	<20	36.2	<10	<10	2,790	14	<10	408	<10	-	177	615
	2/21/2006	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	72.7	1.06	<0.500	184	0.78	-	31.5	5.05
	6/5/2006	<20	<20	<20	<20	<20	<20	<20	2,800	<20	<20	157	<20	-	75	199
	9/6/2006	<2	10.6	<1	<2	8.3	<1	<1	377	3.66	<1	104	<1	-	45	29.9
	12/6/2006	<2	<1	<1	<2	1.32	<1	1.34	113	1.28	1.52	240	1.6	-	58	43.3
	2/7/2007	<10	<5	<5	<10	<5	<5	<5	1,220	18	<5	124	<5	-	26.9	600
	5/22/2007	<5	<5	<5	<5	<5	<5	<5	634	8.45	<5	102	<5	-	40.8	59.4
	9/12/2007	<1	67.5	<0.50	<1	<0.50	<0.50	<0.50	16.2	<0.50	<0.50	0.89	<0.50	-	1.38	1.86
	12/13/2007	<1	<0.50	<0.50	<1	7.1	<0.50	4.67	2,420	9.22	1.14	180	<0.50	-	179	416
	3/7/2008	<1	<0.500	<0.500	<1	2.18	<0.500	1.33	411	3.21	<0.500	86.4	<0.500	<0.500	26.1	105
	9/18/2008	<1	101	<0.500	<1	0.79	<0.500	<0.500	11.2	<0.500	<0.500	1.14	<0.500	<0.500	1.27	1.74
	12/10/2008	<2	<2	<2	<2	3.7	<2	<2	360	2.3	<2	49	<2	<2	53	150
	3/27/2009	<0.50	4.2	<0.50	<0.50	4	<0.50	<0.50	170	1	<0.50	0.59	<0.50	<0.50	<0.50	64
	6/17/2009	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	0.6	160	2.5	<0.50	11	<0.50	<0.50	12	11
	9/18/2009	<0.50	65 BE	<0.50	<0.50	<0.50	<0.50	<0.50	3.6	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	1.2
	12/17/2009	<0.50	<0.80	<0.50	<0.50	2.1	<0.50	1.4	340	2	<0.50	19	<0.50	<0.50	37	93
	3/19/2010	<0.50	1.4	<0.50	<0.50	4.4	<0.50	<0.50	72	<0.50	<0.50	24	<0.50	<0.50	14	21
	6/16/2010	<0.50	<0.50	<0.50	<0.50	3.6	<0.50	0.83	94	0.65	0.54	4.1	<0.50	<0.50	10	23

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		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-5 (continued)	9/23/2010	<0.5	59	<0.5	<0.5	0.84	<0.5	<0.5	9.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.97	1.3
	12/9/2010	<0.5	<0.5	<0.5	<0.5	0.84	<0.5	<0.5	140	0.73	<0.5	5.6	<0.5	<0.5	8.8	15
	3/11/2011	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	34	<0.50	<0.50	8.4	<0.50	<0.50	7.6	4.7
	6/10/2011	<0.5	<0.5	<0.5	<0.5	5	<0.5	<0.5	40	<0.5	0.63	2.2	<0.5	<0.5	3.8	26
	9/19/2011	<0.50	2.3	<0.50	<0.50	2.8	<0.50	<0.50	97	<0.50	<0.50	1.3	<0.50	<0.50	11	6.3
	12/9/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	47	<0.50	<0.50	2.7	<0.50	<0.50	7.7	2.8
	3/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4
	6/22/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	<0.5	<0.5	0.54	<0.5	<0.5	2.9	3
	9/14/2012	<0.50	20	<0.50	<0.50	0.75	<0.50	<0.50	26	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4
	12/13/2012	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	67	0.65	<0.50	<0.50	<0.50	<0.50	1.7	6.6
	3/15/2013	<0.50	7.4	<0.50	<0.50	1.5	<0.50	<0.50	48	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	6.6
	6/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.5	<0.50	<0.50	7.2	<0.50	<0.50	7.2	1.7
	9/19/2013	<0.50	23	<0.50	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	0.61
	12/16/2013	<0.50	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	180	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	71
	3/21/2014	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	39	<0.50	<0.50	<0.50	<0.50	<0.50	3.4	10
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<5	<0.50	<0.50	14	<0.50	<0.50	1.3	<0.50	<0.50	8	2.3
	9/30/2014	<0.50	28	<0.50	<0.50	<5	<0.50	<0.50	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.6
	12/16/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	33	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	1.9
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26.5	<0.50	<0.50	8.4	<0.50	<0.50	5.8	5.6
	6/17/2015	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	3.2	<0.50	<0.50	0.63	<0.50	<0.50	0.64	<0.50
	9/24/2015	<0.50	24.6	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	199	<0.50	<0.50	29.5	<0.50	<0.50	43.2	32.3
	12/8/2015 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.68	175	<0.50	<0.50	27.1	<0.50	<0.50	38.5	28.4
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	9.9	<0.50	<0.50	3.1	<0.50
	6/17/2016	<0.50	7.5	<0.50	<0.50	<0.50	<0.50	<0.50	23.3	<0.50	<0.50	7.3	<0.50	<0.50	3.2	<0.50
	9/29/2016	<5	<20	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	<0.50	11.5	<0.50	<0.50	2.5	1.1
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	8.4	<0.5	<0.5	6.5	<0.5	<0.5	5.8	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	4.2	<0.50	<0.50	16.3	<0.50	<0.50	6.8	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	1.60	<1.0	<0.50	15.6	<0.50	<0.50	26.7	<0.50	<0.50	15.6	0.64
11/7/2017	<2.0	<2.0	<0.50	<0.50	0.99	<0.50	<0.50	35.6	<0.50	<0.50	3.5	<0.50	<0.50	9.7	5.30	
3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.9	<0.500	<0.500	10.6	0.199 J	<0.500	2.4	0.260 J	
6/29/2018	<0.500	<2.50	<0.500	<0.500	0.56	<0.500	<0.500	45.5	0.174 J	<0.500	21.3	<0.500	<0.500	11.8	1.17	
9/27/2018	<1.00	26.9	<1.00	<1.00	<0.400	<0.400	<0.400	0.562	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
12/7/2018	<1.00	<5.00	<1.00	<1.00	1.03	<0.400	<0.400	129.0	<0.400	<0.500	4.7	<0.400	<0.500	11.7	4.80	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-5 (continued)	3/26/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.01	<0.400	<0.500	0.947	<0.400	<0.500	0.977	<0.400
	6/7/2019	<1.00	<5.00	<1.00	<1.00	0.404	<0.400	<0.400	11.1	<0.400	<0.500	20.4	<0.400	<0.500	8.63	<0.400
	9/26/2019	<1.00	<5.00	<1.00	<1.00	<0.4	<0.400	<0.400	10.7	<0.400	<0.500	0.972	<0.400	<0.500	1.35	1.10
	12/4/2019	<1.00	<5.00	<1.00	<1.00	0.817	<0.400	1.60	632	1.11	<0.500	0.925	<0.400	<0.500	9.85	10.70
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	14.3	<0.400	<0.500	18.7	<0.400	<0.500	7.11	2.58
	6/18/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	10.4	<0.400	<0.500	17.3	<0.400	<0.500	18.3	0.41
	10/6/2020	<1.00	8.79	<1.00	<1.00	<0.400	<0.400	<0.400	5.74	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	1.10
	12/10/2020	<2.00	<5.00	<1.00	<1.00	0.499	<0.400	<0.400	38.4	<0.400	<0.500	<0.400	<0.400	<0.500	3.67	4.77
	3/3/2021	<1.00	6.41	<1.00	<1.00	0.664	<0.400	<0.400	10.4	<0.400	<0.500	7.5	<0.400	<0.500	5.55	20.5
	6/16/2021	<1.00	<5.00	<1.00	<1.00	6.51	<0.400	0.963	697	4.67	0.684	20.5	<0.400	<0.500	26.5	72.3
	9/15/2021	<1.00	<5.00	<1.00	<1.00	1.06	<0.400	<0.400	20.3	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	7.48
	12/9/2021	<1.00	<5.00	<1.00	<1.00	0.522	<0.400	0.53	89	0.857	<0.500	10.2	<0.400	<0.500	6.02	33.9
	3/9/2022	<1.00	<5.00	<1.00	<1.00	0.620	<0.400	<0.400	81.9	0.640	<0.500	14.4	<0.400	<0.400	7.62	8.04
	06/16/2022	<1.00	<5.00	<1.00	<1.00	0.640	<0.400	<0.400	17.0	<0.400	<0.500	0.760	<0.400	<0.500	2.00	1.93
	9/14/2022	<1.00	<5.00	<1.00	<1.00	0.430	<0.400	<0.400	2.67	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	1.83
12/8/2022	<10.0	<50.0	<10.0	<10.0	<4.00	<4.00	<4.00	279	<4.00	<5.00	<4.00	<4.00	<5.00	<4.00	30.3	
MW-6	11/17/1993	-	<1	-	-	<0.50	<0.50	-	1.2	-	-	2.1	<0.50	-	0.54	<1
	9/1/1995	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<1
	9/24/1996	<0.50	<2	<0.20	<0.20	<0.20	<0.20	<0.20	0.3	<0.20	<0.20	<0.20	<0.50	-	<0.20	<1
	12/2/1996	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.20	<0.20	<1	<0.20	<0.50	<1	-	<0.20	<0.20
	11/12/1997	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.03	<0.50	-	<0.50	<1
	8/11/1999	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	-	1.37	<0.50
	11/16/1999	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	2/29/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.654	<1	-	<0.50	<0.50
	6/27/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	-	<0.50	<0.50
	5/29/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	-	<0.50	<0.50
	5/30/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	1.51	<0.50	<0.50	1.31	<0.50	-	<0.50	<0.50
	8/28/2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11/8/2002	<1	<0.50	<0.50	<1	0.51	<0.50	<0.50	2.55	<0.50	<0.50	0.97	<0.50	-	0.55	0.52
	1/23/2003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5/30/2003	<0.50	<0.50	<0.50	<1	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	3.73	<0.50	-	0.99	<0.50
11/17/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	
5/17/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	
9/12/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-6 (continued)	3/6/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.16	<0.500	<0.500	<0.500	<0.500
	9/19/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	3/24/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/23/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	3/9/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/15/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/5/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/14/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/19/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	10/2/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/7/2016	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2016	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	9/25/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	3/22/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	6/5/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	12/5/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	10/8/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
12/9/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	
3/4/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	
6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	
9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	
12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-6 (continued)	3/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.549	<0.400	<0.500	<0.400	<0.400
	12/6/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-7	12/2/1996	81	<50	<50	39	<30	<50	110	110	<100	<20	73,000	1,900	-	7,600	<50
	11/12/1997	<500	<1	<500	<500	<500	<500	<500	<500	<500	<500	36,400	<500	-	7,670	<1
	8/11/1999	<1	<5	<500	<500	<500	<500	<500	<500	<500	<500	49,000	1,210	-	4,650	<500
	11/16/1999	<100	<250	<50	<100	<50	<50	92	353	<50	<50	54,800	914	-	5,320	<50
	2/28/2000	<1	<5	<500	<500	<500	<500	<500	<500	<500	<500	52,400	<1	-	4,060	<500
	6/28/2000	<1	<5	<500	<500	<500	<500	<500	<500	<500	<500	54,300	<1	-	3,390	<500
	8/31/2000	<500	<2	<250	<250	<250	<250	<250	<250	<250	<250	50,900	824	-	3,960	<250
	11/30/2000	<500	<2	<250	<250	<250	<250	<250	<250	<250	<250	33,500	520	-	3,560	<250
	2/27/2001	<500	<2	<250	<250	<250	<250	<250	386	<250	<250	26,700	<500	-	3,290	<250
	5/30/2001	<200	<1,000	<100	<100	<100	<100	<100	374	<100	<100	20,400	214	-	2,820	<100
	9/25/2001	<25	<25	<25	<25	28	<25	35	350	<25	<25	19,000	260	-	2,500	<25
	12/17/2001	<100	<50	<50	<50	84.6	<50	<50	506	<50	<50	10,100	200	-	1,960	<50
	3/18/2002	<50	<25	<25	<50	<25	<25	<25	206	<25	<25	7,250	71	-	1,020	<25
	5/31/2002	<50	<25	<25	<50	<25	<25	<25	42.5	<25	<25	5,500	<25	-	311	<25
	8/29/2002	<50	<25	<25	<50	<25	<25	50.5	93	<25	<25	4,940	44.5	-	634	<25
	11/7/2002	<50	<25	<25	<50	<25	<25	<25	123	<25	<25	5,810	43	-	758	<25
	1/23/2003	<20	<10	<10	<20	<10	<10	<10	59.8	<10	<10	2,010	14	-	282	<10
	5/28/2003	<10	<5	<5	<5	6.3	<5	<5	<5	<5	<5	1,080	10.9	-	67.9	<5
	11/11/2003	<20	<20	<20	<20	40.2	<20	<20	246	<20	<20	2,460	62	-	599	<20
	1/27/2004	<20	<10	<10	<20	17	<10	<10	105	<10	<10	3,510	33	-	380	<10
	5/4/2004	<20	<20	<20	<20	<20	<20	<20	72.4	<20	<20	3,940	22	-	323	<20
	11/16/2004	<50	<50	<50	<50	<50	<50	<50	99	<50	<50	8,000	<50	-	520	<50
	3/24/2005	<50	<25	<25	<50	<25	<25	<25	98.5	<25	<25	3,930	26	-	404	<25
	5/18/2005	<10	<5	<5	<10	<5	<5	<5	72.7	<5	<5	1,310	12.4	-	180	<5
	05/18/2005 DUP	<10	<5	<5	<10	<5	<5	<5	69.4	<5	<5	1,250	12.4	-	179	<5
	8/18/2005	<20	<10	<10	<20	<10	<10	<10	54.8	<10	<10	1,800	<10	-	237	<10
11/15/2005	<20	<10	<10	<20	15.2	<10	<10	107	<10	<10	1,960	29.6	-	333	<10	
2/21/2006	<20	<10	<10	<20	<10	<10	<10	<10	<10	<10	2,640	<10	-	139	<10	
6/5/2006	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	26,100	<200	-	568	<200	
9/6/2006	<100	<50	<50	<100	<50	<50	<50	56	<50	<50	12,800	<50	-	422	<50	

Appendix B
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-7	12/6/2006	<200	<100	<100	<200	<100	<100	<100	<100	<100	<100	24,600	<100	-	408	<100
(continued)	2/7/2007	<200	<100	<100	<200	<100	<100	<100	<100	<100	<100	31,500	<100	-	352	<100
	5/22/2007	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	29,100	<200	-	450	<200
	9/12/2007	<200	<100	<100	<200	<100	<100	<100	<100	<100	<100	21,300	<100	-	366	<100
	12/13/2007	<500	<250	<250	<500	<250	<250	<250	345	<250	<250	18,700	<250	-	1,040	280
	03/06/2008 ⁷	<1	<0.500	<0.500	<1	5.06	2.57	3.99	42.3	2.9	<0.500	26,300	38.7	<0.500	430	<0.500
	6/10/2008	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	27,000	<500	<500	575	<500
	9/18/2008	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	23,200	<500	<500	530	<500
	12/11/2008	<50	<50	<50	<50	<50	<50	<50	130	<50	<50	15,000	<50	<50	450	<50
	12/11/2008 DUP	<50	<50	<50	<50	<50	<50	<50	120	<50	<50	14,000	<50	<50	430	<50
	3/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	420	<0.50	<0.50	3,330	<0.50	<0.50	270	<0.50
	6/18/2009	<3	<3	<3	<3	3.7	<3	<3	520	<3	<3	890	5.2	<3	350	<3
	06/18/2009 DUP	<2.5	<2.5	<2.5	<2.5	3.8	<2.5	<2.5	520	<2.5	<2.5	910	5.6	<2.5	360	<2.5
	9/18/2009	<3	<3	<3	<3	9.8	<3	5.5	930	<3	<3	2,600	10	<3	250	<3
	09/18/2009 DUP	<3	<3	<3	<3	8.7	<3	4.8	850	<3	<3	2,600	9.3	<3	240	<3
	12/18/2009	<5	<5	<5	<5	6.7	<5	<5	330	<5	<5	1,600	6.7	<5	160	<5
	12/18/2009 DUP	<5	<5	<5	<5	6.6	<5	<5	320	<5	<5	1,500	6.6	<5	160	<5
	3/16/2010	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	180	<2.5	<2.5	510	<2.5	<2.5	52	<2.5
	03/16/2010 DUP	<2	<2	<2	<2	<2	<2	<2	180	<2	<2	560	<2	<2	55	<2
	6/17/2010	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	360	<1.5	<1.5	200	2.7	<1.5	72	<1.5
	06/17/2010 DUP	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	360	<1.5	<1.5	200	2.8	<1.5	72	<1.5
	9/23/2010	<3	<3	<3	<3	3.3	<3	<3	690	<3	<3	750	3.5	<3	110	4.8
	09/23/2010 DUP	<3	<3	<3	<3	3.1	<3	<3	700	<3	<3	740	3.8	<3	100	4.1
	12/10/2010	<0.9	<0.9	<0.9	<0.9	1.8	<0.9	<0.9	94	<0.9	<0.9	220	1.6	<0.9	36	1.7
	12/10/2010 DUP	<0.9	<0.9	<0.9	<0.9	1.7	<0.9	<0.9	98	<0.9	<0.9	230	1.7	<0.9	36	1.8
	3/11/2011	<0.90	<0.90	<0.90	<0.90	6.6	<0.90	1.6	150	0.91	<0.90	420	5.1	<0.90	82	9.3
	03/11/2011 DUP	<0.90	<0.90	<0.90	<0.90	6.5	<0.90	1.9	150	1.1	<0.90	400	5.2	<0.90	80	9.7
	6/7/2011	<2.5	<2.5	<2.5	<2.5	4.8	<2.5	3.4	1,400	3.3	<2.5	430	4	<2.5	110	7.9
	06/07/2011 DUP	<6	<6	<6	<6	<6	<6	<6	1,400	<6	<6	400	<6	<6	110	7.8
	9/19/2011	<5	<5	<5	<5	<5	<5	<5	1,300	<5	<5	410	<5	<5	84	78
	09/19/2011 DUP	<7	<7	<7	<7	<7	<7	<7	1,300	<7	<7	420	<7	<7	87	81
	12/7/2011	<5	<5	<5	<5	8	<5	6.9	3,400	6.8	<5	200	<5	<5	32	110
	12/07/2011 DUP	<6	<6	<6	<6	7.6	<6	7.8	3,400	6.8	<6	210	<6	<6	32	110
	3/12/2012	<5	<5	<5	<5	9.2	<5	<5	1,600	<5	<5	41	<5	<5	8.6	600
	03/12/2012 DUP	<7	<7	<7	<7	9.5	<7	<7	1,600	<7	<7	42	<7	<7	8.9	660

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-7	06/22/2012	<2	9.2	<2	<2	9.8	<2	<2	540	<2	<2	24	<2	<2	5.1	300
(continued)	06/22/2012 DUP	<2	8.1	<2	<2	9	<2	<2	500	<2	<2	25	<2	<2	5.2	290
	9/14/2012	<0.50	6.3	<0.50	<0.50	3.8	<0.50	0.54	180	0.7	<0.50	28	<0.50	0.52	5.2	80
	09/14/2012 DUP	<0.50	5.7	<0.50	<0.50	3.8	<0.50	<0.50	180	0.78	<0.50	28	<0.50	<0.50	5.3	79
	12/14/2012	<0.50	6.3	<0.50	<0.50	1.9	<0.50	<0.50	130	<0.50	<0.50	8.2	<0.50	<0.50	5.3	16
	12/14/2012 DUP	<0.50	5.6	<0.50	<0.50	1.8	<0.50	<0.50	130	<0.50	<0.50	11	<0.50	<0.50	6.8	18
	3/15/2013	<0.50	5.2	<0.50	<0.50	0.68	<0.50	<0.50	110	<0.50	<0.50	1.5	<0.50	<0.50	0.75	11
	03/15/2013 DUP	<0.50	5.4	<0.50	<0.50	0.69	<0.50	<0.50	110	<0.50	<0.50	1.6	<0.50	<0.50	0.78	11
	6/14/2013	<0.50	2	<0.50	<0.50	<0.50	<0.50	<0.50	57	<0.50	<0.50	1.6	<0.50	<0.50	<0.50	15
	06/14/2013 DUP	<0.50	2	<0.50	<0.50	0.51	<0.50	<0.50	58	<0.50	<0.50	1.5	<0.50	<0.50	<0.50	16
	9/20/2013	<0.50	3	<0.50	<0.50	1.5	<0.50	<0.50	56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10
	09/20/2013 DUP	<0.50	3	<0.50	<0.50	1.5	<0.50	<0.50	56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10
	12/16/2013	<0.50	2.4	<0.50	<0.50	2.9	<0.50	<0.50	6.9	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	9.1
	12/16/2013 DUP	<0.50	2.4	<0.50	<0.50	2.4	<0.50	<0.50	6.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.9
	3/24/2014	<0.50	0.97	<0.50	<0.50	1.6	<0.50	<0.50	13	<0.50	<0.50	9.8	<0.50	<0.50	2.6	7.6
	3/24/2014 DUP	<0.50	1	<0.50	<0.50	1.6	<0.50	<0.50	13	<0.50	<0.50	9.4	<0.50	<0.50	2.5	7.7
	6/25/2014	<0.50	1.3	<0.50	<0.50	0.17	<0.50	<0.50	0.59	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3
	6/25/2014 DUP	<0.50	0.15	<0.50	<0.50	0.19	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4
	9/30/2014	<0.50	1.9	<0.50	<0.50	2.7	<0.50	<0.50	4.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.8
	9/30/2014 DUP	<0.50	1.7	<0.50	<0.50	2.6	<0.50	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.8
	12/15/2014	<0.50	1.2	<0.50	<0.50	3.4	<0.50	<0.50	12	<0.50	<0.50	<0.50	<0.50	<0.50	1	15
	12/15/2014 DUP	<0.50	1.6	<0.50	<0.50	4.5	<0.50	<0.50	16	<0.50	<0.50	0.61	<0.50	<0.50	1.5	21
	3/20/2015	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	8.4	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	1
	3/20/2015 DUP	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	7.7	<0.50	<0.50	0.53	<0.50	<0.50	1	10.4
	6/17/2015	<0.50	0.72	<0.50	<0.50	2.6	<0.50	<0.50	12	<0.50	<0.50	1.2	<0.50	<0.50	1	12.6
	6/17/2015 DUP	<0.50	0.71	<0.50	<0.50	2.6	<0.50	<0.50	12.2	<0.50	<0.50	0.96	<0.50	<0.50	1	12.3
	9/24/2015	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	12.4	<0.50	<0.50	4.5	<0.50	<0.50	4.2	4.6
	9/24/2015 DUP	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	12.7	<0.50	<0.50	4.5	<0.50	<0.50	4.2	4.8
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	9.4	<0.50	<0.50	1.7	1.9
	6/17/2016	<0.50	<2	<0.50	<0.50	0.6	<0.50	<0.50	10.9	<0.50	<0.50	0.69	<0.50	<0.50	2.1	5.4
	6/17/2016 DUP	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	0.62	<0.50	<0.50	2	5.4
	9/29/2016	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	10.9	<0.50	<0.50	<0.50	<0.50	<0.50	5.5	5.5
	9/29/2016 DUP	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	10.9	<0.50	<0.50	<0.50	<0.50	<0.50	6	5.5
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	9.2	<0.50	<0.50	0.65	<0.50	<0.50	<0.50	0.98
	12/14/2016 DUP	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	9.4	<0.50	<0.50	0.78	<0.50	<0.50	<0.50	1

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		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-7	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	0.73	<0.5
(continued)	3/28/2017 DUP	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	0.69	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.55	2.5
	6/14/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	1.7	<0.50	<0.50	2.60	<0.50	<0.50	1.60	1.6
	9/27/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	1.7	<0.50	<0.50	2.60	<0.50	<0.50	1.60	1.7
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	<0.50	6.30	<0.50	<0.50	7.80	1.4
	11/7/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	3.80	<0.50	<0.50	6.40	1.5
	3/21/2018	<0.500	<2.50	<0.500	<0.500	0.495 J	<0.500	<0.500	17.6	<0.500	<0.500	0.228 J	<0.500	<0.500	2.86	4.9
	3/21/2018 DUP	<0.500	<2.50	<0.500	<0.500	0.55	<0.500	<0.500	17.2	<0.500	<0.500	0.284 J	<0.500	<0.500	2.99	4.9
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.461 J	<0.500	<0.500	5.5	<0.500	<0.500	9.89	<0.500	<0.500	3.53	1.5
	6/29/2018 DUP	<0.500	<2.50	<0.500	<0.500	0.437 J	<0.500	<0.500	5.4	<0.500	<0.500	8.94	<0.500	<0.500	3.48	1.6
	9/27/2018	<1.00	<5.00	<1.00	<1.00	1.23	<0.400	<0.400	8.48	<0.400	<0.500	6.50	<0.400	<0.500	10.8	2.08
	12/7/2018	<1.00	<5.00	<1.00	<1.00	3.97	<0.400	0.43	15.4	<0.400	<0.500	30.40	<0.400	<0.500	18.10	1.6
	12/7/2018 DUP	<1.00	<5.00	<1.00	<1.00	3.84	<0.400	0.47	17.7	<0.400	<0.500	26.60	<0.400	<0.500	16.40	1.1
	3/20/2019	<1.00	<5.00	<1.00	<1.00	1.87	<0.400	<0.400	22.2	<0.400	<0.500	22.3	<0.400	<0.500	10.8	0.605
	3/20/2019 DUP	<1.00	<5.00	<1.00	<1.00	1.84	<0.400	<0.400	22.8	<0.400	<0.500	22.8	<0.400	<0.500	10.7	0.553
	6/5/2019	<1.00	<5.00	<1.00	<1.00	2.91	<0.400	0.559	20.2	<0.400	<0.500	28.1	<0.400	<0.500	12.7	1.11
	6/5/2019 DUP	<1.00	<5.00	<1.00	<1.00	2.87	<0.400	0.494	20.2	<0.400	<0.500	28.4	<0.400	<0.500	12.7	1.15
	9/26/2019	<1.00	<5.00	<1.00	<1.00	2.98	<0.400	0.65	20.1	<0.400	<0.500	41.7	<0.400	<0.500	17.9	0.42
	9/26/2019 DUP	<1.00	<5.00	<1.00	<1.00	2.95	<0.400	0.672	21	<0.400	<0.500	39.6	<0.400	<0.500	17.8	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	4.61	<0.400	0.837	29.4	<0.400	<0.500	65.8	<0.400	<0.500	31	<0.400
	12/3/2019 DUP	<1.00	<5.00	<1.00	<1.00	4.58	<0.400	0.839	29.7	<0.400	<0.500	66.1	<0.400	<0.500	31.8	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	0.936	<0.400	<0.400	26.5	<0.400	<0.500	45.8	<0.400	<0.500	14.1	0.476
	3/11/2020 DUP	<1.00	<5.00	<1.00	<1.00	0.912	<0.400	<0.400	25.7	<0.400	<0.500	47.4	<0.400	<0.500	14.3	0.44
	6/18/2020	<1.00	<5.00	<1.00	<1.00	0.78	<0.400	<0.400	10.2	<0.400	<0.500	43	<0.400	<0.500	10	<0.400
	6/18/2020 DUP	<1.00	<5.00	<1.00	<1.00	0.85	<0.400	<0.400	11.1	<0.400	<0.500	40.8	<0.400	<0.500	10.1	<0.400
	10/8/2020	<1.00	<5.00	<1.00	<1.00	1.97	<0.400	0.481	23.1	<0.400	<0.500	49.5	<0.400	<0.500	19.7	<0.400
	10/8/2020 DUP	<1.00	<5.00	<1.00	<1.00	1.96	<0.400	0.431	23.6	<0.400	<0.500	50.2	<0.400	<0.500	19.6	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	7.05	<0.400	1.41	56.3	0.552	<0.500	108	<0.400	<0.500	45.4	<0.400
	12/9/2020 DUP	<2.00	<5.00	<1.00	<1.00	6.83	<0.400	1.38	55.6	0.519	<0.500	106	<0.400	<0.500	44.5	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	1.28	<0.400	<0.400	20	<0.400	<0.500	56.4	<0.400	<0.500	22.4	<0.400
	3/3/2021 DUP	<1.00	<5.00	<1.00	<1.00	1.24	<0.400	<0.400	19.2	<0.400	<0.500	54.3	<0.400	<0.500	22.2	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	4.3	<0.400	0.927	35.5	<0.400	<0.500	78	<0.400	<0.500	39.6	0.45
	6/16/2021 DUP	<1.00	<5.00	<1.00	<1.00	4.12	<0.400	0.825	32.6	<0.400	<0.500	72.8	<0.400	<0.500	37.3	0.426

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-7 (continued)	9/14/2021	<1.00	<5.00	<1.00	<1.00	2.11	<0.400	0.46	25.8	<0.400	<0.500	47.6	<0.400	<0.500	20.6	<0.400
	9/14/2021 DUP	<1.00	<5.00	<1.00	<1.00	2.24	<0.400	0.50	26.7	<0.400	<0.500	46	<0.400	<0.500	21.1	<0.400
	12/8/2021	<1.00	<5.00	<1.00	<1.00	4.67	<0.400	0.87	39.1	<0.400	<0.500	118	0.59	<0.500	51.2	0.537
	12/8/2021 DUP	<1.00	<5.00	<1.00	<1.00	4.56	<0.400	0.86	39.1	<0.400	<0.500	116	0.57	<0.500	51.4	0.531
	3/9/2022	<1.00	<5.00	<1.00	<1.00	3.24	<0.400	0.950	37.2	0.530	<0.500	78.8	<0.400	<0.500	38.2	1.20
	3/9/2022 DUP	<1.00	<5.00	<1.00	<1.00	3.34	<0.400	1.01	38.4	0.550	<0.500	84.9	<0.400	<0.400	40.5	1.26
	6/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.76	<0.400	<0.500	77.0	0.77	<0.500	25.4	<0.400
	6/14/2022 DUP	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.66	<0.400	<0.500	85.6	0.79	<0.500	27.2	<0.400
	9/15/2022	<1.00	<5.00	<1.00	<1.00	1.26	<0.400	<0.400	31.30	<0.400	<0.500	30.900	<0.400	<0.500	13.000	0.66
	9/15/2022 DUP	<1.00	<5.00	<1.00	<1.00	1.33	<0.400	<0.400	32.2	<0.400	<0.500	36.7	<0.400	<0.500	15.6	0.620
	12/7/2022	<1.00	<5.00	<1.00	<1.00	4.22	<0.400	0.93	41.10	0.440	<0.500	118.000	0.57	<0.500	46.300	0.56
	12/7/2022 DUP	<1.00	<5.00	<1.00	<1.00	4.49	<0.400	1.07	43.30	0.500	<0.500	124.000	0.65	<0.500	48.500	0.54
MW-8	12/2/1996	<0.50	<0.50	<0.50	<0.20	1	<0.50	0.2	6.5	<1	<0.20	2.3	<1	-	12	<0.50
	11/13/1997	<1	<2	<1	<1	1.72	<1	2.44	9.32	<1	<1	52.4	4	-	38.6	<2
	8/11/1999	<1	<5	<0.50	<0.50	0.75	<0.50	<0.50	1.82	<0.50	<0.50	46.2	4.79	-	24.3	<0.50
	11/16/1999	<1	<2.5	<0.50	<1	1.22	<0.50	<0.50	2.11	<0.50	<0.50	39.8	1.55	-	15.5	<0.50
	2/28/2000	<1	<5	<0.50	<0.50	0.929	<0.50	0.721	2.38	<0.50	<0.50	41.8	3.7	-	20.5	<0.50
	6/27/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	1.46	<0.50	<0.50	33.7	2.88	-	17.5	<0.50
	5/30/2001	<100	<5	<0.50	<0.50	0.611	<0.50	<0.50	0.601	<0.50	<0.50	11.8	<1	-	5.46	<0.50
	5/30/2002	<1	<0.50	<0.50	<1	1.09	<0.50	<0.50	2.02	<0.50	<0.50	12.1	<0.50	-	4.47	<0.50
	5/28/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.84	<0.50	<0.50	40.4	1.55	-	11.2	<0.50
	11/2/2004	<1	<0.50	<0.50	<1	1.02	<0.50	<0.50	1.99	<0.50	<0.50	8.88	<0.50	-	2.4	<0.50
	11/16/2004	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	1.6	<0.50	<0.50	0.6	<0.50	-	3.1	<0.50
	3/23/2005	<1	<0.50	<0.50	<1	0.78	<0.50	<0.50	1.82	<0.50	<0.50	13.5	0.53	-	2.41	<0.50
	5/17/2005	<1	<0.50	<0.50	<1	1.1	<0.50	<0.50	6.45	<0.50	<0.50	13.2	<0.50	-	6.92	<0.50
	05/17/2005 DUP	<1	<0.50	<0.50	<1	1.19	<0.50	<0.50	6.97	<0.50	<0.50	11.4	<0.50	-	6.39	<0.50
	11/16/2005	<1	<0.500	<0.500	<1	0.78	<0.500	<0.500	4.19	<0.500	<0.500	14.8	0.65	-	2.99	<0.500
	6/5/2006	<1	<1	<1	<1	1.26	<1	<1	19.8	<1	<1	20.7	<1	-	11.4	<1
	12/6/2006	<1	<0.50	<0.50	<1	1.11	<0.50	<0.50	14.2	<0.50	<0.50	18.3	<0.50	-	5.08	<0.50
	5/23/2007	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	22.8	<1	-	2.32	<1
	9/12/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	12.4	0.6	-	0.65	<0.50
	12/12/2007	<1	<0.50	<0.50	<1	1.03	<0.50	<0.50	13.7	<0.50	<0.50	8.27	<0.50	-	2.71	<0.50
3/6/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	1.64	<0.500	<0.500	19.1 J	<0.500	<0.500	1.4	<0.500	
6/10/2008 ⁷	<1	<1	<1	<1	1.07	<1	<1	10.5	<1	<1	10.8	<1	<1	3.87	<1	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-8 (continued)	9/18/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	1.58	<0.500	<0.500	13.2	0.5	<0.500	1.21	<0.500
	12/9/2008	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	9.1	<0.50	<0.50	0.57	<0.50
	12/09/2008 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	9.7	<0.50	<0.50	0.59	<0.50
	3/26/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	8	<0.50	<0.50	0.56	<0.50
	6/17/2009	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	<0.50	12	<0.50	<0.50	4.8	<0.50	<0.50	1.4	<0.50
	9/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50
	12/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.2	<0.50	<0.50	8.4	<0.50	<0.50	0.51	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50
	6/14/2010	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	20	0.52	<0.50	4.2	<0.50	<0.50	1.1	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5	8.1	<0.5	<0.5	<0.5	<0.5
	12/8/2010	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	20	1.1	<0.5	2.5	<0.5	<0.5	0.6	<0.5
	3/11/2011	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	<0.50	20	0.58	<0.50	7.9	<0.50	<0.50	0.95	<0.50
	6/8/2011	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	40	0.82	<0.5	4	<0.5	<0.5	1.1	<0.5
	9/15/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	10	<0.50	<0.50	0.54	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	10	<0.50	<0.50	<0.50	<0.50
	3/6/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.5	<0.50	<0.50	6.8	<0.50	<0.50	0.56	<0.50
	6/20/2012	<0.5	<0.5	<0.5	<0.5	0.89	<0.5	<0.5	22	<0.5	<0.5	6.1	<0.5	<0.5	1.4	<0.5
	9/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	7	<0.50	<0.50	<0.50	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	36	1	<0.50	4.8	<0.50	<0.50	1	<0.80
	3/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	7.2	<0.50	<0.50	<0.50	<0.50
	6/13/2013	<0.50	<0.50	<0.50	<0.50	0.84	<0.50	<0.50	18	0.64	<0.50	6.2	<0.50	<0.50	0.76	<0.50
	9/19/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.6	<0.50	<0.50	4.8	<0.50	<0.50	<0.50	<0.50
	12/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.5	0.54	<0.50	4	<0.50	<0.50	<0.50	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	21	1.1	<0.50	2.3	<0.50	<0.50	0.85	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	5.6	<0.50	<0.50	<0.50	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	6.1	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	7.6	<0.50	<0.50	<0.50	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	<0.50	<0.50
	9/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	6.3	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50
3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	6.4	<0.50	<0.50	<0.50	<0.50	
6/15/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	<0.50	<0.50	
9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	<0.50	<0.50	
12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	3.8	<0.50	<0.50	<0.50	<0.50	
3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	35.7	0.96	<0.5	2.3	<0.5	<0.5	0.57	<0.5	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-8 (continued)	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	14.3	<0.50	<0.50	4.3	<0.50	<0.50	0.56	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	4.4	<0.50	<0.50	<0.50	<0.50
	3/19/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.6	<0.500	<0.500	4.2	<0.500	<0.500	<0.500	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.139 J	<0.500	<0.500	2.6	<0.500	<0.500	5.4	<0.500	<0.500	0.368 J	<0.500
	9/25/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.76	<0.400	<0.500	<0.400	<0.400
	12/7/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.0	<0.400	<0.500	<0.400	<0.400
	3/22/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.83	<0.400	<0.500	<0.400	<0.400
	6/3/2019	<1.00	<5.00	<1.00	<1.00	0.430	<0.400	<0.400	6.57	<0.400	<0.500	2.05	<0.400	<0.500	<0.400	<0.400
	9/26/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	4.2	<0.400	<0.500	<0.400	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	4.06	<0.400	<0.500	<0.400	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.44	<0.400	<0.500	0.929	<0.400	<0.500	<0.400	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	0.770	<0.400	<0.400	12.1	0.45	<0.500	3.51	<0.400	<0.500	0.43	<0.400
	10/6/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	4.56	<0.400	<0.500	<0.400	<0.400
	12/10/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.97	<0.400	<0.500	<0.400	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.575	<0.400	<0.500	2.71	<0.400	<0.500	<0.400	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.24	<0.400	<0.500	6.32	<0.400	<0.500	<0.400	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	4.64	<0.400	<0.500	<0.400	<0.400
	12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.50	<0.400	<0.500	3.8	<0.400	<0.500	<0.400	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.08	<0.400	<0.500	3.90	<0.400	<0.500	<0.400	<0.400
06/15/2022	<1.00	<5.00	<1.00	<1.00	0.750	<0.400	<0.400	10.6	0.730	<0.500	1.50	<0.400	<0.500	0.410	<0.400	
9/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.88	<0.400	<0.500	<0.400	<0.400	
12/7/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.75	<0.400	<0.500	3.2	<0.400	<0.500	<0.400	<0.400	
MW-9	12/2/1996	<50	<50	<50	<20	<30	<50	<20	<20	<100	<20	5,000	200	-	1,600	<50
	11/13/1997	<50	<100	<50	<50	<50	<50	<50	487	<50	<50	2,890	<50	-	1,840	<100
	8/11/1999	<20	<100	<10	<10	<10	<10	<10	54	<10	<10	1,490	43.2	-	517	<10
	11/16/1999	<20	<50	<10	<20	<10	<10	<10	103	<10	<10	1,730	32	-	305	<10
	2/28/2000	<20	<100	<10	<10	<10	<10	<10	<10	<10	<10	2,040	36.4	-	315	<10
	6/27/2000	<50	<250	<25	<25	<25	<25	<25	<25	<25	<25	1,300	<50	-	298	<25
	8/31/2000	<10	<50	<5	<5	<5	<5	<5	<5	<5	<5	1,560	31.3	-	229	<5
	11/30/2000	<10	<50	<5	<5	21.7	<5	10.5	1,330	11.7	<5	823	26.6	-	528	8.15
	9/25/2001	<2.5	<2.5	<2.5	<2.5	3.8	<2.5	<2.5	9.1	<2.5	<2.5	680	16	-	140	<2.5
	12/17/2001	<5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	306	<5	-	74.2	<2.5
	3/18/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	113	<0.50	-	19.1	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-9 (continued)	5/31/2002	<2	<1	<1	<2	<1	<1	<1	1.22	<1	<1	296	1.44	-	44	<1
	8/29/2002	<2	<1	<1	<2	<1	<1	<1	1.88	<1	<1	294	2.12	-	67.4	<1
	11/7/2002	<5	<2.5	<2.5	<5	<2.5	<2.5	<2.5	17.2	<2.5	<2.5	453	4	-	145	<2.5
	1/23/2003	<2	<1	<1	<2	<1	<1	<1	1.66	<1	<1	205	2.74	-	59.5	<1
	5/28/2003	<1	<0.50	<0.50	<1	1.81	<0.50	<0.50	0.97	<0.50	<0.50	141	2.85	-	27.4	<0.50
	11/11/2003	<5	<5	<5	<5	<5	<5	<5	23.7	<5	<5	401	6.25	-	91.4	<5
	1/27/2004	<2	<1	<1	<2	<1	<1	<1	2.58	<1	<1	179	2.54	-	58.1	<1
	5/4/2004	<1	<1	<1	<1	<1	<1	<1	1.09	<1	<1	178	2.56	-	51.9	<1
	11/15/2004	<25	<25	<25	<25	28	<25	<25	1,200	27	<25	1,800	<25	-	1,000	<25
	3/24/2005	<5	<2.5	<2.5	<5	3.3	<2.5	<2.5	54.2	<2.5	<2.5	675	8	-	239	<2.5
	5/18/2005	<2	<1	<1	<2	<1	<1	<1	2.68	<1	<1	2.41	2.08	-	62.4	<1
	8/18/2005	<5	<2.50	<2.50	<5	<2.50	<2.50	<2.50	20.5 B	<2.50	<2.50	551	7.6	-	209	<2.50
	11/15/2005	<10	<5	<5	<10	27.1	<5	6.8	1,020	18.6	<5	1,040	14.1	-	633	21.2
	2/21/2006	<10	<5	<5	<10	<5	<5	<5	16.7	<5	<5	534	<5	-	165	<5
	6/5/2006	<1	<1	<1	<1	<1	<1	<1	1.47	<1	<1	151	2.6	-	57.3	<1
	9/5/2006	<5	<2.50	<2.50	<5	5.5	<2.50	<2.50	117	3.15	<2.50	698	6.8	-	314	<2.50
	12/6/2006	<5	<2.50	<2.50	<5	2.95	<2.50	<2.50	59	<2.50	<2.50	578	5.55	-	237	<2.50
	2/7/2007	<5	<2.50	<2.50	<5	3.15	<2.50	<2.50	72.6	<2.50	<2.50	591	6.1	-	239	2.65
	5/23/2007	<2	<2	<2	<2	<2	<2	<2	6.32	<2	<2	210	3	-	90.4	<2
	9/12/2007	<2	<1	<1	<2	2.34	<1	<1	47.1	1.44	<1	282	5.12	-	184	<1
	12/13/2007	<5	<2.50	<2.50	<5	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	253	4.45	-	78.4	<2.50
	3/6/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	1.92	<0.500	<0.500	138	3.77	<0.500	61.5	<0.500
	6/10/2008	<1	<1	<1	<1	<1	<1	<1	2.73	<1	<1	297	5.16	<1	87.7	<1
	9/18/2008	<5	<2.50	<2.50	<5	7.05	<2.50	<2.50	172	3.8	<0.5000	524	5.35	<0.500	315	4.15
	12/9/2008	<0.90	<0.90	<0.90	<0.90	3.8	<0.90	1.3	130	2.5	<0.90	270	5.1	<0.90	140	2.3
	3/26/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	<0.50	170	4	<0.50	56	<0.50
	6/17/2009	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	1.1	72	2.8	<0.50	420	4.9	<0.50	180	1.8
	9/17/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	170	4.4	<0.50	60	<0.50
	12/17/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	120	2.5	<0.50	43	<0.50
	3/19/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	160	3	<0.50	48	<0.50
6/16/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	100	1.4	<0.50	36	<0.50	
9/21/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5	140	2.9	<0.5	50	<0.5	
12/10/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	100	1.3	<0.5	330	<0.5	
3/11/2011	<0.50	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	17	0.82	<0.50	190	2.7	<0.50	81	0.52	
03/11/2011 DUP	<0.50	<0.50	<0.50	<0.50	0.67	<0.50	<0.50	17	0.85	<0.50	200	2.8	<0.50	84	0.51	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-9 (continued)	6/10/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	53	1.9	<0.5	31	<0.5
	9/19/2011	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	72	2.3	<0.50	230	3.1	<0.50	120	0.78
	12/9/2011	<0.90	<0.90	<0.90	<0.90	53	<0.90	11	1,800	40	<0.90	600	10	<0.90	590	26
	3/12/2012	<0.50	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	20	0.57	<0.50	140	2	<0.50	56	<0.50
	6/22/2012	<0.5	<0.5	<0.5	<0.5	3.3	<0.5	1.1	140	4.3	<0.5	220	3.3	<0.5	180	2.3
	9/14/2012	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	17	<0.90	<0.90	210	2.4	<0.90	78	<0.90
	12/13/2012	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	29	0.96	<0.50	110	1.1	<0.50	49	<0.50
	3/15/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5	<0.50	<0.50	86	1.8	<0.50	34	<0.50
	6/13/2013	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	1	100	3.7	<0.50	240	3.1	<0.50	150	2.2
	9/20/2013	<0.50	<0.50	<0.50	<0.50	2	<0.50	0.51	74	2.2	<0.50	160	2	<0.50	87	0.82
	12/16/2013	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	1.4	230	6.4	<0.50	210	3.5	<0.50	180	2.8
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	39	0.57	<0.50	19	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.68	41	1.6	<0.50	190	2.3	<0.50	91	1.1
	9/30/2014	<0.90	<0.90	<0.90	<0.90	2.3	<0.90	<0.90	77	2.3	<0.90	230	2.9	<0.90	110	1.3
	12/15/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	35	0.64	<0.50	18	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	<0.50	18.9	0.6	<0.50	155	2	<0.50	59.5	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	0.54	12.5	0.78	<0.50	160	1.9	<0.50	61.8	1.6
	9/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	74.3	2.2	<0.50	31.6	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	0.85	145	4.2	<0.50	199	2.4	<0.50	113	2
	12/8/2015 DUP	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	0.93	153	4.4	<0.50	198	2.5	<0.50	118	2.1
	3/8/2016	<1	<4	<1	<1	4.1	<1	<1	117	3.8	<1	164	2.3	<1	94.6	3.4
	6/17/2016	<0.50	<2	<0.50	<0.50	1.8	<0.50	0.58	60.7	2.4	<0.50	116	1.7	<0.50	68.3	0.89
	9/29/2016	<0.50	<2	<0.50	<0.50	1.2	<0.50	<0.50	39.3	1.8	<0.50	192	2.5	<0.50	91.9	0.76
	12/14/2016	<0.50	<2	<0.50	<0.50	1.3	<0.50	<0.50	59.7	1.6	<0.50	75.8	1.1	<0.50	44.9	0.52
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	0.77	<0.5	<0.5	27.9	0.89	<0.5	12.5	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	17.5	0.60	<0.50	104	1.3	<0.50	47.2	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	2.80	<1.0	<0.50	83.1	2.50	<0.50	102	2.4	<0.50	66.7	0.99
	11/7/2017	<2.0	<2.0	<0.50	<0.50	20.30	<0.50	3.30	569.0	15.20	<0.50	205	4.5	<0.50	167.0	7.80
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.2	<0.500	<0.500	39	1.1	<0.500	14.9	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	6.86	<0.500	1.63	169.0	8.28	<0.500	332	3.5	<0.500	182.0	2.42 J
9/27/2018	<1.00	<5.00	<1.00	<1.00	5.69	<0.400	1.59	219	7.54	<0.500	243	3.96	<0.500	168	3.90	
12/7/2018	<1.00	<5.00	<1.00	<1.00	0.75	<0.400	<0.400	20.0	0.80	<0.500	178	3.4	<0.500	66.5	0.55	
3/20/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.47	<0.400	<0.500	58.9	1.47	<0.500	20.0	<0.400	
6/7/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.99	<0.400	<0.500	108	1.34	<0.500	49.4	<0.400	
9/26/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.34	<0.400	<0.500	81.3	2.34	<0.501	25.4	<0.401	

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Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-9 (continued)	12/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.34	<0.400	<0.500	67.5	1.46	<0.502	24.3	<0.402
	3/11/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.21	<0.400	<0.500	55.4	1.41	<0.500	18.1	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.27	<0.400	<0.500	109	1.44	<0.500	45.9	<0.400
	10/8/2020	<1.00	<5.00	<1.00	<1.00	1.78	<0.400	0.817	39.0	1.280	<0.500	191	2.95	<0.500	72.2	1.55
	12/9/2020	<2.00	<5.00	<1.00	<1.00	6.49	<0.400	1.63	211	6.980	<0.500	262	3.86	<0.500	158	2.68
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.56	<0.400	<0.500	73.5	1.38	<0.500	26.4	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.35	<0.400	<0.500	87.7	1.83	<0.500	32.4	<0.400
	9/14/2021	<1.00	<5.00	<1.00	<1.00	0.429	<0.400	<0.400	6.99	0.448	<0.500	144	3.26	<0.500	43	0.654
	12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.799	<0.400	<0.500	134	1.62	<0.500	41.2	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	0.410	<0.400	<0.400	10.3	0.500	<0.500	104	1.25	<0.500	36.2	<0.400
	6/14/2022	<1.00	<5.00	<1.00	<1.00	2.98	<0.400	0.55	29.7	<0.400	<0.500	47.8	<0.400	<0.500	21.7	0.67
	9/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.500	<0.400	<0.500	48.2	1.15	<0.500	12.4	<0.400
	12/7/2022	<1.00	<5.00	<1.00	<1.00	0.72	<0.400	<0.400	21.4	0.97	<0.500	172	3.26	<0.500	48.6	<0.400
MW-10	12/2/1996	<0.50	<0.50	<0.50	<0.20	<0.30	<0.50	<0.20	<0.20	<1	<0.20	2.7	<1	-	0.4	<0.50
	11/13/1997	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.53	<0.50	-	3.65	<1
	8/11/1999	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.02	<1	-	1.24	<0.50
	11/16/1999	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	69.6	1.89	-	10.3	<0.50
	2/28/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.63	<1	-	1.16	<0.50
	6/27/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.72	<1	-	3.74	<0.50
	5/30/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.25	<1	-	2.52	<0.50
	5/30/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.05	<0.50	-	1.43	<0.50
	5/28/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.86	<0.50	<0.50	2.21	<0.50	-	1.28	<0.50
	11/2/2004	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	-	0.98	<0.50
	11/16/2004	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	-	3.4	<0.50
	3/23/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.02	<0.50	-	1.21	<0.50
	5/17/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.26	<0.50	-	1.19	<0.50
	9/12/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59 J	<0.50	-	0.83	<0.50
	3/5/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.66	<0.500	<0.500	1.67	<0.500
	9/18/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.13	<0.500	<0.500	1.4	<0.500
	3/25/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	1.6	<0.50
	9/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	2	<0.50
3/18/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	1.6	<0.50	
9/22/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	1.4	<0.5	
3/9/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	0.8	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-10	9/14/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	2.1	<0.50
(continued)	3/6/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	2	<0.50
	9/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.98	<0.50	<0.50	1.4	<0.50
	3/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	<0.50	3.1	<0.50
	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	1.4	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	8.8	<0.50	<0.50	16	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	2	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	1.8	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	1.6	<0.50
	3/7/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.98	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	1.4	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	1.5	<0.5
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	<0.50	2.4	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	1.1	<0.50
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.161 J	<0.500	<0.500	0.8	<0.500	<0.500	5.7	0.145 J	<0.500	5.8	<0.500
	9/25/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.74	<0.400	<0.500	1.45	<0.400
	9/25/2018 DUP	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.76	<0.400	<0.500	1.54	<0.400
	3/21/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.24	<0.400	<0.500	2.00	<0.400
	6/6/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	7.51	<0.400	<0.500	4.19	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.03	<0.400	<0.500	1.35	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.65	<0.400	<0.500	1.15	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.97	<0.400	<0.500	1.53	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	9.74	<0.400	<0.500	5	<0.400
	10/8/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.34	<0.400	<0.500	1.81	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.40	<0.400	<0.500	1.95	<0.400
	3/4/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.66	<0.400	<0.500	1.84	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.19	<0.400	<0.500	2.6	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.34	<0.400	<0.500	1.96	<0.400
	12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	4.75	<0.400	<0.500	2.7	<0.400
	3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.93	<0.400	<0.500	2.22	<0.400
	06/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	3.22	<0.400	<0.500	1.77	<0.400
	9/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.55	<0.400	<0.500	1.66	<0.400
	12/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	2.66	<0.400	<0.500	1.9	<0.400

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Historical Groundwater Analytical Results
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-11	12/2/1996	<50	<50	<50	<20	<30	<50	52	140	<100	<20	2,200	550	-	5,900	<50
	11/13/1997	<50	<100	<50	<50	<50	<50	<50	<50	<50	<50	686	90.3	-	2,720	<100
	8/10/1999	<5	<25	<2.5	<2.5	13.7	<2.5	22.8	14.4	<2.5	<2.5	259	112	-	1,300	<2.5
	11/16/1999	<20	<50	<10	<20	12	<10	16.8	18.8	<10	<10	478	94.8	-	1,500	<10
	2/28/2000	<5	<25	<2.5	<2.5	2.71	<2.5	7.9	5.05	<2.5	<2.5	247	30.2	-	473	<2.5
	6/27/2000	<10	<50	<5	<5	12.1	<5	28.9	14.8	<5	<5	337	108	-	1,390	<5
	8/31/2000	<20	<100	<10	<10	15.4	<10	28	24.8	<10	<10	646	159	-	1,690	<10
	11/30/2000	<20	<100	<10	<10	12.2	<10	26.4	19.3	<10	<10	342	125	-	1,550	<10
	2/27/2001	<5	<25	<2.5	<2.5	3.65	<2.5	7.82	7.1	<2.5	<2.5	198	35.1	-	468	<2.5
	5/30/2001	<10	<50	<5	<5	5.2	<5	13.6	9.09	<5	<5	256	48.8	-	858	<5
	9/25/2001	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	260	57	-	820	<13
	12/17/2001	<10	<50	<5	<5	<5	<5	15.4	25.9	<5	<5	983	40.9	-	1,390	<5
	3/18/2002	<10	<5	<5	<10	11.9	<5	19.4	17.1	<5	<5	433	79.8	-	1,370	<5
	5/30/2002	<10	<5	<5	<10	5.9	<5	10.9	15.6	<5	<5	571	45.6	-	965	<5
	11/7/2002	<10	<5	<5	<10	15	<5	19.3	18.9	<5	<5	347	112	-	1,640	<5
	1/23/2003	<5	<2.5	<2.5	<5	3.35	<2.5	4.3	5.35	<2.5	<2.5	265	24.1	-	534	<2.5
	5/28/2003	<10	<5	<5	<10	13.3	<5	17.9	17.6	<5	<5	305	105	-	1,580	<5
11/11/2003	<5	<5	<5	<5	5	<5	5.15	9.15	<5	<5	191	38.8	-	504	<5	
1/26/2004	<10	<5	<5	<10	9.6	<5	11.5	13.5	<5	<5	369	73.3	-	1,070	<5	
3/22/2004	Well Abandoned															
MW-12	12/2/1996	<50	<50	<50	<20	<30	<50	<20	29	<100	<20	2,500	<100	-	950	<50
	11/12/1997	<250	<500	<250	<250	<250	<250	<250	2,710	<250	<250	12,900	645	-	5,400	<500
	8/11/1999	<200	<1	<100	<100	120	<100	<100	2,680	<100	<100	11,300	758	-	3,520	<100
	11/16/1999	<200	<500	<100	<200	<100	<100	<100	160	<100	<100	18,200	922	-	4,630	<100
	2/28/2000	<200	<1	<100	<100	<100	<100	<100	908	<100	<100	3,780	<200	-	1,210	<100
	6/27/2000	<100	<500	<50	<50	161	<50	<50	2,880	<50	<50	12,000	712	-	3,180	<50
	5/30/2001	<50	<250	<25	<25	64.8	<25	54	1,650	<25	<25	4,990	298	-	1,810	<25
	5/30/2002	<5	<2.5	<2.5	<5	4.25	<2.5	<2.5	101	<2.5	<2.5	344	6.6	-	81.6	<2.5
	5/29/2003	<5	<2.5	<2.5	<5	28.4	<2.5	8	601	5.7	<2.5	362	18.2	-	199	<2.5
	11/16/2004	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	59	<2.5	<2.5	410	3.5	-	96	<2.5
	3/23/2005	<20	<10	<10	<20	247	<10	53	3,640	40.2	<10	1,080	49.8	-	639	14.2
	5/18/2005	<1	<0.50	<0.50	<1	0.96	<0.50	0.98	30.1	0.57	<0.50	51.1	0.92	-	21.4	<0.50
	5/22/2007	<5	<5	<5	<5	35.6	<5	7.45	785	11.1	<5	233	7.8	-	139	<5
9/11/2007	<100	<50	<50	<100	316	<50	57	6,700	53	<50	431	<50	-	516	<50	
12/12/2007	<2	<1	<1	<2	1.1	<1	<1	43.8	<1	<1	106	3.16	-	39.6	<1	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-12	3/5/2008	<1	4.97	<0.500	<1	156	2.01	46.2	3,170	41.8	<0.500	440	21.2	<0.500	329	18.5
(continued)	9/19/2008	<50	<25	<25	<50	394	<25	66	7,650	69	<25	968	45	<25	924	58
	12/10/2008	<4	<4	<4	<4	33	<4	6.6	670	8.7	<4	99	5	<4	80	<4
	3/27/2009	<4	4.8	<4	<4	230	<4	39	4,800	46	<4	540	28	<4	440	31
	03/27/2009 DUP	<4	5	<4	<4	250	<4	44	4,700	51	<4	600	32	<4	490	35
	6/18/2009	<15	<15	<15	<15	170	<15	32	3,500	36	<15	270	<15	<15	230	26
	06/18/2009 DUP	<15	<15	<15	<15	170	<15	32	3,600	37	<15	310	<15	<15	250	25
	9/18/2009	<15	<15	<15	<15	240	<15	46	4,200	50	<15	540	26	<15	440	51
	09/18/2009 DUP	<15	<15	<15	<15	260	<15	49	4,600	52	<15	590	28	<15	470	56
	12/18/2009	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	100	1.1	1.3	170	2.2	<0.50	65	<0.50
	12/18/2009 DUP	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	96	1.1	1.3	160	2.1	<0.50	62	<0.50
	3/19/2010	<0.50	4.1	<0.50	<0.50	220	2.6	48	4,400	53	<0.50	480	28	0.7	380	37
	03/19/2010 DUP	<15	<15	<15	<15	270	<15	44	4,900	54	<15	600	29	<15	460	39
	6/16/2010	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	19	<0.50	<0.50	38	<0.50	<0.50	17	<0.50
	06/16/2010 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	0.54	<0.50	37	<0.50	<0.50	16	<0.50
	9/23/2010	<15	<15	<15	<15	260	<15	47	4,800	56	<15	780	38	<15	560	68
	9/23/2010 DUP	<15	<15	<15	<15	260	<15	49	4,800	57	<15	800	41	<15	580	65
	12/9/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	5.1	<0.5	<0.5	2.1	<0.5
	12/09/10 DUP	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	<0.5	5.8	<0.5	<0.5	2	<0.5
	3/10/2011	<0.50	0.67	<0.50	<0.50	94	0.96	17	1,900	19	0.55	340	12	<0.50	220	11
	03/10/2011 DUP	<0.50	0.87	<0.50	<0.50	93	1	17	1,600	19	0.55	260	13	<0.50	180	11
	6/7/2011	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	59	1	<0.5	53	0.7	<0.5	25	<0.5
	06/07/2011 DUP	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	60	1	<0.5	58	0.69	<0.5	27	<0.5
	9/19/2011	<0.50	3	<0.50	<0.50	240	2.5	45	4,700	55	<0.50	860	65	0.94	690	63
	09/19/2011 DUP	<20	<20	<20	<20	240	<20	53	4,700	60	<20	860	60	<20	680	68
	12/7/2011	<0.50	<0.50	<0.50	<0.50	130	1.3	28	2,900	33	<0.50	520	34	0.54	380	40
	12/07/2011 DUP	<0.50	<15	<0.50	<0.50	140	1.3	29	2,900	33	<0.50	580	34	0.55	400	41
	3/12/2012	<15	<15	<15	<15	210	<15	44	3,800	45	<15	770	48	<15	540	46
	03/12/2012 DUP	<20	<20	<20	<20	220	<20	44	4,000	47	<20	740	50	<20	540	45
	06/22/2012	<5	<5	<5	<5	100	<5	16	1,700	39	<5	270	13	<5	200	22
	06/22/2012 DUP	<5	<5	<5	<5	100	<5	16	1,700	39	<5	270	13	<5	190	22
	9/14/2012	<5	<5	<5	<5	220	<5	45	4,700	56	<5	890	61	<5	590	58
	09/14/2012 DUP	<15	<15	<15	<15	270	<15	58	5,400	73	<15	1,100	76	<15	730	84
	12/13/2012	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	62	0.97	<0.50	38	0.52	<0.50	22	<0.50
	12/13/2012 DUP	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	62	0.92	<0.50	38	0.53	<0.50	23	<0.50

Appendix B
Historical Groundwater Analytical Results
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-12	3/15/2013	<0.50	1	<0.50	<0.50	200	1.7	40	4,300	55	<0.50	760	53	0.71	540	53
(continued)	03/15/2013 DUP	<0.50	1	<0.50	<0.50	200	1.8	40	4,200	56	<0.50	750	52	0.66	520	54
	6/13/2013	<15	<15	<15	<15	230	<15	38	4,700	53	<15	590	44	<15	480	55
	06/13/2013 DUP	<15	<15	<15	<15	240	<15	39	4,800	53	<15	610	46	<15	500	59
	9/20/2013	<0.50	<0.50	<0.50	<0.50	170	1.6	37	3,400	49	<0.50	510	37	0.66	400	50
	09/20/2013 DUP	<0.50	<0.50	<0.50	<0.50	180	1.7	36	3,400	48	<0.50	520	37	0.63	400	49
	12/16/2013	<2.5	<2.5	<2.5	<2.5	36	<2.5	7.5	800	10	<2.5	150	5.7	<2.5	110	9.6
	12/16/2013 DUP	<2.5	<2.5	<2.5	<2.5	35	<2.5	7.6	770	9.6	<2.5	140	5.8	<2.5	110	9.8
	3/24/2014	<0.50	<0.50	<0.50	<0.50	110	0.77	18	1,900	25	<0.50	180	8.6	<0.50	170	47
	3/24/2014 DUP	<7	<7	<7	<7	97	<7	16	1,900	22	<7	170	7.5	<7	140	35
	6/24/2014	<1.5	<1.5	<1.5	<1.5	14	<1.5	1.7	300	2.1	<1.5	42	<1.5	<1.5	32	<1.5
	6/24/2014 DUP	<1.5	<1.5	<1.5	<1.5	14	<1.5	1.9	310	2.3	<1.5	42	1.6	<1.5	34	<1.5
	9/30/2014	<15	<15	<15	<15	190	<15	39	3,500	45	<15	670	36	<15	480	42
	9/30/2014 DUP	<15	<15	<15	<15	180	<15	39	3,500	45	<15	680	35	<15	460	42
	12/11/2014	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	34	0.64	<0.50	25	<0.50	<0.50	15	<0.50
	12/11/2014 DUP	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	32	0.6	<0.50	24	<0.50	<0.50	14	<0.50
	3/20/2015	<5	<5	<5	<5	102	<5	25.4	2,110	29.4	<5	584	17.8	<5	344	36.8
	3/20/2015 DUP	<12.5	<12.5	<12.5	<12.5	143	<12.5	25.8	2,490	28.8	<12.5	495	21.7	<12.5	340	29
	6/19/2015	<10	<10	<10	<10	151	<10	28.2	2,570	25	<10	514	23.6	<10	356	31.1
	6/19/2015 DUP	<10	<10	<10	<10	157	<10	31	2,680	30	<10	516	23.4	<10	362	33.2
	9/22/2015	<8.3	<8.3	<8.3	<8.3	120	<8.3	16.9	2,250	23.4	<8.3	343	15.7	<8.3	239	22.5
	9/22/2015 DUP	<8.3	<8.3	<8.3	<8.3	134	<8.3	21.4	2,490	25.7	<8.3	425	20.1	<8.3	282	26.5
	12/8/2015	<5	<5	<5	<5	8	<5	<5	40	0.7	<5	45	0.5	<5	22	<5
	3/8/2016	<3.6	<14.3	<3.6	<3.6	79.9	<3.6	15.4	1,380	16.2	<3.6	325	7.7	<3.6	209	21.3
	3/8/2016 DUP	<3.6	<14.3	<3.6	<3.6	82	<3.6	16.6	1,390	15.6	<3.6	336	7.7	<3.6	210	21.2
	6/16/2016	<8.4	<33.4	<8.4	<8.4	174	<8.4	29.9	3,310	31.6	<8.4	314	12.8	<8.4	288	52.3
	6/16/2016 DUP	<8.4	<33.4	<8.4	<8.4	192	<8.4	31.9	3,420	37.4	<8.4	367	15.4	<8.4	311	67
	9/27/2016	<10	<40	<10	<10	26	<10	<10	525	<10	<10	67.6	<10	<10	45.4	14.8
	9/27/2016 DUP	<2.5	<10	<2.5	<2.5	44.4	<2.5	11.5	867	11.4	<2.5	387	3.9	<2.5	163	22.6
	12/14/2016	<1	<4	<1	<1	<1	<1	<1	6.9	2.3	<1	<1	<1	<1	<1	20.5
	12/14/2016 DUP	<2.5	29.1	<2.5	<2.5	16.5	<2.5	4.7	744	<2.5	<2.5	62.3	<2.5	<2.5	42.2	21.2
	3/30/2017	<10	<40	<10	<10	<10	<10	<10	1,120	<10	<10	55.9	<10	<10	29.6	37.8
	3/30/2017 DUP	<2.5	<10	<2.5	<2.5	11.4	<2.5	3.8	853	6.1	<2.5	49	<2.5	<2.5	26	28.3
	6/12/2017	<125	<12.5	<3.1	<3.1	14.0	<3.1	4.7	893	7.6	<3.1	42.4	<3.1	<3.1	18.1	48.4
	6/12/2017 DUP	<3.1	<12.5	<3.1	<3.1	12.8	<3.1	<3.1	860	7.1	<3.1	40.0	<3.1	<3.1	16.5	47.4

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-12	9/28/2017	<3.1	17.4	<3.1	<3.1	19.5	<3.1	<3.1	457	5.4	<3.1	<3.1	<3.1	<3.1	<3.1	47.7
(continued)	9/28/2017 DUP	<1.7	16.3	<1.7	<1.7	17.3	<1.7	<1.7	428	5.2	<1.7	<1.7	<1.7	<1.7	<1.7	45.1
	11/9/2017	<2.0	15.4	<0.50	<0.50	4.5	<0.50	<0.50	22	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	49.1
	11/9/2017 DUP	<2.0	12.6	<0.50	<0.50	4.5	<0.50	<0.50	21	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	36.4
	3/20/2018	<0.500	7.50	<0.500	<0.500	0.5	<0.500	<0.500	6	1.3	<0.500	<0.500	<0.500	<0.500	0.271 J	2.8
	3/20/2018 DUP	<0.500	8.18	<0.500	<0.500	0.550 J	<0.500	<0.500	6	1.29 J	<0.500	0.203 J	<0.500	<0.500	0.261 J	2.6
	7/1/2018	<0.500	9.73	<0.500	<0.500	0.9	<0.500	<0.500	4	1.6	<0.500	0.304 J	<0.500	<0.500	1.0	1.5
	7/1/2018 DUP	<0.500	8.34	<0.500	<0.500	0.8	<0.500	<0.500	4	1.6	<0.500	0.289 J	<0.500	<0.500	1.0	1.3
	9/25/2018	<1.00	24.5	<1.00	<1.00	0.730	<0.400	<0.400	1.46	0.520	<0.500	<0.400	<0.400	<0.500	<0.400	1.23
	9/25/2018 DUP	<1.00	23.7	<1.00	<1.00	0.670	<0.400	<0.400	1.31	0.500	<0.500	<0.400	<0.400	<0.500	<0.400	1.21
	12/4/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4	0.4	<0.500	1.3	<0.400	<0.500	1.3	1.7
	12/4/2018 DUP	<1.00	6.03	<1.00	<1.00	0.5	<0.400	<0.400	4	0.4	<0.500	1.0	<0.400	<0.500	1.0	1.6
	3/20/2019	<2.00	<5.00	<1.00	<1.00	0.655	<0.400	<0.400	6.70	0.675	<0.500	2.11	<0.400	<0.500	1.33	1.64
	3/20/2019 DUP	<2.00	<5.00	<1.00	<1.00	0.615	<0.400	<0.400	6.31	0.621	<0.500	2.05	<0.400	<0.500	1.15	1.56
	6/5/2019	<2.00	<5.00	<1.00	<1.00	0.716	<0.400	<0.400	9.17	0.756	<0.500	3.30	<0.400	<0.500	3.45	2.64
	6/5/2019 DUP	<2.00	<5.00	<1.00	<1.00	0.719	<0.400	<0.400	9.36	0.725	<0.500	3.64	<0.400	<0.500	3.41	2.74
	9/26/2019	<1.00	18.1	<1.00	<1.00	6.26	<0.400	<0.400	5.31	0.565	<0.500	<0.400	<0.400	<0.500	0.442	6.82
	9/26/2019 DUP	<1.00	16	<1.00	<1.00	6.12	<0.400	<0.400	5.06	0.55	<0.500	<0.400	<0.400	<0.500	0.459	6.45
	12/5/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.61	<0.400	<0.500	2.37	<0.400	<0.500	1.41	0.413
	12/5/2019 DUP	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.51	<0.400	<0.500	2.18	<0.400	<0.500	1.23	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	0.803	<0.400	<0.400	8.18	0.515	<0.500	7.01	<0.400	<0.500	4.17	0.423
	3/11/2020 DUP	<1.00	<5.00	<1.00	<1.00	0.806	<0.400	<0.400	8.47	0.561	<0.500	6.95	<0.400	<0.500	4.25	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	1.25	<0.400	<0.400	14.2	0.41	<0.500	2.49	<0.400	<0.500	2.6	1.1
	6/18/2020 DUP	<1.00	<5.00	<1.00	<1.00	1.30	<0.400	<0.400	14.1	<0.400	<0.500	2.59	<0.400	<0.500	2.68	1.04
	10/7/2020	<1.00	<10.0	<1.00	<1.00	36.6	<0.400	<0.400	80.9	0.582	<0.500	<0.400	<0.400	<0.500	0.745	184
	10/7/2020 DUP	<1.00	<10.0	<1.00	<1.00	37.8	<0.400	<0.400	81.7	0.632	<0.500	<0.400	<0.400	<0.500	0.750	196
	12/8/2020	<2.00	<5.00	<1.00	<1.00	1.55	<0.400	<0.400	9.92	<0.400	<0.500	13.5	<0.400	<0.500	6.47	7.36
	12/8/2020 DUP	<2.00	<5.00	<1.00	<1.00	1.52	<0.400	<0.400	9.61	<0.400	<0.500	12.9	<0.400	<0.500	6.24	7.12
	3/5/2021	<1.00	<5.00	<1.00	<1.00	1.55	<0.400	<0.400	8.6	<0.400	<0.500	6.73	<0.400	<0.500	4.92	0.436
	3/5/2021 DUP	<1.00	<5.00	<1.00	<1.00	1.48	<0.400	<0.400	8.21	<0.400	<0.500	5.81	<0.400	<0.500	4.39	0.446
	6/16/2021	<1.00	<5.00	<1.00	<1.00	6.90	<0.400	<0.400	34.0	0.426	<0.500	8.85	<0.400	<0.500	9.62	35.7
	6/16/2021 DUP	<1.00	<5.00	<1.00	<1.00	6.53	<0.400	<0.400	32.4	<0.400	<0.500	8.21	<0.400	<0.500	8.87	33.4
	9/14/2021	<1.00	<5.00	<1.00	<1.00	37.4	<0.400	<0.400	59	0.572	<0.500	4.29	<0.400	<0.500	5.59	308
	9/14/2021 DUP	<1.00	<5.00	<1.00	<1.00	34.8	<0.400	<0.400	54.7	0.570	<0.500	3.75	<0.400	<0.500	5.1	282
	12/9/2021	<1.00	<5.00	<1.00	<1.00	0.644	<0.400	<0.400	7.49	<0.400	<0.500	12	<0.400	<0.500	6.54	2.02
	12/9/2021 DUP	<1.00	<5.00	<1.00	<1.00	0.68	<0.400	<0.400	7.36	<0.400	<0.500	12.3	<0.400	<0.500	6.68	2.1

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-12 (continued)	3/8/2022	<1.00	<5.00	<1.00	<1.00	13.4	<0.400	<0.400	18.6	<0.400	<0.500	8.43	<0.400	<0.500	9.36	168
	3/8/2022 DUP	<1.00	<5.00	<1.00	<1.00	9.15	<0.400	<0.400	15.6	<0.400	<0.500	8.70	<0.400	<0.500	9.62	99.5
	6/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.46	<0.400	<0.500	10.6	<0.400	<0.500	5.38	0.49
	6/14/2022 DUP	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.48	<0.400	<0.500	10.3	<0.400	<0.500	5.18	0.43
	9/14/2022	<1.00	<5.00	<1.00	<1.00	79.60	<0.400	10.20	2,470.00	2.580	<0.500	0.850	<0.400	<0.500	11.600	2000
	9/14/2022 DUP	<1.00	<5.00	<1.00	<1.00	77.80	<0.400	9.41	2,260.00	2.720	<0.500	0.750	<0.400	<0.500	10.000	1710
	12/8/2022	<1.00	<5.00	<1.00	<1.00	8.60	<0.400	0.73	165.00	0.530	<0.500	7.290	<0.400	<0.500	5.110	124
	12/8/2022 DUP	<1.00	<5.00	<1.00	<1.00	8.50	<0.400	0.73	161.00	0.510	<0.500	7.020	<0.400	<0.500	5.080	121
MW-13	12/2/1996	0.7	<0.50	<0.50	<0.20	<0.30	<0.50	0.3	9.1	<1	<0.20	750	6.6	-	82	<0.50
	11/12/1997	<250	<500	<250	<250	291	<250	<250	5,050	<250	<250	18,100	<250	-	9,050	<500
	8/11/1999	<200	<1	<100	<100	<100	<100	<100	2,280	<100	<100	9,590	<200	-	3,920	<100
	11/16/1999	<50	<125	<25	<50	108	<25	51	2,620	<25	<25	7,210	67.5	-	3,050	-
	2/28/2000	<200	<1	<100	<100	<100	<100	<100	562	<100	<100	1,340	<200	-	602	<100
	6/28/2000	<100	<500	<50	<50	132	<50	142	4,210	<50	<50	14,700	155	-	6,360	<50
	5/30/2001	<200	<1,000	<100	<100	<100	<100	<100	2,460	<100	<100	10,300	<200	-	4,620	<100
	5/30/2002	<2	<1	<1	<2	1.44	<1	1.28	60.4	<1	<1	241	1.68	-	86.4	<1
	5/28/2003	<1	<0.50	<0.50	<1	1.71	<0.50	1.75	79.6	1.26	<0.50	121	1.58	-	130	<0.50
	11/16/2004	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	1,200	<12	-	230	<12
	5/18/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	3.14	<0.50	<0.50	71.2	<0.50	-	10.3	<0.50
	9/12/2007	<50	<25	<25	<50	55	<25	28	1,290	<25	<25	2,730	29.5	-	2,020	<25
	12/12/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	3.36	<0.50	<0.50	51.3	0.64	-	19.5	<0.50
	3/5/2008	<1	<0.500	<0.500	<1	8.32	<0.500	4.46	174	4.52	<0.500	383	4.21	<0.500	337	0.96
	6/25/2008	<5	<5	<5	<5	15.2	<5	<5	320	10.4	<5	132	<5	-	160	<5
	9/19/2008	<5	<2.50	<2.50	<5	5.6	<2.50	<2.50	116	2.65	<2.50	266	<2.50	<2.50	187	<2.50
	12/10/2008	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.62	32	0.69	<0.50	25	0.6	<0.50	39	<0.50
	3/27/2009	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	15	<0.50	<0.50	25	<0.50	<0.50	17	<0.50
	03/27/2009 DUP	<0.50	<0.50	<0.50	<0.50	0.79	<0.50	<0.50	15	<0.50	<0.50	25	<0.50	<0.50	17	<0.50
	6/18/2009	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	0.8	58	1.8	<0.50	16	<0.50	<0.50	42	<0.50
	9/17/2009	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	3.3	130	2.9	<0.50	430	4	<0.50	270	1
	12/18/2009	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	16	<0.50	<0.50	66	0.61	<0.50	45	<0.50
	3/19/2010	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	1.4	64	1.2	<0.50	130	1.3	<0.50	110	<0.50
6/16/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	14	<0.50	<0.50	7.6	<0.50	
9/23/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	45	<0.5	<0.5	12	<0.5	
12/21/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3/11/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	0.65	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-13	6/9/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	6.1	<0.5	<0.5	4.2	<0.5
(continued)	9/19/2011	<0.50	0.54	<0.50	<0.50	35	<0.50	17	700	20	<0.50	2,200	17	0.63	1,300	3.6
	12/9/2011	<9	<9	<9	<9	23	<9	11	530	18	<9	2,800	12	<9	1,400	<9
	3/12/2012	<9	<9	<9	<9	24	<9	14	600	14	<9	1,800	11	<9	1,200	<9
	6/22/2012	<4	<4	<4	<4	40	<4	13	940	30	<4	1,300	8.6	<4	1,000	4.5
	9/14/2012	<4	<4	<4	<4	38	<4	21	900	22	<4	3,100	16	<4	1,800	<4
	12/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	13	0.62	<0.50	88	<0.50	<0.50	51	<0.50
	3/15/2013	<0.50	<0.50	<0.50	<0.50	34	<0.50	21	890	20	<0.50	2,400	14	0.68	1,700	3.2
	6/14/2013	<4	<4	<4	<4	19	<4	9.4	520	15	<4	1,100	6	<4	920	<4
	9/20/2013	<0.50	<0.50	<0.50	<0.50	40	<0.50	20	770	19	<0.50	2,600	13	0.74	1,700	3.4
	12/13/2013	<4	<4	<4	<4	11	<4	6.6	280	5.8	<4	1,300	4.9	<4	720	<4
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	100	<0.50	<0.50	54	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	880	33	<0.50	1,500	12	0.67	1,300	3.2
	9/30/2014	<4	<4	<4	<4	38	<4	20	890	19	<4	3,100	13	<4	2,000	<4
	12/11/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	0.66	<0.50	91	<0.50	<0.50	65	<0.50
	3/18/2015	<1.6	<1.6	<1.6	<1.6	19	<1.6	3.1	515	7.4	<1.6	551	2.4	<1.6	609	<1.6
	6/18/2015	<0.50	<0.50	<0.50	<0.50	33.9	<0.50	15.9	615	15.3	<0.50	1,960	10.4	<0.50	1,390	2
	9/22/2015	<0.50	<0.50	<0.50	<0.50	33.9	<0.50	21	754	15.6	<0.50	2,370	10.4	<0.50	1,740	2.4
	12/8/2015	<0.50	<0.50	<0.50	<0.50	0.89	<0.50	0.64	30.5	0.88	<0.50	185	0.7	<0.50	121	<0.50
	3/8/2016	<2.5	<10	<2.5	<2.5	14.3	<2.5	6.4	336	4.6	<2.5	839	3.7	<2.5	736	<2.5
	6/16/2016	<8.4	<33.4	<8.4	<8.4	41.3	<8.4	17.8	841	19.2	<8.4	2,470	10.1	<8.4	1,820	<8.4
	9/28/2016	<2.5	<10	<2.5	<2.5	<2.5	<2.5	<2.5	148	<2.5	<2.5	4,840	<2.5	<2.5	895	<2.5
	9/28/2016 DUP	<2.5	<10	<2.5	<2.5	<2.5	<2.5	<2.5	145	<2.5	<2.5	5,090	<2.5	<2.5	951	<2.5
	12/16/2016	<5	<20	<5	<5	<5	<5	<5	509	<5	<5	1,020	<5	<5	394	<5
	3/30/2017	<5	<20	<5	<5	<5	<5	<5	101	<5	<5	176	<5	<5	57.6	<5
	6/15/2017	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	1.2	272	1.6	<1.0	97.7	<1.0	<1.0	56.3	4.1
	9/27/2017	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	5.0	3,220	7.3	<1.0	3.3	<1.0	<1.0	1.3	25.0
	11/7/2017	<16.7	<16.7	<4.2	<4.2	<4.2	<4.2	<4.2	1,360	5.4	<4.2	<4.2	<4.2	<4.2	<4.2	25.0
	3/20/2018	<0.500	3.29	<0.500	<0.500	0.879	<0.500	2.55	1,730	5.20	<0.500	0.396 J	<0.500	<0.500	2.19	211
	7/1/2018	<0.500	<2.50	<0.500	<0.500	18.3	0.148 J	5.98	1680	26.9	<0.500	<0.500	<0.500	<0.500	0.781	2030
	9/25/2018	<1.00	10.9	<1.00	<1.00	1.91	<0.400	<0.400	9.78	1.26	<0.500	0.410	<0.400	<0.500	0.800	113
	12/5/2018	<1.00	6.7	<1.00	<1.00	<0.400	<0.400	<0.400	6.17	0.682	<0.500	0.567	<0.400	<0.500	0.413	55.2
	3/19/2019	<1.00	5.64	<1.00	<1.00	<0.400	<0.400	<0.400	2.69	<0.400	<0.500	<0.400	<0.400	<0.500	0.433	2.02
	6/6/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.62	<0.400	<0.500	<0.400	<0.400	<0.500	0.673	2.89
	9/26/2019	<1.00	<5.00	<1.00	<1.00	1.07	<0.400	<0.400	1.94	0.439	<0.500	<0.400	<0.400	<0.500	<0.400	2.01
	12/3/2019	<1.00	<5.00	<1.00	<1.00	1.50	<0.400	<0.400	1.06	0.488	<0.500	<0.400	<0.400	<0.500	<0.400	1.42

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-13 (continued)	3/10/2020	<1.00	<5.00	<1.00	<1.00	9.19	<0.400	1.97	72.5	2.040	<0.500	<0.400	<0.400	<0.500	7.59	134
	6/18/2020	<1.00	<5.00	<1.00	<1.00	0.610	<0.400	<0.400	1.15	<0.400	<0.500	<0.400	<0.400	<0.500	1.12	5.28
	10/7/2020	<1.00	7.1	<1.00	<1.00	18.1	<0.400	<0.400	3.47	0.920	<0.500	0.470	<0.400	<0.500	0.870	98.8
	12/8/2020	<2.00	<5.00	<1.00	<1.00	2.67	<0.400	<0.400	0.606	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	2.3
	3/4/2021	<1.00	<5.00	<1.00	<1.00	11.9	<0.400	<0.400	3.48	0.494	<0.500	<0.400	<0.400	<0.500	0.996	27.4
	6/15/2021	<1.00	<5.00	<1.00	<1.00	1.12	<0.400	<0.400	13.4	0.673	<0.500	1.01	<0.400	<0.500	2.56	12.9
	9/14/2021	<10.0	<50.0	<10.0	<10.0	34.3	<0.400	<0.400	90.7	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	635
	12/9/2021	<1.00	<5.00	<1.00	<1.00	0.684	<0.400	<0.400	10.4	<0.400	<0.500	4.97	<0.400	<0.500	3.28	6.13
	3/9/2022	<1.00	<5.00	<1.00	<1.00	2.00	<0.400	0.650	13.2	0.500	<0.500	1.07	<0.400	<0.500	3.37	26.3
	6/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.36	<0.400	<0.500	1.81	<0.400	<0.500	0.72	0.40
	9/15/2022	<1.00	<5.00	<1.00	<1.00	29.8	<0.400	15.2	224	4.860	<0.500	4.10	<0.400	<0.500	15.7	764.00
	12/6/2022	<1.00	<5.00	<1.00	<1.00	2.940	<0.400	<0.400	5.37	<0.400	<0.500	3.4	<0.400	<0.500	4.53	14.10
MW-14	11/12/1997	<5	<10	<5	<5	5.01	<5	<5	<5	<5	<5	42.6	<5	-	394	<10
	8/10/1999	<20	<100	<10	<10	<10	<10	<10	15.1	<10	<10	121	35.6	-	853	<10
	11/16/1999	<2	<5	<1	<2	2.48	<1	2.48	4.2	<1	<1	186	10.8	-	313	<1
	2/28/2000	<100	<500	<50	<50	<50	<50	83.2	85.1	<50	<50	711	190	-	5,300	<50
	6/27/2000	<10	<50	<5	<5	10.1	<5	18.9	219	<5	<5	207	46.2	-	1,150	<5
	11/30/2000	<2	<10	<1	<1	1.08	<1	1.88	2.27	<1	<1	21.3	5.54	-	157	<1
	5/30/2001	<1	<50	<5	<5	6.16	<5	13.8	30.4	<5	<5	268	28.2	-	1,280	<5
	5/30/2002	<10	<5	<5	<10	<5	<5	<5	8.4	<5	<5	78.3	11.9	-	303	<5
	5/28/2003	<1	<0.50	<0.50	<1	0.9	<0.50	1.47	4.15	<0.50	<0.50	80.6	4.99	-	188	<0.50
	11/15/2004	<25	<25	<25	<25	<25	<25	<25	96	<25	<25	480	<25	-	1,200	<25
	5/17/2005	<2	<1	<1	<2	4.64	<1	2.3	41.1	<1	<1	127	9.28	-	367	<1
	9/12/2007	<20	<10	<10	<20	21.6	<10	<10	162	<10	<10	180	22.2	-	963	<10
	3/5/2008	<1	<0.500	0.850 J	<1	24.3	<0.500	13.9	217	3.86	<0.500	549	27.2	<0.500	1,770	<0.500
	6/25/2008	<5	<5	<5	<5	15.2	<5	10.2	113	<5	<5	360	18.2	-	1,290	<5
	9/19/2008	<5	<2.50	<2.50	<5	19.1	<2.50	8.6	173	<2.50	<2.50	425	16.6	<2.50	1,320	<2.50
	12/10/2008	<5	<5	<5	<5	17	<5	9.6	160	<5	<5	330	17	<5	1,200	<5
	3/27/2009	<2.5	<2.5	<2.5	<2.5	16	<2.5	6.7	160	2.5	<2.5	320	14	<2.5	980	<2.5
	6/17/2009	<2.5	<2.5	<2.5	<2.5	21	<2.5	12	150	<2.5	<2.5	400	21	<2.5	1,400	<2.5
	9/18/2009	<0.50	<0.50	0.74	<0.50	19	<0.50	8.8	150	2	<0.50	440	17	<0.50	1,300	<0.50
	12/15/2009	<2.5	<2.5	<2.5	<2.5	11	<2.5	4.7	120	<2.5	<2.5	410	7.6	<2.5	820	<2.5
3/17/2010	<2.5	<2.5	<2.5	<2.5	22	<2.5	9.5	140	<2.5	<2.5	320	15	<2.5	1,300	<2.5	
7/2/2010	<2.5	<2.5	<2.5	<2.5	7	<2.5	4.8	52	<2.5	<2.5	220	5.9	<2.5	610	<2.5	
9/22/2010	<3	<3	<3	<3	16	<3	6.5	140	<3	<3	230	10	<3	800	<3	

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-14 (continued)	12/8/2010	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	0.7	11	<0.5	<0.5	82	1.5	<0.5	150	<0.5
	3/9/2011	<3	<3	<3	<3	6.8	<3	3.8	55	<3	<3	200	5	<3	540	<3
	6/8/2011	<0.5	<0.5	<0.5	<0.5	0.64	<0.5	<0.5	1.8	<0.5	<0.5	27	1.1	<0.5	66	<0.5
	9/14/2011	<2.5	<2.5	<2.5	<2.5	12	<2.5	5.7	120	<2.5	<2.5	300	8	<2.5	850	<2.5
	12/6/2011	<2.5	<2.5	<2.5	<2.5	8.4	<2.5	3.9	88	<2.5	<2.5	320	5.7	<2.5	740	<2.5
	3/7/2012	<2.5	<2.5	<2.5	<2.5	9.3	<2.5	4.6	87	<2.5	<2.5	270	6.1	<2.5	760	<2.5
	6/19/2012	<2.5	<2.5	<2.5	<2.5	11	<2.5	5.6	70	<2.5	<2.5	200	7.4	<2.5	730	<2.5
	9/11/2012	<2.5	<2.5	<2.5	<2.5	11	<2.5	5.1	110	<2.5	<2.5	280	6.6	<2.5	730	<2.5
	12/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	16	<0.50	<0.50	27	<0.50
	3/12/2013	<0.50	<0.50	0.56	<0.50	12	<0.50	4.4	100	1.7	<0.50	230	7.2	<0.50	670	<0.50
	6/12/2013	<3	<3	<3	<3	11	<3	5	84	<3	<3	260	6.6	<3	770	<3
	9/18/2013	<0.50	<0.50	<0.50	<0.50	13	<0.50	4.6	130	2	<0.50	240	5.9	<0.50	640	<0.50
	12/11/2013	<1.5	<1.5	<1.5	<1.5	8.4	<1.5	2.8	83	<1.5	<1.5	180	3.7	<1.5	460	<1.5
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	20	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	17	<0.50	7	120	1.8	<0.50	210	0.87	<0.50	670	<0.50
	9/24/2014	<2.5	<2.5	<2.5	<2.5	10	<2.5	4	120	<2.5	<2.5	240	4	<2.5	640	<2.5
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.7	<0.50	<0.50	29	0.61	<0.50	63	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	15.4	<0.50	5.9	128	2.2	<0.50	312	5.9	<0.50	912	<0.50
	6/16/2015	<3.1	<3.1	<3.1	<3.1	14.7	<3.1	4.9	117	<3.1	<3.1	248	4.4	<3.1	792	<3.1
	9/21/2015	<0.50	<0.50	<0.50	<0.50	15.2	<0.50	5.6	116	2.1	<0.50	201	4.7	<0.50	654	<0.50
	12/8/2015	Not sampled; well monument under water.														
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	12.5	<0.50	<0.50	29.2	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	7.2	<0.50	2.1	61.8	0.94	<0.50	100	1.7	<0.50	218	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	0.56	<0.50	<0.50	0.97	<0.50
	3/27/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	0.57	69.2	<0.5	<0.5	14.7	<0.5	<0.5	33.4	0.62
	6/13/2017	<2.0	<2.0	<0.50	<0.50	10	<1.0	5.3	432	2.7	<0.50	58.3	2.1	<0.50	204	2.5
	9/26/2017	<0.84	<3.3	<0.84	<0.84	6	<0.84	2.6	279	2.8	<0.84	62.4	<0.84	<0.84	265	<0.84
11/8/2017	<3.3	<3.3	<0.84	<0.84	5	<0.84	2.1	306	2.2	<0.84	39.3	<0.84	<0.84	160	0.9	
3/20/2018	<0.500	1.67 J	<0.500	<0.500	5	<0.500	3.6	500	2.6	<0.500	36.0	0.6	<0.500	150	1.35 J	
6/28/2018	<0.500	<2.50	<0.500	<0.500	11	<0.500	2.5	255	2.5	<0.500	34.9	1.6	<0.500	247	0.7	
9/26/2018	<10.0	<50.0	<10.0	<10.0	12.1	<4.00	4.40	361	4.50	<5.00	84.3	<4.00	<5.00	484	<4.00	
12/5/2018	<10.0	<50.0	<10.0	<10.0	5	<4.00	<4.00	333	<4.00	<5.00	83.4	<4.00	<5.00	260	<4.00	
3/19/2019	<5.00	<25.0	<5.00	<5.00	5.40	<4.00	<4.00	223	2.06	<2.50	31.4	<2.00	<2.50	178	<2.00	
6/6/2019	<1.00	<5.00	<1.00	<1.00	1.74	<0.400	1.09	151	0.937	<0.500	19.1	<0.400	<0.500	76.4	<0.400	
9/25/2019	<1.00	<5.00	<1.00	<1.00	12.5	<0.400	4.58	264	3.6	<0.500	91.8	1.47	<0.500	327	0.482	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-14 (continued)	12/4/2019	<1.00	<5.00	<1.00	<1.00	7.81	<0.400	3.17	242	2.88	<0.500	107	0.704	<0.500	351	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	6.8	<2.00	2.72	186	2.45	<2.50	85.9	<2.00	<2.50	294	<2.00
	6/17/2020	<5.00	<25.0	<5.00	<5.00	3.50	<2.00	<2.00	82.6	<2.00	<2.50	62.6	<2.00	<2.50	197	<2.00
	10/8/2020	<5.00	<25.0	<5.00	<5.00	14.6	<2.00	4.79	207	<2.00	<2.50	124	<2.00	<2.50	680	<2.00
	12/9/2020	<10.0	<25.0	<5.00	<5.00	7.77	<2.00	3.04	180	2.520	<2.50	109	<2.00	<2.50	339	<2.00
	3/4/2021	<1.00	<5.00	<1.00	<1.00	9.39	<0.400	3.76	161	2.51	<0.500	128	1.24	<0.500	410	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	0.87	<0.400	0.485	23.8	<0.400	<0.500	28.3	<0.400	<0.500	80.6	<0.400
	9/14/2021	<1.00	<5.00	<1.00	<1.00	11.1	<0.400	4.52	159	3.210	<0.500	156	1.43	<0.500	531	<0.530
	12/9/2021	<1.00	<5.00	<1.00	<1.00	0.522	<0.400	0.47	21.6	<0.400	<0.500	34.9	<0.400	<0.500	72.8	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	2.37	<0.400	1.16	39.3	0.670	<0.500	54.3	0.540	<0.500	194	<0.400
	06/16/2022	<1.00	<5.00	<1.00	<1.00	0.740	<0.400	<0.400	7.36	<0.400	<0.500	16.2	<0.400	<0.500	41.7	<0.400
	9/13/2022	<1.00	<5.00	<1.00	<1.00	6.76	<0.400	2.48	115.00	2.1	<0.500	109.00	0.8	<0.500	321	<0.400
	12/7/2022	<1.00	<5.00	<1.00	<1.00	1.1	<0.400	0.74	27.90	0.67	<0.500	59.60	<0.400	<0.500	108	<0.400
MW-15	11/13/1997	<0.50	<1	<0.50	<0.50	<0.50	1.1	<0.50	6.78	<0.50	<0.50	2.38	1.68	-	1.81	<1
	11/16/1999	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	967	13.7	-	63.4	<0.50
	2/28/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	17.9	1.55	-	1.01	<0.50
	6/27/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.44	1.03	-	0.565	<0.50
	5/30/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.32	<1	-	<0.50	<0.50
	5/31/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.59	0.63	-	<0.50	<0.50
	5/29/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	4.42	<0.50	-	1.3	<0.50
	11/2/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	-	<0.50	<0.50
	11/16/2004	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	12	<0.50	-	3.1	<0.50
	3/24/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	-	1.49	<0.50
	5/17/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.54	<0.50	-	0.58	<0.50
	9/13/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.54 J	<0.50	-	<0.50	<0.50
	3/7/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	2.63 J	<0.500	<0.500	<0.500	<0.500
	9/18/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.86	<0.500	<0.500	<0.500	<0.500
	3/25/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	<0.50	<0.50
	9/17/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.81	<0.50	<0.50	<0.50	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	<0.50	<0.50
	9/23/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.76	<0.5	<0.5	<0.5	<0.5
	3/9/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
9/16/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	<0.50	<0.50	
3/9/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	<0.50	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)															
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride	
MW-15 (continued)	9/10/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	<0.50	<0.50	
	3/14/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	<0.50	<0.50	
	9/19/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	<0.50	
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
	9/30/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	<0.50	
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	<0.50	<0.50	
	9/23/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	<0.50	<0.50	<0.50	<0.50	
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	<0.50	<0.50	
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.60	<0.500	<0.500	<0.500	<0.500	
	6/6/2019	<1.00	<5.00	<1.00	<1.00	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.531	<0.500	<0.500	<0.500	<0.500	
	6/18/2020	<1.00	<5.00	<1.00	<1.00	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.540	<0.400	<0.500	<0.400	<0.400	
	12/10/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.599	<0.400	<0.500	<0.400	<0.400	
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.431	<0.400	<0.500	<0.400	<0.400	
	12/10/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.583	<0.400	<0.500	<0.400	<0.400	
06/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.400	<0.400	<0.500	<0.400	<0.400		
12/5/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.47	<0.400	<0.500	<0.400	<0.400		
MW-16	11/12/1997	<5	<10	<5	<5	19.8	<5	27.8	23.6	<5	<5	328	57.5	-	142	<10	
	8/11/1999	<5	<25	<2.5	<2.5	15.2	<2.5	<2.5	7.2	<2.5	<2.5	205	55.6	-	85.6	<2.5	
	2/28/2000	<2	<10	<1	<1	10.4	<1	12	7.4	<1	<1	523	54.5	-	112	<1	
	6/27/2000	<10	<50	<5	<5	12.4	<5	13.9	8.39	<5	<5	236	45	-	93.8	<5	
	5/30/2001	<10	<50	<5	<5	9.28	<5	12	8.95	<5	<5	302	30.1	-	110	<5	
	5/30/2002	<5	<2.5	<2.5	<5	13.5	<2.5	10.6	8.65	<2.5	<2.5	467	24	-	119	<2.5	
	5/29/2003	<5	<2.5	<2.5	<5	3.6	<2.5	3.35	2.85	<2.5	<2.5	412	13.4	-	76	<2.5	
	11/2/2004	<2	<10	<1	<1	<1	<1	<1	1.66	<1	<1	260	6.9	-	25.4	<1	
	11/16/2004	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	300	7.8	-	26	<2.5	
	3/24/2005	<2	<1	<1	<2	1.8	<1	1.34	1.96	<1	<1	373	11.8	-	49.4	<1	
	5/17/2005	<1	<0.50	<0.50	<1	4.39	<0.50	3.14	9.25	<0.50	<0.50	120	9.09	-	41.5	<0.50	
	11/15/2005	<1	<0.500	<0.500	<1	2.75	<0.500	1.86	2.5	<0.500	<0.500	152	8.94	-	33.4	<0.500	
	2/21/2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/6/2006	<2	<2	<2	<2	12.2	<2	3.38	210	<2	<2	84.6	2.56	-	25.2	5.64	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-16 (continued)	12/6/2006	<2	<1	<1	<2	4.2	<1	2.12	16.7	<1	<1	176	5.88	-	45.6	<1
	5/23/2007	<1	<1	<1	<1	2.57	<1	<1	14	<1	<1	98.8	3.35	-	23.8	<1
	9/13/2007	<1	<0.50	<0.50	<1	3.15	<0.50	1.08	6.6	<0.50	<0.50	163	5.87	-	49.2	<0.50
	12/12/2007	<2	<1	<1	<1	2.32	<1	1.44	5.9	<1	<1	110	5.92	-	28.2	<1
	3/7/2008	<1	<0.500	<0.500	<1	3	<0.500	1.86	5.93	<0.500	<0.500	280	6.12	<0.500	73.3	<0.500
	9/18/2008	<5	<2.50	<2.50	<5	2.7	<2.50	<2.50	5.15	<2.50	<2.50	300	6.2	<2.50	65.2	<2.50
	12/9/2008	<1	<1	<1	<1	2.6	<1	1.8	5.5	<1	<1	300	5.7	<1	67	<1
	3/26/2009	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	0.82	3.2	<0.50	<0.50	150	5.2	<0.50	28	<0.50
	6/17/2009	<0.50	<0.50	<0.50	<0.50	5	<0.50	0.95	29	<0.50	<0.50	54	1.8	<0.50	16	0.68
	9/17/2009	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	1.1	2	<0.50	<0.50	220	4.8	<0.50	33	<0.50
	12/17/2009	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	0.6	1.4	<0.50	<0.50	100	3.2	<0.50	19	<0.50
	3/19/2010	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	1	2	<0.50	<0.50	110	4.5	<0.50	36	<0.50
	6/16/2010	<0.50	<0.50	<0.50	<0.50	4.9	<0.50	0.91	37	<0.50	<0.50	39	0.94	<0.50	9.9	1.6
	9/23/2010	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	0.94	2.8	<0.5	<0.5	240	4.2	<0.5	43	<0.5
	12/10/2010	<0.5	<0.5	<0.5	<0.5	0.85	<0.5	0.54	1.6	<0.5	<0.5	94	2.4	<0.5	18	<0.5
	3/10/2011	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	0.5	6.2	<0.50	<0.50	110	1.9	<0.50	21	<0.50
	6/9/2011	<0.5	<0.5	<0.5	<0.5	4.9	<0.5	1.2	63	<0.5	<0.5	28	<0.5	<0.5	7.1	2.2
	9/19/2011	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	5.1	<0.50	<0.50	160	2.7	<0.50	13	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	0.92	<0.50	0.61	2.2	<0.50	<0.50	210	2.9	<0.50	38	<0.50
	6/20/2012	<0.5	<0.5	<0.5	<0.5	3.6	<0.5	0.56	24	<0.5	<0.5	60	0.98	<0.5	14	0.62
	9/13/2012	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	0.61	6.5	<0.50	<0.50	190	2.4	<0.50	35	<0.50
	12/13/2012	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.68	5.7	<0.50	<0.50	110	1.1	<0.50	24	<0.50
	3/14/2013	<0.50	<0.50	<0.50	<0.50	0.98	<0.50	0.7	4.7	<0.50	<0.50	200	2	<0.50	50	<0.50
	6/14/2013	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	6	<0.50	<0.50	84	0.96	<0.50	18	<0.50
	9/19/2013	<0.50	<0.50	<0.50	<0.50	0.92	<0.50	0.75	7.1	<0.50	<0.50	180	1.4	<0.50	57	<0.50
	12/13/2013	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	0.68	5.9	<0.50	<0.50	160	1.4	<0.50	52	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	0.89	19	<0.50	<0.50	52	<0.50	<0.50	13	0.55
	6/24/2014	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	10	<0.50	<0.50	70	0.7	<0.50	12	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	0.66	8.8	<0.50	<0.50	200	1.4	<0.50	47	<0.50
	12/11/2014	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	4	<0.50	<0.50	76	0.96	<0.50	17	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	6	<0.50	<0.50	157	0.94	<0.50	31	<0.50
6/17/2015	<0.50	<0.50	<0.50	<0.50	0.61	<0.50	<0.50	10.5	<0.50	<0.50	179	1	<0.50	41.6	<0.50	
9/23/2015	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	0.65	10.4	<0.50	<0.50	173	1.2	<0.50	43.5	<0.50	
12/7/2015	Not sampled; well monument under water.															
9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.5	<0.50	<0.50	144	0.66	<0.50	35.6	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-16 (continued)	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	51.5	<0.50	<0.50	11.6	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	1.6	<0.5	<0.5	19	<0.5	<0.5	27	<0.5	<0.5	6.4	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	6.4	<0.50	<0.50	53.7	0.66	<0.50	5.4	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	1.3	<0.50	<0.50	148.0	1.00	<0.50	11.1	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	150.0	0.96	<0.50	17.4	<0.50
	3/19/2018	<0.500	<2.50	<0.500	<0.500	0.232 J	<0.500	0.190 J	3.8	<0.500	<0.500	99.7	0.82	<0.500	12.6	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	0.500 J	<0.500	0.209 J	9.6	<0.500	<0.500	72.5	0.86	<0.500	7.4	<0.500
	9/25/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	15.8	<0.400	<0.500	171	0.580	<0.500	33.9	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.5	<0.400	<0.500	130.0	0.76	<0.500	20.8	<0.400
	3/22/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	7.90	<0.400	<0.500	136	0.771	<0.500	24.3	<0.400
	6/4/2019	<1.00	<5.00	<1.00	<1.00	0.810	<0.400	<0.400	14.3	<0.400	<0.500	30.1	<0.400	<0.500	5.34	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	14.4	<0.400	<0.500	136	0.658	<0.500	23.9	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	8.75	<0.400	<0.500	102	0.598	<0.500	19.9	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	8.67	<0.400	<0.500	79	0.552	<0.500	12.7	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	1.070	<0.400	<0.400	23.8	<0.400	<0.500	27.3	<0.400	<0.500	5.89	0.42
	10/7/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	26.7	<0.400	<0.500	172	0.642	<0.500	35.9	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	15.7	<0.400	<0.500	122	0.550	<0.500	15.5	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	13.2	<0.400	<0.500	71.1	0.457	<0.500	12.2	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	11.6	<0.400	<0.500	75	0.444	<0.500	12.2	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	38.6	<0.400	<0.500	168	0.547	<0.500	31.6	<0.400
12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	6.38	<0.400	<0.500	43.1	<0.400	<0.500	5.79	<0.400	
3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	14.8	<0.400	<0.500	54.0	<0.400	<0.500	8.82	<0.400	
06/16/2022	<1.00	<5.00	<1.00	<1.00	0.840	<0.400	<0.400	26.3	<0.400	<0.500	20.6	<0.400	<0.500	5.48	0.670	
9/14/2022	<1.00	<5.00	<1.00	<1.00	0.490	<0.400	0.48	84.1	<0.400	<0.500	113	0.57	<0.500	25	<0.400	
12/7/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	20.8	<0.400	<0.500	22.8	<0.400	<0.500	4.65	<0.400	
MW-17	11/13/1997	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	-	<0.50	<1
	11/16/1999	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	127	1.5	-	9.54	<0.50
	2/28/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.85	<1	-	2.51	<0.50
	6/27/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.27	<1	-	<0.50	<0.50
	5/30/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	-	<0.50	<0.50
	5/30/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.82	<0.50	-	<0.50	<0.50
	5/28/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.75	<0.50	-	0.92	<0.50
	11/15/2004	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	-	<0.50	<0.50
	5/17/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.06	<0.50	-	6.68	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-17	5/23/2007	<1	<1	<1	<1	<1	<1	<1	8.82	<1	<1	37.8	<1	-	28.2	<1
(continued)	9/11/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50 J	<0.50	-	<0.50	<0.50
	3/5/2008	<1	<0.500	<0.500	<1	0.9	<0.500	<0.500	0.96	<0.500	<0.500	1.05	<0.500	<0.500	3.62	<0.500
	9/19/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.8	<0.500
	3/25/2009	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	1	<0.50	<0.50	0.69	<0.50	<0.50	3	<0.50
	9/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	0.72	<0.50	<0.50	3.2	<0.50
	3/23/2010	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	3.9	<0.50	<0.50	3.2	0.58	<0.50	18	<0.50
	9/20/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.69	<0.5	<0.5	0.71	<0.5	<0.5	3	<0.5
	3/9/2011	<0.50	<0.50	<0.50	<0.50	0.65	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	8.2	<0.50
	9/13/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	0.71	<0.50	<0.50	3.1	<0.50
	3/7/2012	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	5.4	<0.50	<0.50	6.8	0.56	<0.50	25	<0.50
	9/11/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	0.66	<0.50	<0.50	2.5	<0.50
	3/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	4.1	<0.50	<0.50	11	<0.50
	9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	4.2	<0.50	<0.50	8.9	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	3.2	<0.50	<0.50	6.8	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	0.71	<0.50	<0.50	2.4	<0.50	<0.50	3.9	<0.50	<0.50	12.6	<0.50
	9/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	2.5	<0.50	<0.50	4.2	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	0.83	<0.50	<0.50	3.3	<0.50	<0.50	9.4	<0.50	<0.50	22.7	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	4.2	<0.50	<0.50	10.4	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/29/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	2.7	<0.50	<0.50	4.6	<0.50	<0.50	11.4	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	<0.50	9.9	<0.50	<0.50	21.9	<0.50
	6/28/2018	<0.500	<2.50	<0.500	<0.500	0.516	<0.500	<0.500	2.7	<0.500	<0.500	3.7	<0.500	<0.500	9.0	<0.500
	9/26/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.6	<0.400	<0.500	2.2	<0.400	<0.500	4.6	<0.400
	3/19/2019	<1.00	<5.00	<1.00	<1.00	0.623	<0.400	<0.400	10.5	<0.400	<0.500	6.91	<0.400	<0.500	15.2	<0.400
	6/6/2019	<1.00	<5.00	<1.00	<1.00	0.413	<0.400	<0.400	4.34	<0.400	<0.500	4.34	<0.400	<0.500	10.0	<0.400
	9/26/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.87	<0.400	<0.500	2.41	<0.400	<0.500	4.6	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	0.829	<0.400	<0.400	26.8	<0.400	<0.500	5.54	<0.400	<0.500	15.1	<0.400
	3/10/2020	<1.00	<5.00	<1.00	<1.00	1.06	<0.400	<0.400	18.7	<0.400	<0.500	4.74	<0.400	<0.500	11.6	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.11	<0.400	<0.500	4.06	<0.400	<0.500	7.4	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.28	<0.400	<0.500	1.75	<0.400	<0.500	3.61	<0.400
	12/8/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	17.9	<0.400	<0.500	4.76	<0.400	<0.500	8.70	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	0.684	<0.400	<0.400	22.8	<0.400	<0.500	4.19	<0.400	<0.500	11.00	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.99	<0.400	<0.500	1.9	<0.400	<0.500	3.62	<0.400

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Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-17 (continued)	9/14/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.23	<0.400	<0.500	1.14	<0.400	<0.500	3.42	<0.400
	12/8/2021	<1.00	<5.00	<1.00	<1.00	0.517	<0.400	<0.400	35.3	<0.400	<0.500	7.75	<0.400	<0.500	16.20	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.51	<0.400	<0.500	1.47	<0.400	<0.500	1.69	<0.400
	06/16/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/13/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.11	<0.400	<0.500	.490	<0.400	<0.500	1.00	<0.400
	12/7/2022	<1.00	<5.00	<1.00	<1.00	0.44	<0.400	<0.400	27.4	<0.400	<0.500	5.98	<0.400	<0.500	11.4	<0.400
MW-18i	9/29/2000	ND	ND	0.694	ND	0.843	ND	ND	16.5	ND	ND	11.7	ND	-	8.32	ND
	11/30/2000	<1	<5	<0.50	<0.50	0.907	<0.50	<0.50	11.6	<0.50	<0.50	12.4	<1	-	17.6	<0.50
	2/27/2001	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	10.2	<2.5	<2.5	15.2	<5	-	10	<2.5
	5/30/2001	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	6.47	<2.5	<2.5	29.5	<5	-	8.06	<2.5
	9/25/2001	<1	<1	<1	<1	1.8	<1	<1	23	<1	<1	62	2.3	-	39	<1
	3/29/2002	<1	<0.50	<0.50	<1	1.2	<0.50	<0.50	17.3	<0.50	<0.50	71.1	1.22	-	31	<0.50
	5/30/2002	<1	<0.50	<0.50	<1	1.18	<0.50	<0.50	18.6	<0.50	<0.50	53.2	1.14	-	19.3	<0.50
	8/29/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	6.91	<0.50	<0.50	18.2	<0.50	-	7.34	<0.50
	11/7/2002	<1	<0.50	<0.50	<1	0.56	<0.50	<0.50	10.1	<0.50	<0.50	23.3	<0.50	-	9.7	<0.50
	1/23/2003	<1	<0.50	<0.50	<1	0.68	<0.50	<0.50	12.3	<0.50	<0.50	27.6	0.5	-	12.5	<0.50
	5/29/2003	<1	<0.50	<0.50	<1	0.59	<0.50	<0.50	10.4	<0.50	<0.50	23.9	0.5	-	10.8	<0.50
	11/11/2003	<1	<1	<1	<1	<1	<1	<1	16.1	<1	<1	31.5	<1	-	16.3	<1
	1/27/2004	<1	<0.50	<0.50	<1	0.67	<0.50	<0.50	14.2	<0.50	<0.50	69.7	0.53	-	12	<0.50
	5/4/2004	<1	<1	<1	<1	<1	<1	<1	15.6	<1	<1	112	<1	-	12.1	<1
	8/17/2004	<1	<0.50	3.76	<0.50	0.81	1.86	<0.50	22.6	0.78	<0.50	43.8	0.96	-	24	<1
	11/2/2004	<0.50	<0.50	<0.50	<0.50	1.09	<0.50	<0.50	21.8	<0.50	<0.50	32.2	0.6	-	17.8	<0.50
	11/16/2004	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	24	<0.50	<0.50	42	0.69	-	21	<0.50
	2/1/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	8.92	<0.50	<0.50	13	<0.50	-	6.01	<0.50
	5/18/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	11	<0.50	<0.50	9.69	<0.50	-	7.3	<0.50
	8/18/2005	<1	<0.500	<0.500	<1	1.17	<0.500	<0.500	18 B	<0.500	<0.500	21.4 B	0.58	-	16.3 B	<0.500
	08/18/2005 DUP	<1	<0.500	<0.500	<1	1.17	<0.500	<0.500	18.5 B	<0.500	<0.500	21.8 B	0.57	-	16.2 B	<0.500
	11/15/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	7.31	<0.500	<0.500	11.4	<0.500	-	6.31	<0.500
	2/21/2006	<1	<0.500	<0.500	<1	0.93	<0.500	<0.500	14.8	<0.500	<0.500	24.3	0.52	-	15.2	<0.500
6/6/2006	<1	<1	<1	<1	<1	<1	<1	5.88	<1	<1	8.46	<1	-	4.47	<1	
9/6/2006	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	5.79	<0.50	<0.50	7.89	<0.50	-	4.23	<0.50	
12/6/2006	<1	<0.50	<0.50	<1	0.56	<0.50	<0.50	11.6	<0.50	<0.50	11.2	<0.50	-	6.91	<0.50	
2/7/2007	<1	<0.50	<0.50	<1	0.68	<0.50	<0.50	12	<0.50	<0.50	15	<0.50	-	9.32	<0.50	
5/23/2007	<1	<1	<1	<1	<1	<1	<1	14.6	<1	<1	17.2	<1	-	11.3	<1	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-18i	9/11/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.87	<0.50	<0.50	1.13	<0.50	-	1.46	<0.50
(continued)	12/13/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.99	<0.50	<0.50	5.57	<0.50	-	3.32	<0.50
	3/6/2008	<1	<0.500	<0.500	<1	0.82	<0.500	<0.500	13.2	<0.500	<0.500	13.2	<0.500	<0.500	9.78	<0.500
	6/10/2008	<1	1	1	<1	<1	<1	<1	4.17	<1	<1	4.31	<1	-	2.18	<1
	9/17/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	3.95	<0.500	<0.500	3.1	<0.500	<0.500	2.55	<0.500
	12/9/2008	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	12	<0.50	<0.50	8.5	<0.50	<0.50	7.4	<0.50
	3/26/2009	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	8	<0.50	<0.50	4.8	<0.50	<0.50	4.7	<0.50
	6/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	<0.50	2.5	<0.50	<0.50	1.7	<0.50
	9/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.2	<0.50	<0.50	5.9	<0.50	<0.50	4.5	<0.50
	12/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	2.5	<0.50	<0.50	1.6	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	11	<0.50	<0.50	9.7	<0.50	<0.50	6	<0.50
	6/15/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	3.6	<0.50	<0.50	1.8	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	0.71	<0.5	0.5	15	<0.5	<0.5	9.8	<0.5	<0.5	7.4	<0.5
	12/9/2010	<0.5	<0.5	<0.5	<0.5	0.66	<0.5	0.5	15	<0.5	<0.5	12	<0.5	<0.5	8	<0.5
	3/10/2011	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	12	<0.50	<0.50	9.4	<0.50	<0.50	5.2	<0.50
	6/9/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	2.1	<0.5	<0.5	1	<0.5
	9/15/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	<0.50	2.9	<0.50	<0.50	1.9	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.8	<0.50	<0.50	8.5	<0.50	<0.50	4.8	<0.50
	3/7/2012	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	15	<0.50	<0.50	12	<0.50	<0.50	6.4	<0.50
	6/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	1.5	<0.5	<0.5	0.97	<0.5
	9/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	1.7	<0.50	<0.50	1	<0.50
	12/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	3.9	<0.50	<0.50	2.1	<0.50
	3/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.2	<0.50	<0.50	3.8	<0.50	<0.50	2.1	<0.50
	6/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	2.4	<0.50	<0.50	1.3	<0.50
	9/19/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	2.2	<0.50	<0.50	1.3	<0.50
	12/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	5.3	<0.50	<0.50	3.6	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	1	<0.50	<0.50	0.7	<0.50
	6/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.63	<0.50	<0.50	0.19	<0.50	<0.50	1	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	1.5	<0.50	<0.50	0.93	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	<0.50	2	<0.50	<0.50	1.3	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	2	<0.50	<0.50	1.1	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	2	<0.50	<0.50	1.1	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	<0.50	3.4	<0.50	<0.50	1.8	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	4	<0.50	<0.50	2.6	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	1	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.98	<0.50	<0.50	0.73	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-18i (continued)	9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	0.85	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	1.5	<0.50	<0.50	1.2	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	1.4	<0.5	<0.5	1.2	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	0.66	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	6.40	<0.50	<0.50	1.9	<0.50	<0.50	1.30	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	0.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.43	<0.500	<0.500	1.5	<0.500	<0.500	0.82	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.63	<0.500	<0.500	0.6	0.320 J	<0.500	<0.500	<0.500
	9/27/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.7	<0.400	<0.500	<0.400	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.96	<0.400	<0.500	1.3	<0.400	<0.500	0.70	<0.400
	3/21/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.53	<0.400	<0.500	1.38	<0.400	<0.500	1.03	<0.400
	6/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.31	<0.400	<0.500	0.970	<0.400	<0.500	0.560	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.63	<0.400	<0.500	0.920	<0.400	<0.500	0.647	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.300	<0.400	<0.500	0.589	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.6	<0.400	<0.500	0.896	<0.400	<0.500	0.502	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.94	<0.400	<0.500	0.880	<0.400	<0.500	0.400	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.891	<0.400	<0.500	0.419	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.764	<0.400	<0.500	<0.400	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.664	<0.400	<0.500	0.808	<0.400	<0.500	<0.400	<0.400
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.698	<0.400	<0.500	0.45	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.05	<0.400	<0.500	0.487	<0.400
	12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.23	<0.400	<0.500	0.949	<0.400	<0.500	0.533	<0.400
	3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.990	<0.400	<0.500	0.730	<0.400	<0.500	0.450	<0.400
06/16/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.850	<0.400	<0.500	0.920	<0.400	<0.500	0.440	<0.400	
9/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.690	<0.400	<0.500	<0.400	<0.400	
12/7/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.77	<0.400	<0.500	<0.400	<0.400	
MW-19	11/7/2002	<20	<10	<10	<20	252	<10	66.2	2,450	23	<10	3,100	139	-	1,810	79.2
	5/30/2003	<50	<25	<25	<50	109	<25	36	1,300	<25	<25	7,160	104	-	2,070	35.5
	11/16/2004	<50	<50	<50	<50	<50	65	<50	490	<50	<50	7,300	130	-	1,400	<50
	5/18/2005	<10	<5	<5	<10	19.3	<5	<5	161	<5	<5	1,500	33.8	-	205	24.6
	11/15/2005	<20	<10	<10	<20	27	<10	18.8	230	<10	<10	3,080	67.2	-	785	14.6
	11/15/2005 DUP	<20	<10	<10	<20	25	<10	20.2	221	<10	<10	2,860	64.4	-	762	15.2
	6/5/2006	<10	<10	<10	<10	<10	<10	<10	80.9	<10	<10	1,280	13.1	-	237	<10
	12/6/2006	<20	<10	<10	<20	<10	<10	<10	76.2	<10	<10	2,060	17.2	-	304	<10
	5/22/2007	<20	<20	<20	<20	<20	<20	<20	114	<20	<20	2,720	51.4	-	504	<20

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 NuStar Vancouver Facility
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MW-19 (continued)	9/11/2007	<50	<25	<25	<50	<25	<25	<25	85.5	<25	<25	3,370	62.5	-	608	<25
	12/12/2007	<50	<25	<25	<50	<25	<25	<25	80	<25	<25	2,070	38.5	-	326	<25
	03/05/2008 ⁷	<1	<0.500	<0.500	<1	12.5	<0.500	20.5	149	4.53	<0.500	4,060	66	<0.500	1,030	6.41
	6/25/2008	<20	<20	<20	<20	45.8	<20	29.6	435	<20	<20	2,790	46.6	-	1,410	<20
	9/19/2008	<50	<25	<25	<50	62	<25	37.5	715	<25	<25	4,990	56.5	<25	2,870	39.5
	12/10/2008	<25	<25	<25	<25	51	<25	<25	500	<25	<25	6,600	110	<25	1,100	<25
	3/27/2009	<15	<15	<15	<15	53	<15	39	650	<15	<15	4,500	120	<15	1,900	25
	03/27/2009 DUP	<15	<15	<15	<15	56	<15	39	670	<15	<15	4,800	130	<15	1,900	25
	6/18/2009	<2.5	<2.5	<2.5	<2.5	5.4	<2.5	5.3	82	<2.5	<2.5	680	8.6	<2.5	240	<2.5
	06/18/2009 DUP	<2.5	<2.5	<2.5	<2.5	5.1	<2.5	5.4	80	<2.5	<2.5	660	8.4	<2.5	240	<2.5
	9/18/2009	<2.5	<2.5	<2.5	<2.5	12	<2.5	36	170	4.6	<2.5	9,400	140	<2.5	2,000	11
	09/18/2009 DUP	<2.5	<2.5	<2.5	<2.5	12	<2.5	36	170	4.4	<2.5	9,700	140	<2.5	2,000	12
	12/18/2009	<10	<10	<10	<10	87	<10	29	780	13	<10	3,200	57	<10	1,200	35
	12/18/2009 DUP	<10	<10	<10	<10	84	<10	27	740	12	<10	3,100	53	<10	1,200	32
	3/19/2010	<5	<5	<5	<5	<5	<5	8.3	45	<5	<5	1,900	19	<5	380	<5
	03/19/2010 DUP	<7	<7	<7	<7	<7	<7	8.3	44	<7	<7	1,800	18	<7	360	<7
	6/17/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.7	<0.50	<0.50	67	<0.50	<0.50	25	<0.50
	06/17/2010 DUP	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	6.9	<0.50	<0.50	65	0.52	<0.50	24	<0.50
	9/23/2010	<2.5	<2.5	<2.5	<2.5	8.7	<2.5	21	110	3.6	<2.5	3,400	50	<2.5	920	12
	09/23/2010 DUP	<2.5	<2.5	<2.5	<2.5	8.5	<2.5	21	110	3.4	<2.5	3,700	49	<0.25	890	13
	12/9/2010	<15	<15	<15	<15	59	<15	38	590	<15	<15	6,200	68	<15	1,500	48
	12/09/2010 DUP	<1.5	<1.5	<1.5	<1.5	58	<1.5	37	590	<1.5	<1.5	6,000	67	<1.5	1,500	48
	3/8/2011	<5	<5	<5	<5	23	<5	12	280	<5	<5	1,500	18	<5	590	13
	6/10/2011	<0.9	<0.9	<0.9	<0.9	22	<0.9	2.7	160	1.4	<0.9	240	3.6	<0.9	130	5.6
	06/10/2011 DUP	<0.9	<0.9	<0.9	<0.9	19	<0.9	2.3	140	1.3	<0.9	220	3.3	<0.9	120	5
	9/19/2011	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	53	<1.5	<1.5	400	3	<1.5	78	<1.5
	09/19/2011 DUP	<2	<2	<2	<2	<2	<2	<2	53	<2	<2	410	3.2	<2	80	<2
	12/9/2011	<1.5	<1.5	<1.5	<1.5	5	<1.5	4.3	110	<1.5	<1.5	730	10	<1.5	220	3.9
	12/09/2011 DUP	<2	<2	<2	<2	5.4	<2	4.7	120	<2	<2	770	10	<2	230	3.9
	3/9/2012	<2.5	<2.5	<2.5	<2.5	46	<2.5	26	820	1	<2.5	2,400	50	<2.5	1,200	67
03/09/2012 DUP	<4	<4	<4	<4	43	<4	24	770	8.8	<4	2,400	46	<4	1,200	62	
06/22/2012	<5	<5	<5	<5	74	<5	17	1,000	14	<5	1,300	21	<5	1,000	57	
06/22/2012 DUP	<5	<5	<5	<5	74	<5	18	1,000	13	<5	1,300	22	<5	1,000	57	
9/14/2012	<5	<5	<5	<5	<5	<5	5.7	300	<5	<5	2,200	31	<5	340	8	
09/14/2012 DUP	<5	<5	<5	<5	<5	<5	5.9	300	<5	<5	2,300	31	<5	340	<5	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-19	12/14/2012	<1.5	9.8	<1.5	<1.5	21	<1.5	1.8	330	3.6	<1.5	290	3.2	<1.5	140	3.1
(continued)	12/14/2012 DUP	<1	9.3	<1	<1	21	<1	1.7	340	3.7	<1	300	3.1	<1	140	3
	3/15/2013	<1.5	4.7	<1.5	<1.5	29	<1.5	21	870	5.5	<1.5	3,200	67	<1.5	1,600	9
	03/15/2013 DUP	<1.5	4.7	<1.5	<1.5	30	<1.5	20	820	6.1	<1.5	3,200	68	<1.5	1,500	9.2
	6/14/2013	<9	<9	<9	<9	25	<9	13	730	<9	<9	2,500	29	<9	1,000	<9
	06/14/2013 DUP	<9	<9	<9	<9	25	<9	11	720	<9	<9	2,400	26	<9	1,000	<9
	9/20/2013	<0.50	1.2	<0.50	<0.50	14	<0.50	25	520	4.5	<0.50	3,000	61	<0.50	1,100	10
	09/20/2013 DUP	<1	1.1	<1	<1	12	<1	21	490	3.8	<1	3,200	52	<1	1,200	9
	12/16/2013	<15	<15	<15	<15	37	<15	22	680	<15	<15	3,000	36	<15	1,100	<15
	12/16/2013 DUP	<15	<15	<15	<15	36	<15	22	660	<15	<15	2,900	37	<15	1,100	<15
	3/21/2014	<0.50	1.4	<0.50	<0.50	4.8	<0.50	2.4	130	1.2	<0.50	180	1.6	<0.50	51	4.3
	3/21/2014 DUP	<0.50	1.4	<0.50	<0.50	4.8	<0.50	2.2	130	1.1	<0.50	180	1.6	<0.50	51	4.3
	6/26/2014	<5	0.89	<0.50	<0.50	0.54	110	38	2,000	21	<0.50	1,900	36	0.8	1,500	6.2
	6/26/2014 DUP	<5	1.1	<0.50	<0.50	110	<0.50	38	1,900	21	<0.50	1,900	36	0.74	1,600	6.1
	9/30/2014	<15	<15	<15	<15	18	<15	38	520	<15	<15	4,400	61	<15	1,700	32
	9/30/2014 DUP	<15	<15	<15	<15	18	<15	37	510	<15	<15	4,400	60	<15	1,700	30
	12/12/2014	<5	<5	<5	<5	96	<5	20	1,500	12	<5	1,400	19	<5	790	60
	12/12/2014 DUP	<5	<5	<5	<5	110	<5	21	1,500	14	<5	1,500	21	<5	890	68
	3/18/2015	<4.2	<4.2	<4.2	<4.2	72.5	<4.2	48	1,460	17.5	<4.2	5,920	56.5	<4.2	3,970	53.7
	3/18/2015 DUP	<4.2	<4.2	<4.2	<4.2	82.9	<4.2	47.9	1,410	17.8	<4.2	4,930	56.2	<4.2	3,500	46.6
	6/18/2015	<0.50	<0.50	<0.50	<0.50	21.5	<0.5	48.5	628	6.6	<0.50	8,080	94.3	<0.50	2,200	28
	6/18/2015 DUP	<0.50	<0.50	<0.50	<0.50	22.7	<0.50	48.8	614	7.5	<0.50	7,990	985	<0.50	2,090	30.7
	9/22/2015	<0.50	<0.50	<0.50	<0.50	4.9	<0.5	31.7	185	2	<0.50	7,200	74.8	<0.50	791	6.8
	12/8/2015	<0.50	<0.50	<0.50	<0.50	150	<0.5	33.5	1,640	16.4	<0.50	2,900	36	<0.50	1,550	87.3
	12/8/2015 DUP	<0.50	<0.50	<0.50	<0.50	155	<0.50	35.1	1,680	17.2	<0.50	3,020	37.1	<0.50	1,600	89.8
	3/8/2016	<10	<40	<10	<10	96.6	<10	42	1,520	20.2	<10	4,080	40.8	<10	2,610	64.8
	3/8/2016 DUP	<10	<40	<10	<10	93	<10	42.8	1,460	18.2	<10	3,760	40.4	<10	2,560	72.4
	6/16/2016	<10	<40	<10	<10	<10	<10	22.2	507	<10	<10	3,250	29.2	<10	1,030	18.3
	6/16/2016 DUP	<12.5	<50	<12.5	<12.5	19.5	<12.5	23.8	505	<12.5	<12.5	3,460	28.1	<12.5	1,020	17.6
	9/26/2016	<5	<20	<5	<5	10.4	<5	11	235	<5	<5	1,520	14.5	<5	592	10.1
	12/12/2016	<5	<20	<5	<5	72.8	<5	11.2	1,030	10.7	<5	1,730	10.9	<5	812	28.2
	12/12/2016 DUP	<2.5	<10	<2.5	<2.5	78.7	<2.5	14.2	1,010	11.6	<2.5	1,530	15.5	<2.5	975	31.9
	3/28/2017	<5	<20	<5	<5	197	<5	25.5	1,930	19.7	<5	664	17	<5	826	58.5
	3/28/2017 DUP	<5	<20	<5	<5	214	<5	26.7	1,990	21.5	<5	755	19.9	<5	896	63.2
	6/14/2017	<2.5	<10	<2.5	<2.5	40.6	<2.5	15.4	481	6.1	<2.5	531	8.1	<2.5	481	16.5

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-19	6/14/2017 DUP	<2.5	<10	<2.5	<2.5	41.8	<2.5	15.8	486	6.2	<2.5	566	8.2	<2.5	506	17.2
(continued)	9/26/2017	<2.5	<10	<2.5	<2.5	<2.5	<2.5	26.5	1,160	5.4	<2.5	3,620	38.9	<2.5	1,450	111.0
	9/26/2017 DUP	<2.5	<10	<2.5	<2.5	11.1	<2.5	28.9	1,150	5.4	<2.5	3,710	40.4	<2.5	1,480	111.0
	11/9/2017	<20	<20	<5.0	<5.0	104.0	<5.0	24.9	1,660	24.0	<5.0	1,530	20.2	<5.0	1,020	109.0
	11/9/2017 DUP	<2.0	<2.0	<0.50	<0.50	56.5	<0.50	14.7	1,040	14.7	<0.50	970	13.0	0.75	790	115.0
	3/21/2018	<0.500	3.90	<0.500	<0.500	59.0	0.225 J	31.4	2,430	11.2	<0.500	1,250	17.0	0.339 J	1,340	413.0
	3/21/2018 DUP	<0.500	4.26	<0.500	<0.500	58.2	0.242 J	30.7	2,470	10.8	<0.500	996	17.0	0.277 J	1,180	412.0
	6/28/2018	<0.500	<2.50	<0.500	<0.500	81.6	<0.500	35.6	3,890	16.4	<0.500	163	10.9	0.210 J	148	773.0
	6/28/2018 DUP	<0.500	<2.50	<0.500	<0.500	80.2	<0.500	36.3	4,190	18.4	<0.500	177	11.7	0.244 J	191	799.0
	9/25/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1,900	<0.400	<0.500	3,720	<0.400	<0.500	2,190	115.0
	9/25/2018 DUP	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1,960	<0.400	<0.500	3,830	<0.400	<0.500	2,270	116.0
	12/5/2018	<1.00	<500	<1.00	<1.00	91.8	0.453	39.3	1,750	18.2	<0.500	3,090	21.8	0.67	1,490	79.0
	12/5/2018 DUP	<1.00	<500	<1.00	<1.00	90.1	<0.400	39.2	1,610	18.4	<0.500	2,460	21.3	0.67	1,290	77.1
	3/20/2019	<40.0	<100	<20.0	<20.0	49.7	<8.00	39.5	1,910	13.9	<10.0	2,970	22.7	<10.0	2,090	75.8
	3/20/2019 DUP	<40.0	<100	<20.0	<20.0	46.9	<8.00	37.6	1,820	13.5	<10.0	2,960	23.7	<10.0	2,040	70.2
	6/7/2019	<80.0	<100	<20.0	<20.0	108	<10.0	52.6	1,910	20.4	<12.5	894	<10.0	<12.5	793	70.1
	6/7/2019 DUP	<80.0	<100	<20.0	<20.0	89.6	<8.0	41.6	1,810	16.8	<10.0	772	8.60	<10.0	698	80.8
	9/26/2019	<10.0	<50.0	<10.0	<10.0	33.3	<4	35.1	958	9.59	<5	4,340	26.90	<5	1,430	35.4
	9/26/2019 DUP	<10.0	<50.0	<10.0	<10.0	41.9	<4	40.2	1,160	12.1	<5	4,010	30.60	<5	1,620	39.1
	12/3/2019	<50.0	<250	<50.0	<50.0	57.4	<20.0	28.6	1,250	<20.0	<25.0	1,670	<20.0	<25.0	1,190	25.6
	12/3/2019 DUP	<50.0	<250	<50.0	<50.0	53.4	<20.0	27.2	1,190	<20.0	<25.0	1,650	<20.0	<25.0	1,200	23.2
	3/11/2020	<25.0	<125	<25.0	<25.0	31.8	<10.0	55.4	1,290	<10.0	<12.5	4,600	28.80	<12.5	1,800	143
	3/11/2020 DUP	<25.0	<125	<25.0	<25.0	35.4	<10.0	60.4	1,450	14.8	<12.5	4,730	29.10	<12.5	2,010	154
	6/18/2020	<10.0	<50.0	<10.0	<10.0	25.7	<4.00	21.1	1,060	5.6	<5.00	1,000	9.40	<5.00	580	96.3
	6/18/2020 DUP	<50.0	<250	<50.0	<50.0	32.5	<20.0	27.5	956	<20.0	<25.0	1,080	<20.0	<25.0	697	95
	10/7/2020	<50.0	<250	<50.0	<50.0	44.5	<20.0	53.20	1,470	<20.0	<25.0	7,450	39.00	<25.0	2,760	52.4
	10/7/2020 DUP	<50.0	<250	<50.0	<50.0	46.9	<20.0	58.80	1,510	<20.0	<25.0	8,110	39.00	<25.0	2,920	53.8
	12/8/2020	<200	<500	<100	<100	54.5	<40.0	<40.0	1,150	<40.0	<50.0	3,880	<40.0	<50.0	1,110	117
	12/8/2020 DUP	<200	<500	<100	<100	70.8	<40.0	<40.0	1,330	<40.0	<50.0	3,300	<40.0	<50.0	1,210	87.9
	3/3/2021	<1.00	<5.00	<1.00	<1.00	41.4	<0.400	51.00	1,120	11.4	<0.500	4,470	27.8	<0.500	1,880	53.6
	3/3/2021 DUP	<50.0	<250	<50.0	<50.0	35.8	<20.0	48.5	1,140	<20.0	<25.0	4,620	26.4	<25.0	1,920	50
	6/16/2021	<25.0	<125	<25.0	<25.0	58	<10.0	28.2	1,260	15.1	<12.5	4,770	22.5	<12.5	1,190	80.8
	6/16/2021 DUP	<25.0	<125	<25.0	<25.0	54.1	<10.0	26.8	1,160	<10.0	<12.5	4,430	19.9	<12.5	1,090	76.1
	9/15/2021	<25.0	<125	<25.0	<25.0	19.6	<10.0	53.60	922	<10.0	<12.5	6,790	60.80	<12.5	2,540	45.1
	9/15/2021 DUP	<25.0	<125	<25.0	<25.0	19.3	<10.0	52.40	945	<10.0	<12.5	5,880	63.40	<12.5	2,670	49.1

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Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-19 (continued)	12/8/2021	<100	<500	<100	<100	223	<40.0	86.00	3,650	<40.0	<50.0	9,310	55.30	<50.0	3,420	110
	12/8/2021 DUP	<100	<500	<100	<100	226	<40.0	80.30	3,690	<40.0	<50.0	7,030	51.10	<50.0	3,040	117
	3/9/2022	<50.0	<250	<50.0	<50.0	71.0	<20.00	31.0	1,240	<20.0	<25.0	3,500	20.5	<25.0	942	33.0
	3/9/2022 DUP	<50.0	<250	<50.0	<50.0	69.5	<20.00	29.0	1,220	<20.0	<25.0	3,490	<20.0	<25.0	918	31.5
	6/14/2022	<1.00	<5.00	<1.00	<1.00	0.94	<0.400	<0.400	14.6	<0.400	<0.500	44.8	<0.400	<0.500	16.5	0.95
	6/14/2022 DUP	<1.00	<5.00	<1.00	<1.00	0.89	<0.400	<0.400	14.2	<0.400	<0.500	46.2	<0.400	<0.500	16.5	0.93
	9/15/2022	<1.00	<5.00	<1.00	<1.00	16.80	<0.400	44.80	1,050.00	5.79	<0.500	6010	48.2	<0.500	1100	196
	9/15/2022 DUP	<1.00	<5.00	<1.00	<1.00	15.10	<0.400	42.60	898.00	5.98	<0.500	9670	53.2	<0.500	1600	156
	12/6/2022	<50.0	<250	<50.0	<50.0	69.00	<20.00	36.50	1,130.00	<20.0	<25.0	4340	25	<25.0	1390	36.5
12/6/2022 DUP	<50.0	<250	<50.0	<50.0	74.50	<20.0	33.50	1,160.00	<20.0	<25.0	4230	25	<25.0	1360	39.5	
MW-19i	6/10/2008	<1	<1	<1	<1	<1	<1	<1	8.46	<1	<1	<1	<1	<1	1.28	<1
	9/17/2008	<1	<0.500	<0.500	<1	1.93	0.53	<0.500	27.1	<0.500	<0.500	1.72	<0.500	<0.500	5.77	<0.500
	12/10/2008	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	28	<0.50	<0.50	<0.50	<0.50	<0.50	5.6	<0.50
	3/26/2009	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	25	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50
	6/17/2009	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	10	<0.50	<0.50	0.67	<0.50	<0.50	1.5	<0.50
	9/16/2009	<0.50	<0.50	<0.50	<0.50	1.7	0.64	<0.50	28	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	0.79
	12/15/2009	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	10	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	1.1	0.53	<0.50	15	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50
	6/15/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	1.2	0.58	<0.5	20	<0.5	<0.5	<0.5	<0.5	<0.5	2.4	<0.5
	12/9/2010	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	14	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5
	3/9/2011	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	14	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50
	6/9/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.88	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/15/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50
	12/9/2011	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	8.8	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50
	3/12/2012	<0.50	<0.50	<0.50	<0.50	0.86	<0.50	<0.50	13	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50
	6/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	<0.50	<0.50	<0.50	0.65	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/14/2013	<0.50	<0.50	<0.50	<0.50	0.65	<0.50	<0.50	9.5	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50
6/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/19/2013	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	6.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
12/13/2013	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	6.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	0.83	<0.50	<0.50	1.6	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-19i (continued)	9/27/2014	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	6.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2016	<5	<2	<0.50	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	0.83	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.228 J	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.212 J	<0.500	<0.500	0.223 J	<0.500	<0.500	<0.500	<0.500
	9/27/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	3/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	6/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	9/26/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.43	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	12/10/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.489	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.566	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.796	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
	12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400
3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.700	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	
06/16/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	
9/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.890	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	
12/7/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.57	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-20i	6/10/2008	<1	<1	<1	<1	<1	<1	<1	18	<1	<1	5.77	<1	<1	3.2	<1
	9/17/2008	<1	<0.500	<0.500	<1	2.12	<0.500	<0.500	42.3	<0.500	<0.500	12.8	<0.500	<0.500	11	<0.500
	12/11/2008	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	47	<0.50	<0.50	11	<0.50	<0.50	9.3	<0.50
	3/25/2009	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	36	<0.50	<0.50	8.4	<0.50	<0.50	6.4	<0.50
	6/16/2009	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	30	<0.50	<0.50	6.3	<0.50	<0.50	5.1	<0.50
	9/17/2009	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	34	<0.50	<0.50	7.4	<0.50	<0.50	5	<0.50
	12/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	<0.50	1.1	<0.50	<0.50	0.69	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	47	<0.50	<0.50	11	<0.50	<0.50	6.9	<0.50
	6/15/2010	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	13	<0.50	<0.50	4.3	<0.50	<0.50	2.3	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	43	<0.5	<0.5	17	<0.5	<0.5	10	<0.5
	12/9/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	<0.5	<0.5	3.7	<0.5	<0.5	2	<0.5
	3/11/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.6	<0.50	<0.50	2.4	<0.50	<0.50	2.3	<0.50
	6/8/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/15/2011	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	21	<0.50	<0.50	7.6	<0.50	<0.50	4.5	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	26	<0.50	<0.50	6.4	<0.50	<0.50	4.2	<0.50
	3/7/2012	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	32	<0.50	<0.50	11	<0.50	<0.50	5.9	<0.50
	6/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.3	<0.5	<0.5	2.6	<0.5	<0.5	1.5	<0.5
	9/13/2012	<0.50	<0.50	<0.50	<0.50	0.83	<0.50	<0.50	18	<0.50	<0.50	6.1	<0.50	<0.50	3.8	<0.50
	12/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.9	<0.50	<0.50	1.4	<0.50	<0.50	0.84	<0.50
	3/14/2013	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	28	<0.50	<0.50	9.2	<0.50	<0.50	6	<0.50
	6/13/2013	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	14	<0.50	<0.50	7.3	<0.50	<0.50	3.7	<0.50
	9/19/2013	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	11	<0.50	<0.50	3.9	<0.50	<0.50	2.4	<0.50
	12/13/2013	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	16	<0.50	<0.50	2.4	<0.50	<0.50	1.9	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	<0.50
	6/30/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	1.1	<0.50	<0.50	0.58	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	0.68	<0.50	<0.50	12	<0.50	<0.50	4.3	<0.50	<0.50	2.6	<0.50
	12/12/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	0.68	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.3	<0.50	<0.50	3	<0.50	<0.50	1.7	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.8	<0.50	<0.50	3.7	<0.50	<0.50	2.2	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	13.8	<0.50	<0.50	4.1	<0.50	<0.50	2.1	<0.50
	12/7/2015	Not sampled; well monument under water.														
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.8	<0.50	<0.50	3.4	<0.50	<5	1.8
6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.4	<0.50	<0.50	2.1	<0.50	<0.50	1.5	<0.50
9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.7	<0.50	<0.50	4	<0.50	<0.50	2.2	<0.50
12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	0.54	<0.50	<0.50	<0.50	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-20i (continued)	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	5.6	<0.50	<0.50	1.5	<0.50	<0.50	0.84	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	<0.50	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	2.8	<0.50	<0.50	1.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	0.303 J	<0.500	<0.500	5.7	<0.500	<0.500	1.4	<0.500	<0.500	0.90	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	0.436 J	<0.500	<0.500	9.7	<0.500	<0.500	2.3	<0.500	<0.500	1.60	<0.500
	9/25/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	7.7	<0.400	<0.500	2.1	<0.400	<0.500	1.39	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	0.43	<0.400	<0.400	10.7	<0.400	<0.500	2.2	<0.400	<0.500	1.55	<0.400
	3/22/2019	<1.00	<5.00	<1.00	<1.00	0.492	<0.400	<0.400	10.5	<0.400	<0.500	2.04	<0.400	<0.500	1.65	<0.400
	6/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.58	<0.400	<0.500	0.950	<0.400	<0.500	0.590	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	0.461	<0.400	<0.400	9.43	<0.400	<0.500	2.340	<0.400	<0.500	1.440	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	8.68	<0.400	<0.500	1.370	<0.400	<0.500	0.897	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	9.21	<0.400	<0.500	2.320	<0.400	<0.500	1.260	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.93	<0.400	<0.500	0.410	<0.400	<0.500	<0.400	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	7.66	<0.400	<0.500	1.11	<0.400	<0.500	0.850	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	10.0	<0.400	<0.500	1.57	<0.400	<0.500	0.856	<0.400
	3/2/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	8.68	<0.400	<0.500	1.16	<0.400	<0.500	0.902	<0.400
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	9.16	<0.400	<0.500	1.66	<0.400	<0.500	1.12	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	0.401	<0.400	<0.400	10.3	<0.400	<0.500	1.76	<0.400	<0.500	1.12	<0.400
	12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.2	<0.400	<0.500	0.832	<0.400	<0.500	<0.400	<0.400
3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	6.13	<0.400	<0.500	1.25	<0.400	<0.500	0.770	<0.400	
06/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.07	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
9/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	6.99	<0.400	<0.500	1.10	<0.400	<0.500	0.860	<0.400	
12/7/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	6.42	<0.400	<0.500	1.4	<0.400	<0.500	0.72	<0.400	
MW-21i-105	6/10/2008	<2	<2	<2	<2	2	<2	<2	15.8	<2	<2	53.2	<2	<0.50	25.1	<2
	9/18/2008	<1	<0.500	<0.500	<1	0.78	<0.500	<0.500	5.42	<0.500	<0.500	2.97	<0.500	<0.50	1.77	<0.500
	12/11/2008	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	0.88	61	<0.50	<0.50	33	0.87	<0.50	17	<0.50
	3/26/2009	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	61	<0.50	<0.50	0.76	<0.50	<0.50	0.7	<0.50
	6/17/2009	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	76	<0.50	<0.50	4.3	0.6	<0.50	3.4	<0.50
	9/17/2009	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	73	<0.50	<0.50	11	0.59	<0.50	6.7	<0.50
	12/16/2009	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	60	<0.50	<0.50	14	0.65	<0.50	9.3	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	64	<0.50	<0.50	6.2	0.58	<0.50	7.6	<0.50
	6/15/2010	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	0.63	60	<0.50	<0.80	29	0.84	<0.50	22	<0.50
9/22/2010	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5	75	<0.5	<0.5	5.2	0.55	<0.50	5.1	<0.5	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-21i-105	12/8/2010	<0.5	<0.5	<0.5	<0.5	2	<0.5	0.52	72	<0.5	<0.5	27	0.91	<0.50	14	<0.50
(continued)	3/9/2011	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	0.69	61	<0.50	<0.50	32	1.1	<0.50	17	<0.50
	6/9/2011	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	0.61	63	<0.5	<0.5	29	0.7	<0.5	17	<0.5
	9/15/2011	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	88	<0.50	<0.50	12	0.59	<0.50	12	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	73	<0.50	<0.50	15	0.58	<0.50	9.3	<0.50
	3/7/2012	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	38	<0.50	<0.50	5.6	<0.50	<0.50	5.7	<0.50
	6/20/2012	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	52	<0.5	<0.5	1.4	<0.5	<0.5	3	<0.5
	9/12/2012	<0.50	<0.50	<0.50	<0.50	0.82	<0.50	<0.50	34	<0.50	<0.50	5	<0.50	<0.50	6.3	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	60	1	<0.50	13	<0.50	<0.50	15	<0.50
	3/13/2013	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	42	<0.50	<0.50	2.4	<0.50	<0.50	3.7	<0.50
	6/13/2013	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	48	<0.50	<0.50	1.2	<0.50	<0.50	9.9	<0.50
	9/18/2013	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	51	<0.50	<0.50	2.8	<0.50	<0.50	4.2	<0.50
	12/12/2013	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	61	1.6	<0.50	4	<0.50	<0.50	5.4	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	52	<0.50	<0.50	4.4	<0.50	<0.50	6.8	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	5.4	<0.50	<0.50	3.3	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	37	<0.50	<0.50	5.4	<0.50	<0.50	9.6	<0.50
	3/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	13.3	<0.50	<0.50	6.6	<0.50	<0.50	5.4	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20.8	<0.50	<0.50	3.5	<0.50	<0.50	4	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	0.91	<0.50	<0.50	41.4	<0.50	<0.50	3.4	<0.50	<0.50	5.4	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	0.79	<0.50	<0.50	28.5	<0.50	<0.50	4.9	<0.50	<0.50	8.1	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/26/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	11.7	<0.50	<0.50	5.8	<0.50	<0.50	5.1	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	4.8	<0.5	<0.5	5.7	<0.5	<0.5	2.9	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	4.7	<0.50	<0.50	7.6	<0.50	<0.50	4.1	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	4.3	<0.50	<0.50	5.7	<0.50	<0.50	3.9	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	13.0	<0.50	<0.50	7.4	<0.50	<0.50	6.4	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.7	<0.500	<0.500	0.5	<0.500	<0.500	0.477 J	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.9	<0.500	<0.500	1.8	<0.500	<0.500	1.3	<0.500
	9/26/2018	<1.00	<5.00	<1.00	<1.00	0.82	<0.400	<0.400	36.4	<0.400	<0.500	8.6	<0.400	<0.500	11.0	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	8.6	<0.400	<0.500	9.5	<0.400	<0.500	5.9	<0.400
	3/21/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.04	<0.400	<0.500	1.08	<0.400	<0.500	0.760	<0.400
	6/6/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.11	<0.400	<0.500	3.90	<0.400	<0.500	2.38	<0.400

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-21i-105 (continued)	9/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.08	<0.400	<0.500	4.93	<0.400	<0.500	2.62	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.09	<0.400	<0.500	5.61	<0.400	<0.500	2.79	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.48	<0.400	<0.500	3.60	<0.400	<0.500	2.02	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.59	<0.400	<0.500	3.08	<0.400	<0.500	1.49	<0.400
	10/8/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.76	<0.400	<0.500	4.60	<0.400	<0.500	1.96	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.88	<0.400	<0.500	3.53	<0.400	<0.500	1.62	<0.400
	3/4/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.23	<0.400	<0.500	3.32	<0.400	<0.500	1.74	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.37	<0.400	<0.500	1.7	<0.400	<0.500	1.01	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	0.432	<0.400	<0.400	8.73	<0.400	<0.500	11.4	<0.400	<0.500	6.37	<0.400
	12/8/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.38	<0.400	<0.500	2.32	<0.400	<0.500	1.5	<0.400
	3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.560	<0.400	<0.500	<0.400	<0.400
	6/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.80	<0.400	<0.500	6.51	<0.400	<0.500	3.88	<0.400
	9/15/2022	<1.00	<5.00	<1.00	<1.00	0.44	<0.400	<0.400	7.43	<0.400	<0.500	10.8	<0.400	<0.500	5.57	<0.400
12/6/2022	<1.00	<5.00	<1.00	<1.00	0.88	<0.400	0.41	21.2	<0.400	<0.500	20.9	<0.400	<0.500	9.95	<0.400	
MW-21i-40	9/18/2008	<1	<0.500	<0.500	<1	7.48	<0.500	4.38	124	0.77	<0.500	107	2.01	<0.500	133	<0.500
	12/11/2008	<0.50	<0.50	<0.50	<0.50	6.6	<0.50	3.6	130	0.84	<0.50	100	1.6	<0.50	110	<0.50
	3/26/2009	<0.50	<0.50	<0.50	<0.50	6.2	<0.50	3.6	130	0.63	<0.50	77	1.3	<0.50	88	<0.50
	6/17/2009	<0.50	<0.50	<0.50	<0.50	6.6	<0.50	3.1	120	0.79	<0.50	71	1.5	<0.50	88	<0.50
	9/18/2009	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	3.2	120	1	<0.50	75	1.3	<0.50	92	0.55
	12/16/2009	<0.50	<0.50	<0.50	<0.50	5.7	<0.50	2.6	120	1	<0.50	90	1.2	<0.50	89	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	5.5	<0.50	2.8	120	0.74	<0.50	84	1.1	<0.50	91	<0.50
	6/15/2010	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	2.4	120	0.89	<0.50	62	1.2	<0.50	64	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	4.9	<0.5	2.2	110	0.73	<0.5	68	0.93	<0.5	75	<0.5
	12/8/2010	<0.5	<0.5	<0.5	<0.5	5.1	<0.5	2.3	110	0.77	<0.5	72	1	<0.5	69	<0.5
	3/10/2011	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	1.9	100	0.64	<0.50	53	1	<0.50	57	<0.50
	6/9/2011	<0.5	<0.5	<0.5	<0.5	4.7	<0.5	2.1	110	0.7	<0.5	50	0.96	<0.5	55	<0.5
	9/15/2011	<0.50	<0.50	<0.50	<0.50	5	<0.50	1.9	110	0.65	<0.50	54	1.1	<0.50	57	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	4.8	<0.50	2.1	110	0.66	<0.50	61	0.96	<0.50	60	<0.50
	3/7/2012	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	2.1	110	0.76	<0.50	74	1.5	<0.50	58	<0.50
	6/20/2012	<0.5	<0.5	<0.5	<0.5	5	<0.5	2	160	0.84	<0.5	19	0.81	<0.5	23	<0.5
	9/12/2012	<0.50	<0.50	<0.50	<0.50	5	<0.50	1.8	110	0.63	<0.50	50	1.1	<0.50	48	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	2	120	0.69	<0.50	74	1.1	<0.50	53	<0.50
3/13/2013	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	1.8	120	0.6	<0.50	43	0.83	<0.50	42	<0.50	
6/13/2013	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	48	<0.50	<0.50	12	<0.50	<0.50	9.9	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-21i-40 (continued)	9/18/2013	<0.50	<0.50	<0.50	<0.50	4.7	<0.50	1.4	100	0.53	<0.50	38	0.68	<0.50	33	<0.50
	12/12/2013	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	1.3	100	1	<0.50	41	0.73	<0.50	37	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	1.5	100	0.61	<0.50	40	0.76	<0.50	34	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	1.3	100	0.51	<0.50	33	0.65	<0.50	29	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	4	<0.50	1.4	100	86	<0.50	31	0.51	<0.50	32	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	1.4	100	0.6	<0.50	30	0.51	<0.50	32	<0.50
	3/17/2015	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	1.5	102	0.51	<0.50	43.6	<0.50	<0.50	37.2	<0.50
	6/19/2015	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	0.76	61.6	<0.50	<0.50	24.7	<0.50	<0.50	21.8	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	0.95	84.2	<0.50	<0.50	26.3	<0.50	<0.50	26.6	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	0.7	63.6	<0.50	<0.50	24.7	<0.50	<0.50	21.1	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	2.1	<0.50	<0.50	58.6	<0.50	<0.50	14.2	<0.50	<0.50	15.1	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	2.3	<0.50	0.8	67.8	<0.50	<0.50	18.1	<0.50	<0.50	17.1	<0.50
	9/26/2016	<0.50	<2	<0.50	<0.50	2.6	<0.50	0.87	77.2	<0.50	<0.50	20.1	<0.50	<0.50	19.8	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	2.4	<0.50	0.83	74.2	<0.50	<0.50	21.4	<0.50	<0.50	19.4	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	2.6	<0.5	0.91	87.6	0.58	<0.5	21.8	<0.5	<0.5	16.2	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	2.3	<1.0	0.63	63.6	0.56	<0.50	24.1	<0.50	<0.50	15.1	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	2.3	<1.0	0.70	60.0	<0.50	<0.50	18.1	<0.50	<0.50	15.0	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	2.6	<0.50	0.84	65.4	0.63	<0.50	17.4	<0.50	<0.50	14.6	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	2.1	<0.500	0.64	55.1	0.391 J	<0.500	22.5	<0.500	<0.500	16.5	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	2.6	<0.500	0.75	63.2	0.53	<0.500	26.0	0.145 J	<0.500	17.0	<0.500
	9/27/2018	<1.00	<5.00	<1.00	<1.00	2.5	<0.400	0.70	62.1	0.69	<0.500	24.5	<0.400	<0.500	17.1	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	2.4	<0.400	0.67	59.1	0.48	<0.500	32.7	<0.400	<0.500	19.3	<0.400
	3/21/2019	<1.00	<5.00	<1.00	<1.00	2.48	<0.400	0.700	48.8	0.500	<0.500	24.6	<0.400	<0.500	16.2	<0.400
	6/3/2019	<1.00	<5.00	<1.00	<1.00	2.23	<0.400	0.730	60.9	0.470	<0.500	24.1	<0.400	<0.500	16.9	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	2.48	<0.400	0.768	55.5	0.657	<0.500	22.5	<0.400	<0.500	14.9	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	2.5	<0.400	0.614	56.3	0.521	<0.500	32.1	<0.400	<0.500	19.1	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	1.95	<0.400	0.626	47.4	0.411	<0.500	31.2	<0.400	<0.500	17.6	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	1.95	<0.400	0.540	45.9	0.400	<0.500	31.1	<0.400	<0.500	14.6	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	2.16	<0.400	0.527	50.7	0.433	<0.500	32.7	<0.400	<0.500	18.7	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	2.46	<0.400	0.558	53.3	0.486	<0.500	30.0	<0.400	<0.500	15.8	<0.400
3/2/2021	<1.00	<5.00	<1.00	<1.00	1.73	<0.400	0.403	38.1	<0.400	<0.500	19.6	<0.400	<0.500	12.7	<0.400	
6/16/2021	<1.00	<5.00	<1.00	<1.00	1.62	<0.400	<0.400	35.1	<0.400	<0.500	19.0	<0.400	<0.500	13.2	<0.400	
9/15/2021	<1.00	<5.00	<1.00	<1.00	2.04	<0.400	0.517	45.2	0.463	<0.500	30.1	<0.400	<0.500	16.3	<0.400	
12/7/2021	<1.00	<5.00	<1.00	<1.00	1.64	<0.400	<0.400	36.2	<0.400	<0.500	29.9	<0.400	<0.500	15.4	<0.400	
3/8/2022	<1.00	<5.00	<1.00	<1.00	1.89	<0.400	0.450	38.4	0.420	<0.500	28.0	<0.400	<0.500	15.3	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-21i-40 (continued)	6/16/2022	<1.00	<5.00	<1.00	<1.00	1.57	<0.400	<0.400	32.9	<0.400	<0.500	20.7	<0.400	<0.500	11.7	<0.400
	9/14/2022	<1.00	<5.00	<1.00	<1.00	1.68	<0.400	<0.400	34.8	0.420	<0.500	20.8	<0.400	<0.500	12.3	<0.400
	12/7/2022	<1.00	<5.00	<1.00	<1.00	1.03	<0.400	<0.400	22	<0.400	<0.500	16.9	<0.400	<0.500	8.44	<0.400
MW-22i	6/10/2008	<1	<1	<1	<1	1.02	<1	<1	30	<1	<1	10.3	<1	<1	30	<1
	9/17/2008	<1	<0.500	<0.500	<1	7.48	<0.500	4.38	124	0.77	<0.500	107	2.01	<0.500	133	<0.500
	12/11/2008	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.73	63	<0.50	<0.50	1.1	<0.50	<0.50	6.8	<0.50
	3/25/2009	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	0.64	50	<0.50	<0.50	2.5	<0.50	<0.50	14	<0.50
	6/16/2009	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.52	39	<0.50	<0.50	8.5	<0.50	<0.50	24	<0.50
	9/17/2009	<0.50	<0.50	<0.50	<0.50	1	<0.50	0.57	40	<0.50	<0.50	3.3	<0.50	<0.50	21	<0.50
	12/15/2009	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	28	<0.50	<0.50	3.8	<0.50	<0.50	20	<0.50
	3/18/2010	<0.50	<0.50	<0.50	<0.50	0.86	<0.50	<0.50	34	<0.50	<0.50	2.6	<0.50	<0.50	16	<0.50
	6/14/2010	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	17	<0.50	<0.50	4	<0.50	<0.50	18	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	0.75	<0.5	<0.5	24	<0.5	<0.5	3.6	<0.5	<0.5	18	<0.5
	12/8/2010	<0.5	<0.5	<0.5	<0.5	0.73	<0.5	<0.5	21	<0.5	<0.5	3.5	<0.5	<0.5	18	<0.5
	3/11/2011	<0.50	<0.50	<0.50	<0.50	0.67	<0.50	<0.50	17	<0.50	<0.50	3.6	<0.50	<0.50	17	<0.50
	6/8/2011	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	18	<0.5	<0.5	1.8	<0.5	<0.5	12	<0.5
	9/14/2011	<0.50	<0.50	<0.50	<0.50	0.55	<0.50	<0.50	18	<0.50	<0.50	1.3	<0.50	<0.50	11	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	17	<0.50	<0.50	2.5	<0.50	<0.50	14	<0.50
	3/6/2012	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	13	<0.50	<0.50	2.4	<0.50	<0.50	13	<0.50
	6/20/2012	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	12	<0.5	<0.5	1.9	<0.5	<0.5	11	<0.5
	9/12/2012	<0.50	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	16	<0.50	<0.50	1.5	<0.50	<0.50	10	<0.50
	12/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	13	<0.50	<0.50	1.8	<0.50	<0.50	11	<0.50
	3/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	2.2	<0.50	<0.50	11	<0.50
	6/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	1.1	<0.50	<0.50	9.6	<0.50
	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10	<0.50	<0.50	2.1	<0.50	<0.50	11	<0.50
	12/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	<0.50	1.4	<0.50	<0.50	8.2	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10	<0.50	<0.50	1.3	<0.50	<0.50	9.6	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9	<0.50	<0.50	1.1	<0.50	<0.50	5.7	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.8	<0.50	<0.50	1.7	<0.50	<0.50	9.8	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.2	<0.50	<0.50	2.1	<0.50	<0.50	11	<0.50
3/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.2	<0.50	<0.50	1.8	<0.50	<0.50	8.7	<0.50	
6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.6	<0.50	<0.50	1.6	<0.50	<0.50	9	<0.50	
9/23/2015	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	10	<0.50	<0.50	2.1	<0.50	<0.50	1.15	<0.50
12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8	<0.50	<0.50	2.1	<0.50	<0.50	11	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-22i (continued)	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	8	<0.50	<0.50	2.2	<0.50	<0.50	12	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	1	<0.50	<0.50	7.9	<0.50
	9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	8.1	<0.50	<0.50	1.3	<0.50	<0.50	9	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	8.6	<0.50	<0.50	2	<0.50	<0.50	10.2	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	10	<0.5	<0.5	1.1	<0.5	<0.5	9.7	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	9.6	<0.50	<0.50	0.63	<0.50	<0.50	6.2	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	8.8	<0.50	<0.50	0.88	<0.50	<0.50	6.3	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	9.7	<0.50	<0.50	1.20	<0.50	<0.50	6.4	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	0.330 J	<0.500	<0.500	9.6	<0.500	<0.500	1.76	<0.500	<0.500	7.8	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.52	<0.500	<0.500	12.4	<0.500	<0.500	2.77	<0.500	<0.500	8.1	<0.500
	9/26/2018	<1.00	<5.00	<1.00	<1.00	0.42	<0.400	<0.400	12.5	<0.400	<0.500	2.42	<0.400	<0.500	6.8	<0.400
	12/5/2018	<1.00	<5.00	<1.00	<1.00	0.47	<0.400	<0.400	11.7	<0.400	<0.500	3.34	<0.400	<0.500	8.2	<0.400
	3/21/2019	<1.00	<5.00	<1.00	<1.00	0.510	<0.400	<0.400	12.2	<0.400	<0.500	1.24	<0.400	<0.500	4.92	<0.400
	6/6/2019	<1.00	<5.00	<1.00	<1.00	0.584	<0.400	<0.400	15.5	<0.400	<0.500	2.22	<0.400	<0.500	7.22	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	0.577	<0.400	<0.400	15.5	<0.400	<0.500	3.12	<0.400	<0.500	6.88	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	0.461	<0.400	<0.400	15.2	<0.400	<0.500	1.94	<0.400	<0.500	7.35	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	0.587	<0.400	<0.400	16.1	<0.400	<0.500	3.32	<0.400	<0.500	8.23	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	0.580	<0.400	<0.400	13.6	<0.400	<0.500	3.17	<0.400	<0.500	7.62	<0.400
	10/8/2020	<1.00	<5.00	<1.00	<1.00	0.502	<0.400	<0.400	16.0	<0.400	<0.500	3.68	<0.400	<0.500	8.02	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	0.565	<0.400	<0.400	15.6	<0.400	<0.500	4.07	<0.400	<0.500	7.86	<0.400
	3/4/2021	<1.00	<5.00	<1.00	<1.00	0.51	<0.400	<0.400	13.3	<0.400	<0.500	2.12	<0.400	<0.500	6.62	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	0.643	<0.400	<0.400	16.5	<0.400	<0.500	4.47	<0.400	<0.500	8.86	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	0.656	<0.400	<0.400	19.5	<0.400	<0.500	3.01	<0.400	<0.500	6.53	<0.400
	12/8/2021	<1.00	<5.00	<1.00	<1.00	0.514	<0.400	<0.400	13.9	<0.400	<0.500	5	<0.400	<0.500	8.62	<0.400
3/9/2022	<1.00	<5.00	<1.00	<1.00	0.630	<0.400	<0.400	17.4	<0.400	<0.500	3.51	<0.400	<0.500	7.53	<0.400	
6/15/2022	<1.00	<5.00	<1.00	<1.00	0.580	<0.400	<0.400	13.0	<0.400	<0.500	5.85	<0.400	<0.500	7.52	<0.400	
9/14/2022	<1.00	<5.00	<1.00	<1.00	0.450	<0.400	<0.400	11.5	<0.400	<0.500	4.31	<0.400	<0.500	5.88	<0.400	
12/8/2022	<1.00	<5.00	<1.00	<1.00												
MW-23i	6/10/2008	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	06/10/2008 DUP	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	9/17/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	12/9/2008	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/25/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	<0.50	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-23i (continued)	9/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/17/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/2/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	12/8/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	3/9/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/8/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/13/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/6/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/7/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/19/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/11/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.67	<0.50	<0.50	<0.50	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.78	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
3/27/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.207 J	<0.500	<0.500	0.402 J	<0.500	<0.500	0.215 J	<0.500

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-23i (continued)	6/28/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.202 J	<0.500	<0.500	0.247 J	<0.500	<0.500	0.212 J	<0.500
	9/27/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/22/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/26/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.59	<0.400	<0.500	<0.400	<0.400
	12/5/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/9/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/2/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/9/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
9/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
12/7/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.68	<0.400	<0.500	<0.400	<0.400	
MW-24i	10/1/2010	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	0.94	52	<0.50	<0.50	52	1.9	<0.50	29	<0.50
	12/10/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	6.3	<0.5	<0.5	2	<0.5
	3/14/2011	<0.50	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	15	<0.50	<0.50	23	1	<0.50	7.4	<0.50
	6/7/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	6.6	<0.5	<0.5	1.4	<0.5
	9/16/2011	<0.50	<0.50	<0.50	<0.50	13	<0.50	2.5	270	1.7	<0.50	27	5.6	<0.50	24	19
	12/7/2011	<0.50	<0.50	<0.50	<0.50	5	<0.50	0.84	100	<0.50	<0.50	19	2.9	<0.50	14	7.5
	3/12/2012	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	79	<0.50	<0.50	30	2.3	<0.50	11	4.5
	6/22/2012	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	14	<0.5	<0.5	0.85	<0.5	<0.5	<0.5	2.6
	9/14/2012	<0.50	<0.50	<0.50	<0.50	4.4	<0.50	0.87	58	<0.50	<0.50	31	0.79	<0.50	20	<0.50
	12/14/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	2.1	<0.50	<0.50	0.65	<0.50
	3/15/2013	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	48	<0.50	<0.50	23	0.57	<0.50	15	<0.50
	6/14/2013	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	28	<0.50	<0.50	6.2	<0.50	<0.50	3.6	<0.80
	9/20/2013	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	15	<0.50	<0.50	15	<0.50	<0.50	5.9	<0.80
	12/16/2013	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	8.4	<0.50	<0.50	6.7	<0.50	<0.50	3.4	<0.50
3/24/2014	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	16	<0.50	<0.50	10	<0.50	<0.50	5.5	<0.80	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-24i (continued)	6/23/2014	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	13	<0.50	<0.50	1.3	<0.50	<0.50	5.2	2.1
	9/30/2014	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	21	<0.50	<0.50	20	<0.50	<0.50	10	<0.50
	12/15/2014	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	12	<0.50	<0.50	2.4	<0.50	<0.50	1.1	<0.50
	3/20/2015	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	5.9	<0.50	<0.50	6.1	<0.50	<0.50	3.1	<0.50
	6/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/22/2015	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	4.7	<0.50	<0.50	2.2	<0.50	<0.50	0.8	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	18	<0.50	<0.50	189	<0.50	<0.50	36.4	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	<0.50	4.1	<0.50	<0.50	1.6	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	0.99	<0.50	<0.50	7.8	<0.50	<0.50	11.5	<0.50	<0.50	6.3	<0.50
	9/28/2016	<0.50	<2	<0.50	<0.50	0.53	<0.50	<0.50	5.4	<0.50	<0.50	5.8	<0.50	<0.50	3.1	<0.50
	12/12/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5
	6/15/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	3.2	<0.50	<0.50	6.6	<0.50	<0.50	2.8	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	2.10	<1.0	<0.50	24.5	<0.50	<0.50	30.1	<0.50	<0.50	16.6	<0.50
	11/9/2017	<2.0	<2.0	<0.50	<0.50	1.10	<0.50	<0.50	9.6	<0.50	<0.50	12.7	<0.50	<0.50	5.9	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	1.42	<0.500	<0.500	13.5	<0.500	<0.500	19.1	<0.500	<0.500	10.2	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	1.44	<0.500	<0.500	13.6	1.09	<0.500	10.3	<0.500	<0.500	5.9	<0.500
	9/27/2018	<1.00	<5.00	<1.00	<1.00	2.18	<0.400	<0.400	25.0	<0.400	<0.500	24.8	<0.400	<0.500	14.3	<0.400
	12/4/2018	<1.00	<5.00	<1.00	<1.00	0.80	<0.400	<0.400	5.1	<0.400	<0.500	10.2	<0.400	<0.500	3.8	<0.400
	3/25/2019	<1.00	<5.00	<1.00	<1.00	0.888	<0.400	<0.400	8.46	<0.400	<0.500	11.7	<0.400	<0.500	5.91	<0.400
	6/7/2019	<1.00	<5.00	<1.00	<1.00	0.601	<0.400	<0.400	4.99	<0.400	<0.500	7.39	<0.400	<0.500	3.55	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	0.775	<0.400	<0.400	3.82	<0.400	<0.500	8.78	<0.400	<0.500	3.72	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	1.3	<0.400	<0.400	15.4	<0.400	<0.500	17	<0.400	<0.500	8.42	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	0.61	<0.400	<0.400	2.91	<0.400	<0.500	6.24	<0.400	<0.500	2.84	<0.400
	10/9/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.08	<0.400	<0.500	1.35	<0.400	<0.500	<0.400	<0.400
	12/10/2020	<2.00	<5.00	<1.00	<1.00	1.73	<0.400	<0.400	20	<0.400	<0.500	29.7	<0.400	<0.500	13	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.505	<0.400	<0.500	0.955	<0.400	<0.500	<0.400	<0.400
	6/17/2021	<1.00	<5.00	<1.00	<1.00	0.989	<0.400	<0.400	9.31	<0.400	<0.500	15.7	<0.400	<0.500	8	<0.400
	9/14/2021	<1.00	<5.00	<1.00	<1.00	1.98	<0.400	<0.400	27.5	<0.400	<0.500	36.7	<0.400	<0.500	17.2	<0.400
12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.54	<0.400	<0.500	2.22	<0.400	<0.500	0.629	<0.400	
3/8/2022	<1.00	<5.00	<1.00	<1.00	0.900	<0.400	<0.400	7.93	<0.400	<0.500	13.2	<0.400	<0.500	6.19	<0.400	
6/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.430	<0.400	<0.500	0.710	<0.400	<0.500	<0.400	<0.400	
9/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
12/8/2022	<1.00	<5.00	<1.00	<1.00	1.07	<0.400	<0.400	15.5	<0.400	<0.500	38.6	<0.400	<0.500	9.46	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-24d	9/14/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/8/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/14/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/15/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/14/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/20/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/16/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	4	<0.50	<0.50	1.6	<0.50
	6/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	10/2/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/15/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	3.8	<0.50	<0.50	1.7	<0.50
	9/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/12/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/15/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.259 J	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.199 J
	6/27/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.275 J
	9/28/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/10/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/4/2019	<4.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	0.415	<0.400	<0.400	1.00	<0.400	<0.500	1.62	<0.400	<0.500	0.845	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-24d (continued)	6/18/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	10/9/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/14/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/6/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-25i	9/16/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/6/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/20/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/11/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2016 DUP	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/15/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
9/29/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.81	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
6/15/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-25i (continued)	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.245 J	<0.500	<0.500	0.248 J	<0.500	<0.500	<0.500	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.274 B J	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	9/27/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/6/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/22/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/4/2019	<4.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/3/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.54	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/18/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.44	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/9/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/2/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/8/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/16/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.560	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
9/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
12/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
MW-26	9/16/2011	<2	<2	<2	<2	7	<2	2.2	120	2.6	<2	250	5.7	<2	490	<2
	12/8/2011	<2	<2	<2	<2	7.1	<2	2.5	110	2.2	<2	300	5.8	<2	500	<2
	3/6/2012	<2	<2	<2	<2	8.2	<2	2.2	99	<2	<2	210	4.6	<2	450	<2
	6/19/2012	<2	<2	<2	<2	14	<2	3	90	<2	<2	160	5.2	<2	460	<2
	9/11/2012	<2	<2	<2	<2	6.3	<2	2.3	110	3	<2	280	4.3	<2	460	<2
	12/12/2012	<2	<2	<2	<2	5.6	<2	<2	120	3.7	<2	300	3.8	<2	470	<2
	3/13/2013	<2	<2	<2	<2	4.9	<2	<2	83	<2	<2	210	2.9	<2	390	<2
	6/12/2013	<2	<2	<2	<2	8.2	<2	<2	80	<2	<2	170	4.5	<2	360	<2
	9/18/2013	<2	<2	<2	<2	5.7	<2	<2	96	2.4	<2	210	3.2	<2	410	<2
	12/11/2013	<2	<2	<2	<2	7.8	<2	<2	75	<2	<2	150	3.9	<2	370	<2
	3/19/2014	<2	<2	<2	<2	4.9	<2	<2	95	2.1	<2	220	2.9	<2	350	<2
6/24/2014	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	6.4	49	0.86	<0.50	150	2.1	<0.50	200	<0.50	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-26	9/24/2014	<2	<2	<2	<2	3.9	<2	<2	68	<2	<2	220	3.1	<2	340	<2
(continued)	12/9/2014	<0.90	<0.90	<0.90	<0.90	3.8	<0.90	0.96	55	1.3	<0.90	160	2.8	<0.90	280	<0.90
	3/17/2015	<1	<1	<1	<1	5.8	<1	1.7	75.7	1.8	<1	265	3.7	<1	458	<1
	6/16/2015	<1.7	<1.7	<1.7	<1.7	5	<1.7	<1.7	77.9	<1.7	<1.7	205	2.8	<1.7	385	<1.7
	9/21/2015	<1.7	<1.7	<1.7	<1.7	4.3	<1.7	<1.7	72.4	1.7	<1.7	176	2.7	<1.7	326	<1.7
	12/7/2015	<1.2	<1.2	<1.2	<1.2	8.5	<1.2	1.7	75	1.6	<1.2	179	3.5	<1.2	393	<1.2
	3/8/2016	<1.2	<5	<1.2	<1.2	8	<1.2	1.5	76.1	1.8	<1.2	171	3.7	<1.2	370	<1.2
	6/15/2016	<1	<4	<1	<1	4.6	<1	1.4	83.1	2.2	<1	192	2.2	<1	343	<1
	9/27/2016	<0.50	<2	<0.50	<0.50	3.9	<0.50	1.1	61.1	1.6	<0.50	160	2.4	<0.50	288	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	8.9	<0.50	2.4	85.9	2	<0.50	167	3.3	<0.50	410	<0.50
	3/29/2017	<5	<20	<5	<5	<5	<5	<5	170	<5	<5	214	<5	<5	452	<5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	6.7	<1.0	1.9	113	2.0	<0.50	160	2.1	<0.50	311 E, J	0.65
	9/26/2017	<2.0	<2.0	<0.50	<0.50	5.1	<1.0	1.0	192	2.1	<0.50	68	0.8	<0.50	192	0.98
	11/8/2017	<2.0	2	<0.50	<0.50	4.8	<0.50	1.5	204	2.3	<0.50	88	1.0	<0.50	170	1.80
	3/20/2018	<0.500	0.633 J	0.149 J	<0.500	4.9	<0.500	1.4	157	1.9	<0.500	108	1.2	<0.500	190	1.75
	6/29/2018	<0.500	<2.50	<0.500	<0.500	5.1	<0.500	1.5	114	1.9	<0.500	138	1.9	<0.500	221	1.02
	9/24/2018	<1.00	<5.00	<1.00	<1.00	4.2	<0.400	1.2	141	2.1	<0.500	117	1.2	<0.500	233	1.18
	12/5/2018	<2.00	<10.0	<2.00	<2.00	3.0	<0.800	1.1	147	1.9	<1.00	139	0.8	<1.00	210	0.85
	3/22/2019	<2.00	<10.0	<2.00	<2.00	7.74	<0.800	2.18	142	3.18	<1.00	139	2.09	<1.00	383	<0.800
	6/3/2019	<20.0	<25.0	<5.00	<5.00	5.75	<2.00	<2.00	92.2	2.35	<2.50	148	2.10	<2.50	336	<2.00
	9/26/2019	<5.00	<25.0	<5.00	<5.00	5.14	<2.00	<2.00	104	2.6	<2.50	133	<2.00	<2.50	272	<2.00
	12/3/2019	<5.00	<25.0	<5.00	<5.00	2.63	<2.00	<2.00	95	<2.00	<2.50	137	<2.00	<2.50	216	<2.00
	3/11/2020	<5.00	<25.0	<5.00	<5.00	3.65	<2.00	<2.00	59.7	<2.00	<2.50	79.1	<2.00	<2.50	205	<2.00
	6/17/2020	<2.00	<10.0	<2.00	<2.00	5.16	<0.800	1.38	64.2	1.9	<1.00	143	2.20	<1.00	299	<0.800
	10/7/2020	<5.00	<25.0	<5.00	<5.00	2.64	<2.00	<2.00	62.8	<2.00	<2.50	118	<2.00	<2.50	208	<2.00
	12/9/2020	<10.0	<25.0	<5.00	<5.00	3.34	<2.00	<2.00	64.3	<2.00	<2.50	147	<2.00	<2.50	218	<2.00
	3/4/2021	<1.00	<5.00	<1.00	<1.00	5.92	<0.400	1.89	89.4	2.39	<0.500	151	2.04	<0.500	320	<0.400
	6/17/2021	<2.50	<12.5	<2.50	<2.50	4.35	<1.00	1.43	72.3	1.92	<1.25	132	2.06	<1.25	366	<1.00
	9/15/2021	<5.00	<25.0	<5.00	<5.00	3.33	<2.00	<2.00	71.7	<2.00	<2.50	162	<2.00	<2.50	257	<2.00
	12/7/2021	<5.00	<25.0	<5.00	<5.00	2.74	<2.00	<2.00	43.5	<2.00	<2.50	205	<2.00	<2.50	255	<2.00
	3/8/2022	<1.00	<5.00	<1.00	<1.00	2.56	<0.400	0.930	44	1.18	<0.500	184	1.81	<0.500	247	<0.400
	6/15/2022	<5.00	<25.0	<5.00	<5.00	4.30	<2.00	<2.00	63.8	<2.00	<2.50	283	2.40	<2.50	362	<2.00
	9/14/2022	<5.00	<25.0	<5.00	<5.00	2.4	<2.00	<2.00	31.9	<2.00	<2.50	87.9	<2.00	<2.50	151	<2.00
	12/8/2022	<2.00	<10.0	<2.00	<2.00	1.86	<0.800	<0.800	28.1	<0.800	<1.00	129	0.98	<1.00	156	<0.800

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-32s	3/24/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.79	<0.50	-	<0.50	<0.50
	8/18/2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11/14/2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/6/1908	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	9/17/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	12/9/2008	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/2/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/22/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/9/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	0.94	<0.5	<0.5	1.1
	9/15/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/8/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/13/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/14/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/11/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/20/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/16/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2015	<0.50	<0.50	0.77	<0.50	1.5	<0.50	<0.50	73.5	2.5	<0.50	<0.50	3.5	<0.50	52	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
3/22/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	
10/1/2018	<2.0	<2.0	<0.50	<0.50	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)															
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride	
MW-32s (continued)	12/10/2018	<0.500	<2.50	<0.500	<0.500	0.860	<0.400	<0.400	16.5	<0.400	<0.500	14.7	<0.400	<0.500	5.99	<0.400	
	3/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
	9/26/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
	3/13/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
	10/9/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
	3/2/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
	9/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
	3/9/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
	9/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400	
MW-32i	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	7	<0.50	<0.50	8.2	<0.50	<0.50	3.4	<0.50	
MW-F	6/14/1995	-	<10	<5	<5	<5	5	<5	15	<5	-	<5	<5	-	<5	<10	
	2/27/2001	<1	<5	<0.50	<0.50	0.754	<0.50	<0.50	5.99	<0.50	<0.50	0.506	<1	-	1.18	<0.50	
	5/29/2001	<1	<5	<0.50	<0.50	0.58	<0.50	<0.50	6.47	<0.50	<0.50	<0.50	<1	-	0.585	<0.50	
	9/24/2001	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	6.5	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	
	12/18/2001	<1	<5	<0.50	<0.50	1.44	<0.50	<0.50	17.9	<0.50	<0.50	<0.50	<1	-	0.709	<0.50	
	3/18/2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5/31/2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8/28/2002	<1	<0.50	<0.50	<1	1.12	0.65	<0.50	9.54	<0.50	<0.50	<0.50	<0.50	<0.50	-	0.69	<0.50
	11/8/2002	<1	<0.50	<0.50	<1	1.15	0.81	<0.50	9.86	<0.50	<0.50	<0.50	<0.50	-	0.65	<0.50	
	1/23/2003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5/29/2003	<1	<0.50	<0.50	<1	1.11	0.83	<0.50	10.6	<0.50	<0.50	<0.50	<0.50	-	0.62	<0.50	
	11/10/2003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1/26/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5/4/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8/17/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	11/2/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	11/15/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3/24/2005	<1	<0.50	<0.50	<1	0.87	0.64	<0.50	8.31	<0.50	<0.50	0.52	<0.50	-	0.74	<0.50	
	5/17/2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8/18/2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11/14/2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
12/13/2007	<1	<0.50	<0.50	<1	0.5	0.52	<0.50	5.93	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	
9/18/2008	<1	<0.500	<0.500	<1	0.85	0.72	<0.500	8.57	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.57	<0.500	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
EW-1	4/25/1991	-	<2	-	-	35	20	-	750	-	-	9,100	280	-	440	9.3
	11/17/1993	-	<200	-	-	<100	<100	-	1,700	-	-	8,600	<100	-	480	<200
	9/1/1995	<25	<50	<25	<25	<25	<25	<25	140	<25	<25	2,400	74	-	340	<50
	9/24/1996	<1	<4	3	<0.4	8.5	2.1	<0.40	260	6.2	<0.40	49	34	-	29	89
	12/2/1996	0.7	<0.50	1.9	<0.20	5.7	5	1	530	3.3	<0.20	310	86	-	98	10
	11/12/1997	<2.5	<5	<2.5	<2.5	5.05	3.38	<2.5	68.5	4.91	<2.5	111	5.1	-	47.4	9.2
	8/11/1999	<10	<50	<5	<5	<5	<5	<5	14.5	<5	<5	369	<10	-	39.9	<5
	11/16/1999	<5	<12.5	<2.5	<5	<2.5	3.15	<2.5	41.7	3	<2.5	314	6.9	-	35.5	5.1
	2/29/2000	<2	<10	<1	<1	<1	6.42	<1	13.7	<1	<1	97.3	3.48	-	20.8	<1
	6/27/2000	<2	<10	2.12	<1	<1	6.42	<1	17.5	<1	<1	293	5.37	-	35.1	<1
	8/31/2000	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	31.9	<2.5	<2.5	325	<5	-	38.4	<2.5
	1/30/2000	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	45.6	<2.5	<2.5	380	5.86	-	53.9	<2.5
	2/27/2001	<2	<10	1.42	<1	2.51	2.83	<1	35	<1	<1	240	7.98	-	47.5	2.43
	5/29/2001	<10	<50	<5	<5	<5	<5	<5	22.4	<5	<5	338	<10	-	61.1	<5
	9/25/2001	<5	<5	<5	<5	<5	<5	<5	14	<5	<5	320	9.5	-	61	<5
	12/17/2001	<2	<10	<1	<1	1.19	<1	<1	25.8	<1	<1	217	12.8	-	47.1	<1
	3/19/2002	<2	<1	<1	<2	1.04	<1	<1	17.5	<1	<1	323	5.66	-	46.1	<1
	5/30/2002	<2	<1	1.38	<2	1	1.68	<1	23.5	<1	<1	319	6.46	-	39.9	<1
	8/29/2002	<2	<1	1.36	<2	2.44	1.24	<1	20.4	<1	<1	307	3.38	-	37.8	<1
	11/8/2002	<2	<1	1.46	<2	3.02	3.96	<1	28.4	<1	<1	274	5.54	-	50.2	<1
	1/23/2003	<2	<1	1.36	<2	2.34	<1	<1	17	<1	<1	252	5.06	-	51.9	<1
	5/30/2003	<2	<1	5.22	<2	<1	<1	<1	6.12	<1	<1	255	5.06	-	41.1	<1
	11/10/2003	<5	<5	<5	<5	<5	<5	<5	9	<5	<5	85.8	<5	-	16.2	<5
	1/27/2004	<1	<0.50	2.07	<1	0.87	0.78	<0.50	5.2	<0.50	<0.50	151	4.26	-	37.6	<0.50
	5/4/2004	<1	<1	4.73	<1	<1	1.25	<1	4.36	<1	<1	168	3.09	-	30.8	<1
	8/17/2004	<1	<0.50	3.76	<0.50	0.81	1.86	<0.50	6.83	<0.50	<0.50	144	1.73	-	23.2	<0.50
	11/17/2004	<2.5	<2.5	4	<2.5	<2.5	<2.5	<2.5	9.6	<2.5	<2.5	180	3.6	-	33	<2.5
	5/18/2005	<2	<1	<1	<2	<1	<1	<1	8.28	<1	<1	207	<1	-	23.2	2.3
	11/14/2005	<2	<1	1.06	<2	1.36	2.7	<1	11.1	<1	<1	187	<1	-	26.1	<1
	6/5/2006	<1	<1	2.4	<1	<1	<1	<1	6.18	<1	<1	102	3.55	-	19.1	<1
	12/6/2006	<1	<0.50	2.07	<1	1.13	<0.50	<0.50	8.98	<0.50	<0.50	133	2.1	-	28.3	<0.50
	9/12/2007	<1	<0.50	2.66	<1	0.51	1.14	<0.50	6.28	<0.50	<0.50	76.9	1.47	-	18.3	<0.50
	3/6/2008	<1	<0.500	1.71 J	<1	0.64	1.04	<0.500	5.75	<0.500	<0.500	80.9	1.45	<0.500	19.9	<0.500
	9/19/2008	<5	<2.50	<2.50	<5	<2.50	<2.50	<2.50	14.6	<2.50	<2.50	86.1	<2.50	<2.50	20.8	<2.50
	3/26/2009	<0.50	<0.50	3.6	<0.50	<0.50	0.76	<0.50	3.8	<0.50	<0.50	81	1	<0.50	14	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
EW-1 (continued)	9/17/2009	<0.50	<0.50	3.4	<0.50	0.63	<0.50	<0.50	8.3	<0.50	<0.50	100	0.74	<0.50	17	<0.50
	3/19/2010	<0.50	<0.50	3.5 BE	<0.50	<0.50	<0.50	0.52	4.1	<0.50	<0.50	89	1.5	<0.50	22	<0.50
	9/23/2010	<0.50	<0.50	1.7 BE	<0.50	0.86	0.94	<0.50	10	<0.50	<0.50	87	0.64	<0.50	17	<0.50
	3/10/2011	<0.50	<0.50	5.2	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	<0.50	67	0.89	<0.50	13	<0.50
	9/16/2011	<0.50	<0.50	2.7	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	75	0.69	<0.50	9.9	<0.50
	3/12/2012	<0.50	<0.50	4.4	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	52	0.68	<0.50	13	<0.50
	9/13/2012	<0.50	<0.50	1.7	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	60	0.58	<0.50	8.6	<0.50
	3/15/2012	<0.50	<0.50	2.4	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	78	0.63	<0.50	12	<0.50
	9/19/2013	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	63	0.57	<0.50	14	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	32	1.6	<0.50	12	<0.50
	9/27/2014	Insufficient water for sampling during monitoring event.														
	9/21/2015	<0.50	<0.50	2	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	45.3	0.56	<0.50	12.5	<0.50
	3/8/2016	<0.50	<2	2	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	<0.50	62.6	0.83	<0.50	14.3	<0.50
	9/29/2016	<0.50	<2	1.1	<0.50	<0.50	1.5	<0.50	5.4	<0.50	<0.50	38.6	<0.50	<0.50	10.5	<0.50
	3/30/2017	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.7	<0.50	<0.50	2.4	<0.50
	9/28/2017	<2.0	<2.0	2.4	<0.50	<0.50	<1.0	<0.50	1.8	<0.50	<0.50	32.4	<0.50	<0.50	7.2	<0.50
	11/9/2017	<2.0	<2.0	0.91	<0.50	<0.50	<0.50	<0.50	3.30	<0.50	<0.50	33.0	0.66	<0.50	7.3	<0.50
	7/1/2018	<0.500	<2.50	1.94	<0.500	0.134 J	<0.500	<0.500	1.15 B	<0.500	<0.500	30.7	0.56	<0.500	7.6	<0.500
	9/27/2018	<1.00	<5.00	1.15	<1.00	0.41	1.03	<0.400	3.18	<0.400	<0.500	29.7	0.41	<0.500	8.4	<0.400
	3/25/2019	<1.00	<5.00	1.85	<1.00	<0.400	<0.400	<0.400	1.70	<0.400	<0.500	30.7	0.676	<0.500	11.2	<0.400
	6/4/2019	<1.00	<5.00	1.45	<1.00	<0.400	0.590	<0.400	2.56	<0.400	<0.500	27.4	0.690	<0.500	9.53	<0.400
	9/26/2019	<1.00	<5.00	1.54	<1.00	<0.400	<0.4	<0.400	2.39	<0.400	<0.500	24.4	0.482	<0.500	7.4	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	0.552	<0.400	3.34	<0.400	<0.500	28.3	0.488	<0.500	9.99	<0.400
	3/11/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.811	<0.400	<0.500	15	<0.400	<0.500	5.04	<0.400
	6/17/2020	<1.00	<5.00	1.33	<1.00	<0.400	<0.400	<0.400	1.20	<0.400	<0.500	29.9	0.900	<0.500	6.78	<0.400
	10/7/2020	<1.00	<5.00	1.36	<1.00	<0.400	<0.400	<0.400	3.30	<0.400	<0.500	44.7	0.449	<0.500	10.6	<0.400
	12/9/2020	<2.00	<5.00	1.16	<1.00	<0.400	<0.400	<0.400	1.61	<0.400	<0.500	32.2	0.766	<0.500	8.64	<0.400
	3/2/2021	<1.00	<5.00	3.05	<1.00	<0.400	<0.400	<0.400	0.609	<0.400	<0.500	37.8	0.938	<0.500	15	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	21.6	0.711	<0.500	8.39	<0.400
	9/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.62	<0.400	<0.500	24.2	0.406	<0.500	8.06	<0.400
	12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	24.5	1.330	<0.500	8.36	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	18.2	0.530	<0.500	6.02	<0.400
6/16/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	9.19	0.400	<0.500	2.51	<0.400	
9/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.17	<0.400	<0.500	29.2	0.52	<0.500	7.36	<0.400	
12/8/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.68	<0.400	<0.500	23.2	0.4	<0.500	5.76	<0.400	

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 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
S-1	8/10/1999	<1	<5	<0.50	<1	<0.50	<0.50	<0.50	2.63	<0.50	<0.50	7.81	1.3	-	20.6	<0.50
	2/29/2000	<1	<5	<0.50	<0.50	0.761	<0.50	<0.50	2.21	<0.50	<0.50	60.6	2.98	-	24.4	<0.50
	6/28/2000	<5	<25	<2.5	<2.5	<2.5	<2.5	2.7	58.2	<2.5	<2.5	749	14.5	-	232	<2.5
	8/31/2000	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	4.98	<2.5	<2.5	313	5.14	-	60.4	<2.5
	11/30/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	1.61	<0.50	<0.50	9.78	1.95	-	29.8	<0.50
	2/27/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	0.551	1.66	<0.50	<0.50	13.5	2.26	-	45.2	<0.50
	5/30/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	0.974	<0.50	<0.50	7.38	<1	-	12.6	<0.50
	9/25/2001	<2.5	<2.5	<2.5	<2.5	2.6	<2.5	4	2.7	<2.5	<2.5	39	18	-	210	<2.5
	3/19/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.21	<0.50	-	3.73	<0.50
	5/30/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.45	<0.50	-	10.4	<0.50
	11/7/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.34	<0.50	<0.50	8.71	1.02	-	19.7	<0.50
	1/23/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.78	<0.50	<0.50	6.15	0.56	-	13	<0.50
	5/28/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.500	-	8.67	<0.50
	11/11/2003	<1	<1	<1	<1	<1	<1	<1	1.85	<1	<1	4.22	<1	-	13.2	<1
	1/26/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.57	0.67	-	15.5	<0.50
	5/4/2004	<1	<1	<1	<1	<1	<1	<1	1.17	<1	<1	4.07	<1	-	10.6	<1
	11/15/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	8.4	0.82	-	18	<0.50
	2/1/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	1.89	<0.50	-	2.87	<0.50
	5/18/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.24	<0.50	<0.50	3.73	<0.50	-	8.39	<0.50
	5/23/2007	<1	<1	<1	<1	<1	<1	<1	3.63	<1	<1	4.02	<1	-	6.85	<1
	12/13/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.61	<0.50	<0.50	4.87	<0.50	-	8.44	<0.50
	3/5/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	5.15	<0.500	<0.500	<0.500	4.14	<0.500	<0.500	<0.500
	6/25/2008	<1	<1	<1	<1	<1	<1	<1	1.67	<1	<1	<1	1.37	<1	<1	<1
	9/17/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	5.55	<0.500	<0.500	2.81	<0.500	<0.500	6.07	<0.500
	12/9/2008	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	0.62	<0.50	<0.50	1.4	<0.50
	3/25/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.4	<0.50	<0.50	2.7	<0.50
	6/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.91	<0.50	<0.50	0.81	<0.50	<0.50	1.8	<0.50
	9/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	1.7	<0.50	<0.50	5	<0.50
	12/16/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	1.7	<0.50	<0.50	6.1	<0.50
	3/17/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	1	<0.50
	7/2/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/22/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.66	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5
	12/8/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	0.77	<0.5	<0.5	3	<0.5
	3/9/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
S-1 (continued)	6/8/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.66	<0.5
	9/14/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	1.4	<0.50	<0.50	4	<0.50
	12/6/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	1.3	<0.50	<0.50	3.1	<0.50
	3/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	<0.50	<0.50	0.74	<0.50	<0.50	1.8	<0.50
	6/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.98	<0.5	<0.5	0.94	<0.5	<0.5	3.5	<0.5
	9/14/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	0.88	<0.50	<0.50	2.6	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	0.96	<0.50	<0.50	3.8	<0.50
	3/13/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.78	<0.50	<0.50	1.5	<0.50
	6/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	2.2	<0.50
	9/20/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	1.8	<0.50	<0.50	5.4	<0.50
	12/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	1.2	<0.50	<0.50	5.1	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.82	<0.50	<0.50	2.1	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	1.3	<0.50	<0.50	4.3	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	1.3	<0.50	<0.50	4.9	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	1.4	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	1.6	<0.50	<0.50	5.1	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	0.73	<0.50	<0.50	3	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	0.54	<0.50	<0.50	1.6	<0.50
	3/27/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	1.01	<0.500	0.336 J	3.62	<0.500	<0.500	3.16	0.90	<0.500	24.20	<0.500
	9/26/2018	<1.00	<5.00	<1.00	<1.00	0.51	<0.400	<0.400	2.58	<4.00	<0.500	2.11	0.41	<0.500	10.40	<0.400
12/5/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.10	<4.00	<0.500	1.94	<0.400	<0.500	7.39	<0.400	
3/19/2019	<1.00	<5.00	<1.00	<1.00	0.764	<0.400	<0.400	6.27	<0.400	<0.500	0.921	<0.400	<0.500	3.60	<0.400	
6/5/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.11	<0.400	<0.500	0.783	<0.400	<0.500	2.17	<0.400	
9/25/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.86	<0.400	<0.500	1.1	<0.400	<0.500	2.71	<0.400	
12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.988	<0.400	<0.500	0.971	<0.400	<0.500	2.86	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
S-1 (continued)	3/10/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	1.06	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	0.440	<0.400
	10/7/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.95	<0.400	<0.500	1.20	<0.400	<0.500	2.06	<0.400
	12/8/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	1.30	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.2	<0.400	<0.500	0.852	<0.400	<0.500	1.60	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.849	<0.400	<0.500	0.571	<0.400	<0.500	0.881	<0.400
	9/14/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.453	<0.400	<0.500	0.97	<0.400
	12/8/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.548	<0.400	<0.500	1.20	<0.400
	3/8/2022	<1.00	<5.00	<1.00	<1.00	0.440	<0.400	<0.400	3.94	<0.400	<0.500	1.12	<0.400	<0.500	1.92	<0.400
	6/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	9/13/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.30	<0.400	<0.500	1.59	<0.400	<0.400	1.44	<0.400
	12/7/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.98	<0.400	<0.500	1.68	<0.400	<0.500	1.14	<0.400
S-2	8/11/1999	<1	<5	<0.50	<0.50	2.37	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	<1	-	0.843	<0.50
	11/15/2004	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	4.4	<0.50	-	1.6	<0.50
	12/12/2012	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	1.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/13/2013	<0.50	<0.50	<0.50	<0.50	3.4	<0.50	<0.50	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/12/2013	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/20/2013	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	<0.50	3.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/12/2013	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	3.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	4.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	5.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	3.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	3.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	4.3	<0.50	<0.50	6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/26/2016	<0.50	<2	<0.50	<0.50	6.2	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	3.5	<0.50	<0.50	4.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/27/2017	<0.5	<2	<0.5	<0.5	2.6	<0.5	<0.5	4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	3.3	<1.0	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	8.0	<1.0	<0.50	13.2	<0.50	<0.50	<0.50	0.86	<0.50	0.51	<0.50
11/8/2017	<2.0	<2.0	<0.50	<0.50	7.1	<0.50	<0.50	12.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
3/20/2018	<0.500	<2.50	<0.500	<0.500	3.7	<0.500	<0.500	5.9	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
S-2 (continued)	6/28/2018	<0.500	<2.50	<0.500	<0.500	4.1	<0.500	<0.500	23.2	0.56	<0.500	<0.500	1.00	<0.500	2.34	<0.500
	9/26/2018	<1.00	<5.00	<1.00	<1.00	10.0	<0.400	<0.400	50.9	0.70	<0.500	<4.00	1.74	<0.500	4.00	0.42
	12/5/2018	<1.00	<5.00	<1.00	<1.00	7.0	<0.400	<0.400	28.5	<4.00	<0.500	<0.400	<0.400	<0.500	2.18	<0.400
	3/19/2019	<1.00	<5.00	<1.00	<1.00	2.65	<0.400	<0.400	8.23	<4.00	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/5/2019	<1.00	<5.00	<1.00	<1.00	5.38	<0.400	<0.400	19.8	<0.400	<0.500	<0.400	<0.400	<0.500	0.925	<0.400
	9/25/2019	<1.00	<5.00	<1.00	<1.00	8.88	<0.400	<0.400	49.6	0.64	<0.500	<0.400	0.94	<0.500	2.85	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	7.12	<0.400	<0.400	30.5	<0.400	<0.500	<0.400	<0.400	<0.500	1.75	<0.400
	3/10/2020	<1.00	<5.00	<1.00	<1.00	6.54	<0.400	<0.400	26.4	0.52	<0.500	<0.400	<0.400	<0.500	1.15	<0.400
	6/17/2020	<1.00	<5.00	<1.00	<1.00	4.24	<0.400	<0.400	15.5	<0.400	<0.500	<0.400	<0.400	<0.500	0.58	<0.400
	10/7/2020	<1.00	<5.00	<1.00	<1.00	10.2	<0.400	<0.400	54.4	0.539	<0.500	<0.400	1.01	<0.500	3.08	0.448
	12/8/2020	<2.00	<5.00	<1.00	<1.00	7.72	<0.400	<0.400	31.4	<0.400	<0.500	<0.400	<0.400	<0.500	1.13	<0.400
	3/3/2021	<1.00	<5.00	<1.00	<1.00	8	<0.400	<0.400	37.2	0.578	<0.500	<0.400	<0.400	<0.500	1.44	<0.400
	6/15/2021	<1.00	<5.00	<1.00	<1.00	6.15	<0.400	<0.400	29.9	<0.400	<0.500	<0.400	<0.400	<0.500	1.17	<0.400
	9/14/2021	<1.00	<5.00	<1.00	<1.00	8.15	<0.400	<0.400	45.2	0.603	<0.500	<0.400	0.65	<0.500	2.16	<0.400
	12/8/2021	<1.00	<5.00	<1.00	<1.00	6.32	<0.400	<0.400	35.9	<0.400	<0.500	<0.400	<0.400	<0.500	1.38	<0.400
	3/28/2022	<1.00	<5.00	<1.00	<1.00	5.72	<0.400	<0.400	28.6	<0.400	<0.500	<0.400	0.410	<0.500	1.07	<0.400
	6/15/2022	<1.00	<5.00	<1.00	<1.00	5.13	<0.400	<0.400	28.3	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
9/13/2022	<1.00	<5.00	<1.00	<1.00	6.43	<0.400	<0.400	39.8	0.810	<0.500	<0.400	0.82	<0.500	2.06	<0.400	
12/7/2022	<1.00	<5.00	<1.00	<1.00	9.13	<0.400	<0.400	55.4	0.87	<0.500	<0.400	0.41	<0.500	3.05	<0.400	
MGMS1-3(43)	6/28/2000	<50	<250	<25	<25	278	<25	55.9	4,270	<25	<25	734	<50	--	1,840	<25
	8/30/2000	<200	<1	<100	<100	420	<100	116	8,850	<100	<100	5,940	<200	--	3,040	<100
	11/29/2000	<100	<500	<50	<50	249	<50	76.2	4,560	<50	<50	1,210	<100	--	1,140	<50
	2/27/2001	<100	<500	<50	<50	697	<50	164	14,000	<50	<50	148	<100	--	1,390	133
	5/31/2001	<100	<500	<50	<50	<50	<50	<50	5,870	<50	<50	130	<100	--	599	<50
	9/24/2001	<13	<13	<13	<13	150	<13	32	4,700	<13	<13	310	<13	--	450	25
	12/18/2001	<50	<250	<25	<25	153	<25	33.3	3,600	<25	<25	276	<50	--	568	<25
	3/19/2002	<100	<50	<50	<100	310	<50	103	6,700	<50	<50	2,090	<50	--	1,720	86
	5/29/2002	<50	<25	<25	<50	188	<25	39	4,700	<25	<25	470	<25	--	624	37.5
	8/29/2002	<1	<0.50	<0.50	<1	3.72	<0.50	0.84	94.7	0.54	<0.50	34.9	0.75	--	35.7	1.46
	11/11/2002	<100	<50	<50	<100	183	<50	<50	4,810	<50	<50	757	<50	--	831	51
	1/23/2003	<100	<50	<50	<100	378	<50	76	10,500	<50	<50	782	<50	--	1,290	109
	5/28/2003	<100	<50	<50	<100	402	<50	72	9,510	<50	<50	270	<50	--	841	114
	11/11/2003	<50	<50	<50	<50	252	<50	<50	9,710	<50	<50	516	<50	--	1,020	58
1/27/2004	<50	<25	<25	<50	290	<25	54.5	8,160	53.5	<25	393	<25	--	808	95	

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		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-3(43)	5/3/2004	<100	<100	<100	<100	370	<100	<100	12,300	<100	<100	830	<100	-	1,520	111
(continued)	8/17/2004	<100	<50	<50	<100	401	<50	114	12,700	109	<50	1,540	<50	-	2,340	151
	11/15/2004	<120	<120	<120	<120	270	<120	<120	9,600	<120	<120	1,400	<120	-	1,600	<120
	3/24/2005	<100	<50	<50	<100	481	<50	148	15,600	135	<50	1,390	<50	-	2,090	266
	5/16/2005	<50	<25	<25	<50	327	<25	89	9,670	83	<25	802	<25	-	1,410	157
	5/17/2005	<100	<50	<50	<100	353	<50	86	10,600	94	<50	920	<50	-	1,660	173
	11/17/2005	<100	<50	<50	<100	392	<50	121	13,400	133	<50	1,310	<50	-	2,280	186
	6/6/2006	<100	<100	<100	<100	385	<100	<100	11,800	115	<100	628	<100	-	1,370	192
	12/6/2006	<100	<50	<50	<100	256	<50	72	9,960	92	<50	843	<50	-	1,260	155
	5/22/2007	<100	<100	<100	<100	439	<100	119	14,200	152	<100	910	<100	-	1,920	245
	9/11/2007	<100	<50	<50	<100	303	<50	109	11,700	128	<50	1,100	<50	-	2,060	189
	12/12/2007	<100	<50	<50	<100	270	<50	75	8,740	93	<50	1,010	<50	-	1,540	167
	3/5/2008	<50	<25	<25	<50	370	<25	128	6,740	220	<25	1,480	36	<25	2,350	234
	9/16/2008	<100	<50	<50	<100	302	<50	112	10,400	139	<50	2,700	<50	<50	2,500	171
	12/8/2008	<4	<4	<4	<4	190	<4	63	6,000	78	<4	1,300	19	<4	1,200	100
	3/25/2009	<15	<15	<15	<15	110	<15	66	3,500	34	<15	3,600	49	<15	2,100	49
	9/15/2009	<15	<15	<15	<15	140	<15	74	4,200	45	<15	4,300	44	<15	2,300	84
	12/14/2009	<15	<15	<15	<15	140	<15	46	4,000	55	<15	1,500	15	<15	1,100	67
	3/17/2010	<15	<15	<15	<15	160	<15	63	4,600	44	<15	2,800	32	<15	1,900	78
	6/14/2010	<25	<25	<25	<25	220	<25	46	5,400	69	<25	790	<25	<25	900	85
	9/21/2010	<15	<15	<15	<15	130	<15	55	3,800	43	<15	2,900	37	<15	1,900	68
	12/7/2010	<15	<15	<15	<15	190	<15	63	5,500	69	<15	2,500	23	<15	1,800	96
	3/8/2011	<20	<20	<20	<20	170	<20	52	4,600	56	<20	1,400	<20	<20	1,300	86
	6/6/2011	<15	<15	<15	<15	190	<15	36	4,700	71	<15	610	<15	<15	790	97
	9/13/2011	<20	<20	<20	<20	290	<20	78	8,000	160	<20	900	<20	<20	1,800	160
	3/8/2012	<4	<40	<40	<40	340	<40	62	9,500	150	<40	240	<40	<40	690	890
	6/21/2012	<20	<20	<20	<20	220	<20	25	4,400	76	<20	74	<20	<20	260	1,100
	9/12/2012	<20	<20	<20	<20	280	<20	72	8,800	180	<20	360	<20	<20	970	890
	12/11/2012	<20	<20	<20	<20	220	<20	40	6,100	110	<20	160	<20	<20	430	680
	3/12/2013	<20	<20	<20	<20	220	<20	21	4,700	74	<20	110	<20	<20	340	1,600
	6/11/2013	<20	<20	<20	<20	190	<20	<20	3,900	56	<20	78	<20	<20	260	1,100
	9/17/2013	<15	<15	<15	<15	190	<15	21	4,600	66	<15	100	<15	<15	350	1,100
	12/10/2013	<15	<15	<15	<15	210	<15	18	3,600	54	<15	95	<15	<15	270	1,800
	3/18/2014	<20	<20	<20	<20	150	<20	<20	3,600	40	<20	93	<20	<20	260	440
	6/26/2014	<7	<7	<7	<7	120	<7	14	2,000	14	<7	21	<7	<7	57	480

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		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-3(43)	9/23/2014	<15	<15	<15	<15	190	<15	35	4,700	69	<15	120	<15	<15	420	550
(continued)	12/12/2014	<7	<7	<7	<7	200	<7	23	4,000	52	<7	100	<7	<7	350	810
	3/19/2015	<12.5	<12.5	<12.5	<12.5	131	<12.5	<12.5	2,450	16.6	<12.5	31.7	<12.5	<12.5	129	249
	6/18/2015	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	59.1	<0.50	<0.50	0.84	<0.50	<0.50	2.8	3.1
	9/21/2015	<10	<10	<10	<10	124	<10	14.1	2,810	24.8	<10	53.5	<10	<10	171	129
	12/8/2015	<0.50	<0.50	<0.50	<0.50	92	<0.50	<0.50	1,580	11.5	<0.50	26.2	<0.50	<0.50	88	230
	3/9/2016	<10	<40	<10	<10	93.9	<10	<10	1,700	12.4	<10	24.1	<10	<10	81.9	209
	6/17/2016	<8.3	<33.3	<8.3	<8.3	163	<8.3	26.6	3,130	36.1	<8.3	64.6	<8.3	<8.3	248	288
	9/30/2016	<8.3	<33.3	<8.3	<8.3	81.9	<8.3	13.5	1,980	24.2	<8.3	230	<8.3	<8.3	366	52
	12/16/2016	<8.4	<33.4	<8.4	<8.4	92.6	<8.4	9.5	1,810	20.1	<8.4	64.1	<8.4	<8.4	171	239
	3/31/2017	<8.4	<33.4	<8.4	<8.4	90.8	<8.4	12.5	1,430	15.2	<8.4	45.8	<8.4	<8.4	119	348
	6/12/2017	<8.3	<33.3	<8.3	<8.3	173	<8.3	16.7	2,620	18.7	<8.3	24.4	<8.3	<8.3	116	681
	9/29/2017	<2.5	<10.0	<2.5	<2.5	60	<2.5	6.9	901	12.9	<2.5	70.7	<2.5	<2.5	126	117
	11/7/2017	<10.0	<10.0	<2.5	<2.5	153	<2.5	13.7	2,350 J	26.6	<2.5	108	<2.5	<2.5	211	181
	3/22/2018	<0.500	<2.50	<0.500	<0.500	192	<0.500	18.0	2,450	34.9	<0.500	80	0.8	0.200 J	278	236
	7/1/2018	<0.500	<2.50 J3	<0.500	<0.500	116	<0.500	13.8	1,880	32.8	<0.500	107	0.6	<0.500	246	118
	9/28/2018	<20.0	<100	<20.0	<20.0	141	<8.00	27.8	3,150	47.4	<10.0	252	<8.00	<10.0	528	134
	12/4/2018	<1.00	<5.00	<1.00	<1.00	148	<0.400	22.5	2,750	48.1	<0.500	146	1.1	<0.500	388	129
	3/26/2019	<40.0	<100	<20.0	<20.0	160	<8.00	22.3	3,210	42.2	<10.0	145	<8.00	<10.0	372	105
	6/7/2019	<20.0	<100	<20.0	<20.0	169	<8.00	26.5	3090	40.8	<10.0	115	<8.00	<10.0	315	145
	9/27/2019	<20.0	<100	<20.0	<20.0	156	<8.00	30.5	3240	53.9	<10.0	212	<8.00	<10.0	434	113
	12/4/2019	<20.0	<100	<20.0	<20.0	124	<8.00	17.5	2860	40.9	<10.0	162	<8.00	<10.0	398	11.8
	3/11/2020	<25.0	<125	<25.0	<25.0	157	<10.0	29.7	3230	60.4	<12.5	228	<10.0	<12.5	495	157
	6/16/2020	<25.0	<125	<25.0	<25.0	114	<10.0	21.8	2520	31.5	<12.5	116	<10.0	<12.5	264	152
	10/6/2020	<25.0	<125	<25.0	<25.0	124	<10.0	26.0	2980	45.5	<12.5	219	<10.0	<12.5	507	48.2
	12/10/2020	<100	<250	<50	<50	131	<20	<20	2620	34.300	<25	151	<20	<25	294	40.6
	3/4/2021	<10.0	<50.0	<10.0	<10.0	128	<0.400	29.00	2840	38.500	<0.500	135	<0.400	<0.500	388	161
	6/16/2021	<25.0	<125	<25.0	<25.0	103	<10.0	20.80	2690	34.900	<12.5	90.5	<10.0	<12.5	297	153
	9/14/2021	<25.0	<125	<25.0	<25.0	152	<10.0	31.20	3550	49.600	<12.5	170	<10.0	<12.5	464	61.6
	12/7/2021	<25.0	<125	<25.0	<25.0	87.6	<10.0	17.20	2280	61.200	<12.5	139	<10.0	<12.5	338	177
	3/10/2022	<10.0	<50.0	<10.0	<10.0	114	<4.00	23.5	2,250	28.7	<5.00	53.6	<4.00	<5.00	209	322
	6/15/2022	<50.0	<250	<50.0	<50.0	74.5	<20.0	<20.0	1250	<20.0	<25.0	43.5	<20.0	<25.0	140	572
	9/12/2022	<10.0	<50.0	<10.0	<10.0	124	<4.00	27.9	2960	55.2	<5.00	193	<4.00	<5.00	471	176
	12/8/2022	<25.0	<125	<25.0	<25.0	104	<10.0	25	2630	39.8	<12.5	175	<10.0	<12.5	385	41.2

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		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-2(60)	6/28/2000	<10	<50	<5	<5	53.6	<5	<5	369	<5	<5	658	19.7	-	240	<5
	8/30/2000	<20	<100	<10	<10	21.7	<10	13.1	267	<10	<10	2,590	108	-	586	<10
	11/29/2000	<2	<10	<1	<1	1.58	<1	1.09	57.7	<1	<1	121	4.58	-	40.3	<1
	2/27/2001	<1	<5	<0.5	<0.5	0.838	<0.5	0.686	32.9	<0.5	<0.5	54.6	2.06	-	24.7	<0.5
	5/31/2001	<1	<5	<0.50	<0.50	0.662	<0.50	0.581	39	<0.50	<0.50	69.4	<1	-	27.8	0.52
	9/24/2001	<13	<13	<13	<13	<13	<13	<13	89	<13	<13	830	14	-	150	<13
	12/18/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	20.4	<0.50	<0.50	12.8	<1	-	15.7	<0.50
	3/19/2002	<1	<0.50	<0.50	<1	2.52	<0.50	0.99	68	<0.50	<0.50	62.9	1.2	-	34	3.48
	5/29/2002	<1	<0.50	<0.50	<1	0.78	<0.50	<0.50	22.8	<0.50	<0.50	23.4	<0.50	-	14.2	0.6
	8/29/2002	<10	<5	<5	<10	30.6	<5	5.1	661	<5	<5	138	<5	-	116	<5
	11/11/2002	<1	<0.50	<0.50	<1	2.99	<0.50	0.83	86	<0.50	<0.50	38.2	1.16	-	38.9	<0.50
	1/23/2003	<1	<0.50	<0.50	<1	1.53	<0.50	0.74	42.6	<0.50	<0.50	42.8	0.78	-	34.2	1.04
	5/28/2003	<1	<0.50	<0.50	<1	2.87	<0.50	1.21	72	<0.50	<0.50	51.1	1.18	-	47.6	0.63
	11/11/2003	<1	<1	<1	<1	1.84	<1	<1	48.8	<1	<1	45.9	<1	-	36	<1
	1/27/2004	<1	<0.50	<0.50	<1	2.06	<0.50	1.06	72.3	0.69	<0.50	40.9	0.66	-	43.1	0.63
	5/3/2004	<1	<1	<1	<1	4.07	<1	1.22	70.7	<1	<1	54.8	1.36	-	43.5	2.53
	8/17/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11/2/2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11/15/2004	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.68	39	<0.50	<0.50	31	<0.50	-	28	0.67
	2/1/2005	<1	<0.50	<0.50	<1	1.31	<0.50	<0.50	37.5	0.56	<0.50	33.2	<0.50	-	21.7	1.3
	5/16/2005	<1	<0.50	<0.50	<1	0.95	<0.50	<0.50	40.6	<0.50	<0.50	21.7	<0.50	-	19.8	<0.50
	05/16/2005 DUP	<1	<0.50	<0.50	<1	1.02	<0.50	<0.50	42.1	<0.50	<0.50	21.4	<0.50	-	20.5	<0.50
	8/18/2005	<1	<0.500	<0.500	<1	7.28	<0.500	2.41	145	1.2	<0.500	76.5 B	1.46	-	65.6	5.16 B
	11/17/2005	<1	<0.500	<0.500	<1	2.53	<0.500	0.99	87	0.59	<0.500	34.8	<0.500	-	26.4	0.93
	2/20/2006	<1	<0.500	<0.500	<1	6.17	<0.500	1.93	136	1.1	<0.500	61.9	0.93	-	45.5	4.17
	6/6/2006	<1	<1	<1	<1	1.02	<1	<1	33.7	<1	<1	23.4	<1	-	18.7	<1
	9/5/2006	<1	<0.50	<0.50	<1	5.37	<0.50	1.75	115	0.84	<0.50	55.9	0.8	-	37.5	4.79
	12/6/2006	<1	<0.50	<0.50	<1	3.39	<0.50	1.12	90.9	0.62	<0.50	39.5	<0.50	-	28.3	2.15
	2/7/2007	<1	<0.50	<0.50	<1	4.37	<0.50	1.37	116	0.93	<0.50	55.9	0.58	-	40.7	3
	5/22/2007	<1	<1	<1	<1	1.18	<1	<1	38.5	<1	<1	31.6	<1	-	25.2	<1
	9/11/2007	<5	<2.50	<2.50	<5	26.6	<2.50	8.75	711	7.2	<2.50	81.4	2.95	-	216	11.9
	12/12/2007	<1	<0.50	<0.50	<1	1.83	<0.50	0.79	64.9	0.65	<0.50	28.1	<0.50	-	24.9	0.67
3/4/2008	<1	<0.500	<0.500	<1	6.65	<0.500	2.22	166	2.92	<0.500	75.4	0.81	<0.500	60.5	2.79	
9/16/2008	<5	<2.50	<2.50	<2.50	5.5	<2.50	<2.50	160	<2.50	<2.50	38.8	<2.50	<2.50	65.5	<2.50	
12/8/2008	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	1.2	88	1.1	<0.50	40	0.51	<0.50	38	1.3	

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-2(60)	12/08/2008 DUP	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	1.2	84	1.1	<0.50	42	0.52	<0.50	38	1.3
(continued)	3/25/2009	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	1.3	71	0.75	<0.50	40	0.65	<0.50	37	0.54
	6/15/2009	<0.50	<0.50	<0.50	<0.50	1	<0.50	0.8	47	0.9	<0.50	26	<0.50	<0.50	30	0.55
	9/15/2009	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	0.82	44	0.58	<0.50	42	<0.50	<0.50	30	0.82
	12/14/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	17	<0.50	<0.50	18	<0.50	<0.50	16	<0.50
	3/17/2010	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	0.96	61	0.68	<0.50	40	0.51	<0.50	38	<0.50
	6/14/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20	<0.50	<0.50	17	<0.50	<0.50	15	<0.50
	9/21/2010	<0.5	<0.5	<0.5	<0.5	2.1	<0.5	0.57	46	<0.5	<0.5	42	<0.5	<0.5	32	0.8
	12/7/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	16	<0.5	<0.5	19	<0.5	<0.5	15	<0.5
	3/8/2011	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	19	<0.50	<0.50	27	<0.50	<0.50	16	<0.50
	6/6/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.3	<0.5	<0.5	16	<0.5	<0.5	11	<0.5
	9/13/2011	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	0.73	42	0.5	<0.50	42	0.89	<0.50	30	0.74
	12/6/2011	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	30	<0.50	<0.50	33	<0.50	<0.50	22	0.6
	3/8/2012	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	32	<0.50	<0.50	36	<0.50	<0.50	21	<5
	6/19/2012	<0.5	<0.5	<0.5	<0.5	0.71	<0.5	<0.5	28	<0.5	<0.5	22	<0.5	<0.5	16	<0.5
	9/12/2012	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	0.66	36	<0.50	<0.50	33	<0.50	<0.50	20	1.1
	12/11/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20	<0.50	<0.50	19	<0.50	<0.50	11	<0.50
	3/12/2013	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	0.56	38	<0.50	<0.50	35	<0.50	<0.50	20	0.66
	6/11/2013	<0.50	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	29	<0.50	<0.50	27	<0.50	<0.50	18	<0.50
	9/17/2013	<0.50	<0.50	<0.50	<0.50	0.89	<0.50	<0.50	20	<0.50	<0.50	32	<0.50	<0.50	16	0.54
	12/10/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	16	<0.50	<0.50	17	<0.50	<0.50	11	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.5	<0.50	<0.50	10	<0.50	<0.50	5.8	<0.50
	6/26/2014	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	33	<0.50	<0.50	21	<0.50	<0.50	20	<0.50
	9/23/2014	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	26	<0.50	<0.50	34	<0.50	<0.50	20	12
	12/12/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<0.50	<0.50	20	<0.50	<0.50	14	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	26.1	<0.50	<0.50	22.7	<0.50	<0.50	16.1	<0.50
	6/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.95	<0.50	<0.50	17.7	<0.50	<0.50	9.1	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.6	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18.8	<0.50	<0.50	13.8	<0.50	<0.50	12.4	<0.50
	3/9/2016	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	17.5	<0.50	<0.50	16.9	<0.50	<0.50	14	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	11.8	<0.50	<0.50	18	<0.50	<0.50	11.1	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	0.89	<0.50	<0.50	17.7	<0.50	<0.50	22.5	<0.50	<0.50	17.6	<0.50
	12/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	7.6	<0.50	<0.50	4.7	<0.50
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	15.6	<0.5	<0.5	13.6	<0.5	<0.5	13.2	<0.5
	6/12/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	6.0	<0.50	<0.50	12.8	<0.50	<0.50	7.1	<0.50

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-2(60) (continued)	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.00	<1.0	<0.50	18.3	<0.50	<0.50	18.3	<0.50	<0.50	13.4	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	1.60	<0.50	<0.50	24.9	<0.50	<0.50	14.0	<0.50	<0.50	14.7	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	1.30	<0.500	<0.500	13.4	<0.500	<0.500	23.3	<0.500	<0.500	13.9	<0.500
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.89	<0.500	<0.500	11.8	<0.500	<0.500	18.4	<0.500	<0.500	8.5	<0.500
	10/1/2018	<1.00	<5.00	<1.00	<1.00	6.66	<0.400	<0.400	23.9	<0.400	<0.500	29.4	<0.400	<0.500	16.6	20.00
	12/4/2018	<1.00	<5.00	<1.00	<1.00	0.67	<0.400	<0.400	9.6	<0.400	<0.500	14.4	<0.400	<0.500	8.2	<0.400
	3/26/2019	<1.00	<5.00	<1.00	<1.00	0.439	<0.400	<0.400	9.10	<0.400	<0.500	12.9	<0.400	<0.500	8.37	<0.400
	6/7/2019	<1.00	<5.00	<1.00	<1.00	0.651	<0.400	<0.400	11.4	<0.400	<0.500	15.5	<0.400	<0.500	9.57	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	4.58	<0.400	0.44	27.9	<0.400	<0.500	33.2	<0.400	<0.500	19	7.9
	12/4/2019	<1.00	<5.00	<1.00	<1.00	0.465	<0.400	<0.400	8.86	<0.400	<0.500	16.8	<0.400	<0.500	9.35	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	1.32	<0.400	<0.400	15.6	<0.400	<0.500	26.5	<0.400	<0.500	11.8	<0.400
	6/16/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.23	<0.400	<0.500	12.4	<0.400	<0.500	6.01	<0.400
	10/6/2020	<1.00	<5.00	<1.00	<1.00	1.16	<0.400	<0.400	16.5	<0.400	<0.500	24	<0.400	<0.500	15.3	<0.400
	12/10/2020	<2.00	<5.00	<1.00	<1.00	1.54	<0.400	<0.400	13.1	<0.400	<0.500	20.3	<0.400	<0.500	10	0.64
	3/4/2021	<1.00	<5.00	<1.00	<1.00	1.19	<0.400	<0.400	18.4	<0.400	<0.500	20.3	<0.400	<0.500	14.9	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	6.28	<0.400	<0.500	13	<0.400	<0.500	7.17	<0.400
	9/14/2021	<1.00	<5.00	<1.00	<1.00	17.2	<0.400	0.75	71.4	0.44	<0.500	29.8	<0.400	<0.500	18	60.5
	12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.67	<0.400	<0.500	11.2	<0.400	<0.500	6.32	<0.400
	3/10/2022	<1.00	<5.00	<1.00	<1.00	0.690	<0.400	<0.400	10.5	<0.400	<0.500	14.4	<0.400	<0.500	8.03	<0.400
	6/15/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.36	<0.400	<0.500	7.70	<0.400	<0.500	4.30	<0.400
9/12/2022	<1.00	<5.00	<1.00	<1.00	1.29	<0.400	<0.400	16	<0.400	<0.500	20.9	<0.400	<0.500	9.74	<0.400	
12/8/2022	<1.00	<5.00	<1.00	<1.00	6.73	<0.400	<0.400	26	<0.400	<0.500	20.6	<0.400	<0.500	11.6	13.3	
MGMS1-1(110)	6/28/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	3.78	<0.50	<0.50	3.9	<1	--	3.35	<0.50
	8/30/2000	<5	<25	<2.5	<2.5	3.7	<2.5	3.32	55	<2.5	<2.5	510	24	--	130	<2.5
	11/29/2000	<5	<25	<2.5	<2.5	4.21	<2.5	4.59	51	<2.5	<2.5	583	23.2	--	166	<2.5
	2/27/2001	<5	<25	<2.5	<2.5	5.21	<2.5	3.39	47.5	<2.5	<2.5	385	16.5	--	105	<2.5
	5/31/2001	<10	<50	<5	<5	<5	<5	<5	55.8	<5	<5	639	13.8	--	141	<5
	9/24/2001	<1.3	<1.3	<1.3	<1.3	6.1	<1.3	2.9	57	<1.3	<1.3	580	20	--	120	<1.3
	12/18/2001	<5	<25	<2.5	<2.5	5.04	<2.5	2.68	54.8	<2.5	<2.5	527	20.2	--	131	<2.5
	3/19/2002	<5	<2.5	<2.5	<5	5.25	<2.5	<2.5	54	<2.5	<2.5	454	10.8	--	98	<2.5
	5/29/2002	<5	<2.5	<2.5	<5	4.9	<2.5	<2.5	62.3	<2.5	<2.5	299	9.7	--	65.1	<2.5
	8/29/2002	<1	<0.50	<0.50	<1	5.43	<0.50	1.32	110	0.8	<0.50	60.2	3.62	--	47.8	<0.50
	11/11/2002	<2	<1	<1	<2	4.74	<1	1.2	46.1	<1	<1	208	7.84	--	66.1	<1
	1/23/2003	<2	<1	<1	<2	4.44	<1	1.24	65.3	<1	<1	210	6.54	--	74.1	<1

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		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-1(110) (continued)	5/28/2003	<2	<1	<1	<2	3.96	<1	<1	69.2	<1	<1	109	2.48	-	57.5	<1
	11/11/2003	<2	<2	<2	<2	4.14	<2	<2	44.8	<2	<2	256	3.6	-	60.2	<2
	1/27/2004	<2	<1	<1	<2	4.22	<1	1.1	67.1	<1	<1	167	4.16	-	69.7	<1
	5/3/2004	<1	<1	<1	<1	3.66	<1	<1	47.2	<1	<1	190	2.18	-	55.9	<1
	11/15/2004	<2.5	<2.5	<2.5	<2.5	3.7	<2.5	<2.5	95	<2.5	<2.5	76	<2.5	-	64	<2.5
	6/20/2005	<2	<1	<1	<2	9.22	<1	2.58	283	1.8	<1	23.6	1.62	-	70	1.24
	11/17/2005	<1	<0.500	<0.500	<1	2.93	<0.500	<0.500	51.3	<0.500	<0.500	102	1.95	-	76.1	<0.500
	6/6/2006	<1	<1	<1	<1	2.15	<1	<1	44	<1	<1	94.4	1.36	-	66.8	<1
	12/6/2006	<1	<0.50	<0.50	<1	5.81	<0.50	0.6	142	<0.50	<0.50	53.8	0.88	-	74.6	0.57
	9/11/2007	<2	<1	<1	<2	3.78	<1	1.2	189	<1	<1	31.6	<1	-	61.1	<1
	3/4/2008	<1	<0.500	<0.500	<1	3.73	<0.500	0.91	242	2.37	<0.500	32.7	0.64	<0.500	44.4	<0.500
	3/25/2009	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	0.87	160	0.9	<0.50	25	<0.50	<0.50	39	<0.50
	6/15/2009	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	0.74	130	1	<0.50	24	<0.50	<0.50	39	<0.50
	9/15/2009	<2.5	<2.5	<2.5	<2.5	20	<2.5	2.7	620	3.6	<2.5	24	<2.5	<2.5	75	<2.5
	3/17/2010	<2.5	<2.5	<2.5	<2.5	20	<2.5	4.3	720	3.7	<2.5	20	<2.5	<2.5	79	<2.5
	9/21/2010	<0.5	<0.5	<0.5	<0.5	2.5	<0.5	1.1	150	1	<0.5	28	<0.5	<0.5	53	<0.5
	3/10/2011	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	0.57	83	0.52	<0.50	26	<0.50	<0.50	31	<0.50
	9/13/2011	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	1.2	110	0.96	<0.50	30	<0.50	<0.50	59	<0.50
	3/8/2012	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	62	<0.50	<0.50	22	<0.50	<0.50	21	<0.50
	9/12/2012	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	0.53	60	<0.50	<0.50	22	<0.50	<0.50	25	<0.50
	3/12/2013	<0.50	<0.50	<0.50	<0.50	0.95	<0.50	<0.50	65	<0.50	<0.50	23	<0.50	<0.50	24	<0.50
	9/17/2013	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	0.56	68	<0.50	<0.50	26	<0.50	<0.50	32	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	63	<0.50	<0.50	23	<0.50	<0.50	27	0.65
	9/24/2014	Not sampled; 60-foot port accidentally sampled twice.														
	3/19/2015	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	0.69	126	<0.50	<0.50	23.7	<0.50	<0.50	41.5	0.82
	9/21/2015	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	49	<0.50	<0.50	19.4	<0.50	<0.50	20.4	<0.50
	9/30/2016	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	56.7	<0.50	<0.50	18.4	<0.50	<0.50	28.7	<0.50
	3/31/2017	<0.50	<20	<0.50	<0.50	13.3	<0.50	1.1	328	0.7	<0.50	20.1	<0.50	<0.50	62.0	6.5
	9/29/2017	<2.0	<2.0	<0.50	<0.50	5.9	<1.0	0.540	173	<0.50	<0.50	9.0	<0.50	<0.50	32.8	0.6
	11/7/2017	<2.0	<2.0	<0.50	<0.50	10.5	<0.50	0.910	257	0.7	<0.50	11.5	<0.50	<0.50	41.8	0.9
	7/1/2018	<0.500	<2.50	<0.500	<0.500	3.30	<0.500	0.462 J	104	0.357 J	<0.500	18.5	0.132 J	<0.500	36.6	0.6
	10/1/2018	<1.00	<5.00	<1.00	<1.00	6.12	<0.400	0.723	153	0.485	<0.500	13.0	<0.400	<0.500	39.3	0.7
6/7/2019	<1.00	<5.00	<1.00	<1.00	3.55	<0.400	<0.400	102	<0.400	<0.500	13.8	<0.400	<0.500	24.2	<0.400	
12/4/2019	<1.00	<5.00	<1.00	<1.00	4.61	<0.400	<0.400	134	<0.400	<0.500	14.0	<0.400	<0.500	31.9	<0.400	
6/16/2020	<1.00	<5.00	<1.00	<1.00	4.22	<0.400	0.450	141	<0.400	<0.500	17.6	<0.400	<0.500	33.2	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-1(110) (continued)	12/8/2020	<2.00	<5.00	<1.00	<1.00	5.56	<0.400	0.523	163	0.488	<0.500	16.1	<0.400	<0.500	32.7	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	4.87	<0.400	0.408	166	0.464	<0.500	14.1	<0.400	<0.500	34.6	<0.400
	12/7/2021	<1.00	<5.00	<1.00	<1.00	4.06	<0.400	<0.400	132	<0.400	<0.500	18.0	<0.400	<0.500	33.2	<0.400
	6/15/2022	<1.00	<5.00	<1.00	<1.00	2.17	<0.400	<0.400	70.7	<0.400	<0.500	14.2	<0.400	<0.500	19.1	<0.400
	12/8/2022	<1.00	<5.00	<1.00	<1.00	5.17	<0.400	0.59	154	0.66	<0.500	17.6	<0.400	<0.500	32.5	<0.400
MGMS2-4(40)	6/28/2000	<50	<250	<25	<25	44.9	<25	<25	1,210	<25	<25	5,030	215	-	3,090	<25
	8/30/2000	<10	<50	<5	<5	23.4	<5	31.3	644	7.28	<5	2,980	152	-	1,850	<5
	11/29/2000	<100	<500	<50	<50	51.3	<50	94	1,420	<50	<50	8,740	424	-	3,980	<50
	2/27/2001	<50	<250	<25	<25	35.6	<25	66.2	753	<25	<25	7,360	280	-	3,360	<25
	5/31/2001	<50	<250	<25	<25	<25	<25	<25	604	<25	<25	3,610	94.4	-	2,050	<25
	9/24/2001	<5	<5	<5	<5	28	<5	26	780	13	<5	2,600	170	-	1,700	<5
	12/18/2001	<50	<250	<25	<25	175	<25	77	1,350	<25	<25	5,590	374	-	3,220	<25
	3/19/2002	<50	<25	<25	<50	36	<25	36	868	<25	<25	6,240	180	-	3,040	<25
	5/29/2002	<50	<25	<25	<50	76	<25	53	1,330	<25	<25	6,580	230	-	2,530	<25
	11/11/2002	<20	<10	<10	<20	19.8	<10	13.6	639	<10	<10	3,080	89.4	-	1,820	<10
	1/23/2003	<20	<10	<10	<20	13.4	<10	<10	353	<10	<10	2,290	52.6	-	1,480	<10
	5/28/2003	<10	<5	<5	<10	5.4	<5	<5	110	<5	<5	1,190	19.1	-	474	<5
	11/11/2003	<10	<10	<10	<10	<10	<10	<10	54.1	<10	<10	1,820	14	-	398	<10
	1/27/2004	<20	<10	<10	<20	45.2	<10	10	397	<10	<10	1,740	55.8	-	688	<10
	5/3/2004	<10	<10	<10	<10	<10	<10	<10	41.2	<10	<10	599	<10	-	200	<10
	8/17/2004	<10	<5	<5	<10	9.7	<5	6.1	158	<5	<5	1,530	30.7	-	705	<5
	11/15/2004	<25	<25	<25	<25	<25	<25	<25	310	<25	<25	2,900	<25	-	1,300	<25
	3/24/2005	<20	<10	<10	<20	10.8	<10	<10	159	<10	<10	1,900	25.8	-	834	<10
	5/16/2005	<20	<10	<10	<20	34.2	<10	28.2	489	<10	<10	2,540	52.2	-	1,150	<10
	11/16/2005	<50	<25	<25	<50	43.5	<25	<25	396	<25	<25	4,240	82.5	-	1,750	<25
	6/6/2006	<50	<50	<50	<50	62	<50	<50	917	<50	<50	4,820	55	-	1,770	<50
	12/5/2006	<50	<25	<25	<50	<25	<25	<25	370	<25	<25	3,090	31.5	-	1,200	<25
	5/21/2007	<20	<20	<20	<20	27.4	<20	<20	359	<20	<20	2,880	38.2	-	1,080	<20
9/10/2007	<50	<25	<25	<50	<25	<25	<25	402	<25	<25	2,010	52.5	-	1,600	<25	
12/12/2007	<50	<25	<25	<50	26	<25	<25	330	<25	<25	2,080	35.5	-	914	<25	
03/04/2008 ⁷	<1	<0.500	<0.500	<1	20.4	<0.500	16.1	181	7.71	<0.500	1,810	53.7	0.51	950	4.68	
9/16/2008	<50	<25	<25	<25	<25	<25	<25	208	<25	<25	2,330	32	<25	1,130	<25	
12/8/2008	Not sampled. Air leak in sampling point prohibited the collection of the sample.															
3/24/2009	<2	<2	<2	<2	8.4	<2	3.6	100	2	<2	990	14	<2	430	<2	

Appendix B
Historical Groundwater Analytical Results
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 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-4(40)	9/15/2009	<1.5	<1.5	<1.5	<1.5	3.1	<1.5	<1.5	52	<1.5	<1.5	440	4.1	<1.5	200	<1.5
(continued)	12/14/2009	<1.5	<1.5	<1.5	<1.5	54	<1.5	16	360	6.9	<1.5	2,400	62	<1.5	1,000	2.6
	3/16/2010	<7	<7	<7	<7	16	<7	<7	140	<7	<7	1,800	19	<7	810	<7
	6/14/2010	<25	<25	<25	<25	72	<25	41	1,400	<25	<25	6,400	68	<25	1,500	43
	9/21/2010	<2.5	<2.5	<2.5	<2.5	35	<2.5	17	480	9	<2.5	3,500	48	<2.5	1,500	5.4
	12/7/2010	<15	<15	<15	<15	69	<15	26	700	<15	<15	4,100	83	<15	1,600	<15
	3/7/2011	<15	<15	<15	<15	88	<15	30	930	<15	<15	3,700	91	<15	1,600	<15
	6/7/2011	<15	<15	<15	<15	65	<15	30	1,600	17	<15	4,400	57	<15	1,400	48
	9/12/2011	<15	<15	<15	<15	44	<15	28	7,400	20	<15	790	48	<15	380	58
	12/7/2011	<15	<15	<15	<15	35	<15	<15	5,300	<15	<15	61	<15	<15	39	460
	3/8/2012	<2	<2	<2	<2	38	<2	2.3	470	2.8	<2	9.9	5.2	<2	5.4	260
	6/19/2012	<0.5	3.9	<0.5	<0.5	53	<0.5	<0.5	20	1.3	<0.5	7.2	<0.5	<0.5	2.5	63
	9/13/2012	<1.5	1.8	<1.5	<1.5	39	<1.5	2.8	310	3.2	<1.5	89	5	<1.5	80	440
	12/11/2012	<0.50	30	<0.50	<0.50	4.8	<0.50	<0.50	33	1.3	<0.50	10	<0.50	<0.50	3.4	4
	3/12/2013	<0.50	8.2	<0.50	<0.50	28	<0.50	1.9	300	2	<0.50	5.6	2.5	<0.50	2.2	270
	6/11/2013	<0.50	15	<0.50	<0.50	8.3	<0.50	<0.50	7.9	<0.50	<0.50	0.94	<0.50	<0.50	<0.50	4.8
	9/17/2013	<0.50	9.4	<0.50	<0.50	28	<0.50	4.8	290	1.4	<0.50	16	1.6	<0.50	17	330
	12/16/2013	<0.50	6.9	<0.50	<0.50	9.7	<0.50	<0.50	8.4	<0.50	<0.50	2.4	<0.50	<0.50	1.4	3.4
	3/24/2014	<0.50	2.4	<0.50	<0.50	45	<0.50	2.9	84	<0.50	<0.50	2.6	<0.50	<0.50	1.8	270
	6/26/2014	<0.50	6.1	<0.50	<0.50	31	<0.50	10	88	0.84	<0.50	21	<0.50	<0.50	22	90
	9/23/2014	<0.50	2.5	<0.50	<0.50	30	<0.50	30	590	2.4	<0.50	170	3.2	<0.50	110	800
	12/12/2014	<0.50	12	<0.50	<0.50	35	<0.50	<0.50	10	<0.50	<0.50	3.4	<0.50	<0.50	2.3	18
	3/20/2015	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	3.9	47	<0.50	<0.50	30.6	<0.50	<0.50	22.1	17.3
	6/19/2015	<0.50	<0.50	<0.50	<0.50	13.8	<0.50	1.3	53.8	<0.50	<0.50	18.4	<0.50	<0.50	12.8	48.3
	9/25/2015	<0.50	<0.50	<0.50	<0.50	12.3	<0.50	4.2	105	0.61	<0.50	67.4	0.92	<0.50	45.9	57.8
	12/8/2015	<0.50	3.8	<0.50	<0.50	13.5	<0.50	<0.50	7	<0.50	<0.50	4	<0.50	<0.50	2.8	3.3
	3/9/2016	<0.50	<2	<0.50	<0.50	20.6	<0.50	1.6	36	<0.50	<0.50	6.5	<0.50	<0.50	6.2	36
	6/17/2016	<0.50	<2	<0.50	<0.50	24.9	<0.50	26.4	744	2.8	<0.50	223	3.1	<0.50	146	227
	9/29/2016	<0.50	<2	<0.50	<0.50	12.1	<0.50	<0.50	115	<0.50	<0.50	33.3	<0.50	<0.50	24.8	142
	12/16/2016	<0.50	<2	<0.50	<0.50	10.3	<0.50	<0.50	5.2	<0.50	<0.50	2.6	<0.50	<0.50	1.9	2
	3/31/2017	<0.5	<2	<0.5	<0.5	57.6	<0.5	14.3	236	0.6	<0.5	4.3	<0.5	<0.5	14.4	235
	6/15/2017	<0.50	<2.0	<0.50	<0.50	38.6	<0.50	3.5	46.2	<0.50	<0.50	5.1	<0.50	<0.50	4.9	98.9
	9/29/2017	<2.0	<2.0	<0.50	<0.50	21.7	<1.0	6.8	195.0	0.74	<0.50	41.5	0.67	<0.50	31.3	428.0
	11/9/2017	<2.0	<2.0	<0.50	<0.50	21.3	<0.50	0.9	61.6	0.52	<0.50	13.2	<0.50	<0.50	9.2	170.0
	3/22/2018	<0.500	<2.50	<0.500	<0.500	25.9	<0.500	4.2	109.0	0.57	<0.500	46.0	0.259 J	<0.500	27.3	122.0

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Historical Groundwater Analytical Results
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-4(40) (continued)	7/1/2018	<0.500	<2.50	<0.500	<0.500	12.7	<0.500	5.9	151.0	0.97	<0.500	62.1	1.04	<0.500	48.9	38.2
	9/28/2018	<2.00	<10.00	<2.00	<2.00	8.7	<0.800	1.4	140.0	<0.800	<1.00	66.9	<0.800	<1.00	43.3	106.0
	12/10/2018	<1.00	<5.00	<1.00	<1.00	20.9	<0.400	0.6	24.9	<0.400	<0.500	18.7	<0.400	<0.500	12.0	123.0
	3/25/2019	<1.00	<5.00	<1.00	<1.00	26.6	<0.400	2.58	136	0.752	<0.500	62.0	0.581	<0.500	35.9	155
	6/4/2019	<1.00	<5.00	<1.00	<1.00	28.2	<0.400	0.960	37.8	<0.400	<0.500	14.6	<0.400	<0.500	10.4	145
	9/27/2019	<1.00	<5.00	<1.00	<1.00	11.2	<0.400	0.729	73.8	<0.400	<0.500	17	<0.400	<0.500	13.1	101
	12/4/2019	<1.00	<5.00	<1.00	<1.00	20.6	<0.400	0.778	40.5	<0.400	<0.500	32.3	<0.400	<0.500	17.9	65.4
	3/12/2020	<1.00	<5.00	<1.00	<1.00	24.1	<0.400	2.730	105	0.64	<0.500	86.3	0.45	<0.500	43.3	134
	6/16/2020	<1.00	<5.00	<1.00	<1.00	27.3	<0.400	1.250	85	<0.400	<0.500	14.8	<0.400	<0.500	9.09	138
	10/6/2020	<1.00	<5.00	<1.00	<1.00	19.1	<0.400	2.45	98.4	0.635	<0.500	101	0.593	<0.500	56.2	148
	12/8/2020	<4.00	<10.0	<2.00	<2.00	17.8	<0.800	1.85	82.6	<0.800	<1.00	41.0	<0.800	<1.00	19.4	80.2
	3/4/2021	<1.00	<5.00	<1.00	<1.00	25.1	<0.400	3.83	159	1.120	<0.500	115.0	<0.400	<0.500	59.9	72.5
	6/17/2021	<1.00	<5.00	<1.00	<1.00	20.7	<0.400	3.25	181	0.975	<0.500	68.8	<0.400	<0.500	35.6	66.3
	9/16/2021	<1.00	<5.00	<1.00	<1.00	9.92	<0.400	1.40	98.7	0.734	<0.500	42.2	<0.400	<0.500	28.3	34.2
	12/7/2021	<1.00	<5.00	<1.00	<1.00	22.7	<0.400	6.97	178	1.500	<0.500	190.0	<0.400	<0.500	106	0.989
	3/10/2022	<10.0	<50.0	<50.0	<10.0	21.8	<4.00	8.70	260	<4.00	<5.00	155	<4.00	<5.00	92.9	<4.00
	6/14/2022	<5.00	<25.0	<5.00	<5.00	35.2	<2.00	7.20	209	<2.00	<2.50	138	4.75	<2.50	69.3	<2.00
	9/12/2022	<1.00	<5.00	<1.00	<1.00	16.2	<0.400	9.45	330	2.55	<0.500	271	0.96	<0.500	142	1.41
12/6/2022	<1.00	<5.00	<1.00	<1.00	19.6	<0.400	9.63	297	2.58	<0.500	245	1.55	<0.500	153	0.4	
MGMS2-3(60)	6/28/2000	<5	<25	<2.5	<2.5	35.6	<2.5	8.3	433	<2.5	<2.5	110	22.3	-	198	<2.5
	8/30/2000	<10	<50	<5	<5	36	<5	13	1,120	<5	<5	164	32	-	136	<5
	11/29/2000	<5	<25	<2.5	<2.5	5.08	<2.5	3.88	279	<2.5	<2.5	26.8	<5	-	38	<2.5
	2/27/2001	<2	<10	<1	<1	40.2	<1	2.65	46.6	<1	<1	20.7	12.4	-	27	173
	5/31/2001	<1	<5	<0.50	<0.50	2.47	<0.50	2.3	39.1	<0.50	<0.50	113	3.44	-	75.6	5.06
	9/24/2001	<2.5	<2.5	<2.5	<2.5	14	<2.5	11	180	3.6	<2.5	340	11	-	220	48
	12/18/2001	<1	<5	<0.50	<0.50	0.607	<0.50	1.01	15	<0.50	<0.50	64.4	2.06	-	47.7	<0.50
	3/19/2002	<1	<0.50	<0.50	<1	5.4	<0.50	2.96	62.9	0.81	<0.50	91.9	5.78	-	80.1	15.2
	5/29/2002	<1	<0.50	<0.50	<1	2.55	<0.50	2.02	59.7	0.82	<0.50	119	4.8	-	67.6	1.06
	1/23/2003	<1	<0.50	<0.50	<1	10.1	<0.50	2.7	114	1.12	<0.50	111	6.06	-	96	22.8
	5/28/2003	<2	<1	<1	<2	15	<1	3.28	178	1.48	<1	131	9.3	-	126	15.6
	11/11/2003	<2	<2	<2	<2	21.3	<2	4.56	208	<2	<2	223	9.06	-	139	20.6
	1/27/2004	<1	<0.50	<0.50	<1	17.2	<0.50	2.83	117	1.57	<0.50	96.3	5.38	-	92.2	17.7
	5/3/2004	<1	<1	<1	<1	4.79	<1	1.96	86.4	<1	<1	121	3.31	-	84	<1
	11/15/2004	<2.5	<2.5	<2.5	<2.5	<2.5	13	4.4	220	2.8	<2.5	170	6.4	-	140	11

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 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-3(60)	2/1/2005	<1	<0.50	<0.50	<1	2.49	<0.50	1.47	92	2.46	<0.50	97.7	2.41	-	73.9	0.6
(continued)	5/16/2005	<1	<0.50	<0.50	<1	1.49	<0.50	1.51	45.2	0.59	<0.50	74.1	1.61	-	41.5	<0.50
	8/18/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	27.6 B	<0.500	<0.500	23.5 B	<0.500	-	13 B	<0.500
	11/16/2005	<1	<0.500	<0.500	<1	7.5	<0.500	2.05	90.9	1.16	<0.500	107	3.1	-	78.3	2.68
	2/20/2006	<1	<0.500	<0.500	<1	3.35	<0.500	1.6	65	0.82	<0.500	99.5	1.55	-	62.3	1.27
	6/6/2006	<1	<1	<1	<1	<1	<1	<1	55	<1	<1	76.3	1.01	-	36.2	<1
	9/5/2006	<1	<0.50	<0.50	<1	2.85	<0.50	1.13	75.1	0.73	<0.50	73	1.11	-	45.6	0.83
	12/5/2006	<1	<0.50	<0.50	<1	2.58	<0.50	1.44	77	0.75	<0.50	98.7	1.27	-	61.2	0.79
	2/7/2007	<1	<0.50	<0.50	<1	3.36	<0.50	1.3	96.5	0.79	<0.50	76.3	1.64	-	55	1.51
	5/21/2007	<1	<1	<1	<1	2.45	<1	1.33	73.7	<1	<1	99.1	1.51	-	54.5	<1
	9/10/2007	<10	<5	<5	<10	31.2	<5	8.2	559	<5	<5	221	10.8	-	192	26.7
	12/12/2007	<1	<0.50	<0.50	<1	1.49	<0.50	0.88	78.6	0.56	<0.50	66.1	0.98	-	36.8	1.75
	3/4/2008	<1	<0.500	<0.500	<1	4.46	<0.500	2.19	164	1.37	<0.500	89.7	2.32	<0.500	72.2	6.88
	9/16/2008	<5	<2.50	<2.50	<5	10.4	<2.50	3.65	166	<2.50	<2.50	111	3.85	<2.50	96.4	7.15
	12/8/2008	<0.80	<0.80	<0.80	<0.80	11	<0.80	3	160	1.7	<0.80	110	3.2	<0.80	80	10
	3/24/2009	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	1.6	110	1	<0.50	84	2.2	<0.50	53	3.7
	9/15/2009	<0.50	<0.50	<0.50	<0.50	6.4	<0.50	2.3	91	1.2	<0.50	110	2.4	<0.50	72	4.2
	12/14/2009	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	1.1	61	0.75	<0.50	84	1.1	<0.50	54	0.96
	3/16/2010	<0.50	<0.50	<0.50	<0.50	15	<0.50	3.6	140	1.6	<0.50	160	8.2	<0.50	110	12
	6/14/2010	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.75	46	0.55	<0.50	73	0.86	<0.50	38	0.88
	9/21/2010	<0.5	<0.5	<0.5	<0.5	11	<0.5	3	130	1.5	<0.5	150	5.8	<0.5	100	6.8
	12/7/2010	<0.5	<0.5	<0.5	<0.5	4.1	<0.5	1.8	86	1.2	<0.5	120	1.7	<0.5	77	1.6
	3/7/2011	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.86	73	0.62	<0.50	61	1.2	<0.50	34	1.4
	6/6/2011	<0.5	<0.5	<0.5	<0.5	0.64	<0.5	<0.5	22	<0.5	<0.5	64	0.54	<0.5	27	<0.5
	9/12/2011	<0.50	<0.50	<0.50	<0.50	10	<0.50	3.2	110	1.4	<0.50	170	6	<0.50	100	2
	12/5/2011	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	0.95	51	0.54	<0.50	84	1	<0.50	41	<0.50
	3/8/2012	<0.50	<0.50	<0.50	<0.50	10	<0.50	2.9	300	1.9	<0.50	71	1.5	<0.50	45	43
	6/19/2012	<0.5	<0.5	<0.5	<0.5	2	<0.5	1	79	0.87	<0.5	78	0.78	<0.5	45	5.3
	9/12/2012	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.56	48	<0.50	<0.50	44	<0.50	<0.50	20	2.7
	12/11/2012	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	2.5	59	1.5	<0.50	57	0.62	<0.50	36	16
	3/12/2013	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	22	<0.50	<0.50	16	<0.50	<0.50	9	<0.50
	6/11/2013	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	1.5	53	0.58	<0.50	29	0.55	<0.50	21	12
	9/17/2013	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	0.98	73	0.66	<0.50	24	0.6	<0.50	13	29
	12/10/2013	<0.50	<0.50	<0.50	<0.50	3	<0.50	1	88	0.88	<0.50	23	0.6	<0.50	18	13

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-3(60) (continued)	3/18/2014	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	28	<0.50	<0.50	33	<0.50	<0.50	13	1.7
	9/23/2014	Insufficient air pressure to inflate dedicated bladder; no sample collected.														
	12/12/2014	Insufficient air pressure to inflate dedicated bladder; no sample collected.														
	3/20/2015	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	29.4	<0.50	<0.50	41.4	<0.50	<0.50	24.3	5.2
	6/19/2015	<0.50	<0.50	<0.50	<0.50	2	<0.50	0.56	38.1	<0.50	<0.50	35.1	<0.50	<0.50	23.5	7.9
	9/25/2015	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	0.5	51.6	<0.50	<0.50	18.4	<0.50	<0.50	15.8	9.7
	12/8/2015	Well Damaged, Unable to Sample														
	6/17/2016	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	19.4	<0.50	<0.50	17.2	<0.50	<0.50	11.8	3.4
	9/30/2016	<0.50	<2	<0.50	<0.50	2	<0.50	<0.50	40	<0.50	<0.50	9.6	<0.50	<0.50	11.5	9.6
	12/16/2016	<0.50	<2	<0.50	<0.50	1.7	<0.50	<0.50	35.3	<0.50	<0.50	40.7	<0.50	<0.50	24.8	1.4
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	18.5	<0.5	<0.5	26	<0.5	<0.5	11.2	0.75
	6/15/2017	<2.0	<2.0	<0.50	<0.50	0.88	<1.0	<0.50	20.7	<0.50	<0.50	40.4	<0.50	<0.50	17.3	1.3
	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.30	<1.0	<0.50	30.4	<0.50	<0.50	17.5	<0.50	<0.50	12.0	6.7
	11/9/2017	<2.0	<2.0	<0.50	<0.50	1.80	<0.50	<0.50	30.2	<0.50	<0.50	34.2	<0.50	<0.50	20.1	1.1
	3/22/2018	<0.500	<2.50	<0.500	<0.500	0.82	<0.500	0.244 J	17.3	0.164 J	<0.500	20.6	0.205 J	<0.500	11.6	1.2
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.73	<0.500	<0.500	14.1	<0.500	<0.500	19.6	0.20	<0.500	10.1	1.6
	12/10/2018	<0.500	<2.50	<0.500	<0.500	2.26	<0.500	0.43	41.7	0.43	<0.500	36.1	<0.400	<0.500	20.7	4.4
	3/25/2019	<1.00	<5.00	<1.00	<1.00	1.86	<0.400	<0.400	36.8	0.415	<0.500	40.1	<0.400	<0.500	23.3	0.773
	6/4/2019	<1.00	<5.00	<1.00	<1.00	0.580	<0.400	<0.400	18.00	<0.400	<0.500	32.3	<0.400	<0.500	15.7	0.420
	9/27/2019	<1.00	<5.00	<1.00	<1.00	1.590	<0.400	<0.400	35.20	0.47	<0.500	25	<0.400	<0.500	13.8	3.080
	12/4/2019	<1.00	<5.00	<1.00	<1.00	2.030	<0.400	0.427	54.50	0.42	<0.500	28.9	<0.400	<0.500	19.4	2.850
	3/12/2020	<1.00	<5.00	<1.00	<1.00	0.541	<0.400	<0.400	12.30	<0.400	<0.500	21.7	<0.400	<0.500	9.24	0.642
	6/16/2020	<1.00	<5.00	<1.00	<1.00	0.820	<0.400	<0.400	16.50	<0.400	<0.500	23.7	<0.400	<0.500	10.4	0.850
	10/6/2020	<1.00	<5.00	<1.00	<1.00	1.21	<0.400	<0.400	28.9	<0.400	<0.500	32.3	<0.400	<0.500	17.9	1.38
	12/8/2020	<2.00	<5.00	<1.00	<1.00	0.860	<0.400	<0.400	20.2	<0.400	<0.500	21.8	<0.400	<0.500	10.5	0.757
	3/4/2021	<1.00	<5.00	<1.00	<1.00	0.455	<0.400	<0.400	10.2	<0.400	<0.500	11.7	<0.400	<0.500	5.95	0.524
	6/17/2021	<1.00	<5.00	<1.00	<1.00	0.621	<0.400	<0.400	11.8	<0.400	<0.500	15.5	<0.400	<0.500	8.23	0.602
9/16/2021	<1.00	<5.00	<1.00	<1.00	1.290	<0.400	<0.400	26.9	<0.400	<0.500	18.9	<0.400	<0.500	11.5	0.956	
12/7/2021	<1.00	<5.00	<1.00	<1.00	1.570	<0.400	0.41	40.5	<0.400	<0.500	41.8	<0.400	<0.500	21	1.5	
3/10/2022	<1.00	<5.00	<1.00	<1.00	0.530	<0.400	<0.400	11.0	<0.400	<0.500	9.29	<0.400	<0.500	5.21	1.10	
6/14/2022	<1.00	<5.00	<1.00	<1.00	0.490	<0.400	<0.400	15.6	<0.400	<0.500	39.3	<0.400	<0.500	14.7	<0.400	
9/12/2022	<1.00	<5.00	<1.00	<1.00	0.990	<0.400	<0.400	22.4	<0.400	<0.500	18.5	<0.400	<0.500	9.37	0.780	
12/6/2022	<1.00	<5.00	<1.00	<1.00	0.81	<0.400	<0.400	15.2	<0.400	<0.500	26.6	<0.400	<0.500	10.2	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-2(110)	6/28/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	12.2	<0.50	<0.50	6.04	<1	-	17.1	<0.50
	8/30/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	4.41	<0.50	<0.50	16.4	<1	-	14.7	<0.50
	11/29/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	0.717	8.23	<0.50	<0.50	13	<1	-	19.3	<0.50
	2/27/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	0.756	7.31	<0.50	<0.50	15.2	<1	-	21.6	<0.50
	5/31/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	0.938	10.7	<0.50	<0.50	24.4	1.14	-	29.1	<0.50
	9/24/2001	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	6.8	<0.50	<0.50	37	1.1	-	34	<0.50
	12/18/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	0.62	4.91	<0.50	<0.50	35.1	<1	-	27.5	<0.50
	3/19/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	0.61	9.97	<0.50	<0.50	35.6	1.23	-	24.6	<0.50
	5/29/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	1.21	31.9	<0.50	<0.50	114	2.39	-	51	0.61
	1/23/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	1.01	57.1	<0.50	<0.50	47.8	2.79	-	44.1	2.98
	5/28/2003	<1	<0.50	<0.50	<1	0.61	<0.50	0.73	63.9	<0.50	<0.50	54.6	1.98	-	43.1	1.13
	11/11/2003	<1	<1	<1	<1	1.14	<1	<1	76.7	1.07	<1	32.4	2.19	-	30.8	2.03
	1/27/2004	<1	<0.50	<0.50	<1	0.63	<0.50	<0.50	49	<0.50	<0.50	67.9	1.17	-	30	1
	5/3/2004	<1	<1	<1	<1	<1	<1	<1	14	<1	<1	28	<1	-	13.6	<1
	11/15/2004	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	0.62	60	<0.50	<0.50	50	1.6	-	30	<0.50
	5/16/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	27.9	<0.50	<0.50	21.5	0.52	-	10.9	<0.50
	11/16/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	15.1	<0.500	<0.500	18	<0.500	-	8.42	<0.500
	6/6/2006	<1	<1	<1	<1	<1	<1	<1	30.9	<1	<1	13.9	<1	-	6.59	<1
	12/5/2006	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	36.2	<0.50	<0.50	17.9	<0.50	-	8.27	<0.50
	9/10/2007	<5	<2.50	<2.50	<5	<2.50	<2.50	3.2	512	<2.50	<2.50	146	5.65	-	94.4	14.9
	3/4/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	59.5	<0.500	<0.500	33.4	0.75	<0.500	16.7	2.82
	9/16/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	0.71	77	<0.500	<0.500	44	1.18	<0.500	23.8	3.45
	3/24/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	40	<0.50	<0.50	27	<0.50	<0.50	11	2.5
	6/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	31	<0.50	<0.50	20	0.57	<0.50	8.9	2.3
	9/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	16	<0.50		6.7	1.8
	3/15/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	28	<0.50	<0.50	21	<0.50	<0.50	8.1	1.6
	9/21/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	33	<0.5	<0.5	34	0.6	<0.5	14	1.3
	3/7/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	24	<0.50	<0.50	26	<0.50	<0.50	8.6	1
	9/12/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15	<0.50	<0.50	22	<0.50	<0.50	8.3	<0.50
	3/8/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	31	<0.50	<0.50	23	<0.50	<0.50	9.3	2.4
9/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	<0.50	<0.50	20	<0.50	<0.50	8.3	1.4	
3/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	34	<0.50	<0.50	23	0.52	<0.50	10	2.7	
9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	30	<0.50	<0.50	18	<0.50	<0.50	8.7	2.2	
3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	21	<0.50	<0.50	13	<0.50	<0.50	6.2	2.5	
9/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	25	<0.50	<0.50	12	<0.50	<0.50	7.3	4.9	

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 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-2(110) (continued)	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18.3	<0.50	<0.50	7.9	<0.50	<0.50	4.8	4.6
	9/25/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15.3	<0.50	<0.50	9.4	<0.50	<0.50	5.9	4.1
	3/9/2016	<0.50	<2	<0.50	<0.50	0.73	<0.50	<0.50	22.6	<0.50	<0.50	7.1	<0.50	<0.50	8	10
	9/29/2016	<0.50	<2	<0.50	<0.50	0.62	<0.50	<0.50	16.8	<0.50	<0.50	6.5	<0.50	<0.50	6.3	5.8
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	19.5	<0.5	<0.5	6.4	<0.5	<0.5	6.6	6.4
	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.8	<1.0	<0.50	63.5	<0.50	<0.50	2.2	<0.50	<0.50	5.3	25.0
	11/9/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	3.9	<0.50	<0.50	3.1	1.9
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.446 J	<0.500	<0.500	<0.500	6.7	<0.500	4.4	0.175 J	<0.500	3.4	3.87
	9/28/2018	<1.00	<5.00	<1.00	<1.00	0.4	<0.400	<0.400	11.3	<0.400	<0.500	5.0	<0.400	<0.500	4.3	4.63
	6/4/2019	<4.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.37	<0.400	<0.500	3.44	<0.400	<0.500	2.04	0.770
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.49	<0.400	<0.500	4.29	<0.400	<0.500	2.73	2.320
	6/16/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.91	<0.400	<0.500	4.19	<0.400	<0.500	2.5	1.170
	12/8/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.63	<0.400	<0.500	3.21	<0.400	<0.500	2.52	1.560
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.23	<0.400	<0.500	2.89	<0.400	<0.500	3.01	1.74
	12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.5	<0.400	<0.500	4.06	<0.400	<0.500	3.23	1.410
	06/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.51	<0.400	<0.500	3.86	<0.400	<0.500	2.29	0.820
12/6/2022	<1.00	<5.00	<1.00	<1.00	0.59	<0.400	<0.400	17.6	<0.400	<0.500	3.48	<0.400	<0.500	3.83	3.65	
MGMS2-1(132)	6/28/2000	<1	<5	<0.50	<0.50	1.25	<0.50	1.77	27.6	<0.50	<0.50	27.5	2.06	--	54.3	<0.50
	8/30/2000	<1	<5	<0.50	<0.50	0.903	<0.50	<0.50	23	<0.50	<0.50	77.8	2.47	--	52.9	<0.50
	11/29/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	0.569	12.4	<0.50	<0.50	25.3	<1	--	27.8	<0.50
	2/27/2001	<1	<5	<0.50	<0.50	0.537	<0.50	0.605	11.4	<0.50	<0.50	25.2	<1	--	24.4	2.6
	5/31/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	8.86	<0.50	<0.50	25.5	<1	--	24.4	<0.50
	9/24/2001	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.76	7.6	<0.50	<0.50	29	1.1	--	30	<0.50
	12/18/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	0.773	6.81	<0.50	<0.50	26.8	1.36	--	23.8	<0.50
	3/19/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	0.53	8.62	<0.50	<0.50	33.5	0.77	--	24.2	<0.50
	5/29/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	1.29	35.4	0.52	<0.50	117	2.5	--	53.6	0.62
	1/23/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	0.96	57.4	<0.50	<0.50	49.9	2.35	--	46.2	3.19
	5/28/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	0.53	27.2	<0.50	<0.50	29.3	0.98	--	24	1.07
	11/11/2003	<1	<1	<1	<1	<1	<1	<1	46.3	<1	<1	28.8	1.56	--	29.7	1.49
	1/27/2004	<1	<0.50	<0.50	<1	0.63	<0.50	0.56	37.6	<0.50	<0.50	28	0.96	--	22.2	1.51
	5/4/2004	<1	<1	<1	<1	<1	<1	<1	38.2	<1	<1	7.55	<1	--	5.22	<1
	11/15/2004	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.58	62	<0.50	<0.50	38	1.1	--	26	0.85
	5/16/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	29.5	<0.50	<0.50	23.7	0.56	--	15.2	0.86
	11/16/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	8.85	<0.500	<0.500	13	<0.500	--	6.06	<0.500
6/6/2006	<1	<1	<1	<1	<1	<1	<1	23.1	<1	<1	14.8	<1	--	6.71	<1	

Appendix B
Historical Groundwater Analytical Results
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-1(132)	12/5/2006	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	27.6	<0.50	<0.50	14.9	<0.50	-	7.89	<0.50
(continued)	9/10/2007	<5	<2.50	<2.50	<5	4.55	<2.50	3	615	<2.50	<2.50	93.2	5.5	-	61	21.5
	3/4/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	37.3 J	<0.500	<0.500	22.6 J	0.59	<0.500	12.9 J	2.4
	9/16/2008	<1	<0.500	<0.500	<1	0.53	<0.500	1	101	0.56	<0.500	38.3	1.37	<0.500	26.1	6.11
	3/24/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	32	<0.50	<0.50	24	0.57	<0.50	11	1.5
	6/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	32	<0.50	<0.50	24	<0.50	<0.50	12	1.6
	9/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	18	<0.50		8	1.5
	3/15/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	28	<0.50	<0.50	23	<0.50	<0.50	9.9	1.6
	9/21/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	28	<0.5	<0.5	31	<0.5	<0.5	12	1.1
	3/7/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	30	<0.50	<0.50	41	0.56	<0.50	13	0.97
	3/8/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	24	<0.50	<0.50	9.4	1.8
	9/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<0.50	<0.50	22	<0.50	<0.50	9	2
	3/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	24	<0.50	<0.50	19	<0.50	<0.50	8.3	1.9
	9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	35	<0.50	<0.50	15	<0.50	<0.50	8.1	2.7
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<0.50	<0.50	12	<0.50	<0.50	5.4	2.6
	9/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	32	<0.50	<0.50	9.8	<0.50	<0.50	6	5.5
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.5	<0.50	<0.50	9.4	<0.50	<0.50	4.4	0.75
	3/9/2016	<0.50	<0.50	<0.50	<0.50	0.860	<0.50	<0.50	36.8	<0.50	<0.50	7.9	0.69	<0.50	10.7	12.4
	9/29/2016	<0.50	<0.50	<0.50	<0.50	0.700	<0.50	<0.50	31.4	<0.50	<0.50	6.4	<0.50	<0.50	7.9	8.2
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	15.6	<0.5	<0.5	5.2	<0.5	<0.5	4.7	4.8
	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.20	<1.0	<0.50	64.9	<0.50	<0.50	2.4	0.6	<0.50	6.3	19.4
	11/9/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	14.3	<0.50	<0.50	3.6	<0.50	<0.50	4.5	5.0
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.531	<0.500	<0.500	13.8	<0.500	<0.500	4.5	0.191 J	<0.500	4.9	4.6
	9/28/2018	<1.00	<5.00	<1.00	<1.00	0.520	<0.400	<0.400	17.8	<0.400	<0.500	4.8	<0.400	<0.500	5.6	6.7
	6/4/2019	<4.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.43	<0.400	<0.500	2.76	<0.400	<0.500	2.13	2.07
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	7.96	<0.400	<0.500	3.66	<0.400	<0.500	3.07	3.29
	6/16/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.37	<0.400	<0.500	3.79	<0.400	<0.500	2.50	1.99
	12/8/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	7.82	<0.400	<0.500	3.34	<0.400	<0.500	3.14	2.84
	6/17/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	7.06	<0.400	<0.500	2.9	<0.400	<0.500	3.34	2.54
	12/7/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	7.65	<0.400	<0.500	3.47	<0.400	<0.500	3.4	2.12
	6/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.34	<0.400	<0.500	2.47	<0.400	<0.500	1.53	0.870
	12/6/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.72	<0.400	<0.500	3.3	<0.400	<0.500	2.11	0.98

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-4(40)	8/30/2000	<10	<50	<5	<5	13.2	<5	5.01	858	14.1	<5	580	10.8	-	205	6.65
	11/29/2000	<20	<100	<10	<10	<10	<10	<10	820	10.6	<10	2,810	<20	-	395	<10
	2/27/2001	<50	<250	<25	<25	39.4	<25	29.2	4,570	<25	<25	2,970	<50	-	756	79.3
	5/31/2001	<50	<250	<25	<25	<25	<25	<25	2,920	38.5	<25	3,960	<50	-	716	<25
	9/24/2001	<2.5	<2.5	<2.5	<2.5	5.8	<2.5	<2.5	730	5.4	<2.5	1,400	9.2	-	230	3.5
	12/18/2001	<50	<250	<25	<25	<25	<25	<25	2,550	<25	<25	3,310	<50	-	631	31
	3/19/2002	<20	<10	<10	<20	34.6	<10	15.4	3,370	30.2	<10	3,560	23.8	-	707	57
	5/29/2002	<50	<25	<25	<50	71.5	<25	26	5,180	38.5	<25	2,470	33.5	-	728	86
	11/11/2002	<50	<25	<25	<50	<25	<25	<25	1,520	<25	<25	2,750	<25	-	309	<25
	1/23/2003	<20	<10	<10	<20	137	<10	38.4	3,530	32.6	<10	2,380	118	-	1,400	83.6
	5/28/2003	<50	<25	<25	<50	56	<25	28.5	1,720	<25	<25	3,560	<25	-	1,470	<25
	11/11/2003	<10	<10	<10	<10	<10	<10	<10	672	<10	<10	58.3	<10	-	32.4	<10
	1/27/2004	<20	<10	<10	<20	20	<10	<10	1,900	19.4	<10	1,350	10	-	246	20
	5/3/2004	<20	<20	<20	<20	50	<20	<20	1,420	<20	<20	2,700	34.2	-	913	24.8
	8/17/2004	<20	<10	<10	<20	71.6	<10	17	3,300	31	<10	1,360	29.2	-	569	45.2
	11/15/2004	<25	<25	<25	<25	<25	<25	<25	1,400	<25	<25	1,600	<25	-	290	<25
	3/24/2005	<20	<10	<10	<20	79.4	<10	30	3,440	34.2	<10	2,330	43.8	-	1,080	60.2
	03/24/2005 DUP	<20	<10	<10	<20	83.2	<10	29.2	3,450	34	<10	2,150	44	-	1,040	58.6
	5/16/2005	<10	<5	<5	<10	7	<5	<5	657	11.3	<5	1,130	8.1	-	224	<5
	11/16/2005	<10	<5	<5	<10	5.8	<5	<5	794	8.4	<5	1,180	7.6	-	210	<5
	3/14/2006	<50	<50	<50	<50	51	<50	<50	4,130	<50	<50	1,410	<50	-	484	<50
	6/6/2006	<20	<20	<20	<20	20.4	<20	<20	2,290	32.2	<20	1,410	<20	-	401	23.6
	12/5/2006	<20	<10	<10	<20	29.8	<10	<10	3,570	29	<10	1,020	<10	-	360	95.4
	5/22/2007	<20	<20	<20	<20	20.8	<20	<20	2,640	20.2	<20	952	<20	-	349	22.6
	9/10/2007	<50	<25	<25	<50	<25	<25	<25	2,340	<25	<25	499	<25	-	215	25.5
	12/12/2007	<50	<25	<25	<50	<25	<25	<25	723	<25	<25	536	<25	-	133	<25
	3/4/2008	<1	<0.500	<0.500	<1	32.4	3.08	22	2,280	25.4	3.86	1,580	27.5	<0.500	972	85.1
	9/16/2008	<50	<25	<25	<50	64.5	<25	<25	2,700	<25	<25	714	<25	<25	462	47
	12/8/2008	<9	<9	<9	<9	24	<9	<9	1,800	20	<9	350	<9	<9	160	90
	3/24/2009	<7	<7	<7	<7	36	<7	7.9	1,600	12	<7	600	11	<7	280	33
	9/15/2009	<5	<5	<5	<5	15	<5	<5	1,500	13	<5	550	<5	<5	180	8.2
	09/15/2009 DUP	<5	<5	<5	<5	15	<5	<5	1,400	13	<5	540	<5	<5	170	9.8
12/14/2009	<2.5	<2.5	<2.5	<2.5	8.1	<2.5	<2.5	750	5.3	<2.5	180	<2.5	<2.5	74	19	
3/17/2010	<2.5	<2.5	<2.5	<2.5	52	<2.5	14	1,800	18	2.9	810	16	<2.5	490	41	
03/17/2010 DUP	<5	<5	<5	<5	51	<5	14	1,600	18	<5	780	16	<5	470	39	

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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-4(40)	6/14/2010	<0.90	<0.90	<0.90	<0.90	2.4	<0.90	<0.90	230	2.3	<0.90	300	2.2	<0.90	88	1.5
(continued)	9/20/2010	<7	<7	<7	<7	32	<7	8.6	1,800	16	<7	530	7.9	<7	230	31
	09/20/2010 DUP	<6	<6	<6	<6	31	<6	7.4	1,700	15	<6	510	7.4	<6	220	29
	12/7/2010	<2	<2	<2	<2	5.3	<2	<2	460	3.9	<2	330	2.2	<2	95	3.2
	3/7/2011	<2	<2	<2	<2	20	<2	4.7	1,300	10	<2	330	4	<2	140	53
	03/07/2011 DUP	<4	<4	<4	<4	19	<4	4.9	1,200	10	<4	320	<4	<4	140	46
	6/6/2011	<3	<3	<3	<3	6.5	<3	4.1	780	7	<3	370	5.4	<3	150	8.5
	9/13/2011	<5	<5	<5	<5	45	<5	13	1,800	19	<5	560	15	<5	380	29
	09/13/2011 DUP	<7	<7	<7	<7	40	<7	12	1,700	16	<7	570	12	<7	330	23
	12/6/2011	<5	<5	<5	<5	14	<5	<5	1,000	9.3	<5	140	<5	<5	64	44
	3/8/2012	<5	<5	<5	<5	33	<5	13	1,400	14	<5	930	17	<5	450	28
	03/08/2012 DUP	<6	<6	<6	<6	35	<6	14	1,400	14	<6	990	18	<6	480	30
	06/21/2012	<5	<5	<5	<5	22	<5	5.6	1,300	11	<5	220	<5	<5	140	44
	9/12/2012	<5	<5	<5	<5	23	<5	6.2	1,400	13	<5	220	<5	<5	120	85
	09/12/2012 DUP	<5	<5	<5	<5	23	<5	5.3	1,400	13	<5	230	<5	<5	120	86
	12/11/2012	<2	<2	<2	<2	7.1	<2	<2	510	6.5	<2	180	<2	<2	72	6.5
	3/12/2013	<2	<2	<2	<2	30	<2	8.4	1,400	12	<2	510	8.7	<2	260	35
	03/12/2013 DUP	<2	<2	<2	<2	29	<2	8.8	1,300	12	<2	470	8.4	<2	250	35
	6/11/2013	<2.5	<2.5	<2.5	<2.5	11	<2.5	<2.5	740	7.1	<2.5	110	<2.5	<2.5	58	34
	9/16/2013	<2	<2	<2	<2	7.7	<2	<2	360	4.6	<2	100	<2	<2	48	24
	09/16/2013 DUP	<2	<2	<2	<2	8.5	<2	<2	380	5.1	<2	100	<2	<2	49	25
	12/10/2013	<0.90	<0.90	<0.90	<0.90	4.7	<0.90	<0.90	230	2.8	<0.90	60	<0.90	<0.90	29	2
	12/10/2013 DUP	<0.90	<0.90	<0.90	<0.90	4.6	<0.90	<0.90	230	2.7	<0.90	61	<0.90	<0.90	29	1.9
	3/18/2014	<0.90	<0.90	<0.90	<0.90	2.7	<0.90	0.98	280	1.8	0.91	84	<0.90	<0.90	38	<0.90
	3/18/2014 DUP	<0.90	<0.90	<0.90	<0.90	2.6	<0.90	<0.90	280	1.9	0.93	86	<0.90	<0.90	39	<0.90
	6/26/2014	<0.90	<0.90	<0.90	<0.90	12	<0.90	3.5	690	5.7	<0.90	180	1.3	<0.90	100	20
	6/26/2014 DUP	<0.90	<0.90	<0.90	<0.90	11	<0.90	2.8	490	5	<0.90	160	1.1	<0.90	930	14
	9/23/2014	<0.90	<0.90	<0.90	<0.90	10	<0.90	1.7	410	5.8	<0.90	72	<0.90	<0.90	55	74
	9/23/2014 DUP	<0.20	<0.20	<0.20	<0.20	11	<0.20	<0.20	430	5.5	<0.20	70	<0.20	<0.20	53	75
	12/12/2014	<2	<2	<2	<2	7.9	<2	<2	490	4.2	<2	36	<2	<2	28	20
	3/18/2015	<1.6	<1.6	<1.6	<1.6	20	<1.6	3.2	896	7.3	<1.6	249	<1.6	<1.6	159	21.7
	3/18/2015 DUP	<0.50	<0.50	<0.50	<0.50	17	<0.50	2.4	713	5.5	<0.50	194	<0.50	<0.50	124	16.8
	6/19/2015	<0.84	<0.84	<0.84	<0.84	7.2	<0.84	<0.84	339	3.2	<0.84	34.4	<0.84	<0.84	32.8	73.3
	9/22/2015	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	164	<0.50	<0.50	2.5	<0.50	<0.50	8.6	61.9
	9/22/2015 DUP	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	151	1.2	<0.50	2.3	<0.50	<0.50	7.8	51.9

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-4(40)	12/7/2015	<0.50	<0.50	<0.50	<0.50	9.1	<0.50	2	370	3.1	<0.50	109	<0.50	<0.50	94.8	4
(continued)	3/9/2016	<2.5	<10	<2.5	<2.5	11.6	<2.5	<2.5	610	4	<2.5	86.7	<2.5	<2.5	89.7	22.9
	3/8/2016 DUP	<2.5	<10	<2.5	<2.5	12.4	<2.5	<2.5	643	5.4	<2.5	97.4	<2.5	<2.5	102	28
	6/17/2016	<1.2	<5	<1.2	<1.2	24.5	<1.2	6	955	9.1	<1.2	232	<1.2	<1.2	209	85.9
	9/30/2016	<0.50	<2	<0.50	<0.50	4.1	<0.50	0.54	226	1.8	<0.50	1.7	<0.50	<0.50	1.3	45.8
	9/30/2016 DUP	<0.50	<2	<0.50	<0.50	4.5	<0.50	0.6	219	2	<0.50	1.5	<0.50	<0.50	1.4	52.1
	12/16/2016	<0.50	<2	<0.50	<0.50	1	<0.50	<0.50	1.3	0.97	<0.50	0.63	<0.50	<0.50	<0.50	0.88
	3/28/2017	<0.5	<2	<0.5	<0.5	22.5	0.68	2.8	979	5.5	<0.5	1.4	<0.5	<0.5	0.6	257
	3/28/2017 DUP	<2.5	<10	<2.5	<2.5	20.7	<2.5	3.3	1,050	6	<2.5	<2.5	<2.5	<2.5	<2.5	323
	6/12/2017	<0.50	<2.0	<0.50	<0.50	3.3	<0.50	<0.50	1.7	<0.50	<0.50	0.97	<0.50	<0.50	<0.50	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	1.1	<1.0	<0.50	0.7	<0.50	<0.50	0.79	<0.50	<0.50	<0.50	<0.50
	9/26/2017 DUP	<2.0	<2.0	<0.50	<0.50	1.1	<1.0	<0.50	0.8	<0.50	<0.50	0.86	<0.50	<0.50	<0.50	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	4.2	<0.50	<0.50	7.6	<0.50	<0.50	0.85	<0.50	<0.50	<0.50	12.80
	11/10/2017 DUP	<2.0	<2.0	<0.50	<0.50	4.3	<0.50	<0.50	8.0	<0.50	<0.50	0.71	<0.50	<0.50	<0.50	15.80
	3/22/2018	<0.500	<2.50	<0.500	<0.500	8.6	<0.500	<0.500	9.8	0.179 J	0.63	1.45	<0.500	<0.500	0.53	39.80
	7/1/2018	<0.500	<2.50	<0.500	<0.500	1.4	<0.500	<0.500	7.6	<0.500	0.279 J	0.498 J	<0.500	<0.500	0.169 J	8.98
	7/1/2018 DUP	<0.500	<2.50	<0.500	<0.500	2.0	<0.500	<0.500	9.4	<0.500	0.318 J	0.63	<0.500	<0.500	0.163 J	17.30
	9/28/2018	<1.00	<5.00	<1.00	<1.00	6.7	<0.400	<0.400	116.0	<0.400	<0.500	0.97	<0.400	<0.500	<0.400	129.0
	9/28/2018 DUP	<1.00	<5.00	<1.00	<1.00	9.1	<0.400	0.56	143.0	<0.400	<0.500	0.69	<0.400	<0.500	<0.400	129.0
	12/10/2018	<1.00	<5.00	<1.00	<1.00	1.5	<0.400	<0.400	1.8	<0.400	<0.500	0.60	<0.400	<0.500	<0.400	5.44
	3/26/2019	<2.00	<5.00	<1.00	<1.00	8.36	<0.400	0.709	117	<0.400	<0.500	0.680	<0.400	<0.500	<0.400	151
	6/3/2019	<2	<5	<0.5	<0.5	7.22	<0.400	0.440	74.7	<0.400	0.520	0.530	<0.400	<0.500	<0.400	157
	6/3/2019 DUP	<2	<5	<0.5	<0.5	7.40	<0.400	0.420	75.6	<0.400	0.610	0.560	<0.400	<0.500	<0.400	144
	9/27/2019	<1.00	<5.00	<1.00	<1.00	5.09	<0.400	<0.400	80.5	<0.400	<0.500	0.497	<0.400	<0.500	<0.400	106
	9/27/2019 DUP	<1.00	<5.00	<1.00	<1.00	5.09	<0.400	0.413	80.4	<0.400	<0.500	0.578	<0.400	<0.500	<0.400	104
	12/4/2019	<1.00	<5.00	<1.00	<1.00	1.63	<0.400	<0.400	2.57	<0.400	<0.500	1.350	<0.400	<0.500	0.45	4.5
	12/4/2019 DUP	<1.00	<5.00	<1.00	<1.00	1.67	<0.400	<0.400	2.66	<0.400	<0.500	1.130	<0.400	<0.500	<0.400	5.79
	3/12/2020	<1.00	<5.00	<1.00	<1.00	12.80	<0.400	2.430	418	0.64	<0.500	0.529	<0.400	<0.500	0.44	330
	6/16/2020	<1.00	<5.00	<1.00	<1.00	3.54	<0.400	<0.400	135	<0.400	0.670	0.660	<0.400	<0.500	<0.400	129
	6/16/2020 DUP	<1.00	<5.00	<1.00	<1.00	3.71	<0.400	<0.400	138	<0.400	0.700	0.600	<0.400	<0.500	<0.400	134
	10/6/2020	<1.00	<5.00	<1.00	<1.00	4.23	<0.400	<0.400	67.2	<0.400	<0.500	0.85	<0.400	<0.500	<0.400	83.9
	10/6/2020 DUP	<1.00	<5.00	<1.00	<1.00	4.38	<0.400	<0.400	66.9	<0.400	<0.500	0.828	<0.400	<0.500	<0.400	84
	12/10/2020	<40.0	<100	<20.0	<20.0	<8.00	<8.00	<8.00	104	<8.00	<10.0	<8.00	<8.00	<10.0	<8.00	131
	12/10/2020 DUP	<40.0	<100	<20.0	<20.0	<8.00	<8.00	<8.00	125	<8.00	<10.0	<8.00	<8.00	<10.0	<8.00	155
	3/4/2021	<1.00	<5.00	<1.00	<1.00	6.69	<0.400	<0.400	111	<0.400	<0.500	0.698	<0.400	<0.500	<0.400	137

Appendix B
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Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-4(40) (continued)	3/4/2021 DUP	<1.00	<5.00	<1.00	<1.00	6.81	<0.400	<0.400	116	<0.400	<0.500	0.617	<0.400	<0.500	<0.400	137
	6/16/2021	<1.00	<5.00	<1.00	<1.00	4.74	<0.400	<0.400	16.3	<0.400	<0.500	0.486	<0.400	<0.500	<0.400	109
	6/16/2021 DUP	<1.00	<5.00	<1.00	<1.00	4.8	<0.400	<0.400	17	<0.400	<0.500	0.466	<0.400	<0.500	<0.400	108
	9/16/2021	<1.00	<5.00	<1.00	<1.00	2.86	<0.400	<0.400	9.61	<0.400	<0.500	0.547	<0.400	<0.500	<0.400	30.7
	9/16/2021 DUP	<1.00	<5.00	<1.00	<1.00	2.86	<0.400	<0.400	9.86	<0.400	<0.500	0.549	<0.400	<0.500	<0.400	30.5
	12/10/2021	<1.00	<5.00	<1.00	<1.00	2.32	<0.400	<0.400	6.02	<0.400	<0.500	0.509	<0.400	<0.500	<0.400	25.7
	12/10/2021 DUP	<1.00	<5.00	<1.00	<1.00	2.13	<0.400	<0.400	5.65	<0.400	<0.500	0.535	<0.400	<0.500	<0.400	24.6
	3/10/2022	<1.00	<5.00	<1.00	<1.00	5.70	<0.400	<0.400	102	<0.400	<0.500	0.510	<0.400	<0.500	<0.400	122
	3/10/2022 DUP	<1.00	<5.00	<1.00	<1.00	6.34	<0.400	0.400	114	<0.400	<0.500	0.870	<0.400	<0.500	0.400	136
	6/14/2022	<1.00	<5.00	<1.00	<1.00	12.8	<0.400	1.85	234	0.560	0.540	0.720	<0.400	<0.500	2.12	267
	6/14/2022	<1.00	<5.00	<1.00	<1.00	12.6	<0.400	1.80	280	0.610	0.520	0.570	<0.400	<0.500	2.15	292
	9/14/2022	<5.00	<25.0	<5.00	<5.00	7.85	<2.00	<2.00	391	<2.00	<2.5	<2.00	<2.00	<2.50	<2.00	171
	9/14/2022 DUP	<5.00	<25.0	<5.00	<5.00	8.9	<2.00	<2.00	391	<2.00	<2.50	<2.00	<2.00	<2.50	<2.00	190
	12/6/2022	<1.00	<5.00	<1.00	<1.00	3.61	<0.400	<0.400	8.19	<0.400	<0.500	0.54	<0.400	<0.500	<0.400	58.5
	12/6/2022 DUP	<1.00	<5.00	<1.00	<1.00	3.78	<0.400	<0.400	7.94	<0.400	<0.500	1.02	<0.400	<0.500	<0.400	59.6
MGMS3-3(60)	8/30/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	7.03	<1	-	3.31	<0.50
	11/29/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	3.11	<0.50	<0.50	2.8	<1	-	1.28	<0.50
	2/27/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	21.5	<0.50	<0.50	14.9	<1	-	7.32	<0.50
	5/31/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	10.1	<0.50	<0.50	9.84	<1	-	4.76	<0.50
	9/24/2001	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.1	<0.50	<0.50	9.7	<0.50	-	3.7	<0.50
	12/18/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	3.26	<0.50	<0.50	17	<1	-	3.84	<0.50
	3/19/2002	<1	<0.50	<0.50	<1	0.68	<0.50	<0.50	17.6	<0.50	<0.50	32.3	0.5	-	14	<0.50
	5/29/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	40.5	<0.50	<0.50	20.8	<0.50	-	7.92	<0.50
	1/23/2003	<1	<0.50	<0.50	<1	0.5	<0.50	<0.50	33.9	<0.50	<0.50	20.3	<0.50	-	12.7	<0.50
	5/28/2003	<1	<0.50	<0.50	<1	0.58	<0.50	<0.50	88.3	0.53	<0.50	16.9	<0.50	-	11.9	0.7
	11/11/2003	<2	<2	<2	<2	<2	<2	<2	298	<2	<2	36.1	<2	-	23	<2
	1/27/2004	<2	<1	<1	<2	1.2	<1	<1	274	1.24	<1	25.2	<1	-	23.4	1.28
	5/3/2004	<2	<2	<2	<2	<2	<2	<2	274	<2	<2	46.6	<2	-	27	<2
	11/15/2004	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	43	<0.50	<0.50	8.8	<0.50	-	3.4	<0.50
	2/1/2005	<2	<1	<1	<2	<1	<1	<1	179	1.72	<1	15.6	<1	-	7.9	<1
	5/16/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	33.8	<0.50	<0.50	5.7	<0.50	-	2.39	<0.50
	8/18/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	47.9	<0.500	<0.500	4.39	<0.500	-	1.96	0.66
	11/16/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	8.39	<0.500	<0.500	2.59	<0.500	-	0.83	<0.500
	2/21/2006	<5	<2.50	<2.50	<5	2.65	<2.50	<2.50	558	<2.50	<2.50	25	<2.50	-	14.4	21.6
	3/14/2006	<1	<1	<1	<1	2.92	<1	1.37	97.1	<1	<1	50.6	<1	-	39.2	<1

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Historical Groundwater Analytical Results
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 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-3(60)	6/6/2006	<1	<1	<1	<1	<1	<1	<1	7.97	<1	<1	2.84	<1	-	1.04	<1
(continued)	9/5/2006	<1	<0.50	<0.50	<1	2.75	<0.50	1.17	108	0.78	<0.50	47.3	0.93	-	34.2	0.65
	12/5/2006	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	19.8	<0.50	<0.50	10.5	<0.50	-	5.57	<0.50
	2/7/2007	<1	<0.50	<0.50	<1	1.08	<0.50	<0.50	44.3	<0.50	<0.50	21.5	<0.50	-	15.4	<0.50
	5/22/2007	<1	<1	<1	<1	<1	<1	<1	32.5	<1	<1	45.2	<1	-	18.2	<1
	9/10/2007	<2	<1	<1	<2	2.98	<1	<1	148	<1	<1	28.8	<1	-	31.6	1.67
	12/12/2007	<2	<1	<1	<2	<1	<1	<1	11.5	<1	<1	4.22	<1	-	1.9	1.18
	3/4/2008	<1	<0.500	<0.500	<1	1.58	<0.500	0.68	72.1	0.6	<0.500	27.2	0.5	<0.500	22.7	2.33
	12/8/2008	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	44	<0.50	<0.50	12	<0.50	<0.50	9.2	1.3
	3/24/2009	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	42	<0.50	<0.50	21	<0.50	<0.50	14	0.91
	9/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15	<0.50	<0.50	8.5	<0.50	<0.50	4.3	0.84
	12/14/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	2	<0.50	<0.50	0.85	<0.50
	3/17/2010	<0.50	<0.50	<0.50	<0.50	0.69	<0.50	<0.50	25	<0.50	<0.50	17	<0.50	<0.50	10	0.57
	6/14/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.8	<0.50	<0.50	2.4	<0.50	<0.50	1.1	0.69
	9/20/2010	<0.5	<0.5	<0.5	<0.5	0.81	<0.5	<0.5	28	<0.5	<0.5	18	<0.5	<0.5	11	0.52
	12/7/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	9	<0.5	<0.5	3.4	<0.5	<0.5	1.5	0.94
	3/7/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	17	<0.50	<0.50	10	<0.50	<0.50	4.6	0.67
	6/6/2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.9	<0.5	<0.5	2	<0.5	<0.5	0.73	<0.5
	9/13/2011	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	34	<0.50	<0.50	17	<0.50	<0.50	12	<0.50
	12/5/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	14	<0.50	<0.50	7.3	<0.50
	3/8/2012	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	21	<0.50	<0.50	15	<0.50	<0.50	9	<0.50
	6/21/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.9	<0.5	<0.5	3	<0.5	<0.5	1.2	<0.5
	9/12/2012	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	39	<0.50	<0.50	18	<0.50	<0.50	12	<0.50
	12/11/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	2.3	<0.50	<0.50	0.9	<0.50
	3/12/2013	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	22	<0.50	<0.50	16	<0.50	<0.50	9	<0.50
	6/11/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	16	<0.50	<0.50	11	<0.50	<0.50	5.4	<0.50
	9/16/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	6.8	<0.50	<0.50	3.3	<0.50
	12/10/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	3.6	<0.50	<0.50	1.5	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	2.5	<0.50	<0.50	0.89	<0.50
	6/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	3.4	<0.50	<0.50	1.4	<0.50
	9/23/2014	<0.50	<0.50	<0.50	<0.50	0.71	<0.50	<0.50	2	<0.50	<0.50	8.8	<0.50	<0.50	4.7	<0.50
	12/12/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	2.2	<0.50	<0.50	0.72	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12.2	<0.50	<0.50	6	<0.50	<0.50	3.7	<0.50
	6/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6	<0.50	<0.50	3.5	<0.50	<0.50	1.6	<0.50

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-3(60) (continued)	9/22/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	3.9	<0.50	<0.50	2	0.6
	12/7/2015	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	13.9	<0.50	<0.50	4.2	<0.50	<0.50	2.5	16.7
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	2.8	<0.50	<0.50	0.78	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	17.4	<0.50	<0.50	5.8	<0.50	<0.50	5	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	3.7	<0.50	<0.50	1.9	<0.50
	12/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	1.7	<0.50	<0.50	0.68	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	0.62	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5
	6/12/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.3	<0.50	<0.50	0.64	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	1.20	<1.0	<0.50	34.2	<0.50	<0.50	8.6	<0.50	<0.50	7.80	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	1.70	<0.50	<0.50	37.6	<0.50	<0.50	0.8	<0.50	<0.50	1.50	13.90
	3/22/2018	<0.500	<2.50	<0.500	<0.500	0.76	<0.500	<0.500	15.6	<0.500	<0.500	2.2	<0.500	<0.500	1.76	5.89
	7/2/2018	<0.500	<2.50 J3	<0.500	<0.500	0.67	<0.500	<0.500	12.7	<0.500	<0.500	2.7	<0.500	<0.500	1.92	3.36
	9/28/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	9.3	<0.400	<0.500	3.3	<0.400	<0.500	2.31	<0.400
	12/10/2018	<1.00	<5.00	<1.00	<1.00	1.21	<0.400	<0.400	17.7	<0.400	<0.500	0.9	<0.400	<0.500	1.16	0.86
	3/26/2019	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.23	<0.400	<0.500	1.04	<0.400	<0.500	0.420	<0.400
	6/3/2019	<4.00	<5.00	<1.00	<1.00	0.420	<0.400	<0.400	8.52	<0.400	<0.500	0.790	<0.400	<0.500	0.730	<0.400
	9/27/2019	<1.00	<5.00	<1.00	<1.00	1.130	<0.4	<0.4	21.8	<0.400	<0.500	1.030	<0.400	<0.500	1.230	3.980
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.62	<0.400	<0.500	1.170	<0.400	<0.500	0.634	<0.400
	3/12/2020	<1.00	<5.00	<1.00	<1.00	0.761	<0.400	<0.400	14.7	<0.400	<0.500	1.660	<0.400	<0.500	1.720	0.659
	6/16/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.92	<0.400	<0.500	1.170	<0.400	<0.500	0.510	<0.400
	10/6/2020	<1.00	<5.00	<1.00	<1.00	0.444	<0.400	<0.400	10.9	<0.400	<0.500	2.36	<0.400	<0.500	2.03	<0.400
	12/10/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.76	<0.400	<0.500	1.86	<0.400	<0.500	1.11	<0.400
	3/4/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	9.54	<0.400	<0.500	2.44	<0.400	<0.500	1.95	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.65	<0.400	<0.500	1.38	<0.400	<0.500	0.949	<0.400
	9/16/2021	<1.00	<5.00	<1.00	<1.00	0.786	<0.400	<0.400	17.8	<0.400	<0.500	2.06	<0.400	<0.500	1.94	1.59
	12/10/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.84	<0.400	<0.500	1.07	<0.400	<0.500	<0.400	0.542
3/10/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	8.18	<0.400	<0.500	1.60	<0.400	<0.500	1.74	0.410	
6/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	0.840	<0.400	<0.500	<0.400	<0.400	
9/14/2022	<1.00	<5.00	<1.00	<1.00	0.45	<0.400	<0.400	15.3	<0.400	<0.500	2.51	<0.400	<0.500	2.62	0.43	
12/6/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.2	<0.400	<0.500	1.84	<0.400	<0.500	1.21	0.56	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-2(110)	8/30/2000	<10	<50	<5	<5	7.28	<5	<5	120	<5	<5	154	12.1	-	98.2	<5
	11/29/2000	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	11.4	<2.5	<2.5	11.5	<5	-	13	<2.5
	2/27/2001	<2	<10	<1	<1	<1	<1	<1	2.4	<1	<1	3.36	<2	-	1.98	<1
	5/31/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	4.24	<0.50	<0.50	3.07	<1	-	1.85	<0.50
	9/24/2001	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.6	<0.50	<0.50	5.3	<0.50	-	2.4	<0.50
	12/18/2001	<1	<5	<0.50	<0.50	0.864	<0.50	0.913	10.3	<0.50	<0.50	50.9	2.98	-	23.9	<0.50
	3/19/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.02	<0.50	<0.50	6.88	<0.50	-	2.54	<0.50
	5/29/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	8.19	<0.50	<0.50	11.5	<0.50	-	3.9	<0.50
	1/23/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	21.2	<0.50	<0.50	17.2	<0.50	-	8.38	<0.50
	5/28/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	28.6	<0.50	<0.50	18.4	<0.50	-	8.76	<0.50
	11/11/2003	<1	<1	<1	<1	<1	<1	<1	53.7	<1	<1	18.3	<1	-	9.3	<1
	1/27/2004	<1	<0.50	<0.50	<1	0.53	<0.50	<0.50	114	0.8	<0.50	24	<0.50	-	15.1	<0.50
	5/3/2004	<1	<1	<1	<1	<1	<1	<1	22.1	<1	<1	6.74	<1	-	4.21	<1
	11/15/2004	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	47	<0.50	<0.50	6.3	<0.50	-	2.9	<0.50
	5/16/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	66.5	<0.50	<0.50	3.59	<0.50	-	1.48	0.77
	11/16/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	25.3	<0.500	<0.500	4.93	<0.500	-	1.66	0.66
	3/14/2006	<1	<1	<1	<1	<1	<1	<1	23.1	<1	<1	2.91	<1	-	1.14	1.06
	6/6/2006	<1	<1	<1	<1	<1	<1	<1	15.9	<1	<1	3.56	<1	-	1.88	1.06
	12/5/2006	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	32.6	<0.50	<0.50	2.84	<0.50	-	1.17	2.85
	9/10/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	40.4	<0.50	<0.50	6.32	<0.50	-	3.7	13.2
	3/4/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	18.1	<0.500	<0.500	3.4	<0.500	<0.500	1.47	5.64
	9/16/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	20.4	<0.500	<0.500	6.34	<0.500	<0.500	3.5	4.24
	3/24/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15	<0.50	<0.50	3	<0.50	<0.50	1.5	2.3
	6/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	2.4	<0.50	<0.50	1.2	2.2
	9/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	3.8	<0.50	<0.50	2.1	3.2
	3/17/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7	<0.50	<0.50	3.1	<0.50	<0.50	1.8	1.2
	9/20/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.5	<0.5	<0.5	3	<0.5	<0.5	1.4	1.2
	3/7/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	3.7	<0.50	<0.50	2.2	0.86
	3/8/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	5.9	<0.50	<0.50	4.5	<0.50
	9/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	2.7	<0.50	<0.50	1.3	<0.50
3/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.9	<0.50	<0.50	5.6	<0.50	<0.50	4.4	0.59	
9/16/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	3.6	<0.50	<0.50	2.1	<0.50	
3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.8	<0.50	<0.50	9.1	<0.50	<0.50	6.5	<0.50	
9/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	<0.50	3	<0.50	<0.50	1.5	<0.50	
3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	4.4	<0.50	<0.50	2.8	<0.50	

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 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-2(110) (continued)	9/22/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	3.8	<0.50	<0.50	2.6	1.2
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	7.3	<0.50	<0.50	7.5	<0.50	<0.50	6.1	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	4.4	<0.50	<0.50	3	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	7	<0.5	<0.5	7	<0.5	<0.5	6	<0.5
	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	5	<0.50	<0.50	0.96	<0.50	<0.50	1	0.9
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	2.50	<0.50	<0.50	2	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	2	<0.500	<0.500	1.82	<0.500	<0.500	1	0.359 J
	9/28/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2	<0.400	<0.500	1.98	<0.400	<0.500	1	<0.400
	6/3/2019	<4.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.930	<0.400	<0.500	1.89	<0.400	<0.500	1.11	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.852	<0.400	<0.500	1.84	<0.400	<0.500	0.958	<0.400
	6/16/2020	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.000	<0.400	<0.500	3.01	<0.400	<0.500	1.33	<0.400
	12/10/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.45	<0.400	<0.500	<0.400	<0.400
	6/16/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.482	<0.400	<0.500	1.34	<0.400	<0.500	0.572	<0.400
	12/10/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.480	<0.400	<0.500	3.49	<0.400	<0.500	1.92	<0.400
	6/14/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.46	<0.400	<0.500	6.31	<0.400	<0.500	3.61	<0.400
12/6/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	1.52	<0.400	<0.500	0.46	<0.400	
MGMS3-1(132)	8/30/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	5.58	<1	-	0.746	<0.50
	11/29/2000	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	2.04	<0.50	<0.50	0.754	<1	-	<0.50	<0.50
	2/27/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	1.08	<0.50	<0.50	2.62	<1	-	0.722	<0.50
	5/31/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	6.67	<0.50	<0.50	3.13	<1	-	1.44	<0.50
	9/24/2001	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	6.1	<0.50	-	1.9	<0.50
	12/18/2001	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	4.11	<0.50	<0.50	8.75	<1	-	2.24	<0.50
	3/19/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.88	<0.50	<0.50	9.63	<0.50	-	3.02	<0.50
	5/29/2002	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	11.8	<0.50	<0.50	14.6	<0.50	-	4.28	<0.50
	1/23/2003	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	16.8	<0.50	<0.50	11.4	<0.50	-	6.04	<0.50
	5/28/2003	<1	<0.50	<0.50	<1	0.59	<0.50	<0.50	93.3	0.76	<0.50	16.3	<0.50	-	10.1	0.83
	11/11/2003	<1	<1	<1	<1	<1	<1	<1	72.4	<1	<1	12.2	<1	-	8	<1
	1/27/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	34.9	0.61	<0.50	12.7	<0.50	-	9.47	<0.50
	5/3/2004	<1	<1	<1	<1	<1	<1	<1	11.9	<1	<1	<1	<1	-	14.2	<1
	11/15/2004	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	200	<2.5	<2.5	6.2	<2.5	-	3.4	<2.5
	5/16/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	42.6	0.79	<0.50	4.42	<0.50	-	2.23	<0.50
	11/16/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	19.9	<0.500	<0.500	2.41	<0.500	-	0.8	<0.500
	3/14/2006	<1	<1	<1	<1	<1	<1	<1	20.3	<1	<1	2.13	<1	-	<1	<1
6/6/2006	<1	<1	<1	<1	<1	<1	<1	18.6	<1	<1	1.57	<1	-	<1	1.36	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-1(132) (continued)	12/5/2006	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	24.1	<0.50	<0.50	3.05	<0.50	-	1.08	4.68
	9/10/2007	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	36.5	<0.50	<0.50	4.69	<0.50	-	3.17	16.8
	3/4/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	21.8	<0.500	<0.500	3.37	<0.500	<0.500	1.64	6.83
	9/16/2008	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	26	<0.500	<0.500	4.86	<0.500	<0.500	3.52	4.96
	3/24/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	1.8	<0.50	<0.50	0.79	2.4
	03/24/2009 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	1.6	<0.50	<0.50	0.78	2.3
	6/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	4.3	<0.50	<0.50	1.9	1.6
	9/15/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	2.1	<0.50	<0.50	1.2	2
	3/17/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.2	<0.50	<0.50	2.6	<0.50	<0.50	1.9	0.92
	9/20/2010	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.5	<0.5	<0.5	2.9	<0.5	<0.5	2.3	1.3
	3/7/2011	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	18	<0.50	<0.50	4	<0.50	<0.50	3.8	4.3
	9/13/2011	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.6	<0.50	<0.50	3.8	<0.50	<0.50	3.4	0.55
	3/8/2012	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	9.3	<0.50	<0.50	7	<0.50	<0.50	6.9	0.67
	9/12/2012	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6	<0.50	<0.50	4.9	<0.50	<0.50	4	<0.50
	3/12/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.4	<0.50	<0.50	8.1	<0.50	<0.50	7.2	0.98
	9/16/2013	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	9.8	<0.50	<0.50	7.9	<0.50	<0.50	8.1	0.84
	3/18/2014	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	0.51	11	<0.50	<0.50	13	<0.50	<0.50	11	0.76
	9/23/2014	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	8.9	<0.50	<0.50	9	<0.50	<0.50	7.9	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	9.3	<0.50	<0.50	6.3	<0.50	<0.50	6	0.56
	9/22/2015	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	13.3	<0.50	<0.50	8.1	<0.50	<0.50	8.2	1.2
	3/9/2016	<0.50	<2	<0.50	<0.50	1	<0.50	0.56	14.4	<0.50	<0.50	13.5	0.56	<0.50	12.7	0.8
	9/30/2016	<0.50	<2	<0.50	<0.50	0.84	<0.50	0.54	12.9	<0.50	<0.50	13.8	<0.50	<0.50	11.9	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	7.9	<0.5	<0.5	13.8	<0.5	<0.5	9.6	<0.5
	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	3.4	<0.50	<0.50	3.0	<0.50	<0.50	2.8	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	<0.50	5.1	<0.50	<0.50	3.8	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.247 J	<0.500	<0.500	4.0	<0.500	<0.500	5.6	<0.500	<0.500	4.1	0.359 J
	9/28/2018	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	3.5	<0.400	<0.500	3.8	<0.400	<0.500	3.2	<0.400
	6/5/2019	<4.00	<5.00	<1.00	<1.00	0.412	<0.400	<0.400	5.97	<0.400	<0.500	9.45	<0.400	<0.500	6.79	<0.400
	12/4/2019	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	5.34	<0.400	<0.500	8.69	<0.400	<0.500	6.21	<0.400
	6/16/2020	<1.00	<5.00	<1.00	<1.00	0.43	<0.400	<0.400	4.61	<0.400	<0.500	9.87	<0.400	<0.500	6.01	<0.400
12/10/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	2.73	<0.400	<0.500	3.61	<0.400	<0.500	2.46	<0.400	
12/10/2021	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	4.86	<0.400	<0.500	7.3	<0.400	<0.500	5.35	<0.400	
6/14/2022	<1.00	<5.00	<1.00	<1.00	0.440	<0.400	<0.400	6.23	<0.400	<0.500	11.0	<0.400	<0.500	6.88	<0.400	
12/6/2022	<1.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	1.71	<0.400	<0.500	3.29	<0.400	<0.500	1.85	<0.400	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
CMT1-1	11/11/2003	<1	<1	2.87	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
	1/26/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	5/3/2004	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
	8/19/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	11/17/2004	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
	3/23/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	5/17/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	11/17/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	-	<0.500	<0.500
	5/26/2006	Well Abandoned														
CMT1-2	11/11/2003	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
	1/26/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	-	1.03	<0.50
	5/3/2004	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
	8/19/2004	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	11/17/2004	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	-	0.88	<0.50
	2/1/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.37	<0.50	-	0.99	<0.50
	5/16/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	-	0.69	<0.50
	11/17/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.6	<0.500	-	<0.500	<0.500
	5/26/2006	Well Abandoned														
CMT1-3	11/11/2003	<2	<2	3.56	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2
	1/26/2004	<1	<0.50	1.1	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	5/3/2004	<1	<1	2.97	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
	8/19/2004	<1	<0.50	2.16	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50
	11/17/2004	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	<25	<25
	5/16/2005	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	-	<0.50	<0.50
	11/17/2005	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	-	<0.500	<0.500
	5/26/2006	Well Abandoned														
EX	3/23/2009	<5	<5	<5	<5	<5	<5	<5	50	<5	<5	1,400	43	<5	420	<5
	6/18/2009	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	24	1.1	<0.50	11	<0.50
	9/18/2009	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	3.3	120	0.76	<0.50	2,100	38	<0.50	380	1.1
	12/18/2009	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	5.6	<2.5	<2.5	700	3.7	<2.5	56	<2.5
	3/16/2010	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20	<0.50	<0.50	150	3.2	<0.50	33	<0.50
	6/17/2010	<0.50	<0.50	<0.50	<0.50	0.97	<0.50	<0.50	92	<0.50	<0.50	150	2.3	<0.50	39	2.2
	9/23/2010	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	1.6	90	0.53	<0.5	2,400	20	<0.5	220	1.8
	12/21/2010	<0.5	<0.5	<0.5	<0.5	0.83	<0.5	0.59	30	<0.50	<0.5	900	6.7	<0.5	99	0.71

Appendix B
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 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)															
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride	
EX (continued)	3/31/2011	<4	<4	<4	<4	8.2	<4	8.1	240	<4	<4	6,800	110	<4	910	5.1	
	6/7/2011	<4	<4	<4	<4	<4	<4	<4	140	<4	<4	1,400	15	<4	170	<4	
	9/19/2011	<5	<5	<5	<5	7.9	<5	11	290	<5	<5	4,100	73	<5	460	14	
	12/7/2011	<5	<5	<5	<5	16	<5	19	12,000	9.3	<5	<50	17	<5	<50	140	
	3/9/2012	<4	<4	<4	<4	5	<4	<4	1,400	8.6	<4	33	<4	<4	10	290	
	6/22/2012	<0.5	5.5	<0.5	<0.5	3.4	<0.5	0.68	170	1.3	<0.5	3	0.59	<0.5	1.1	120	
	9/14/2012	<1.5	2.7	<1.5	<1.5	1.5	<1.5	<1.5	320	<1.5	<1.5	3	<1.5	<1.5	<1.5	42	
	12/14/2012	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	12	
	3/15/2013	<0.50	2.8	<0.50	<0.50	<0.50	<0.50	<0.50	9.5	<0.50	<0.50	1.2	<0.50	<0.50	<0.50	4.4	
	6/14/2013	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	0.79	<0.50	<0.50	<0.50	<0.50	
	9/20/2013	<0.50	1.9	<0.50	<0.50	1.9	<0.50	0.54	71	0.68	<0.50	4.1	<0.50	<0.50	2.6	30	
	12/16/2013	<0.50	1.4	<0.50	<0.50	3.8	<0.50	<0.50	34	<0.50	<0.50	2	<0.50	<0.50	1.4	28	
	3/24/2014	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	30	<0.50	<0.50	20	<0.50	<0.50	7.5	11	
	6/23/2014	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	1.1	160	0.97	<0.50	29	<0.50	<0.50	15	38	
	9/30/2014	Insufficient water for sampling .															
	12/15/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10	<0.50	<0.50	22	<0.50	<0.50	2.7	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	2.1	688	1.9	<0.50	168	2.5	<0.50	55.8	2.8	
	6/18/2015	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	2.6	420	1.6	<0.50	186	0.88	<0.50	42	3.2	
	9/22/2015	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	3.7	543	2.6	<0.50	302	0.65	<0.50	61.9	24.4	
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	427	<0.50	<0.50	94	<0.50	<0.50	21.3	2.1	
	3/8/2016	<1.2	<5	<1.2	<1.2	4	<1.2	2.9	1,160	3.6	<1.2	274	5	<1.2	71.1	13.3	
	6/17/2016	<5	<20	<5	<5	<5	<5	<5	1,040	<5	<5	592	<5	<5	90.8	<5	
	9/28/2016	<1.7	<6.7	<1.7	<1.7	4.6	<1.7	3.5	2,230	3.8	<1.7	39.4	2.5	<1.7	549	128	
	12/12/2016	<0.50	3.7	<0.50	<0.50	<0.50	<0.50	<0.50	8.1	<0.50	<0.50	4.3	<0.50	<0.50	0.96	51.9	
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	5.2	<0.5	<0.5	6.1	<0.5	<0.5	1.9	<0.5	
	6/14/2017	<2.0	10.2	<0.50	<0.50	10.7	<1.0	<0.50	11.7	0.56	<0.50	9.5	<0.50	<0.50	3.0	1.3	
	9/26/2017	<2.0	3.4	<0.50	<0.50	8.8	<1.0	<0.50	6.9	<0.50	<0.50	0.8	<0.50	<0.50	0.6	10.1	
	3/21/2018	<0.500	1.45 J	<0.500	<0.500	1.3	<0.500	<0.500	22.6	<0.500	<0.500	1.5	<0.500	<0.500	2.7	10.8	
	6/28/2018	<0.500	42.9	<0.500	<0.500	4.6	<0.500	1.11	722.0	8.72	<0.500	1.9	<0.500	<0.500	0.8	424.0	
	9/24/2018	<1.00	<5.00	<1.00	<1.00	1.4	<0.400	<0.400	3.4	0.75	<0.500	3.1	<0.400	<0.500	2.4	7.6	
	12/4/2018	<1.00	<5.00	<1.00	<1.00	0.9	<0.400	<0.400	8.2	<0.400	<0.500	6.4	<0.400	<0.500	3.6	1.9	
	6/17/2021	<1.00	<5.00	<1.00	<1.00	4.55	<0.400	3.90	415	2.33	<0.500	4,570	12.4	<0.500	322	22.2	
9/16/2021	<1.00	<5.00	<1.00	<1.00	11.3	<0.400	7.65	739	6.50	<0.500	2,940	7.80	<0.500	380	20.6		
12/10/2021	<1.00	<5.00	<1.00	<1.00	3.1	<0.400	3.73	198	1.55	<0.500	4,900	10.60	<0.500	268	6.8		
3/8/2022	<1.00	<5.00	<1.00	<1.00	3.27	<0.400	4.40	224	1.74	<0.500	6,930	19.8	<0.500	321	9.0		

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
EX (continued)	6/16/2022	<10.0	<50.0	<10.0	<10.0	22.7	<4.00	7.80	412	8.50	<5.00	1,590	7.20	<5.00	344	7.30
	9/14/2022	<50.0	<250	<50.0	<50.0	<20.0	<20.0	<20.0	466	<20.0	<25.0	2340	<20.0	<25.0	224	24.5
	12/8/2022	<50.0	<250	<50.0	<50.0	<20.0	<20.0	<20.0	608	<20.0	<25.0	4040	<20.0	<25.0	334	<20.0
MP-1	3/23/2009	<4	<4	<4	<4	6	<4	<4	89	<4	<4	1,200	10	<4	180	<4
	6/18/2009	<4	<4	<4	<4	4.3	<4	<4	43	<4	<4	1,500	12	<4	180	<4
	9/18/2009	<4	<4	<4	<4	14	<4	<4	240	8.9	<4	1,100	8.2	<4	310	7.3
	12/18/2009	<4	<4	<4	<4	<4	<4	<4	58	<4	<4	1,000	7.1	<4	180	<4
	3/16/2010	<3	<3	<3	<3	22	<3	4.7	410	13	<3	1,500	8.6	<3	400	10
	6/17/2010	<3	<3	<3	<3	3.2	<3	<3	120	<3	<3	800	5.4	<3	140	<3
	9/23/2010	<3	<3	<3	<3	<3	<3	<3	41	<3	<3	730	4	<3	120	<3
	12/10/2010	<3	<3	<3	<3	<3	<3	<3	27	<3	<3	1,000	4.5	<3	150	<3
	3/14/2011	<3	<3	<3	<3	7.1	<3	<3	150	<3	<3	1,200	6.4	<3	180	5.9
	6/7/2011	<2.5	<2.5	<2.5	<2.5	4.9	<2.5	<2.5	75	<2.5	<2.5	640	3.3	<2.5	130	<2.5
	9/19/2011	<1.5	<1.5	<1.5	<1.5	2.4	<1.5	<1.5	41	<1.5	<1.5	300	1.9	<1.5	72	1.6
	12/7/2011	<2.5	<2.5	<2.5	<2.5	2.6	<2.5	<2.5	49	3.1	<2.5	640	3.1	<2.5	120	<2.5
	3/9/2012	<1.5	<1.5	<1.5	<1.5	9.4	<1.5	2.8	440	6.3	<1.5	490	3.5	<1.5	140	21
	6/22/2012	<2.5	<2.5	<2.5	<2.5	5.6	<2.5	2.8	530	2.9	<2.5	690	12	<2.5	120	48
	9/14/2012	<1.5	<1.5	<1.5	<1.5	4	<1.5	<1.5	170	2.2	<1.5	340	2	<1.5	83	4.5
	12/14/2012	<0.90	<0.90	<0.90	<0.90	2	<0.90	<0.90	170	1.7	<0.90	230	1	<0.90	48	1.8
	3/15/2013	<0.90	<0.90	<0.90	<0.90	5.1	<0.90	0.94	140	2.5	<0.90	230	1	<0.90	69	1.8
	6/14/2013	<0.90	<0.90	<0.90	<0.90	4.5	<0.90	1.4	190	1.6	<0.90	330	1.4	<0.90	70	1.8
	9/20/2013	<0.90	<0.90	<0.90	<0.90	2.9	<0.90	<0.90	77	1.5	<0.90	260	0.95	<0.90	66	<0.90
	12/16/2013	<0.90	<0.90	<0.90	<0.90	1.7	<0.90	1.1	67	0.92	<0.90	290	1.2	<0.90	70	<0.90
	3/24/2014	<1.5	<1.5	<1.5	<1.5	2.2	<1.5	<1.5	240	<1.5	<1.5	360	1.8	<1.5	54	<1.5
	6/23/2014	<1.5	<1.5	<1.5	<1.5	4.9	<1.5	2.3	290	1.7	<1.5	1,200	9.5	<1.5	130	5
	9/30/2014	<2	<2	<2	<2	2.8	<2	<2	110	<2	<2	360	<2	<2	63	16
	12/15/2014	<1.5	<1.5	<1.5	<1.5	1.7	<1.5	<1.5	58	<1.5	<1.5	320	<1.5	<1.5	59	<1.5
	3/20/2015	<1	<1	<1	<1	3.6	<1	1.5	188	1.5	<1	565	1	<1	95.6	24.8
	6/18/2015	<0.84	<0.84	<0.84	<0.84	2.9	<0.84	1.5	91	0.87	<0.84	376	<0.84	<0.84	80.8	<0.84
	9/22/2015	<1.2	<1.2	<1.2	<1.2	1.8	<1.2	1.4	38.3	<1.2	<1.2	343	<1.2	<1.2	68.3	<1.2
12/8/2015	<1.2	<1.2	<1.2	<1.2	1.8	<1.2	1.5	50.9	<1.2	<1.2	308	<1.2	<1.2	62.6	<1.2	
3/8/2016	<0.84	<3.3	<0.84	<0.84	7.5	<0.84	2.1	148	1.2	<0.84	433	<0.84	<0.84	100	<0.84	
6/17/2016	<0.50	<2	<0.50	<0.50	5	<0.50	1.5	125	0.97	<0.50	206	<0.50	<0.50	67.3	<0.50	
9/28/2016	<0.50	<2	<0.50	<0.50	1.3	<0.50	3.1	40.5	<0.50	<0.50	99.4	<0.50	<0.50	35.5	3.3	

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MP-1	12/13/2016	<0.50	<2	<0.50	<0.50	0.64	<0.50	0.92	209	0.55	<0.50	2.9	<0.50	<0.50	1	4.3
(continued)	3/30/2017	<0.5	71.4	<0.5	<0.5	7.5	<0.5	<0.5	177	6	<0.5	<0.5	<0.5	<0.5	0.79	186
	6/14/2017	<2.0	4.0	<0.50	<0.50	2.3	<1.0	<0.50	143	1.9	<0.50	16.2	<0.50	<0.50	8.5	29.4
	9/26/2017	<2.0	<2.0	<0.50	<0.50	3.4	<1.0	4.50	83	0.8	<0.50	307.0	<0.50	<0.50	65.9	2.3
	11/9/2017	<2.0	<2.0	<0.50	<0.50	3.3	<0.50	4.30	105	0.9	<0.50	198.0	<0.50	<0.50	74.0	2.6
	3/21/2018	<0.500	<2.50	<0.500	<0.500	3.2	<0.500	4.04	151	1.0	<0.500	245.0	<0.500	<0.500	64.5	1.6
	6/28/2018	<0.500	<2.50	<0.500	<0.500	10.2	<0.500	9.34	353	1.7	<0.500	747.0	0.56	<0.500	140.0	5.3
	9/26/2018	<20.0	<100	<20.0	<20.0	<8.00	<8.00	<8.00	60	<8.00	<10.0	322.0	<8.00	<10.0	57.0	<8.00
	12/4/2018	<1.00	<5.00	<1.00	<1.00	<0.400	2.79	6.59	130	0.8	<0.500	355.0	<0.400	<0.500	76.7	1.2
	3/20/2019	<2.00	<5.00	<1.00	<1.00	1.43	<0.400	3.08	69.0	<0.400	<0.500	146	<0.400	<0.500	36.6	1.55
	6/7/2019	<10	<100	<10	<10	<8.00	<8.00	<8.00	205	<8.00	<10.0	769	<8.00	<10.0	111	<8.00
	9/26/2019	<2.00	<5.00	<2.00	<2.00	1.36	<0.800	1.14	37.1	<0.800	<1.00	176	<0.800	<1.00	26.8	<0.800
	12/3/2019	<2.00	<10.0	<2.00	<2.00	1.57	<0.800	1.8	40.6	<0.800	<1.00	306	<0.800	<1.00	57.8	<0.800
	3/11/2020	<2.00	<10.0	<2.00	<2.00	3.94	<0.800	5.63	177	1.14	<1.00	1370	1.77	<1.00	190	<0.800
	6/17/2020	<10.0	<50.0	<10.0	<10.0	<4.00	<4.00	<4.00	72	<4.00	<5.00	427	<4.00	<5.00	61.2	<4.00
	10/8/2020	<5.00	<25.0	<5.00	<5.00	<2.00	<2.00	<2.00	36.7	<2.00	<2.50	510	<2.00	<2.50	52.3	<2.00
	12/9/2020	<4.00	<10.0	<2.00	<2.00	1.15	<0.800	<0.800	29.5	<0.800	<1.00	362	<0.800	<1.00	41.3	<0.800
	3/3/2021	<5.00	<25.0	<5.00	<5.00	<2.00	<2.00	2.34	70.1	<2.00	<2.5	831	<2.00	<2.5	100	<2.00
	6/16/2021	<10.0	<50.0	<10.0	<10.0	<0.400	<0.400	<0.400	70.7	<4.00	<5.00	309	<4.00	<5.00	52	<4.00
	9/15/2021	<2.00	<10.0	<2.00	<2.00	1.67	<0.800	1.27	38.1	<0.800	<1.00	392	<0.800	<1.00	63.8	<0.800
	12/8/2021	<5.00	<25.0	<5.00	<5.00	<0.400	<2.00	<2.00	9.16	<2.00	<2.50	152	<2.00	<2.50	29.2	<2.00
	3/9/2022	<5.00	<25.0	<5.00	<5.00	<2.00	<2.00	<2.00	33.4	<2.00	<2.50	322	<2.00	<2.50	59.0	<2.00

Appendix B
Historical Groundwater Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MP-1 (continued)	6/14/2022	<5.00	<25.0	<5.00	<5.00	<2.00	<2.00	<2.00	40.0	<2.00	<2.50	417	<2.00	<2.50	41.9	<2.00
	9/14/2022	<5.00	<25.0	<5.00	<5.00	<2.00	<2.00	<2.00	24.6	<2.00	<2.50	470	<2.00	<2.50	39.4	<2.00
	12/7/2022	<5.00	<25.0	<5.00	<5.00	<2.00	<2.00	<2.00	27.6	<2.00	<2.50	436	<2.00	<2.50	56.8	<2.00
MP-3	6/28/2018	<0.500	<2.50	<0.500	<0.500	5.24	<0.500	1.78	203	1.31	<0.500	398	1.82	<0.500	65.1	8.96
	9/27/2018	<1.00	<5.00	<1.00	<1.00	4.06	<0.400	3.52	187	1.60	<0.500	721	0.950	<0.500	148	0.730

Notes:

1. HVOCs = Halogenated volatile organic compounds analysis by U.S. Environmental Protection Agency (EPA) Method 8260B; results reported in micrograms per liter (µg/L).
2. TPH = Total petroleum hydrocarbons in the diesel and heavy oil range analysis by Washington Department of Ecology (WDOE) Method TPH-418.1 Results reported in milligrams per liter (mg/L).
3. -- = Not sampled or not analyzed.
4. < = Not detected at or above the specified laboratory method reporting limit (MRL).
5. B = Estimated concentration based on data quality review - similar detection in associated field blank/equipment blanks (less than 5x difference).
6. J = Estimated concentration based on data quality review.
7. n-Propylbenzene, 1,1,1,2-Tetrachloro-ethane, and 1,1,2-Trichloroethane were detected during the first semi-annual 2008 monitoring event. Refer to Table 3 of the *First Semi-Annual 2008 Groundwater Monitoring Report* for detection concentrations.
8. ND = Not detected and no reporting limit specified.
10. E = Chloroform was detected in the equipment blank during the March 2010 and September 2010 sampling events. Chloroform was flagged with an "E" in samples where the concentration was five times or less than the maximum detection in the equipment blank.
11. * = Well EX was decommissioned during the third quarter 2019 and a replacement well was installed adjacent (offset 3 - 4 ft) in April 2021. Historically the well has been referred to as EX or EX-1.

APPENDIX C
Laboratory Analytical Reports and
Data Quality Review (on CD)

APPENDIX C DATA QUALITY REVIEW

1.0 INTRODUCTION

This appendix documents the results of a quality assurance/quality control (QA/QC) review of the analytical data for groundwater samples collected during the March and June 2023 groundwater sampling events, and air samples collected during the January, March, and May 2023 soil vapor extraction (SVE) effluent sampling events. The samples were collected at the NuStar Terminals Services, Inc. (NuStar) Vancouver Facility (Facility) in Vancouver, Washington, and submitted to Eurofins Air Toxics in Folsom, California, and Apex Labs in Tigard, Oregon. A list of the laboratory reports is presented below. A copy of each analytical laboratory report is included in this appendix.

Report	Report Date	Sample Date	Sampling Event
A3C0505	4/4/2023	3/14/2023	First Quarter Groundwater Monitoring Event
A3C0576	4/4/2023	3/15/2023	First Quarter Groundwater Monitoring Event
A3C0644	4/4/2023	3/16/2023	First Quarter Groundwater Monitoring Event
A3C0668	4/4/2023	3/17/2023	First Quarter Groundwater Monitoring Event
A3F1125	6/27/2023	6/13/2023	Second Quarter Groundwater Monitoring Event
A3F1126	6/28/23	6/13/2023	Second Quarter Groundwater Monitoring Event
A3F1170	7/6/2023	6/14/2023	Second Quarter Groundwater Monitoring Event
A3F1221	7/6/2023	6/15/2023	Second Quarter Groundwater Monitoring Event
2301288	1/31/2023	1/18/2023	Soil Vapor Extraction System Monitoring
2303542	3/30/2023	3/17/2023	Soil Vapor Extraction System Monitoring
2305380	5/25/2023	5/11/2023	Soil Vapor Extraction System Monitoring

2.0 DATA VALIDATION

The QA review outlines the applicable QC criteria utilized during the data review process, as well as any deviations from those criteria. Examination and validation of the laboratory summary reports include:

- Analytical preparation and quantitation methods;
- Analytical method holding times;
- Sample handling;
- Chain-of-custody handling;
- Detection and reporting limits;

- Method blank, field blank, equipment blank and trip blank detections;
- Laboratory control samples, matrix spikes and surrogates to assess laboratory accuracy;
- Laboratory control sample duplicates, matrix spike duplicates and laboratory duplicates to assess laboratory precision; and
- Field duplicates to assess sampling and laboratory precision.

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

3.0 ANALYTICAL METHODS

Chemical analyses for water samples consisted of halogenated volatile organic compounds (HVOCs) by U.S. Environmental Protection Agency (EPA) Method 8260C. Select groundwater samples were also analyzed for total organic carbon (TOC) by EPA Method 5310, ethene by Method RSK-175, ammonia as nitrogen by EPA Method 4500-NH₃ G and nitrate as nitrogen and nitrite as nitrogen by EPA Method 300.0. SVE effluent vapor samples were analyzed for HVOCs using EPA Method TO-15.

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 monitoring groundwater quality trends and SVE monitoring data 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 were compared to action levels for each parameter in the media of concern. Precision, accuracy, representativeness, completeness, and comparability parameters used to indicate data quality are defined below.

Sample Receipt. Groundwater samples were received by the laboratory in good condition and on ice. Volatile Organic Analysis (VOA) containers for HVOC analysis arrived without headspace with the exceptions of 2 of 3 vials from sample MW-21i-105 (report A3C0505); 1 of 5 vials from sample MW-12 (report A3F1170); and 2 of 3 vials from sample S-2 (report A3F1170). Field staff check and doublecheck for headspace when collecting samples and sealing bottles by inverting the sealed vial to visually check for air bubbles. This has been brought to the laboratory's attention.

Reporting Limits. Detection limits are set by the laboratory and are based on instrumentation abilities, sample matrix, and suggested detection limits by the EPA or the Washington State Department of Ecology (Ecology). In some cases, the detection limits may be raised due to high concentrations of analytes in the samples or matrix interferences. Detection limits were generally consistent with industry standards and below promulgated regulatory standards when possible (if not raised, as previously discussed). Reporting limits were reviewed and are generally acceptable for this project. Reporting limits for individual samples are varied based on the magnitude of the chemical impact. It is not expected that any of the raised detection limits would compromise the usability of the data.

Holding Times. Samples were analyzed within the recommended method holding time, except for nitrate and nitrite in the following samples during the first quarter 2023: EW-1, S-2, MW-6, MW-7, MW-7 DUP, MW-19, MW-19 DUP, MW-19i, MW-21i-105, MW-23i. The hold time for nitrate is 48 hours and the analysis of samples was made approximately 72 hours after sampling. The following samples during the second quarter of 2023 were analyzed outside the recommended holding time: nitrate for MP-1, Nitrate for MP-1 was analyzed approximately 108 hours after sampling. Associated project data have been flagged with the H-01 qualifier to indicate the hold time exceedances

Calibration and Analysis. Calibration verification was outside of acceptable limits for select HVOCs in each sample batch. As the corresponding sample results are below method reporting limits and are not considered chemicals of concern for this project, no data were flagged. All other calibrations were within the control limits for analytes presented in Table 3.

Method Blanks. A method, or laboratory, blank is a sample prepared in the laboratory along with the actual samples, which is analyzed for the same parameters at the same time. It is used to assess if detected contaminants may have been the result of contamination of the samples in the laboratory. No analytes were detected in the laboratory method blanks for the water or air analyses.

Laboratory Control Samples and Laboratory Control Sample Duplicate. Laboratory Control Samples (LCS) and Laboratory Control Sample Duplicates (LCSD) were analyzed to assess the accuracy of the analytical equipment and methods. LCS are prepared from an analyte-free matrix that is then spiked with known levels of the constituents of interest (COI; i.e., a standard). The concentrations are measured, and the results compared to the known spiked levels. This comparison is expressed as percent recovery. The LCS and LCSD recovery for each QC batch was within acceptable recovery limits, with the following exceptions:

- Report 2301288. The LCS recovery of chloromethane and hexachlorobutadiene was outside acceptable limits for sample file p012003. No associated sample data were detected; therefore, no sample data were flagged.
- Report A3C0505. The LCS recovery of chloromethane and dichlorodifluoromethane was outside acceptable limits for sample batch 23C0660. The LCS recovery of bromochloromethane, chloromethane, dichlorodifluoromethane, and 1,2-dichloropropane was outside acceptable limits for sample batch 23C0661. The LCS recovery of bromochloromethane, chloroethane, and chloromethane was outside acceptable limits for sample batch 23C0768. The LCS recovery of bromochloromethane, chloroethane, and chloromethane was outside acceptable limits for batch 23C0785. These constituents were not detected in project samples, and these constituents have not been detected in project samples historically. Therefore, no sample data were flagged.
- Report A3C0576. The LCS recovery of bromochloromethane, chloroethane, and chloromethane was outside acceptable limits for sample batch 23C0768. The LCS recovery of bromochloromethane, chloroethane, and trichlorofluoromethane chloromethane was outside acceptable limits for sample batch 23C0785. These constituents were not detected in project samples, and these constituents have not been detected in project samples historically. Therefore, no sample data were flagged.
- Report A3C0644. The LCS recovery of bromochloromethane, chloroethane, chloromethane, and dichlorodifluoromethane in sample batch 23C0904 was outside acceptable limits. The LCS recovery of chloroethane in sample batch 23C0967 was outside acceptable limits. These constituents were

not detected in project samples, and these constituents have not been detected in project samples historically. Therefore, no sample data were flagged.

- Report A3C0668. The LCS recovery of trichlorofluoromethane was outside acceptable limits in sample batch 23C0990. These constituents were not detected in project samples, and these constituents have not been detected in project samples historically. Therefore, no sample data were flagged.
- Report A3F1125. The LCS recovery of 2,2-dichloropropane was outside acceptable limits for sample batch 23F0490. The LCS recovery of 2,2-dichloropropane was outside acceptable limits for sample batch 23F0538. The LCS recovery of bromomethane, chloroethane, 1,1,1,2-tetrachloroethane, and trichlorofluoromethane was outside acceptable limits for sample batch 23F0596. No associated sample data were detected; therefore, no sample data were flagged.
- Report A3F1126. The LCS recovery of 2,2-dichloropropane was outside acceptable limits for sample batch 23F0490. The LCS recovery of bromomethane, chloroethane, 1,1,1,2-tetrachloroethane, and trichlorofluoromethane was outside acceptable limits for sample batch 23F0596. These constituents were not detected in project samples, and these constituents have not been detected in project samples historically. Therefore, no sample data were flagged.
- Report A3F1170. The LCS recovery of bromomethane, chloroethane, and trichlorofluoromethane, was outside acceptable limits for sample batch 23F0540. These constituents were not detected in project samples, and these constituents have not been detected in project samples historically. Therefore, no sample data were flagged.
- Report A3F1221. The LCS recovery of chloroethane and trichlorofluoromethane was outside acceptable limits for sample batch 23F0713. The LCS recovery of bromomethane, chloroethane, 1,1,1,2-tetrachloroethane, and trichlorofluoromethane was outside acceptable limits for sample batch 23F0776. The LCS recovery of bromomethane, chloroethane, 1,1,1,2-tetrachloroethane, 2,2-dichloropropane, and trichlorofluoromethane was outside acceptable limits for sample batch 23F0890. These constituents were not detected in project samples, and these constituents have not been detected in project samples historically. Therefore, no sample data were flagged.

The LCS is then compared to the LCSD of the same batch and expressed as a relative percent difference (RPD) value. The percent recovery and RPD values are then compared to control limits to assess data quality. The RPDs between the LCS and LCSD were within an acceptable range.

Matrix Spike Analyses. A matrix spike QC sample is used to assess the performance of the analytical method by determining potential matrix interferences. Matrix spike (MS) and matrix spike duplicate (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 MSD is then compared to the MS of the same batch and expressed as an RPD value. The percent recovery and RPD values are then compared to control limits to assess data quality.

The recovery from the following MS and MSD samples were outside of control limits:

- Report A3C0505. The MS recovery percentage (using the non-source sample) was outside acceptable limits for bromochloromethane, bromodichloromethane, chloromethane, 1,1-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,2-dichloropropane for sample batch 23C0660. For sample batch 23C0785, the MS recovery percentage (using the non-source sample) was outside acceptable limits for bromochloromethane and chloroethane, and in the associated MSD the percent recovery for bromochloromethane, chloroethane, 1,1-dichloroethane, 1,1-dichloroethene, and 1,1-dichloropropene was outside control limits. For sample batch 23C0785, the MS percent recovery (using the non-source sample) and MSD percent recovery was outside acceptable limits for bromochloromethane and chloroethane. For sample batch 23C0630, the MS percent recovery (using the non-source sample) was outside acceptable limits for nitrate and nitrite. Associated sample data that were detected had associated LCS recoveries within acceptable limits; therefore, no sample data were flagged as a result.
- Report A3C0576. For sample batch 23C0785, the MS percent recovery (using the non-source sample) was outside acceptable limits for bromochloromethane and chloroethane, and in the associated MSD, the percent recovery for bromochloromethane, chloroethane, 1,1-dichloroethane, 1,1-dichloroethene, and 1,1-dichloropropene was outside acceptable limits. For sample batch 23C0785, the MS percent recovery (using the non-source sample) was outside acceptable limits for bromochloromethane and chloroethane. For sample batch 23C0731, the MS percent recovery (using a non-source sample) was outside acceptable limits for ammonia. Associated sample data that were detected had associated LCS recoveries within acceptable limits; therefore, no sample data were flagged as a result.
- Report A3C0644. For sample batch 23C0904, the MS percent recovery (using MW-13) was outside acceptable limits for bromochloromethane, chloroethane, 1,1-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, and vinyl chloride. Associated sample data that were detected had associated LCS recoveries within acceptable limits; therefore, no sample data were flagged as a result.
- Report A3F1125. For sample batch 23F0596, the MS percent recovery (using the non-source sample) was outside acceptable limits for chloroethane, 1,1,1,2-tetrachloroethane, and trichlorofluoromethane. No associated sample data were detected; therefore, no sample data were flagged as a result.
- Report A3F1126. For sample batch 23F0596 the MS percent recovery (using the non-source sample) was outside acceptable limits for chloroethane, 1,1,1,2-tetrachloroethane, and trichlorofluoromethane. No associated sample data were detected; therefore, no sample data were flagged as a result.
- Report A3F1170. For sample batch 23F0540, the MS percent recovery (using MW-19 DUP) was outside acceptable limits for bromoethane, chloroethane, tetrachloroethene (PCE), and trichlorofluoromethane. Associated sample data that were detected had associated LCS recoveries within acceptable limits; therefore, no sample data were flagged as a result.
- Report A3F1221. For sample batch 23F0713, the MS percent recovery (using the non-source sample) was outside acceptable limits for chloroethane, 1,1,1,2-tetrachloroethane, and trichlorofluoromethane. The MS percent recovery (using MGMS3-4(40) DUP) was outside acceptable limits for bromomethane, chloroethane, 1,1,1,2-tetrachloroethane, and trichlorofluoromethane. For sample batch 23F0890, the MS percent recovery (using the non-source sample) was outside

acceptable limits for chloroethane and hexachlorobutadiene. No associated sample data were detected; therefore, no sample data were flagged as a result.

The RPD between the corresponding MS and MSD samples was within an acceptable range, indicating that the precision of the analysis process was acceptable.

No MS or MSD samples were analyzed as part of the air sample QC batch.

Surrogate Recovery. Surrogates are organic compounds that are similar in chemical composition to the COI and are spiked into environmental and batch QC samples prior to sample preparation and analysis. Surrogate recoveries for environmental samples are used to evaluate matrix interference on a sample-specific basis. Surrogate recoveries were within acceptable control limits, with the exception of 1,4-difluorobenzene in the June 2023 sample from well MW-14 (report A3F1125), which was outside of acceptable limits. The laboratory narrative notes that surrogate recovery cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

Laboratory Duplicate. A laboratory duplicate is a second analysis of an environmental sample received by the laboratory, which serves as an internal check on laboratory quality as well as potential variability of the sample matrix. The laboratory duplicate concentration is compared to the primary sample concentration to assess the precision of the analytical method. This comparison can be expressed by the RPD between the original and duplicate samples. The laboratory duplicate sample RPD values were within the recommended RPD range, with the exception of nitrate in the sample collected from MGMS-3(60) in batch 230700, which was outside acceptable limits. The sample data are appropriately flagged denoting the RPD analysis for the duplicate analysis was outside of laboratory control limits.

Field Duplicate. A field duplicate is a second field sample collected from a selected monitoring point. Field duplicate samples serve as a check on laboratory quality as well as potential variability of the sample matrix. The field duplicate is analyzed and compared with the primary sample to assess the precision of the analytical method. This comparison can be expressed by the RPD between the primary and duplicate samples. The field duplicate sample RPD values were within the recommended limit of +/- 30% with the exception of ammonia (36%), and nitrate (36%) in well MW-7 during the March 2023 sampling event. These values have been flagged with a "D" qualifier.

Conclusion. In conclusion, the overall QA objectives have been met and the data are of adequate quality for use in this project with appropriate lab qualifiers.

1/31/2023

Mr. Jeff Pratt

GeoEngineers, Inc. (formerly Cascadia Associates, LLC)

5820 SW Kelly Ave

Unit B

Portland OR 97239

Project Name: Nustar Van Main South SVE

Project #:

Workorder #: 2301288

Dear Mr. Jeff Pratt

The following report includes the data for the above referenced project for sample(s) received on 1/18/2023 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Monica Tran at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Monica Tran

Project Manager

WORK ORDER #: 2301288

Work Order Summary

CLIENT:	Mr. Jeff Pratt GeoEngineers, Inc. (formerly Cascadia Associates, LLC) 5820 SW Kelly Ave Unit B Portland, OR 97239 (503)906-6577	BILL TO:	Mr. Jeff Pratt GeoEngineers, Inc. (formerly Cascadia Associates, LLC) 5820 SW Kelly Ave Unit B
PHONE:		P.O. #	0060-002-004
FAX:	(503)906-6567	PROJECT #	Nustar Van Main South SVE
DATE RECEIVED:	01/18/2023	CONTACT:	Monica Tran
DATE COMPLETED:	01/31/2023		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	PreCarbon_SVE_South_011623	TO-15	7.0 "Hg	2 psi
02A	PostCarbon_SVE_South_011623	TO-15	4.5 "Hg	2 psi
03A	Lab Blank	TO-15	NA	NA
04A	CCV	TO-15	NA	NA
05A	LCS	TO-15	NA	NA
05AA	LCSD	TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 01/31/23

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP – 209222, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP – T104704434-22-18, UT NELAP – CA009332022-14, VA NELAP - 12240, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
 Accreditation number: CA300005-017, Effective date: 10/18/2022, Expiration date: 10/17/2023.

Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
GeoEngineers, Inc. (formerly Cascadia Associates, LLC)
Workorder# 2301288

Two 6 Liter Summa Canister samples were received on January 18, 2023. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Dilution was performed on sample PreCarbon_SVE_South_011623 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

**Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN**

Client Sample ID: PreCarbon_SVE_South_011623

Lab ID#: 2301288-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	4.7	18	19	71
1,1,1-Trichloroethane	3.5	4.0	19	22
Trichloroethene	4.7	57	25	310
Tetrachloroethene	4.7	1500	32	10000

Client Sample ID: PostCarbon_SVE_South_011623

Lab ID#: 2301288-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.54	0.54	2.6	2.7
cis-1,2-Dichloroethene	0.54	17	2.1	69
1,1,1-Trichloroethane	0.40	1.1	2.2	6.2
Trichloroethene	0.54	4.4	2.9	24
Chlorobenzene	0.40	0.49	1.8	2.3



Air Toxics

Client Sample ID: PreCarbon_SVE_South_011623

Lab ID#: 2301288-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012012	Date of Collection:	1/16/23 08:15:00
Dil. Factor:	11.8	Date of Analysis:	1/20/23 05:30 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	4.7	Not Detected	23	Not Detected
Freon 114	4.7	Not Detected	33	Not Detected
Chloromethane	59	Not Detected	120	Not Detected
Vinyl Chloride	4.7	Not Detected	12	Not Detected
Bromomethane	59	Not Detected	230	Not Detected
Chloroethane	24	Not Detected	62	Not Detected
Freon 11	4.7	Not Detected	26	Not Detected
Freon 113	4.7	Not Detected	36	Not Detected
1,1-Dichloroethene	9.4	Not Detected	37	Not Detected
Acetone	59	Not Detected	140	Not Detected
Carbon Disulfide	24	Not Detected	73	Not Detected
Methylene Chloride	59	Not Detected	200	Not Detected
trans-1,2-Dichloroethene	4.7	Not Detected	19	Not Detected
1,1-Dichloroethane	3.5	Not Detected	14	Not Detected
2-Butanone (Methyl Ethyl Ketone)	24	Not Detected	70	Not Detected
cis-1,2-Dichloroethene	4.7	18	19	71
Chloroform	3.5	Not Detected	17	Not Detected
1,1,1-Trichloroethane	3.5	4.0	19	22
Carbon Tetrachloride	9.4	Not Detected	59	Not Detected
Benzene	4.7	Not Detected	15	Not Detected
1,2-Dichloroethane	9.4	Not Detected	38	Not Detected
Trichloroethene	4.7	57	25	310
1,2-Dichloropropane	4.7	Not Detected	22	Not Detected
Bromodichloromethane	3.5	Not Detected	24	Not Detected
cis-1,3-Dichloropropene	4.7	Not Detected	21	Not Detected
4-Methyl-2-pentanone	4.7	Not Detected	19	Not Detected
Toluene	12	Not Detected	44	Not Detected
trans-1,3-Dichloropropene	4.7	Not Detected	21	Not Detected
1,1,2-Trichloroethane	4.7	Not Detected	26	Not Detected
Tetrachloroethene	4.7	1500	32	10000
2-Hexanone	24	Not Detected	97	Not Detected
Dibromochloromethane	4.7	Not Detected	40	Not Detected
1,2-Dibromoethane (EDB)	9.4	Not Detected	72	Not Detected
Chlorobenzene	3.5	Not Detected	16	Not Detected
Ethyl Benzene	4.7	Not Detected	20	Not Detected
m,p-Xylene	9.4	Not Detected	41	Not Detected
o-Xylene	4.7	Not Detected	20	Not Detected
Styrene	4.7	Not Detected	20	Not Detected
Bromoform	4.7	Not Detected	49	Not Detected
1,1,2,2-Tetrachloroethane	4.7	Not Detected	32	Not Detected
4-Ethyltoluene	4.7	Not Detected	23	Not Detected
1,3,5-Trimethylbenzene	4.7	Not Detected	23	Not Detected



Air Toxics

Client Sample ID: PreCarbon_SVE_South_011623

Lab ID#: 2301288-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012012	Date of Collection:	1/16/23 08:15:00
Dil. Factor:	11.8	Date of Analysis:	1/20/23 05:30 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	9.4	Not Detected	46	Not Detected
1,3-Dichlorobenzene	4.7	Not Detected	28	Not Detected
1,4-Dichlorobenzene	4.7	Not Detected	28	Not Detected
alpha-Chlorotoluene	9.4	Not Detected	49	Not Detected
1,2-Dichlorobenzene	4.7	Not Detected	28	Not Detected
1,2,4-Trichlorobenzene	24	Not Detected	180	Not Detected
Hexachlorobutadiene	24	Not Detected	250	Not Detected
Vinyl Acetate	24	Not Detected	83	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	102	70-130



Air Toxics

Client Sample ID: PostCarbon_SVE_South_011623

Lab ID#: 2301288-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012013	Date of Collection:	1/16/23 08:30:00
Dil. Factor:	1.34	Date of Analysis:	1/20/23 06:01 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.54	0.54	2.6	2.7
Freon 114	0.54	Not Detected	3.7	Not Detected
Chloromethane	6.7	Not Detected	14	Not Detected
Vinyl Chloride	0.54	Not Detected	1.4	Not Detected
Bromomethane	6.7	Not Detected	26	Not Detected
Chloroethane	2.7	Not Detected	7.1	Not Detected
Freon 11	0.54	Not Detected	3.0	Not Detected
Freon 113	0.54	Not Detected	4.1	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Acetone	6.7	Not Detected	16	Not Detected
Carbon Disulfide	2.7	Not Detected	8.3	Not Detected
Methylene Chloride	6.7	Not Detected	23	Not Detected
trans-1,2-Dichloroethene	0.54	Not Detected	2.1	Not Detected
1,1-Dichloroethane	0.40	Not Detected	1.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.7	Not Detected	7.9	Not Detected
cis-1,2-Dichloroethene	0.54	17	2.1	69
Chloroform	0.40	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.40	1.1	2.2	6.2
Carbon Tetrachloride	1.1	Not Detected	6.7	Not Detected
Benzene	0.54	Not Detected	1.7	Not Detected
1,2-Dichloroethane	1.1	Not Detected	4.3	Not Detected
Trichloroethene	0.54	4.4	2.9	24
1,2-Dichloropropane	0.54	Not Detected	2.5	Not Detected
Bromodichloromethane	0.40	Not Detected	2.7	Not Detected
cis-1,3-Dichloropropene	0.54	Not Detected	2.4	Not Detected
4-Methyl-2-pentanone	0.54	Not Detected	2.2	Not Detected
Toluene	1.3	Not Detected	5.0	Not Detected
trans-1,3-Dichloropropene	0.54	Not Detected	2.4	Not Detected
1,1,2-Trichloroethane	0.54	Not Detected	2.9	Not Detected
Tetrachloroethene	0.54	Not Detected	3.6	Not Detected
2-Hexanone	2.7	Not Detected	11	Not Detected
Dibromochloromethane	0.54	Not Detected	4.6	Not Detected
1,2-Dibromoethane (EDB)	1.1	Not Detected	8.2	Not Detected
Chlorobenzene	0.40	0.49	1.8	2.3
Ethyl Benzene	0.54	Not Detected	2.3	Not Detected
m,p-Xylene	1.1	Not Detected	4.6	Not Detected
o-Xylene	0.54	Not Detected	2.3	Not Detected
Styrene	0.54	Not Detected	2.3	Not Detected
Bromoform	0.54	Not Detected	5.5	Not Detected
1,1,2,2-Tetrachloroethane	0.54	Not Detected	3.7	Not Detected
4-Ethyltoluene	0.54	Not Detected	2.6	Not Detected
1,3,5-Trimethylbenzene	0.54	Not Detected	2.6	Not Detected



Air Toxics

Client Sample ID: PostCarbon_SVE_South_011623

Lab ID#: 2301288-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012013	Date of Collection:	1/16/23 08:30:00
Dil. Factor:	1.34	Date of Analysis:	1/20/23 06:01 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	1.1	Not Detected	5.3	Not Detected
1,3-Dichlorobenzene	0.54	Not Detected	3.2	Not Detected
1,4-Dichlorobenzene	0.54	Not Detected	3.2	Not Detected
alpha-Chlorotoluene	1.1	Not Detected	5.5	Not Detected
1,2-Dichlorobenzene	0.54	Not Detected	3.2	Not Detected
1,2,4-Trichlorobenzene	2.7	Not Detected	20	Not Detected
Hexachlorobutadiene	2.7	Not Detected	28	Not Detected
Vinyl Acetate	2.7	Not Detected	9.4	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	102	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2301288-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012006f	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 01:35 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.40	Not Detected	2.0	Not Detected
Freon 114	0.40	Not Detected	2.8	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.40	Not Detected	1.0	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.40	Not Detected	2.2	Not Detected
Freon 113	0.40	Not Detected	3.1	Not Detected
1,1-Dichloroethene	0.80	Not Detected	3.2	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	0.40	Not Detected	1.6	Not Detected
1,1-Dichloroethane	0.30	Not Detected	1.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.40	Not Detected	1.6	Not Detected
Chloroform	0.30	Not Detected	1.5	Not Detected
1,1,1-Trichloroethane	0.30	Not Detected	1.6	Not Detected
Carbon Tetrachloride	0.80	Not Detected	5.0	Not Detected
Benzene	0.40	Not Detected	1.3	Not Detected
1,2-Dichloroethane	0.80	Not Detected	3.2	Not Detected
Trichloroethene	0.40	Not Detected	2.1	Not Detected
1,2-Dichloropropane	0.40	Not Detected	1.8	Not Detected
Bromodichloromethane	0.30	Not Detected	2.0	Not Detected
cis-1,3-Dichloropropene	0.40	Not Detected	1.8	Not Detected
4-Methyl-2-pentanone	0.40	Not Detected	1.6	Not Detected
Toluene	1.0	Not Detected	3.8	Not Detected
trans-1,3-Dichloropropene	0.40	Not Detected	1.8	Not Detected
1,1,2-Trichloroethane	0.40	Not Detected	2.2	Not Detected
Tetrachloroethene	0.40	Not Detected	2.7	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.40	Not Detected	3.4	Not Detected
1,2-Dibromoethane (EDB)	0.80	Not Detected	6.1	Not Detected
Chlorobenzene	0.30	Not Detected	1.4	Not Detected
Ethyl Benzene	0.40	Not Detected	1.7	Not Detected
m,p-Xylene	0.80	Not Detected	3.5	Not Detected
o-Xylene	0.40	Not Detected	1.7	Not Detected
Styrene	0.40	Not Detected	1.7	Not Detected
Bromoform	0.40	Not Detected	4.1	Not Detected
1,1,2,2-Tetrachloroethane	0.40	Not Detected	2.7	Not Detected
4-Ethyltoluene	0.40	Not Detected	2.0	Not Detected
1,3,5-Trimethylbenzene	0.40	Not Detected	2.0	Not Detected

Client Sample ID: Lab Blank

Lab ID#: 2301288-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012006f	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 01:35 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	0.80	Not Detected	3.9	Not Detected
1,3-Dichlorobenzene	0.40	Not Detected	2.4	Not Detected
1,4-Dichlorobenzene	0.40	Not Detected	2.4	Not Detected
alpha-Chlorotoluene	0.80	Not Detected	4.1	Not Detected
1,2-Dichlorobenzene	0.40	Not Detected	2.4	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Vinyl Acetate	2.0	Not Detected	7.0	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	102	70-130

Client Sample ID: CCV

Lab ID#: 2301288-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012002	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 10:05 AM

Compound	%Recovery
Freon 12	112
Freon 114	92
Chloromethane	84
Vinyl Chloride	82
Bromomethane	86
Chloroethane	81
Freon 11	114
Freon 113	97
1,1-Dichloroethene	86
Acetone	88
Carbon Disulfide	87
Methylene Chloride	100
trans-1,2-Dichloroethene	93
1,1-Dichloroethane	102
2-Butanone (Methyl Ethyl Ketone)	89
cis-1,2-Dichloroethene	96
Chloroform	103
1,1,1-Trichloroethane	102
Carbon Tetrachloride	116
Benzene	98
1,2-Dichloroethane	115
Trichloroethene	103
1,2-Dichloropropane	98
Bromodichloromethane	108
cis-1,3-Dichloropropene	98
4-Methyl-2-pentanone	95
Toluene	100
trans-1,3-Dichloropropene	100
1,1,2-Trichloroethane	100
Tetrachloroethene	105
2-Hexanone	91
Dibromochloromethane	106
1,2-Dibromoethane (EDB)	100
Chlorobenzene	97
Ethyl Benzene	100
m,p-Xylene	102
o-Xylene	100
Styrene	102
Bromoform	110
1,1,2,2-Tetrachloroethane	96
4-Ethyltoluene	102
1,3,5-Trimethylbenzene	102

Client Sample ID: CCV

Lab ID#: 2301288-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012002	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 10:05 AM

Compound	%Recovery
1,2,4-Trimethylbenzene	112
1,3-Dichlorobenzene	110
1,4-Dichlorobenzene	112
alpha-Chlorotoluene	107
1,2-Dichlorobenzene	113
1,2,4-Trichlorobenzene	118
Hexachlorobutadiene	133 Q
Vinyl Acetate	91

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	110	70-130

Client Sample ID: LCS

Lab ID#: 2301288-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012003	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 11:13 AM

Compound	%Recovery	Method Limits
Freon 12	121	70-130
Freon 114	102	70-130
Chloromethane	61 Q	70-130
Vinyl Chloride	95	70-130
Bromomethane	92	70-130
Chloroethane	89	70-130
Freon 11	120	70-130
Freon 113	100	70-130
1,1-Dichloroethene	91	70-130
Acetone	91	70-130
Carbon Disulfide	93	70-130
Methylene Chloride	103	70-130
trans-1,2-Dichloroethene	100	70-130
1,1-Dichloroethane	107	70-130
2-Butanone (Methyl Ethyl Ketone)	92	70-130
cis-1,2-Dichloroethene	102	70-130
Chloroform	103	70-130
1,1,1-Trichloroethane	108	70-130
Carbon Tetrachloride	122	70-130
Benzene	100	70-130
1,2-Dichloroethane	114	70-130
Trichloroethene	103	70-130
1,2-Dichloropropane	98	70-130
Bromodichloromethane	105	70-130
cis-1,3-Dichloropropene	100	70-130
4-Methyl-2-pentanone	90	70-130
Toluene	97	70-130
trans-1,3-Dichloropropene	102	70-130
1,1,2-Trichloroethane	106	70-130
Tetrachloroethene	108	70-130
2-Hexanone	86	70-130
Dibromochloromethane	109	70-130
1,2-Dibromoethane (EDB)	102	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	101	70-130
m,p-Xylene	102	70-130
o-Xylene	99	70-130
Styrene	101	70-130
Bromoform	113	70-130
1,1,2,2-Tetrachloroethane	100	70-130
4-Ethyltoluene	100	70-130
1,3,5-Trimethylbenzene	101	70-130

Client Sample ID: LCS

Lab ID#: 2301288-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012003	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 11:13 AM

Compound	%Recovery	Method Limits
1,2,4-Trimethylbenzene	108	70-130
1,3-Dichlorobenzene	109	70-130
1,4-Dichlorobenzene	109	70-130
alpha-Chlorotoluene	101	70-130
1,2-Dichlorobenzene	110	70-130
1,2,4-Trichlorobenzene	119	70-130
Hexachlorobutadiene	133 Q	70-130
Vinyl Acetate	111	70-130

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	110	70-130

Client Sample ID: LCSD

Lab ID#: 2301288-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012004	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 11:44 AM

Compound	%Recovery	Method Limits
Freon 12	121	70-130
Freon 114	104	70-130
Chloromethane	64 Q	70-130
Vinyl Chloride	94	70-130
Bromomethane	93	70-130
Chloroethane	92	70-130
Freon 11	124	70-130
Freon 113	104	70-130
1,1-Dichloroethene	93	70-130
Acetone	95	70-130
Carbon Disulfide	96	70-130
Methylene Chloride	106	70-130
trans-1,2-Dichloroethene	101	70-130
1,1-Dichloroethane	110	70-130
2-Butanone (Methyl Ethyl Ketone)	96	70-130
cis-1,2-Dichloroethene	104	70-130
Chloroform	106	70-130
1,1,1-Trichloroethane	111	70-130
Carbon Tetrachloride	124	70-130
Benzene	101	70-130
1,2-Dichloroethane	113	70-130
Trichloroethene	104	70-130
1,2-Dichloropropane	98	70-130
Bromodichloromethane	108	70-130
cis-1,3-Dichloropropene	100	70-130
4-Methyl-2-pentanone	92	70-130
Toluene	98	70-130
trans-1,3-Dichloropropene	100	70-130
1,1,2-Trichloroethane	103	70-130
Tetrachloroethene	109	70-130
2-Hexanone	86	70-130
Dibromochloromethane	108	70-130
1,2-Dibromoethane (EDB)	103	70-130
Chlorobenzene	99	70-130
Ethyl Benzene	101	70-130
m,p-Xylene	102	70-130
o-Xylene	99	70-130
Styrene	100	70-130
Bromoform	111	70-130
1,1,2,2-Tetrachloroethane	99	70-130
4-Ethyltoluene	100	70-130
1,3,5-Trimethylbenzene	101	70-130

Client Sample ID: LCSD

Lab ID#: 2301288-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	p012004	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/20/23 11:44 AM

Compound	%Recovery	Method Limits
1,2,4-Trimethylbenzene	107	70-130
1,3-Dichlorobenzene	108	70-130
1,4-Dichlorobenzene	108	70-130
alpha-Chlorotoluene	100	70-130
1,2-Dichlorobenzene	109	70-130
1,2,4-Trichlorobenzene	127	70-130
Hexachlorobutadiene	140 Q	70-130
Vinyl Acetate	116	70-130

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	108	70-130

Analytical Report

3/30/2023

Mr. Jeff Pratt

GeoEngineers, Inc. (formerly Cascadia Associates, LLC)

5820 SW Kelly Ave

Unit B

Portland OR 97239

Project Name: NuStar Van Main OKM

Project #: 019001-009-10

Workorder #: 2303542

Dear Mr. Jeff Pratt

The following report includes the data for the above referenced project for sample(s) received on 3/17/2023 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Monica Tran at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Monica Tran

Project Manager

WORK ORDER #: 2303542

Work Order Summary

CLIENT:	Mr. Jeff Pratt GeoEngineers, Inc. (formerly Cascadia Associates, LLC) 5820 SW Kelly Ave Unit B Portland, OR 97239 (503)906-6577	BILL TO:	Mr. Jeff Pratt GeoEngineers, Inc. (formerly Cascadia Associates, LLC) 5820 SW Kelly Ave Unit B
PHONE:		P.O. #	0060-002-004
FAX:	(503)906-6567	PROJECT #	019001-009-10 NuStar Van Main OKM
DATE RECEIVED:	03/17/2023	CONTACT:	Monica Tran
DATE COMPLETED:	03/30/2023		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	PreCarbon_South_SVE_03132023	TO-15	4.9 "Hg	1.9 psi
02A	PostCarbon_South_SVE_03132023	TO-15	4.5 "Hg	1.9 psi
03A	Lab Blank	TO-15	NA	NA
04A	CCV	TO-15	NA	NA
05A	LCS	TO-15	NA	NA
05AA	LCSD	TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 03/30/23

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP – 209222, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP – T104704434-22-18, UT NELAP – CA009332022-14, VA NELAP - 12240, WA ELAP - C935
 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) CA300005-017
 Eurofins Environment Testing Northern California, LLC certifies that the test results contained in this report meet all requirements of the 2016 TNI Standard.

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.
 180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
GeoEngineers, Inc. (formerly Cascadia Associates, LLC)
Workorder# 2303542

Two 6 Liter Summa Canister samples were received on March 17, 2023. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on sample PreCarbon_South_SVE_03132023 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

**Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN**

Client Sample ID: PreCarbon_South_SVE_03132023

Lab ID#: 2303542-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	3.4	16	13	65
1,1,1-Trichloroethane	3.4	3.5	18	19
Trichloroethene	3.4	54	18	290
Tetrachloroethene	3.4	1100	23	7300

Client Sample ID: PostCarbon_South_SVE_03132023

Lab ID#: 2303542-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	6.6	27	16	64
cis-1,2-Dichloroethene	0.66	16	2.6	63
1,1,1-Trichloroethane	0.66	1.1	3.6	5.8
Trichloroethene	0.66	6.8	3.6	36
Tetrachloroethene	0.66	0.80	4.5	5.4



Air Toxics

Client Sample ID: PreCarbon_South_SVE_03132023

Lab ID#: 2303542-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032716	Date of Collection:	3/13/23 12:00:00 PM
Dil. Factor:	6.75	Date of Analysis:	3/27/23 06:16 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3.4	Not Detected	17	Not Detected
Freon 114	3.4	Not Detected	24	Not Detected
Chloromethane	34	Not Detected	70	Not Detected
Vinyl Chloride	3.4	Not Detected	8.6	Not Detected
Bromomethane	34	Not Detected	130	Not Detected
Chloroethane	14	Not Detected	36	Not Detected
Freon 11	3.4	Not Detected	19	Not Detected
Freon 113	3.4	Not Detected	26	Not Detected
1,1-Dichloroethene	3.4	Not Detected	13	Not Detected
Acetone	34	Not Detected	80	Not Detected
Carbon Disulfide	14	Not Detected	42	Not Detected
Methylene Chloride	34	Not Detected	120	Not Detected
trans-1,2-Dichloroethene	3.4	Not Detected	13	Not Detected
1,1-Dichloroethane	3.4	Not Detected	14	Not Detected
2-Butanone (Methyl Ethyl Ketone)	14	Not Detected	40	Not Detected
cis-1,2-Dichloroethene	3.4	16	13	65
Chloroform	3.4	Not Detected	16	Not Detected
1,1,1-Trichloroethane	3.4	3.5	18	19
Carbon Tetrachloride	3.4	Not Detected	21	Not Detected
Benzene	3.4	Not Detected	11	Not Detected
1,2-Dichloroethane	3.4	Not Detected	14	Not Detected
Trichloroethene	3.4	54	18	290
1,2-Dichloropropane	3.4	Not Detected	16	Not Detected
Bromodichloromethane	3.4	Not Detected	23	Not Detected
cis-1,3-Dichloropropene	3.4	Not Detected	15	Not Detected
4-Methyl-2-pentanone	3.4	Not Detected	14	Not Detected
Toluene	6.8	Not Detected	25	Not Detected
trans-1,3-Dichloropropene	3.4	Not Detected	15	Not Detected
1,1,2-Trichloroethane	3.4	Not Detected	18	Not Detected
Tetrachloroethene	3.4	1100	23	7300
2-Hexanone	14	Not Detected	55	Not Detected
Dibromochloromethane	3.4	Not Detected	29	Not Detected
1,2-Dibromoethane (EDB)	3.4	Not Detected	26	Not Detected
Chlorobenzene	3.4	Not Detected	16	Not Detected
Ethyl Benzene	3.4	Not Detected	15	Not Detected
m,p-Xylene	6.8	Not Detected	29	Not Detected
o-Xylene	3.4	Not Detected	15	Not Detected
Styrene	3.4	Not Detected	14	Not Detected
Bromoform	3.4	Not Detected	35	Not Detected
1,1,2,2-Tetrachloroethane	3.4	Not Detected	23	Not Detected
4-Ethyltoluene	3.4	Not Detected	16	Not Detected
1,3,5-Trimethylbenzene	3.4	Not Detected	16	Not Detected

Client Sample ID: PreCarbon_South_SVE_03132023

Lab ID#: 2303542-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032716	Date of Collection:	3/13/23 12:00:00 PM
Dil. Factor:	6.75	Date of Analysis:	3/27/23 06:16 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	3.4	Not Detected	16	Not Detected
1,3-Dichlorobenzene	3.4	Not Detected	20	Not Detected
1,4-Dichlorobenzene	3.4	Not Detected	20	Not Detected
alpha-Chlorotoluene	3.4	Not Detected	17	Not Detected
1,2-Dichlorobenzene	3.4	Not Detected	20	Not Detected
1,2,4-Trichlorobenzene	14	Not Detected	100	Not Detected
Hexachlorobutadiene	14	Not Detected	140	Not Detected
Vinyl Acetate	14	Not Detected	48	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	96	70-130



Air Toxics

Client Sample ID: PostCarbon_South_SVE_03132023

Lab ID#: 2303542-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032717	Date of Collection:	3/13/23 12:15:00 PM
Dil. Factor:	1.33	Date of Analysis:	3/27/23 06:43 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.66	Not Detected	3.3	Not Detected
Freon 114	0.66	Not Detected	4.6	Not Detected
Chloromethane	6.6	Not Detected	14	Not Detected
Vinyl Chloride	0.66	Not Detected	1.7	Not Detected
Bromomethane	6.6	Not Detected	26	Not Detected
Chloroethane	2.7	Not Detected	7.0	Not Detected
Freon 11	0.66	Not Detected	3.7	Not Detected
Freon 113	0.66	Not Detected	5.1	Not Detected
1,1-Dichloroethene	0.66	Not Detected	2.6	Not Detected
Acetone	6.6	27	16	64
Carbon Disulfide	2.7	Not Detected	8.3	Not Detected
Methylene Chloride	6.6	Not Detected	23	Not Detected
trans-1,2-Dichloroethene	0.66	Not Detected	2.6	Not Detected
1,1-Dichloroethane	0.66	Not Detected	2.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.7	Not Detected	7.8	Not Detected
cis-1,2-Dichloroethene	0.66	16	2.6	63
Chloroform	0.66	Not Detected	3.2	Not Detected
1,1,1-Trichloroethane	0.66	1.1	3.6	5.8
Carbon Tetrachloride	0.66	Not Detected	4.2	Not Detected
Benzene	0.66	Not Detected	2.1	Not Detected
1,2-Dichloroethane	0.66	Not Detected	2.7	Not Detected
Trichloroethene	0.66	6.8	3.6	36
1,2-Dichloropropane	0.66	Not Detected	3.1	Not Detected
Bromodichloromethane	0.66	Not Detected	4.4	Not Detected
cis-1,3-Dichloropropene	0.66	Not Detected	3.0	Not Detected
4-Methyl-2-pentanone	0.66	Not Detected	2.7	Not Detected
Toluene	1.3	Not Detected	5.0	Not Detected
trans-1,3-Dichloropropene	0.66	Not Detected	3.0	Not Detected
1,1,2-Trichloroethane	0.66	Not Detected	3.6	Not Detected
Tetrachloroethene	0.66	0.80	4.5	5.4
2-Hexanone	2.7	Not Detected	11	Not Detected
Dibromochloromethane	0.66	Not Detected	5.7	Not Detected
1,2-Dibromoethane (EDB)	0.66	Not Detected	5.1	Not Detected
Chlorobenzene	0.66	Not Detected	3.1	Not Detected
Ethyl Benzene	0.66	Not Detected	2.9	Not Detected
m,p-Xylene	1.3	Not Detected	5.8	Not Detected
o-Xylene	0.66	Not Detected	2.9	Not Detected
Styrene	0.66	Not Detected	2.8	Not Detected
Bromoform	0.66	Not Detected	6.9	Not Detected
1,1,2,2-Tetrachloroethane	0.66	Not Detected	4.6	Not Detected
4-Ethyltoluene	0.66	Not Detected	3.3	Not Detected
1,3,5-Trimethylbenzene	0.66	Not Detected	3.3	Not Detected



Air Toxics

Client Sample ID: PostCarbon_South_SVE_03132023

Lab ID#: 2303542-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032717	Date of Collection:	3/13/23 12:15:00 PM
Dil. Factor:	1.33	Date of Analysis:	3/27/23 06:43 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	0.66	Not Detected	3.3	Not Detected
1,3-Dichlorobenzene	0.66	Not Detected	4.0	Not Detected
1,4-Dichlorobenzene	0.66	Not Detected	4.0	Not Detected
alpha-Chlorotoluene	0.66	Not Detected	3.4	Not Detected
1,2-Dichlorobenzene	0.66	Not Detected	4.0	Not Detected
1,2,4-Trichlorobenzene	2.7	Not Detected	20	Not Detected
Hexachlorobutadiene	2.7	Not Detected	28	Not Detected
Vinyl Acetate	2.7	Not Detected	9.4	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	96	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2303542-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032707c	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/27/23 12:42 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	1.0	Not Detected	3.8	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	1.0	Not Detected	4.3	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2303542-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032707c	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	3/27/23 12:42 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Vinyl Acetate	2.0	Not Detected	7.0	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	95	70-130

Client Sample ID: CCV

Lab ID#: 2303542-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032702	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/27/23 09:47 AM

Compound	%Recovery
Freon 12	101
Freon 114	108
Chloromethane	96
Vinyl Chloride	110
Bromomethane	118
Chloroethane	107
Freon 11	107
Freon 113	104
1,1-Dichloroethene	108
Acetone	96
Carbon Disulfide	103
Methylene Chloride	114
trans-1,2-Dichloroethene	105
1,1-Dichloroethane	103
2-Butanone (Methyl Ethyl Ketone)	92
cis-1,2-Dichloroethene	100
Chloroform	99
1,1,1-Trichloroethane	101
Carbon Tetrachloride	102
Benzene	97
1,2-Dichloroethane	103
Trichloroethene	101
1,2-Dichloropropane	95
Bromodichloromethane	99
cis-1,3-Dichloropropene	95
4-Methyl-2-pentanone	96
Toluene	95
trans-1,3-Dichloropropene	99
1,1,2-Trichloroethane	101
Tetrachloroethene	104
2-Hexanone	100
Dibromochloromethane	109
1,2-Dibromoethane (EDB)	103
Chlorobenzene	101
Ethyl Benzene	100
m,p-Xylene	98
o-Xylene	98
Styrene	100
Bromoform	109
1,1,2,2-Tetrachloroethane	95
4-Ethyltoluene	100
1,3,5-Trimethylbenzene	98

Client Sample ID: CCV

Lab ID#: 2303542-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032702	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/27/23 09:47 AM

Compound	%Recovery
1,2,4-Trimethylbenzene	100
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	101
alpha-Chlorotoluene	94
1,2-Dichlorobenzene	102
1,2,4-Trichlorobenzene	93
Hexachlorobutadiene	97
Vinyl Acetate	102

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	100	70-130



Air Toxics

Client Sample ID: LCS

Lab ID#: 2303542-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032703	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/27/23 10:13 AM

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Freon 114	103	70-130
Chloromethane	117	70-130
Vinyl Chloride	106	70-130
Bromomethane	112	70-130
Chloroethane	104	70-130
Freon 11	101	70-130
Freon 113	98	70-130
1,1-Dichloroethene	101	70-130
Acetone	93	70-130
Carbon Disulfide	97	70-130
Methylene Chloride	103	70-130
trans-1,2-Dichloroethene	100	70-130
1,1-Dichloroethane	97	70-130
2-Butanone (Methyl Ethyl Ketone)	92	70-130
cis-1,2-Dichloroethene	94	70-130
Chloroform	92	70-130
1,1,1-Trichloroethane	94	70-130
Carbon Tetrachloride	95	70-130
Benzene	95	70-130
1,2-Dichloroethane	100	70-130
Trichloroethene	99	70-130
1,2-Dichloropropane	93	70-130
Bromodichloromethane	95	70-130
cis-1,3-Dichloropropene	92	70-130
4-Methyl-2-pentanone	94	70-130
Toluene	90	70-130
trans-1,3-Dichloropropene	96	70-130
1,1,2-Trichloroethane	100	70-130
Tetrachloroethene	102	70-130
2-Hexanone	94	70-130
Dibromochloromethane	105	70-130
1,2-Dibromoethane (EDB)	99	70-130
Chlorobenzene	96	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	94	70-130
o-Xylene	93	70-130
Styrene	93	70-130
Bromoform	104	70-130
1,1,2,2-Tetrachloroethane	93	70-130
4-Ethyltoluene	94	70-130
1,3,5-Trimethylbenzene	90	70-130

Client Sample ID: LCS

Lab ID#: 2303542-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032703	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/27/23 10:13 AM

Compound	%Recovery	Method Limits
1,2,4-Trimethylbenzene	93	70-130
1,3-Dichlorobenzene	96	70-130
1,4-Dichlorobenzene	94	70-130
alpha-Chlorotoluene	86	70-130
1,2-Dichlorobenzene	96	70-130
1,2,4-Trichlorobenzene	96	70-130
Hexachlorobutadiene	99	70-130
Vinyl Acetate	108	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	99	70-130



Air Toxics

Client Sample ID: LCSD

Lab ID#: 2303542-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032704	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/27/23 10:37 AM

Compound	%Recovery	Method Limits
Freon 12	91	70-130
Freon 114	102	70-130
Chloromethane	99	70-130
Vinyl Chloride	105	70-130
Bromomethane	108	70-130
Chloroethane	103	70-130
Freon 11	100	70-130
Freon 113	99	70-130
1,1-Dichloroethene	102	70-130
Acetone	94	70-130
Carbon Disulfide	96	70-130
Methylene Chloride	105	70-130
trans-1,2-Dichloroethene	99	70-130
1,1-Dichloroethane	98	70-130
2-Butanone (Methyl Ethyl Ketone)	91	70-130
cis-1,2-Dichloroethene	94	70-130
Chloroform	93	70-130
1,1,1-Trichloroethane	96	70-130
Carbon Tetrachloride	96	70-130
Benzene	94	70-130
1,2-Dichloroethane	99	70-130
Trichloroethene	97	70-130
1,2-Dichloropropane	92	70-130
Bromodichloromethane	95	70-130
cis-1,3-Dichloropropene	91	70-130
4-Methyl-2-pentanone	93	70-130
Toluene	90	70-130
trans-1,3-Dichloropropene	96	70-130
1,1,2-Trichloroethane	100	70-130
Tetrachloroethene	102	70-130
2-Hexanone	95	70-130
Dibromochloromethane	106	70-130
1,2-Dibromoethane (EDB)	100	70-130
Chlorobenzene	97	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	95	70-130
o-Xylene	93	70-130
Styrene	95	70-130
Bromoform	105	70-130
1,1,2,2-Tetrachloroethane	94	70-130
4-Ethyltoluene	92	70-130
1,3,5-Trimethylbenzene	93	70-130

Client Sample ID: LCSD

Lab ID#: 2303542-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a032704	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/27/23 10:37 AM

Compound	%Recovery	Method Limits
1,2,4-Trimethylbenzene	94	70-130
1,3-Dichlorobenzene	97	70-130
1,4-Dichlorobenzene	95	70-130
alpha-Chlorotoluene	88	70-130
1,2-Dichlorobenzene	97	70-130
1,2,4-Trichlorobenzene	99	70-130
Hexachlorobutadiene	103	70-130
Vinyl Acetate	114	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	100	70-130

5/25/2023

Mr. Jeff Pratt

GeoEngineers, Inc. (formerly Cascadia Associates, LLC)

5820 SW Kelly Ave

Unit B

Portland OR 97239

Project Name: South SVE O&M

Project #:

Workorder #: 2305380

Dear Mr. Jeff Pratt

The following report includes the data for the above referenced project for sample(s) received on 5/11/2023 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Monica Tran at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Monica Tran

Project Manager

WORK ORDER #: 2305380

Work Order Summary

CLIENT:	Mr. Jeff Pratt GeoEngineers, Inc. (formerly Cascadia Associates, LLC) 5820 SW Kelly Ave Unit B Portland, OR 97239 (503)906-6577	BILL TO:	Mr. Jeff Pratt GeoEngineers, Inc. (formerly Cascadia Associates, LLC) 5820 SW Kelly Ave Unit B
PHONE:		P.O. #	0060-002-004
FAX:	(503)906-6567	PROJECT #	South SVE O&M
DATE RECEIVED:	05/11/2023	CONTACT:	Monica Tran
DATE COMPLETED:	05/25/2023		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	PreCarbon_SouthSVE_050923	TO-15	6.1 "Hg	1.9 psi
02A	PostCarbon_SouthSVE_050923	TO-15	3.3 "Hg	1.9 psi
03A	Lab Blank	TO-15	NA	NA
04A	CCV	TO-15	NA	NA
05A	LCS	TO-15	NA	NA
05AA	LCSD	TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 05/25/23

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP – 209222, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP – T104704434-22-18, UT NELAP – CA009332022-14, VA NELAP - 12240, WA ELAP - C935
 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) CA300005-017
 Eurofins Environment Testing Northern California, LLC certifies that the test results contained in this report meet all requirements of the 2016 TNI Standard.

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.
 180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
GeoEngineers, Inc. (formerly Cascadia Associates, LLC)
Workorder# 2305380

Two 6 Liter Summa Canister samples were received on May 11, 2023. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

The Chain of Custody was missing method assignment in the 'Requested Analyses' checkboxes for the associated samples. EATL proceeded with the analysis as per the original contract or verbal agreement.

Analytical Notes

Dilution was performed on sample PreCarbon_SouthSVE_050923 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

**Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN**

Client Sample ID: PreCarbon_SouthSVE_050923

Lab ID#: 2305380-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	5.6	13	22	50
Trichloroethene	5.6	42	30	220
Tetrachloroethene	5.6	1500	38	10000

Client Sample ID: PostCarbon_SouthSVE_050923

Lab ID#: 2305380-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	0.64	0.82	2.5	3.2
cis-1,2-Dichloroethene	0.64	24	2.5	96
Trichloroethene	0.64	2.6	3.4	14



Air Toxics

Client Sample ID: PreCarbon_SouthSVE_050923

Lab ID#: 2305380-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052428	Date of Collection:	5/9/23 7:45:00 AM
Dil. Factor:	11.3	Date of Analysis:	5/25/23 02:33 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.6	Not Detected	28	Not Detected
Freon 114	5.6	Not Detected	39	Not Detected
Chloromethane	56	Not Detected	120	Not Detected
Vinyl Chloride	5.6	Not Detected	14	Not Detected
Bromomethane	56	Not Detected	220	Not Detected
Chloroethane	23	Not Detected	60	Not Detected
Freon 11	5.6	Not Detected	32	Not Detected
Freon 113	5.6	Not Detected	43	Not Detected
1,1-Dichloroethene	5.6	Not Detected	22	Not Detected
Acetone	56	Not Detected	130	Not Detected
Carbon Disulfide	23	Not Detected	70	Not Detected
Methylene Chloride	56	Not Detected	200	Not Detected
trans-1,2-Dichloroethene	5.6	Not Detected	22	Not Detected
1,1-Dichloroethane	5.6	Not Detected	23	Not Detected
2-Butanone (Methyl Ethyl Ketone)	23	Not Detected	67	Not Detected
cis-1,2-Dichloroethene	5.6	13	22	50
Chloroform	5.6	Not Detected	28	Not Detected
1,1,1-Trichloroethane	5.6	Not Detected	31	Not Detected
Carbon Tetrachloride	5.6	Not Detected	36	Not Detected
Benzene	5.6	Not Detected	18	Not Detected
1,2-Dichloroethane	5.6	Not Detected	23	Not Detected
Trichloroethene	5.6	42	30	220
1,2-Dichloropropane	5.6	Not Detected	26	Not Detected
Bromodichloromethane	5.6	Not Detected	38	Not Detected
cis-1,3-Dichloropropene	5.6	Not Detected	26	Not Detected
4-Methyl-2-pentanone	5.6	Not Detected	23	Not Detected
Toluene	11	Not Detected	42	Not Detected
trans-1,3-Dichloropropene	5.6	Not Detected	26	Not Detected
1,1,2-Trichloroethane	5.6	Not Detected	31	Not Detected
Tetrachloroethene	5.6	1500	38	10000
2-Hexanone	23	Not Detected	92	Not Detected
Dibromochloromethane	5.6	Not Detected	48	Not Detected
1,2-Dibromoethane (EDB)	5.6	Not Detected	43	Not Detected
Chlorobenzene	5.6	Not Detected	26	Not Detected
Ethyl Benzene	5.6	Not Detected	24	Not Detected
m,p-Xylene	11	Not Detected	49	Not Detected
o-Xylene	5.6	Not Detected	24	Not Detected
Styrene	5.6	Not Detected	24	Not Detected
Bromoform	5.6	Not Detected	58	Not Detected
1,1,2,2-Tetrachloroethane	5.6	Not Detected	39	Not Detected
4-Ethyltoluene	5.6	Not Detected	28	Not Detected
1,3,5-Trimethylbenzene	5.6	Not Detected	28	Not Detected



Air Toxics

Client Sample ID: PreCarbon_SouthSVE_050923

Lab ID#: 2305380-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052428	Date of Collection:	5/9/23 7:45:00 AM
Dil. Factor:	11.3	Date of Analysis:	5/25/23 02:33 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	5.6	Not Detected	28	Not Detected
1,3-Dichlorobenzene	5.6	Not Detected	34	Not Detected
1,4-Dichlorobenzene	5.6	Not Detected	34	Not Detected
alpha-Chlorotoluene	5.6	Not Detected	29	Not Detected
1,2-Dichlorobenzene	5.6	Not Detected	34	Not Detected
1,2,4-Trichlorobenzene	23	Not Detected	170	Not Detected
Hexachlorobutadiene	23	Not Detected	240	Not Detected
Vinyl Acetate	23	Not Detected	80	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	87	70-130



Air Toxics

Client Sample ID: PostCarbon_SouthSVE_050923

Lab ID#: 2305380-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052427	Date of Collection:	5/9/23 7:55:00 AM
Dil. Factor:	1.27	Date of Analysis:	5/25/23 02:07 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.64	Not Detected	3.1	Not Detected
Freon 114	0.64	Not Detected	4.4	Not Detected
Chloromethane	6.4	Not Detected	13	Not Detected
Vinyl Chloride	0.64	Not Detected	1.6	Not Detected
Bromomethane	6.4	Not Detected	25	Not Detected
Chloroethane	2.5	Not Detected	6.7	Not Detected
Freon 11	0.64	Not Detected	3.6	Not Detected
Freon 113	0.64	Not Detected	4.9	Not Detected
1,1-Dichloroethene	0.64	Not Detected	2.5	Not Detected
Acetone	6.4	Not Detected	15	Not Detected
Carbon Disulfide	2.5	Not Detected	7.9	Not Detected
Methylene Chloride	6.4	Not Detected	22	Not Detected
trans-1,2-Dichloroethene	0.64	0.82	2.5	3.2
1,1-Dichloroethane	0.64	Not Detected	2.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.5	Not Detected	7.5	Not Detected
cis-1,2-Dichloroethene	0.64	24	2.5	96
Chloroform	0.64	Not Detected	3.1	Not Detected
1,1,1-Trichloroethane	0.64	Not Detected	3.5	Not Detected
Carbon Tetrachloride	0.64	Not Detected	4.0	Not Detected
Benzene	0.64	Not Detected	2.0	Not Detected
1,2-Dichloroethane	0.64	Not Detected	2.6	Not Detected
Trichloroethene	0.64	2.6	3.4	14
1,2-Dichloropropane	0.64	Not Detected	2.9	Not Detected
Bromodichloromethane	0.64	Not Detected	4.2	Not Detected
cis-1,3-Dichloropropene	0.64	Not Detected	2.9	Not Detected
4-Methyl-2-pentanone	0.64	Not Detected	2.6	Not Detected
Toluene	1.3	Not Detected	4.8	Not Detected
trans-1,3-Dichloropropene	0.64	Not Detected	2.9	Not Detected
1,1,2-Trichloroethane	0.64	Not Detected	3.5	Not Detected
Tetrachloroethene	0.64	Not Detected	4.3	Not Detected
2-Hexanone	2.5	Not Detected	10	Not Detected
Dibromochloromethane	0.64	Not Detected	5.4	Not Detected
1,2-Dibromoethane (EDB)	0.64	Not Detected	4.9	Not Detected
Chlorobenzene	0.64	Not Detected	2.9	Not Detected
Ethyl Benzene	0.64	Not Detected	2.8	Not Detected
m,p-Xylene	1.3	Not Detected	5.5	Not Detected
o-Xylene	0.64	Not Detected	2.8	Not Detected
Styrene	0.64	Not Detected	2.7	Not Detected
Bromoform	0.64	Not Detected	6.6	Not Detected
1,1,2,2-Tetrachloroethane	0.64	Not Detected	4.4	Not Detected
4-Ethyltoluene	0.64	Not Detected	3.1	Not Detected
1,3,5-Trimethylbenzene	0.64	Not Detected	3.1	Not Detected



Air Toxics

Client Sample ID: PostCarbon_SouthSVE_050923

Lab ID#: 2305380-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052427	Date of Collection:	5/9/23 7:55:00 AM
Dil. Factor:	1.27	Date of Analysis:	5/25/23 02:07 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	0.64	Not Detected	3.1	Not Detected
1,3-Dichlorobenzene	0.64	Not Detected	3.8	Not Detected
1,4-Dichlorobenzene	0.64	Not Detected	3.8	Not Detected
alpha-Chlorotoluene	0.64	Not Detected	3.3	Not Detected
1,2-Dichlorobenzene	0.64	Not Detected	3.8	Not Detected
1,2,4-Trichlorobenzene	2.5	Not Detected	19	Not Detected
Hexachlorobutadiene	2.5	Not Detected	27	Not Detected
Vinyl Acetate	2.5	Not Detected	8.9	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	91	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2305380-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052406e	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 02:17 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	1.0	Not Detected	3.8	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	1.0	Not Detected	4.3	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected

Client Sample ID: Lab Blank

Lab ID#: 2305380-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052406e	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 02:17 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Vinyl Acetate	2.0	Not Detected	7.0	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	90	70-130

Client Sample ID: CCV

Lab ID#: 2305380-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052403	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 12:04 PM

Compound	%Recovery
Freon 12	100
Freon 114	105
Chloromethane	122
Vinyl Chloride	115
Bromomethane	98
Chloroethane	105
Freon 11	90
Freon 113	93
1,1-Dichloroethene	100
Acetone	97
Carbon Disulfide	106
Methylene Chloride	105
trans-1,2-Dichloroethene	97
1,1-Dichloroethane	92
2-Butanone (Methyl Ethyl Ketone)	89
cis-1,2-Dichloroethene	92
Chloroform	90
1,1,1-Trichloroethane	88
Carbon Tetrachloride	87
Benzene	95
1,2-Dichloroethane	91
Trichloroethene	94
1,2-Dichloropropane	91
Bromodichloromethane	93
cis-1,3-Dichloropropene	80
4-Methyl-2-pentanone	85
Toluene	88
trans-1,3-Dichloropropene	83
1,1,2-Trichloroethane	94
Tetrachloroethene	92
2-Hexanone	86
Dibromochloromethane	91
1,2-Dibromoethane (EDB)	95
Chlorobenzene	90
Ethyl Benzene	91
m,p-Xylene	92
o-Xylene	87
Styrene	96
Bromoform	92
1,1,2,2-Tetrachloroethane	88
4-Ethyltoluene	96
1,3,5-Trimethylbenzene	89

Client Sample ID: CCV

Lab ID#: 2305380-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052403	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 12:04 PM

Compound	%Recovery
1,2,4-Trimethylbenzene	93
1,3-Dichlorobenzene	96
1,4-Dichlorobenzene	86
alpha-Chlorotoluene	90
1,2-Dichlorobenzene	99
1,2,4-Trichlorobenzene	90
Hexachlorobutadiene	102
Vinyl Acetate	86

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: LCS

Lab ID#: 2305380-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052404	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 12:30 PM

Compound	%Recovery	Method Limits
Freon 12	96	70-130
Freon 114	102	70-130
Chloromethane	116	70-130
Vinyl Chloride	114	70-130
Bromomethane	100	70-130
Chloroethane	106	70-130
Freon 11	88	70-130
Freon 113	87	70-130
1,1-Dichloroethene	96	70-130
Acetone	100	70-130
Carbon Disulfide	107	70-130
Methylene Chloride	100	70-130
trans-1,2-Dichloroethene	96	70-130
1,1-Dichloroethane	92	70-130
2-Butanone (Methyl Ethyl Ketone)	93	70-130
cis-1,2-Dichloroethene	93	70-130
Chloroform	89	70-130
1,1,1-Trichloroethane	87	70-130
Carbon Tetrachloride	85	70-130
Benzene	94	70-130
1,2-Dichloroethane	99	70-130
Trichloroethene	94	70-130
1,2-Dichloropropane	89	70-130
Bromodichloromethane	92	70-130
cis-1,3-Dichloropropene	80	70-130
4-Methyl-2-pentanone	85	70-130
Toluene	84	70-130
trans-1,3-Dichloropropene	85	70-130
1,1,2-Trichloroethane	94	70-130
Tetrachloroethene	92	70-130
2-Hexanone	86	70-130
Dibromochloromethane	89	70-130
1,2-Dibromoethane (EDB)	94	70-130
Chlorobenzene	91	70-130
Ethyl Benzene	92	70-130
m,p-Xylene	91	70-130
o-Xylene	88	70-130
Styrene	93	70-130
Bromoform	88	70-130
1,1,2,2-Tetrachloroethane	87	70-130
4-Ethyltoluene	93	70-130
1,3,5-Trimethylbenzene	90	70-130

Client Sample ID: LCS

Lab ID#: 2305380-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052404	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 12:30 PM

Compound	%Recovery	Method Limits
1,2,4-Trimethylbenzene	94	70-130
1,3-Dichlorobenzene	95	70-130
1,4-Dichlorobenzene	84	70-130
alpha-Chlorotoluene	86	70-130
1,2-Dichlorobenzene	95	70-130
1,2,4-Trichlorobenzene	88	70-130
Hexachlorobutadiene	102	70-130
Vinyl Acetate	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	95	70-130

Client Sample ID: LCSD

Lab ID#: 2305380-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052405	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 12:56 PM

Compound	%Recovery	Method Limits
Freon 12	96	70-130
Freon 114	102	70-130
Chloromethane	118	70-130
Vinyl Chloride	115	70-130
Bromomethane	100	70-130
Chloroethane	107	70-130
Freon 11	88	70-130
Freon 113	87	70-130
1,1-Dichloroethene	96	70-130
Acetone	100	70-130
Carbon Disulfide	109	70-130
Methylene Chloride	101	70-130
trans-1,2-Dichloroethene	97	70-130
1,1-Dichloroethane	93	70-130
2-Butanone (Methyl Ethyl Ketone)	94	70-130
cis-1,2-Dichloroethene	94	70-130
Chloroform	87	70-130
1,1,1-Trichloroethane	85	70-130
Carbon Tetrachloride	84	70-130
Benzene	104	70-130
1,2-Dichloroethane	110	70-130
Trichloroethene	94	70-130
1,2-Dichloropropane	88	70-130
Bromodichloromethane	90	70-130
cis-1,3-Dichloropropene	87	70-130
4-Methyl-2-pentanone	87	70-130
Toluene	92	70-130
trans-1,3-Dichloropropene	86	70-130
1,1,2-Trichloroethane	87	70-130
Tetrachloroethene	93	70-130
2-Hexanone	80	70-130
Dibromochloromethane	82	70-130
1,2-Dibromoethane (EDB)	90	70-130
Chlorobenzene	88	70-130
Ethyl Benzene	90	70-130
m,p-Xylene	90	70-130
o-Xylene	88	70-130
Styrene	89	70-130
Bromoform	91	70-130
1,1,2,2-Tetrachloroethane	86	70-130
4-Ethyltoluene	95	70-130
1,3,5-Trimethylbenzene	89	70-130

Client Sample ID: LCSD

Lab ID#: 2305380-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	91052405	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/24/23 12:56 PM

Compound	%Recovery	Method Limits
1,2,4-Trimethylbenzene	93	70-130
1,3-Dichlorobenzene	94	70-130
1,4-Dichlorobenzene	88	70-130
alpha-Chlorotoluene	86	70-130
1,2-Dichlorobenzene	96	70-130
1,2,4-Trichlorobenzene	88	70-130
Hexachlorobutadiene	100	70-130
Vinyl Acetate	111	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	93	70-130



ANALYTICAL REPORT

Apex Laboratories, LLC

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

Tuesday, April 4, 2023
Stephanie Bosze-Salisbury
GeoEngineers - Portland
5820 S Kelly Ave Unit B
Portland, OR 97239

RE: A3C0505 - Nustar-Vancouver-GWM - 2023 - [none]

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 A3C0505, which was received by the laboratory on 3/14/2023 at 3:57:00PM.

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

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

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler 2.8 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

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.

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-6	A3C0505-01	Water	03/14/23 08:31	03/14/23 15:57
MW-21i-105	A3C0505-02	Water	03/14/23 09:40	03/14/23 15:57
MW-7	A3C0505-03	Water	03/14/23 10:46	03/14/23 15:57
MW-7 DUP	A3C0505-04	Water	03/14/23 10:46	03/14/23 15:57
MW-19	A3C0505-05	Water	03/14/23 12:09	03/14/23 15:57
MW-19 DUP	A3C0505-06	Water	03/14/23 12:09	03/14/23 15:57
S-2	A3C0505-07	Water	03/14/23 14:12	03/14/23 15:57
MW-19i	A3C0505-08	Water	03/14/23 09:30	03/14/23 15:57
MW-23i	A3C0505-09	Water	03/14/23 10:46	03/14/23 15:57
EW-1	A3C0505-10	Water	03/14/23 14:57	03/14/23 15:57

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.

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water				
				Batch: 23C0660				
MW-6 (A3C0505-01)								
Bromobenzene	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Chloromethane	ND	---	6.00	ug/L	1	03/17/23 21:00	EPA 8260D	R-02
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/17/23 21:00	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0660		
MW-6 (A3C0505-01)								
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/17/23 21:00	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/17/23 21:00	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/17/23 21:00	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 103 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/17/23 21:00</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>100 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/17/23 21:00</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>101 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/17/23 21:00</i>	<i>EPA 8260D</i>	

			Matrix: Water			Batch: 23C0660		V-01
MW-21i-105 (A3C0505-02)								
Bromobenzene	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/17/23 21:23	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water			Batch: 23C0660	V-01
MW-21i-105 (A3C0505-02)								
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
cis-1,2-Dichloroethene	1.09	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/17/23 21:23	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
Tetrachloroethene (PCE)	3.12	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
Trichloroethene (TCE)	1.23	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/17/23 21:23	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/17/23 21:23	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/17/23 21:23	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 90 %</i>		<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/17/23 21:23</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/17/23 21:23</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/17/23 21:23</i>	<i>EPA 8260D</i>	

				Matrix: Water			Batch: 23C0661	
MW-7 (A3C0505-03)								
Bromobenzene	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0661		
MW-7 (A3C0505-03)								
Bromoform	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/18/23 07:02	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,1-Dichloroethane	1.97	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
1,1-Dichloroethene	0.430	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
cis-1,2-Dichloroethene	22.1	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/18/23 07:02	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
Tetrachloroethene (PCE)	67.0	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0661		
MW-7 (A3C0505-03)								
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/18/23 07:02	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
Trichloroethene (TCE)	27.3	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/18/23 07:02	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:02	EPA 8260D	
Vinyl chloride	0.820	---	0.400	ug/L	1	03/18/23 07:02	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 07:02</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 07:02</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 07:02</i>	<i>EPA 8260D</i>

			Matrix: Water			Batch: 23C0661		
MW-7 DUP (A3C0505-04)								
Bromobenzene	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/18/23 07:24	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,1-Dichloroethane	1.95	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-7 DUP (A3C0505-04)				Matrix: Water		Batch: 23C0661		
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
1,1-Dichloroethene	0.460	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
cis-1,2-Dichloroethene	22.6	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/18/23 07:24	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
Tetrachloroethene (PCE)	63.4	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/18/23 07:24	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
Trichloroethene (TCE)	27.8	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/18/23 07:24	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:24	EPA 8260D	
Vinyl chloride	0.800	---	0.400	ug/L	1	03/18/23 07:24	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 07:24</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 07:24</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 07:24</i>	<i>EPA 8260D</i>

MW-19 (A3C0505-05)				Matrix: Water		Batch: 23C0661		
Bromobenzene	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/18/23 07:46	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0661		
MW-19 (A3C0505-05)								
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/18/23 07:46	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,1-Dichloroethane	21.0	---	0.400	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/18/23 07:46	EPA 8260D	
1,1-Dichloroethene	42.8	---	0.400	ug/L	1	03/18/23 07:46	EPA 8260D	
trans-1,2-Dichloroethene	7.58	---	0.400	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/18/23 07:46	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/18/23 07:46	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,1,1-Trichloroethane	34.1	---	0.400	ug/L	1	03/18/23 07:46	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-19 (A3C0505-05)			Matrix: Water			Batch: 23C0661		
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/18/23 07:46	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/18/23 07:46	EPA 8260D	
Vinyl chloride	51.3	---	0.400	ug/L	1	03/18/23 07:46	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 97 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 07:46</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 07:46</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 07:46</i>	<i>EPA 8260D</i>
MW-19 (A3C0505-05RE1)			Matrix: Water			Batch: 23C0768		
cis-1,2-Dichloroethene	690	---	20.0	ug/L	50	03/21/23 03:39	EPA 8260D	
Tetrachloroethene (PCE)	5770	---	20.0	ug/L	50	03/21/23 03:39	EPA 8260D	
Trichloroethene (TCE)	1860	---	20.0	ug/L	50	03/21/23 03:39	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 03:39</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 03:39</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 03:39</i>	<i>EPA 8260D</i>
MW-19 DUP (A3C0505-06)			Matrix: Water			Batch: 23C0661		
Bromobenzene	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
Bromochloromethane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Bromodichloromethane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Bromoform	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Bromomethane	ND	---	25.0	ug/L	5	03/18/23 10:23	EPA 8260D	
Carbon tetrachloride	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Chlorobenzene	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
Chloroethane	ND	---	25.0	ug/L	5	03/18/23 10:23	EPA 8260D	
Chloroform	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Chloromethane	ND	---	25.0	ug/L	5	03/18/23 10:23	EPA 8260D	
2-Chlorotoluene	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
4-Chlorotoluene	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Dibromochloromethane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	25.0	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
Dibromomethane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2-Dichlorobenzene	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
1,3-Dichlorobenzene	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-19 DUP (A3C0505-06)			Matrix: Water			Batch: 23C0661		
1,4-Dichlorobenzene	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
Dichlorodifluoromethane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,1-Dichloroethane	20.5	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,1-Dichloroethene	36.2	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
cis-1,2-Dichloroethene	767	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
trans-1,2-Dichloroethene	12.6	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2-Dichloropropane	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
1,3-Dichloropropane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
2,2-Dichloropropane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,1-Dichloropropene	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Hexachlorobutadiene	ND	---	25.0	ug/L	5	03/18/23 10:23	EPA 8260D	
Methylene chloride	ND	---	50.0	ug/L	5	03/18/23 10:23	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	10.0	ug/L	5	03/18/23 10:23	EPA 8260D	
1,1,2-Trichloroethane	ND	---	2.50	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	10.0	ug/L	5	03/18/23 10:23	EPA 8260D	
1,1,1-Trichloroethane	32.2	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Trichlorofluoromethane	ND	---	10.0	ug/L	5	03/18/23 10:23	EPA 8260D	
1,2,3-Trichloropropane	ND	---	5.00	ug/L	5	03/18/23 10:23	EPA 8260D	
Vinyl chloride	45.8	---	2.00	ug/L	5	03/18/23 10:23	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 10:23</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 10:23</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 10:23</i>	<i>EPA 8260D</i>

MW-19 DUP (A3C0505-06RE1)			Matrix: Water			Batch: 23C0768		
cis-1,2-Dichloroethene	697	---	10.0	ug/L	25	03/21/23 03:17	EPA 8260D	
Trichloroethene (TCE)	1840	---	10.0	ug/L	25	03/21/23 03:17	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 106 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 03:17</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 03:17</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 03:17</i>	<i>EPA 8260D</i>

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-19 DUP (A3C0505-06RE2)			Matrix: Water			Batch: 23C0785		
Tetrachloroethene (PCE)	5260	---	100	ug/L	250	03/23/23 02:22	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>	1	03/23/23 02:22	EPA 8260D	
<i>Toluene-d8 (Surr)</i>				<i>103 %</i>	1	03/23/23 02:22	EPA 8260D	
<i>4-Bromofluorobenzene (Surr)</i>				<i>98 %</i>	1	03/23/23 02:22	EPA 8260D	
S-2 (A3C0505-07)			Matrix: Water			Batch: 23C0661		
Bromobenzene	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/18/23 08:09	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
1,1-Dichloroethane	9.16	---	0.400	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/18/23 08:09	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 08:09	EPA 8260D	
trans-1,2-Dichloroethene	0.610	---	0.400	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0661		
S-2 (A3C0505-07)								
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/18/23 08:09	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/18/23 08:09	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 08:09	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 08:09	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/18/23 08:09	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/18/23 08:09	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:09	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/18/23 08:09	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 102 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 08:09</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>109 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 08:09</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 08:09</i>	<i>EPA 8260D</i>

			Matrix: Water			Batch: 23C0768		
S-2 (A3C0505-07RE1)								
cis-1,2-Dichloroethene	50.4	---	0.400	ug/L	1	03/21/23 02:54	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/21/23 02:54	EPA 8260D	
Trichloroethene (TCE)	1.74	---	0.400	ug/L	1	03/21/23 02:54	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 02:54</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 02:54</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 02:54</i>	<i>EPA 8260D</i>

			Matrix: Water			Batch: 23C0661		
MW-19i (A3C0505-08)								
Bromobenzene	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-19i (A3C0505-08)				Matrix: Water		Batch: 23C0661		
Chloroethane	ND	---	5.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/18/23 08:31	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/18/23 08:31	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 08:31	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/18/23 08:31	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/18/23 08:31	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/18/23 08:31	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/18/23 08:31	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/18/23 08:31	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:31	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-19i (A3C0505-08)			Matrix: Water			Batch: 23C0661		
Vinyl chloride	ND	---	0.400	ug/L	1	03/18/23 08:31	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 08:31</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 08:31</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 08:31</i>	<i>EPA 8260D</i>
MW-19i (A3C0505-08RE1)			Matrix: Water			Batch: 23C0768		
cis-1,2-Dichloroethene	1.13	---	0.400	ug/L	1	03/21/23 02:32	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/21/23 02:32	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/21/23 02:32	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 02:32</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 02:32</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 02:32</i>	<i>EPA 8260D</i>
MW-23i (A3C0505-09)			Matrix: Water			Batch: 23C0661		
Bromobenzene	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/18/23 08:53	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-23i (A3C0505-09)			Matrix: Water			Batch: 23C0661		
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/18/23 08:53	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 08:53	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 08:53	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/18/23 08:53	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/18/23 08:53	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/18/23 08:53	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 08:53</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 08:53</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 08:53</i>	<i>EPA 8260D</i>
MW-23i (A3C0505-09RE1)			Matrix: Water			Batch: 23C0768		
Tetrachloroethene (PCE)	0.520	---	0.400	ug/L	1	03/21/23 02:10	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/21/23 02:10	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 102 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 02:10</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 02:10</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 02:10</i>	<i>EPA 8260D</i>
EW-1 (A3C0505-10)			Matrix: Water			Batch: 23C0661		

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water				
				Batch: 23C0661				
EW-1 (A3C0505-10)								
Bromobenzene	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Chloroform	1.42	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/18/23 09:16	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/18/23 09:16	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 09:16	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/18/23 09:16	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/18/23 09:16	EPA 8260D	

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0661		
EW-1 (A3C0505-10)								
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,1,1-Trichloroethane	0.590	---	0.400	ug/L	1	03/18/23 09:16	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/18/23 09:16	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/18/23 09:16	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/18/23 09:16	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/18/23 09:16</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 09:16</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/18/23 09:16</i>	<i>EPA 8260D</i>
			Matrix: Water			Batch: 23C0768		
EW-1 (A3C0505-10RE1)								
cis-1,2-Dichloroethene	0.880	---	0.400	ug/L	1	03/21/23 01:48	EPA 8260D	
Tetrachloroethene (PCE)	26.7	---	0.400	ug/L	1	03/21/23 01:48	EPA 8260D	
Trichloroethene (TCE)	7.81	---	0.400	ug/L	1	03/21/23 01:48	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 01:48</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 01:48</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 01:48</i>	<i>EPA 8260D</i>

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ANALYTICAL REPORT

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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ANALYTICAL SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water		Batch: 23C0645		
MW-6 (A3C0505-01RE1)								
Ammonia as N	2.18	---	0.0200	mg/L	1	03/16/23 20:24	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0645		
MW-21i-105 (A3C0505-02RE1)								
Ammonia as N	0.101	---	0.0200	mg/L	1	03/16/23 20:22	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0645		
MW-7 (A3C0505-03)								
Ammonia as N	11.8	---	0.200	mg/L	10	03/16/23 19:58	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0730		
MW-7 DUP (A3C0505-04)								
Ammonia as N	7.52	---	0.100	mg/L	5	03/20/23 12:11	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
MW-19 (A3C0505-05RE2)								
Ammonia as N	112	---	1.00	mg/L	50	03/21/23 16:00	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
MW-19 DUP (A3C0505-06RE2)								
Ammonia as N	123	---	1.00	mg/L	50	03/21/23 16:05	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0730		
S-2 (A3C0505-07)								
Ammonia as N	3.95	---	0.0200	mg/L	1	03/20/23 12:17	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0730		
MW-19i (A3C0505-08)								
Ammonia as N	0.342	---	0.0200	mg/L	1	03/20/23 12:18	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0730		
MW-23i (A3C0505-09)								
Ammonia as N	ND	---	0.0300	mg/L	1	03/20/23 12:20	SM 4500-NH3 G	R-01
				Matrix: Water		Batch: 23C0730		
EW-1 (A3C0505-10)								
Ammonia as N	ND	---	0.0200	mg/L	1	03/20/23 12:23	SM 4500-NH3 G	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-6 (A3C0505-01)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 03:45	EPA 300.0	H-01
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 03:45	EPA 300.0	H-01
MW-21i-105 (A3C0505-02)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	2.61	---	0.250	mg/L	1	03/17/23 04:07	EPA 300.0	H-01
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 04:07	EPA 300.0	H-01
MW-7 (A3C0505-03)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	16.1	---	1.25	mg/L	5	03/17/23 04:28	EPA 300.0	H-01
MW-7 (A3C0505-03RE1)				Matrix: Water				
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 05:33	EPA 300.0	H-01
MW-7 DUP (A3C0505-04)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	10.3	---	1.25	mg/L	5	03/17/23 04:50	EPA 300.0	H-01
MW-7 DUP (A3C0505-04RE1)				Matrix: Water				
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 05:54	EPA 300.0	H-01
MW-19 (A3C0505-05RE1)				Matrix: Water				
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 06:16	EPA 300.0	H-01
MW-19 (A3C0505-05RE2)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	205	---	12.5	mg/L	50	03/17/23 08:47	EPA 300.0	H-01
MW-19 DUP (A3C0505-06RE1)				Matrix: Water				
Batch: 23C0630								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 08:25	EPA 300.0	H-01

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ANALYTICAL REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
MW-19 DUP (A3C0505-06RE2)				Matrix: Water					
Batch: 23C0630									
Nitrate-Nitrogen	211	---	12.5	mg/L	50	03/17/23 17:08	EPA 300.0	H-01	
S-2 (A3C0505-07RE1)				Matrix: Water					
Batch: 23C0626									
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 15:54	EPA 300.0	H-01	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 15:54	EPA 300.0	H-01	
MW-19i (A3C0505-08)				Matrix: Water					
Batch: 23C0630									
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 09:08	EPA 300.0	H-01	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 09:08	EPA 300.0	H-01	
MW-23i (A3C0505-09)				Matrix: Water					
Batch: 23C0630									
Nitrate-Nitrogen	1.69	---	0.250	mg/L	1	03/17/23 09:30	EPA 300.0	H-01	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 09:30	EPA 300.0	H-01	
EW-1 (A3C0505-10)				Matrix: Water					
Batch: 23C0626									
Nitrate-Nitrogen	3.46	---	0.250	mg/L	1	03/16/23 16:15	EPA 300.0	H-01	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 16:15	EPA 300.0	H-01	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0660 - EPA 5030C						Water						
Blank (23C0660-BLK1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 13:11									
<u>EPA 8260D</u>												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0660 - EPA 5030C						Water						
Blank (23C0660-BLK1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 13:11									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0660-BS1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 12:18									
EPA 8260D												
Bromobenzene	18.4	---	0.500	ug/L	1	20.0	---	92	80-120%	---	---	
Bromochloromethane	20.0	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
Bromodichloromethane	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Bromoform	19.3	---	1.00	ug/L	1	20.0	---	96	80-120%	---	---	
Bromomethane	18.5	---	5.00	ug/L	1	20.0	---	92	80-120%	---	---	
Carbon tetrachloride	19.4	---	1.00	ug/L	1	20.0	---	97	80-120%	---	---	
Chlorobenzene	18.8	---	0.500	ug/L	1	20.0	---	94	80-120%	---	---	
Chloroethane	19.6	---	5.00	ug/L	1	20.0	---	98	80-120%	---	---	
Chloroform	18.7	---	1.00	ug/L	1	20.0	---	93	80-120%	---	---	
Chloromethane	13.6	---	5.00	ug/L	1	20.0	---	68	80-120%	---	---	Q-55
2-Chlorotoluene	19.7	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
4-Chlorotoluene	20.9	---	1.00	ug/L	1	20.0	---	105	80-120%	---	---	
Dibromochloromethane	19.8	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
1,2-Dibromo-3-chloropropane	18.0	---	5.00	ug/L	1	20.0	---	90	80-120%	---	---	
1,2-Dibromoethane (EDB)	19.6	---	0.500	ug/L	1	20.0	---	98	80-120%	---	---	
Dibromomethane	19.7	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
1,2-Dichlorobenzene	19.4	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	

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ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0660 - EPA 5030C						Water						
LCS (23C0660-BS1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 12:18									
1,3-Dichlorobenzene	19.7	---	0.500	ug/L	1	20.0	---	99	80-120%	---	---	
1,4-Dichlorobenzene	18.2	---	0.500	ug/L	1	20.0	---	91	80-120%	---	---	
Dichlorodifluoromethane	7.08	---	1.00	ug/L	1	20.0	---	35	80-120%	---	---	Q-55
1,1-Dichloroethane	20.3	---	0.400	ug/L	1	20.0	---	101	80-120%	---	---	
1,2-Dichloroethane (EDC)	19.2	---	0.400	ug/L	1	20.0	---	96	80-120%	---	---	
1,1-Dichloroethene	19.0	---	0.400	ug/L	1	20.0	---	95	80-120%	---	---	
cis-1,2-Dichloroethene	18.9	---	0.400	ug/L	1	20.0	---	95	80-120%	---	---	
trans-1,2-Dichloroethene	19.6	---	0.400	ug/L	1	20.0	---	98	80-120%	---	---	
1,2-Dichloropropane	20.3	---	0.500	ug/L	1	20.0	---	101	80-120%	---	---	
1,3-Dichloropropane	20.1	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
2,2-Dichloropropane	20.7	---	1.00	ug/L	1	20.0	---	104	80-120%	---	---	
1,1-Dichloropropene	19.6	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
cis-1,3-Dichloropropene	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
trans-1,3-Dichloropropene	22.3	---	1.00	ug/L	1	20.0	---	112	80-120%	---	---	
Hexachlorobutadiene	17.9	---	5.00	ug/L	1	20.0	---	90	80-120%	---	---	
Methylene chloride	19.2	---	10.0	ug/L	1	20.0	---	96	80-120%	---	---	
1,1,1,2-Tetrachloroethane	18.1	---	0.400	ug/L	1	20.0	---	90	80-120%	---	---	
1,1,2,2-Tetrachloroethane	20.6	---	0.500	ug/L	1	20.0	---	103	80-120%	---	---	
Tetrachloroethene (PCE)	18.6	---	0.400	ug/L	1	20.0	---	93	80-120%	---	---	
1,2,3-Trichlorobenzene	19.9	---	2.00	ug/L	1	20.0	---	100	80-120%	---	---	
1,1,2-Trichloroethane	19.4	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
1,2,4-Trichlorobenzene	19.0	---	2.00	ug/L	1	20.0	---	95	80-120%	---	---	
1,1,1-Trichloroethane	18.7	---	0.400	ug/L	1	20.0	---	94	80-120%	---	---	
Trichloroethene (TCE)	18.4	---	0.400	ug/L	1	20.0	---	92	80-120%	---	---	
Trichlorofluoromethane	17.7	---	2.00	ug/L	1	20.0	---	88	80-120%	---	---	
1,2,3-Trichloropropane	19.9	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
Vinyl chloride	15.9	---	0.400	ug/L	1	20.0	---	80	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 102 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>96 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0660-DUP1)						Prepared: 03/17/23 06:34 Analyzed: 03/17/23 15:03						
QC Source Sample: Non-SDG (A3C0657-01)												
Bromobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0660 - EPA 5030C						Water						
Duplicate (23C0660-DUP1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 15:03									
QC Source Sample: Non-SDG (A3C0657-01)												
Bromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromoform	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromomethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Chloroethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Chloroform	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chloromethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dibromomethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Methylene chloride	ND	---	10.0	ug/L	1	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0660 - EPA 5030C						Water						
Duplicate (23C0660-DUP1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 15:03									
QC Source Sample: Non-SDG (A3C0657-01)												
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 102 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0660-MS1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 16:10									
QC Source Sample: Non-SDG (A3C0478-04)												
EPA 8260D												
Bromobenzene	19.2	---	0.500	ug/L	1	20.0	ND	96	80-120%	---	---	
Bromochloromethane	28.4	---	1.00	ug/L	1	20.0	ND	142	78-123%	---	---	Q-01
Bromodichloromethane	26.2	---	1.00	ug/L	1	20.0	ND	131	79-125%	---	---	Q-01
Bromoform	21.1	---	1.00	ug/L	1	20.0	ND	105	66-130%	---	---	
Bromomethane	24.5	---	5.00	ug/L	1	20.0	ND	123	53-141%	---	---	
Carbon tetrachloride	25.1	---	1.00	ug/L	1	20.0	ND	125	72-136%	---	---	
Chlorobenzene	20.8	---	0.500	ug/L	1	20.0	ND	104	80-120%	---	---	
Chloroethane	25.8	---	5.00	ug/L	1	20.0	ND	129	60-138%	---	---	
Chloroform	24.2	---	1.00	ug/L	1	20.0	ND	121	79-124%	---	---	
Chloromethane	17.4	---	5.00	ug/L	1	20.0	ND	87	50-139%	---	---	Q-54e
2-Chlorotoluene	21.3	---	1.00	ug/L	1	20.0	ND	106	79-122%	---	---	
4-Chlorotoluene	22.8	---	1.00	ug/L	1	20.0	ND	114	78-122%	---	---	
Dibromochloromethane	21.2	---	1.00	ug/L	1	20.0	ND	106	74-126%	---	---	
1,2-Dibromo-3-chloropropane	18.4	---	5.00	ug/L	1	20.0	ND	92	62-128%	---	---	
1,2-Dibromoethane (EDB)	20.7	---	0.500	ug/L	1	20.0	ND	104	77-121%	---	---	
Dibromomethane	24.3	---	1.00	ug/L	1	20.0	ND	121	79-123%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0660 - EPA 5030C						Water						
Matrix Spike (23C0660-MS1)			Prepared: 03/17/23 06:34 Analyzed: 03/17/23 16:10									
QC Source Sample: Non-SDG (A3C0478-04)												
1,2-Dichlorobenzene	20.8	---	0.500	ug/L	1	20.0	ND	104	80-120%	---	---	
1,3-Dichlorobenzene	21.4	---	0.500	ug/L	1	20.0	ND	107	80-120%	---	---	
1,4-Dichlorobenzene	19.8	---	0.500	ug/L	1	20.0	ND	99	79-120%	---	---	
Dichlorodifluoromethane	10.4	---	1.00	ug/L	1	20.0	ND	52	32-152%	---	---	Q-54j
1,1-Dichloroethane	25.7	---	0.400	ug/L	1	20.0	ND	128	77-125%	---	---	Q-01
1,2-Dichloroethane (EDC)	19.3	---	0.400	ug/L	1	20.0	ND	96	73-128%	---	---	
1,1-Dichloroethene	25.9	---	0.400	ug/L	1	20.0	ND	130	71-131%	---	---	
cis-1,2-Dichloroethene	25.2	---	0.400	ug/L	1	20.0	ND	126	78-123%	---	---	Q-01
trans-1,2-Dichloroethene	25.0	---	0.400	ug/L	1	20.0	ND	125	75-124%	---	---	Q-01
1,2-Dichloropropane	25.0	---	0.500	ug/L	1	20.0	ND	125	78-122%	---	---	Q-01
1,3-Dichloropropane	21.4	---	1.00	ug/L	1	20.0	ND	107	80-120%	---	---	
2,2-Dichloropropane	27.8	---	1.00	ug/L	1	20.0	ND	139	60-139%	---	---	
1,1-Dichloropropene	21.3	---	1.00	ug/L	1	20.0	ND	107	79-125%	---	---	
cis-1,3-Dichloropropene	20.3	---	1.00	ug/L	1	20.0	ND	101	75-124%	---	---	
trans-1,3-Dichloropropene	23.4	---	1.00	ug/L	1	20.0	ND	117	73-127%	---	---	
Hexachlorobutadiene	20.2	---	5.00	ug/L	1	20.0	ND	101	66-134%	---	---	
Methylene chloride	23.4	---	10.0	ug/L	1	20.0	ND	117	74-124%	---	---	
1,1,1,2-Tetrachloroethane	20.0	---	0.400	ug/L	1	20.0	ND	100	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	22.2	---	0.500	ug/L	1	20.0	ND	111	71-121%	---	---	
Tetrachloroethene (PCE)	22.1	---	0.400	ug/L	1	20.0	ND	110	74-129%	---	---	
1,2,3-Trichlorobenzene	20.8	---	2.00	ug/L	1	20.0	ND	104	69-129%	---	---	
1,1,2-Trichloroethane	20.8	---	0.500	ug/L	1	20.0	ND	104	80-120%	---	---	
1,2,4-Trichlorobenzene	19.8	---	2.00	ug/L	1	20.0	ND	99	69-130%	---	---	
1,1,1-Trichloroethane	22.4	---	0.400	ug/L	1	20.0	ND	112	74-131%	---	---	
Trichloroethene (TCE)	22.2	---	0.400	ug/L	1	20.0	ND	111	79-123%	---	---	
Trichlorofluoromethane	25.8	---	2.00	ug/L	1	20.0	ND	129	65-141%	---	---	
1,2,3-Trichloropropane	20.4	---	1.00	ug/L	1	20.0	ND	102	73-122%	---	---	
Vinyl chloride	21.3	---	0.400	ug/L	1	20.0	ND	107	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 107 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0661 - EPA 5030C						Water						
Blank (23C0661-BLK1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 01:50									
<u>EPA 8260D</u>												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

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ANALYTICAL REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0661 - EPA 5030C						Water						
Blank (23C0661-BLK1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 01:50									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0661-BS1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 01:05									
EPA 8260D												
Bromobenzene	19.3	---	0.500	ug/L	1	20.0	---	96	80-120%	---	---	
Bromochloromethane	24.6	---	1.00	ug/L	1	20.0	---	123	80-120%	---	---	Q-56
Bromodichloromethane	18.0	---	1.00	ug/L	1	20.0	---	90	80-120%	---	---	
Bromoform	21.5	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
Bromomethane	18.0	---	5.00	ug/L	1	20.0	---	90	80-120%	---	---	
Carbon tetrachloride	22.0	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
Chlorobenzene	20.4	---	0.500	ug/L	1	20.0	---	102	80-120%	---	---	
Chloroethane	23.2	---	5.00	ug/L	1	20.0	---	116	80-120%	---	---	
Chloroform	20.3	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
Chloromethane	13.6	---	5.00	ug/L	1	20.0	---	68	80-120%	---	---	Q-55
2-Chlorotoluene	20.3	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
4-Chlorotoluene	21.7	---	1.00	ug/L	1	20.0	---	108	80-120%	---	---	
Dibromochloromethane	21.5	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
1,2-Dibromo-3-chloropropane	19.9	---	5.00	ug/L	1	20.0	---	100	80-120%	---	---	
1,2-Dibromoethane (EDB)	21.4	---	0.500	ug/L	1	20.0	---	107	80-120%	---	---	
Dibromomethane	17.7	---	1.00	ug/L	1	20.0	---	89	80-120%	---	---	
1,2-Dichlorobenzene	20.4	---	0.500	ug/L	1	20.0	---	102	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0661 - EPA 5030C						Water						
LCS (23C0661-BS1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 01:05									
1,3-Dichlorobenzene	20.7	---	0.500	ug/L	1	20.0	---	104	80-120%	---	---	
1,4-Dichlorobenzene	19.5	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
Dichlorodifluoromethane	9.66	---	1.00	ug/L	1	20.0	---	48	80-120%	---	---	Q-55
1,1-Dichloroethane	21.4	---	0.400	ug/L	1	20.0	---	107	80-120%	---	---	
1,2-Dichloroethane (EDC)	21.6	---	0.400	ug/L	1	20.0	---	108	80-120%	---	---	
1,1-Dichloroethene	20.7	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
cis-1,2-Dichloroethene	21.3	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
trans-1,2-Dichloroethene	20.5	---	0.400	ug/L	1	20.0	---	102	80-120%	---	---	
1,2-Dichloropropane	15.1	---	0.500	ug/L	1	20.0	---	76	80-120%	---	---	Q-55
1,3-Dichloropropane	21.4	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
2,2-Dichloropropane	18.5	---	1.00	ug/L	1	20.0	---	92	80-120%	---	---	
1,1-Dichloropropene	21.6	---	1.00	ug/L	1	20.0	---	108	80-120%	---	---	
cis-1,3-Dichloropropene	20.0	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
trans-1,3-Dichloropropene	22.9	---	1.00	ug/L	1	20.0	---	114	80-120%	---	---	
Hexachlorobutadiene	19.7	---	5.00	ug/L	1	20.0	---	98	80-120%	---	---	
Methylene chloride	19.9	---	10.0	ug/L	1	20.0	---	100	80-120%	---	---	
1,1,1,2-Tetrachloroethane	19.8	---	0.400	ug/L	1	20.0	---	99	80-120%	---	---	
1,1,2,2-Tetrachloroethane	22.6	---	0.500	ug/L	1	20.0	---	113	80-120%	---	---	
Tetrachloroethene (PCE)	20.7	---	0.400	ug/L	1	20.0	---	103	80-120%	---	---	
1,2,3-Trichlorobenzene	21.4	---	2.00	ug/L	1	20.0	---	107	80-120%	---	---	
1,1,2-Trichloroethane	21.2	---	0.500	ug/L	1	20.0	---	106	80-120%	---	---	
1,2,4-Trichlorobenzene	19.6	---	2.00	ug/L	1	20.0	---	98	80-120%	---	---	
1,1,1-Trichloroethane	21.0	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
Trichloroethene (TCE)	19.2	---	0.400	ug/L	1	20.0	---	96	80-120%	---	---	
Trichlorofluoromethane	20.3	---	2.00	ug/L	1	20.0	---	102	80-120%	---	---	
1,2,3-Trichloropropane	21.8	---	1.00	ug/L	1	20.0	---	109	80-120%	---	---	
Vinyl chloride	17.6	---	0.400	ug/L	1	20.0	---	88	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0661-DUP1)						Prepared: 03/17/23 13:00 Analyzed: 03/18/23 06:17						
QC Source Sample: Non-SDG (A3C0512-11)												
Bromobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0661 - EPA 5030C						Water						
Duplicate (23C0661-DUP1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 06:17									
QC Source Sample: Non-SDG (A3C0512-11)												
Bromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromoform	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromomethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Chloroethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Chloroform	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chloromethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dibromomethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	2.53	---	0.400	ug/L	1	---	2.72	---	---	7	30%	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Methylene chloride	ND	---	10.0	ug/L	1	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0661 - EPA 5030C						Water						
Duplicate (23C0661-DUP1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 06:17									
QC Source Sample: Non-SDG (A3C0512-11)												
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	0.350	---	---	***	30%	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Vinyl chloride	0.860	---	0.400	ug/L	1	---	0.860	---	---	0	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0661-MS1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 09:38									
QC Source Sample: EW-1 (A3C0505-10)												
EPA 8260D												
Bromobenzene	18.1	---	0.500	ug/L	1	20.0	ND	90	80-120%	---	---	
Bromochloromethane	23.5	---	1.00	ug/L	1	20.0	ND	118	78-123%	---	---	Q-54c
Bromodichloromethane	20.5	---	1.00	ug/L	1	20.0	ND	103	79-125%	---	---	
Bromoform	20.1	---	1.00	ug/L	1	20.0	ND	100	66-130%	---	---	
Bromomethane	20.6	---	5.00	ug/L	1	20.0	ND	103	53-141%	---	---	
Carbon tetrachloride	22.5	---	1.00	ug/L	1	20.0	ND	112	72-136%	---	---	
Chlorobenzene	19.3	---	0.500	ug/L	1	20.0	ND	97	80-120%	---	---	
Chloroethane	22.1	---	5.00	ug/L	1	20.0	ND	110	60-138%	---	---	
Chloroform	20.9	---	1.00	ug/L	1	20.0	1.42	97	79-124%	---	---	
Chloromethane	14.8	---	5.00	ug/L	1	20.0	ND	74	50-139%	---	---	Q-54e
2-Chlorotoluene	19.6	---	1.00	ug/L	1	20.0	ND	98	79-122%	---	---	
4-Chlorotoluene	20.6	---	1.00	ug/L	1	20.0	ND	103	78-122%	---	---	
Dibromochloromethane	19.8	---	1.00	ug/L	1	20.0	ND	99	74-126%	---	---	
1,2-Dibromo-3-chloropropane	18.0	---	5.00	ug/L	1	20.0	ND	90	62-128%	---	---	
1,2-Dibromoethane (EDB)	19.1	---	0.500	ug/L	1	20.0	ND	96	77-121%	---	---	
Dibromomethane	19.2	---	1.00	ug/L	1	20.0	ND	96	79-123%	---	---	

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ANALYTICAL REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0661 - EPA 5030C						Water						
Matrix Spike (23C0661-MS1)			Prepared: 03/17/23 13:00 Analyzed: 03/18/23 09:38									
QC Source Sample: EW-1 (A3C0505-10)												
1,2-Dichlorobenzene	19.5	---	0.500	ug/L	1	20.0	ND	97	80-120%	---	---	
1,3-Dichlorobenzene	19.8	---	0.500	ug/L	1	20.0	ND	99	80-120%	---	---	
1,4-Dichlorobenzene	18.5	---	0.500	ug/L	1	20.0	ND	93	79-120%	---	---	
Dichlorodifluoromethane	9.87	---	1.00	ug/L	1	20.0	ND	49	32-152%	---	---	Q-54h
1,1-Dichloroethane	21.0	---	0.400	ug/L	1	20.0	ND	105	77-125%	---	---	
1,2-Dichloroethane (EDC)	20.8	---	0.400	ug/L	1	20.0	ND	104	73-128%	---	---	
1,1-Dichloroethene	20.8	---	0.400	ug/L	1	20.0	ND	104	71-131%	---	---	
cis-1,2-Dichloroethene	20.9	---	0.400	ug/L	1	20.0	0.920	100	78-123%	---	---	
trans-1,2-Dichloroethene	20.1	---	0.400	ug/L	1	20.0	ND	101	75-124%	---	---	
1,2-Dichloropropane	19.1	---	0.500	ug/L	1	20.0	ND	95	78-122%	---	---	Q-54i
1,3-Dichloropropane	19.5	---	1.00	ug/L	1	20.0	ND	97	80-120%	---	---	
2,2-Dichloropropane	15.6	---	1.00	ug/L	1	20.0	ND	78	60-139%	---	---	
1,1-Dichloropropene	20.8	---	1.00	ug/L	1	20.0	ND	104	79-125%	---	---	
cis-1,3-Dichloropropene	16.7	---	1.00	ug/L	1	20.0	ND	84	75-124%	---	---	
trans-1,3-Dichloropropene	20.3	---	1.00	ug/L	1	20.0	ND	102	73-127%	---	---	
Hexachlorobutadiene	18.6	---	5.00	ug/L	1	20.0	ND	93	66-134%	---	---	
Methylene chloride	19.0	---	10.0	ug/L	1	20.0	ND	95	74-124%	---	---	
1,1,1,2-Tetrachloroethane	18.7	---	0.400	ug/L	1	20.0	ND	93	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	21.0	---	0.500	ug/L	1	20.0	ND	105	71-121%	---	---	
Tetrachloroethene (PCE)	45.7	---	0.400	ug/L	1	20.0	26.9	94	74-129%	---	---	
1,2,3-Trichlorobenzene	19.4	---	2.00	ug/L	1	20.0	ND	97	69-129%	---	---	
1,1,2-Trichloroethane	19.6	---	0.500	ug/L	1	20.0	ND	98	80-120%	---	---	
1,2,4-Trichlorobenzene	18.1	---	2.00	ug/L	1	20.0	ND	90	69-130%	---	---	
1,1,1-Trichloroethane	21.6	---	0.400	ug/L	1	20.0	0.590	105	74-131%	---	---	
Trichloroethene (TCE)	25.6	---	0.400	ug/L	1	20.0	7.84	89	79-123%	---	---	
Trichlorofluoromethane	21.2	---	2.00	ug/L	1	20.0	ND	106	65-141%	---	---	
1,2,3-Trichloropropane	19.8	---	1.00	ug/L	1	20.0	ND	99	73-122%	---	---	
Vinyl chloride	18.4	---	0.400	ug/L	1	20.0	ND	92	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 97 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Blank (23C0768-BLK1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 00:41									
<u>EPA 8260D</u>												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	Q-54g
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Blank (23C0768-BLK1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 00:41									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0768-BS1)			Prepared: 03/20/23 15:48 Analyzed: 03/20/23 23:57									
EPA 8260D												
Bromobenzene	17.8	---	0.500	ug/L	1	20.0	---	89	80-120%	---	---	
Bromochloromethane	24.8	---	1.00	ug/L	1	20.0	---	124	80-120%	---	---	Q-56
Bromodichloromethane	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Bromoform	19.4	---	1.00	ug/L	1	20.0	---	97	80-120%	---	---	
Bromomethane	22.0	---	5.00	ug/L	1	20.0	---	110	80-120%	---	---	
Carbon tetrachloride	20.7	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
Chlorobenzene	19.0	---	0.500	ug/L	1	20.0	---	95	80-120%	---	---	
Chloroethane	27.3	---	5.00	ug/L	1	20.0	---	136	80-120%	---	---	Q-56
Chloroform	19.7	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
Chloromethane	12.7	---	5.00	ug/L	1	20.0	---	63	80-120%	---	---	Q-54
2-Chlorotoluene	19.6	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
4-Chlorotoluene	20.7	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
Dibromochloromethane	19.5	---	1.00	ug/L	1	20.0	---	97	80-120%	---	---	
1,2-Dibromo-3-chloropropane	18.1	---	5.00	ug/L	1	20.0	---	90	80-120%	---	---	
1,2-Dibromoethane (EDB)	19.6	---	0.500	ug/L	1	20.0	---	98	80-120%	---	---	
Dibromomethane	20.1	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
1,2-Dichlorobenzene	18.9	---	0.500	ug/L	1	20.0	---	94	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
LCS (23C0768-BS1)			Prepared: 03/20/23 15:48 Analyzed: 03/20/23 23:57									
1,3-Dichlorobenzene	19.4	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
1,4-Dichlorobenzene	17.9	---	0.500	ug/L	1	20.0	---	90	80-120%	---	---	
Dichlorodifluoromethane	18.5	---	1.00	ug/L	1	20.0	---	93	80-120%	---	---	
1,1-Dichloroethane	21.2	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
1,2-Dichloroethane (EDC)	21.3	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
1,1-Dichloroethene	21.3	---	0.400	ug/L	1	20.0	---	107	80-120%	---	---	
cis-1,2-Dichloroethene	21.2	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
trans-1,2-Dichloroethene	20.9	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
1,2-Dichloropropane	20.6	---	0.500	ug/L	1	20.0	---	103	80-120%	---	---	
1,3-Dichloropropane	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
2,2-Dichloropropane	20.0	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
1,1-Dichloropropene	21.3	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
cis-1,3-Dichloropropene	21.1	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
trans-1,3-Dichloropropene	22.1	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
Hexachlorobutadiene	17.0	---	5.00	ug/L	1	20.0	---	85	80-120%	---	---	
Methylene chloride	19.9	---	10.0	ug/L	1	20.0	---	99	80-120%	---	---	
1,1,1,2-Tetrachloroethane	18.5	---	0.400	ug/L	1	20.0	---	93	80-120%	---	---	
1,1,2,2-Tetrachloroethane	20.9	---	0.500	ug/L	1	20.0	---	105	80-120%	---	---	
Tetrachloroethene (PCE)	19.1	---	0.400	ug/L	1	20.0	---	96	80-120%	---	---	
1,2,3-Trichlorobenzene	19.4	---	2.00	ug/L	1	20.0	---	97	80-120%	---	---	
1,1,2-Trichloroethane	19.2	---	0.500	ug/L	1	20.0	---	96	80-120%	---	---	
1,2,4-Trichlorobenzene	18.2	---	2.00	ug/L	1	20.0	---	91	80-120%	---	---	
1,1,1-Trichloroethane	20.1	---	0.400	ug/L	1	20.0	---	101	80-120%	---	---	
Trichloroethene (TCE)	18.7	---	0.400	ug/L	1	20.0	---	93	80-120%	---	---	
Trichlorofluoromethane	21.2	---	2.00	ug/L	1	20.0	---	106	80-120%	---	---	
1,2,3-Trichloropropane	19.7	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
Vinyl chloride	20.7	---	0.400	ug/L	1	20.0	---	103	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0768-DUP1)						Prepared: 03/20/23 15:48 Analyzed: 03/21/23 08:29						
QC Source Sample: Non-SDG (A3C0576-06)												
Bromobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Duplicate (23C0768-DUP1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 08:29									
QC Source Sample: Non-SDG (A3C0576-06)												
Bromochloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromoform	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromomethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Chloroethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Chloroform	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Chloromethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	Q-54g
2-Chlorotoluene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Dibromomethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloroethane	3.10	---	2.00	ug/L	5	---	2.70	---	---	14	30%	
1,2-Dichloroethane (EDC)	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	41.2	---	2.00	ug/L	5	---	35.9	---	---	14	30%	
trans-1,2-Dichloroethene	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Methylene chloride	ND	---	50.0	ug/L	5	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	

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ANALYTICAL REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Duplicate (23C0768-DUP1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 08:29									
QC Source Sample: Non-SDG (A3C0576-06)												
1,1,2,2-Tetrachloroethane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	185	---	2.00	ug/L	5	---	161	---	---	14	30%	
1,2,3-Trichlorobenzene	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	2.00	ug/L	5	---	1.55	---	---	***	30%	
Trichloroethene (TCE)	233	---	2.00	ug/L	5	---	203	---	---	14	30%	
Trichlorofluoromethane	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 108 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0768-MS1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 09:58									
QC Source Sample: Non-SDG (A3C0565-09RE1)												
EPA 8260D												
Bromobenzene	19.0	---	0.500	ug/L	1	20.0	ND	95	80-120%	---	---	
Bromochloromethane	27.7	---	1.00	ug/L	1	20.0	ND	139	78-123%	---	---	Q-54d
Bromodichloromethane	23.3	---	1.00	ug/L	1	20.0	ND	116	79-125%	---	---	
Bromoform	21.2	---	1.00	ug/L	1	20.0	ND	106	66-130%	---	---	
Bromomethane	27.1	---	5.00	ug/L	1	20.0	ND	135	53-141%	---	---	
Carbon tetrachloride	25.5	---	1.00	ug/L	1	20.0	ND	127	72-136%	---	---	
Chlorobenzene	21.0	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
Chloroethane	30.2	---	5.00	ug/L	1	20.0	ND	151	60-138%	---	---	Q-54b
Chloroform	22.0	---	1.00	ug/L	1	20.0	ND	110	79-124%	---	---	
Chloromethane	16.5	---	5.00	ug/L	1	20.0	ND	82	50-139%	---	---	Q-54g
2-Chlorotoluene	21.0	---	1.00	ug/L	1	20.0	ND	105	79-122%	---	---	
4-Chlorotoluene	22.3	---	1.00	ug/L	1	20.0	ND	111	78-122%	---	---	
Dibromochloromethane	21.2	---	1.00	ug/L	1	20.0	ND	106	74-126%	---	---	
1,2-Dibromo-3-chloropropane	19.7	---	5.00	ug/L	1	20.0	ND	99	62-128%	---	---	
1,2-Dibromoethane (EDB)	20.6	---	0.500	ug/L	1	20.0	ND	103	77-121%	---	---	
Dibromomethane	21.9	---	1.00	ug/L	1	20.0	ND	110	79-123%	---	---	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Matrix Spike (23C0768-MS1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 09:58									
QC Source Sample: Non-SDG (A3C0565-09RE1)												
1,2-Dichlorobenzene	20.4	---	0.500	ug/L	1	20.0	ND	102	80-120%	---	---	
1,3-Dichlorobenzene	21.0	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
1,4-Dichlorobenzene	19.5	---	0.500	ug/L	1	20.0	ND	98	79-120%	---	---	
Dichlorodifluoromethane	24.3	---	1.00	ug/L	1	20.0	ND	121	32-152%	---	---	
1,1-Dichloroethane	24.3	---	0.400	ug/L	1	20.0	ND	122	77-125%	---	---	
1,2-Dichloroethane (EDC)	23.8	---	0.400	ug/L	1	20.0	ND	119	73-128%	---	---	
1,1-Dichloroethene	25.6	---	0.400	ug/L	1	20.0	ND	128	71-131%	---	---	
cis-1,2-Dichloroethene	23.1	---	0.400	ug/L	1	20.0	ND	115	78-123%	---	---	
trans-1,2-Dichloroethene	23.3	---	0.400	ug/L	1	20.0	ND	117	75-124%	---	---	
1,2-Dichloropropane	22.8	---	0.500	ug/L	1	20.0	ND	114	78-122%	---	---	
1,3-Dichloropropane	21.9	---	1.00	ug/L	1	20.0	ND	109	80-120%	---	---	
2,2-Dichloropropane	19.2	---	1.00	ug/L	1	20.0	ND	96	60-139%	---	---	
1,1-Dichloropropene	24.4	---	1.00	ug/L	1	20.0	ND	122	79-125%	---	---	
cis-1,3-Dichloropropene	19.3	---	1.00	ug/L	1	20.0	ND	97	75-124%	---	---	
trans-1,3-Dichloropropene	23.3	---	1.00	ug/L	1	20.0	ND	116	73-127%	---	---	
Hexachlorobutadiene	19.8	---	5.00	ug/L	1	20.0	ND	99	66-134%	---	---	
Methylene chloride	21.7	---	10.0	ug/L	1	20.0	ND	108	74-124%	---	---	
1,1,1,2-Tetrachloroethane	20.1	---	0.400	ug/L	1	20.0	ND	101	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	23.1	---	0.500	ug/L	1	20.0	ND	115	71-121%	---	---	
Tetrachloroethene (PCE)	21.6	---	0.400	ug/L	1	20.0	ND	108	74-129%	---	---	
1,2,3-Trichlorobenzene	20.6	---	2.00	ug/L	1	20.0	ND	103	69-129%	---	---	
1,1,2-Trichloroethane	21.0	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
1,2,4-Trichlorobenzene	19.2	---	2.00	ug/L	1	20.0	ND	96	69-130%	---	---	
1,1,1-Trichloroethane	23.6	---	0.400	ug/L	1	20.0	ND	118	74-131%	---	---	
Trichloroethene (TCE)	20.8	---	0.400	ug/L	1	20.0	ND	104	79-123%	---	---	
Trichlorofluoromethane	27.0	---	2.00	ug/L	1	20.0	ND	135	65-141%	---	---	
1,2,3-Trichloropropane	21.4	---	1.00	ug/L	1	20.0	ND	107	73-122%	---	---	
Vinyl chloride	25.4	---	0.400	ug/L	1	20.0	ND	127	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>91 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike Dup (23C0768-MSD1)	Prepared: 03/20/23 15:48 Analyzed: 03/21/23 10:21
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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Matrix Spike Dup (23C0768-MSD1)						Prepared: 03/20/23 15:48 Analyzed: 03/21/23 10:21						
QC Source Sample: Non-SDG (A3C0565-09RE1)												
Bromobenzene	20.1	---	0.500	ug/L	1	20.0	ND	100	80-120%	5	30%	
Bromochloromethane	28.8	---	1.00	ug/L	1	20.0	ND	144	78-123%	4	30%	Q-54d
Bromodichloromethane	24.0	---	1.00	ug/L	1	20.0	ND	120	79-125%	3	30%	
Bromoform	21.7	---	1.00	ug/L	1	20.0	ND	109	66-130%	3	30%	
Bromomethane	25.6	---	5.00	ug/L	1	20.0	ND	128	53-141%	6	30%	
Carbon tetrachloride	26.1	---	1.00	ug/L	1	20.0	ND	130	72-136%	2	30%	
Chlorobenzene	21.8	---	0.500	ug/L	1	20.0	ND	109	80-120%	4	30%	
Chloroethane	30.6	---	5.00	ug/L	1	20.0	ND	153	60-138%	1	30%	Q-54b
Chloroform	22.8	---	1.00	ug/L	1	20.0	ND	114	79-124%	3	30%	
Chloromethane	17.7	---	5.00	ug/L	1	20.0	ND	88	50-139%	7	30%	Q-54g
2-Chlorotoluene	22.2	---	1.00	ug/L	1	20.0	ND	111	79-122%	6	30%	
4-Chlorotoluene	24.0	---	1.00	ug/L	1	20.0	ND	120	78-122%	7	30%	
Dibromochloromethane	22.3	---	1.00	ug/L	1	20.0	ND	112	74-126%	5	30%	
1,2-Dibromo-3-chloropropane	20.2	---	5.00	ug/L	1	20.0	ND	101	62-128%	2	30%	
1,2-Dibromoethane (EDB)	21.8	---	0.500	ug/L	1	20.0	ND	109	77-121%	6	30%	
Dibromomethane	22.8	---	1.00	ug/L	1	20.0	ND	114	79-123%	4	30%	
1,2-Dichlorobenzene	21.9	---	0.500	ug/L	1	20.0	ND	109	80-120%	7	30%	
1,3-Dichlorobenzene	22.2	---	0.500	ug/L	1	20.0	ND	111	80-120%	6	30%	
1,4-Dichlorobenzene	20.7	---	0.500	ug/L	1	20.0	ND	104	79-120%	6	30%	
Dichlorodifluoromethane	25.1	---	1.00	ug/L	1	20.0	ND	126	32-152%	4	30%	
1,1-Dichloroethane	25.3	---	0.400	ug/L	1	20.0	ND	126	77-125%	4	30%	Q-01
1,2-Dichloroethane (EDC)	24.6	---	0.400	ug/L	1	20.0	ND	123	73-128%	4	30%	
1,1-Dichloroethene	26.9	---	0.400	ug/L	1	20.0	ND	134	71-131%	5	30%	Q-01
cis-1,2-Dichloroethene	24.2	---	0.400	ug/L	1	20.0	ND	121	78-123%	5	30%	
trans-1,2-Dichloroethene	24.8	---	0.400	ug/L	1	20.0	ND	124	75-124%	6	30%	
1,2-Dichloropropane	23.9	---	0.500	ug/L	1	20.0	ND	120	78-122%	5	30%	
1,3-Dichloropropane	23.3	---	1.00	ug/L	1	20.0	ND	116	80-120%	6	30%	
2,2-Dichloropropane	20.0	---	1.00	ug/L	1	20.0	ND	100	60-139%	4	30%	
1,1-Dichloropropene	26.1	---	1.00	ug/L	1	20.0	ND	130	79-125%	7	30%	Q-01
cis-1,3-Dichloropropene	20.8	---	1.00	ug/L	1	20.0	ND	104	75-124%	7	30%	
trans-1,3-Dichloropropene	24.7	---	1.00	ug/L	1	20.0	ND	123	73-127%	6	30%	
Hexachlorobutadiene	21.5	---	5.00	ug/L	1	20.0	ND	108	66-134%	8	30%	
Methylene chloride	22.5	---	10.0	ug/L	1	20.0	ND	112	74-124%	3	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Matrix Spike Dup (23C0768-MSD1)						Prepared: 03/20/23 15:48 Analyzed: 03/21/23 10:21						
QC Source Sample: Non-SDG (A3C0565-09RE1)												
1,1,1,2-Tetrachloroethane	20.9	---	0.400	ug/L	1	20.0	ND	105	78-124%	4	30%	
1,1,2,2-Tetrachloroethane	24.1	---	0.500	ug/L	1	20.0	ND	121	71-121%	5	30%	
Tetrachloroethene (PCE)	22.5	---	0.400	ug/L	1	20.0	ND	113	74-129%	4	30%	
1,2,3-Trichlorobenzene	22.7	---	2.00	ug/L	1	20.0	ND	113	69-129%	9	30%	
1,1,2-Trichloroethane	21.7	---	0.500	ug/L	1	20.0	ND	109	80-120%	4	30%	
1,2,4-Trichlorobenzene	20.7	---	2.00	ug/L	1	20.0	ND	103	69-130%	7	30%	
1,1,1-Trichloroethane	24.6	---	0.400	ug/L	1	20.0	ND	123	74-131%	4	30%	
Trichloroethene (TCE)	21.4	---	0.400	ug/L	1	20.0	ND	107	79-123%	3	30%	
Trichlorofluoromethane	27.9	---	2.00	ug/L	1	20.0	ND	140	65-141%	3	30%	
1,2,3-Trichloropropane	22.4	---	1.00	ug/L	1	20.0	ND	112	73-122%	5	30%	
Vinyl chloride	27.2	---	0.400	ug/L	1	20.0	ND	136	58-137%	7	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>93 %</i>		<i>80-120 %</i>		<i>"</i>						

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Blank (23C0785-BLK1)			Prepared: 03/22/23 14:00 Analyzed: 03/22/23 23:45									
<u>EPA 8260D</u>												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

Q-54f

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Blank (23C0785-BLK1)			Prepared: 03/22/23 14:00 Analyzed: 03/22/23 23:45									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0785-BS1)			Prepared: 03/22/23 14:00 Analyzed: 03/22/23 22:39									
EPA 8260D												
Bromobenzene	18.3	---	0.500	ug/L	1	20.0	---	92	80-120%	---	---	
Bromochloromethane	24.8	---	1.00	ug/L	1	20.0	---	124	80-120%	---	---	Q-56
Bromodichloromethane	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Bromoform	19.9	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
Bromomethane	22.1	---	5.00	ug/L	1	20.0	---	110	80-120%	---	---	
Carbon tetrachloride	21.1	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Chlorobenzene	19.5	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
Chloroethane	26.1	---	5.00	ug/L	1	20.0	---	130	80-120%	---	---	Q-56
Chloroform	19.7	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
Chloromethane	12.8	---	5.00	ug/L	1	20.0	---	64	80-120%	---	---	Q-54f
2-Chlorotoluene	19.9	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
4-Chlorotoluene	21.4	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
Dibromochloromethane	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
1,2-Dibromo-3-chloropropane	19.0	---	5.00	ug/L	1	20.0	---	95	80-120%	---	---	
1,2-Dibromoethane (EDB)	20.4	---	0.500	ug/L	1	20.0	---	102	80-120%	---	---	
Dibromomethane	20.6	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
1,2-Dichlorobenzene	19.6	---	0.500	ug/L	1	20.0	---	98	80-120%	---	---	

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ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
LCS (23C0785-BS1)			Prepared: 03/22/23 14:00 Analyzed: 03/22/23 22:39									
1,3-Dichlorobenzene	20.0	---	0.500	ug/L	1	20.0	---	100	80-120%	---	---	
1,4-Dichlorobenzene	18.5	---	0.500	ug/L	1	20.0	---	92	80-120%	---	---	
Dichlorodifluoromethane	18.1	---	1.00	ug/L	1	20.0	---	90	80-120%	---	---	
1,1-Dichloroethane	21.5	---	0.400	ug/L	1	20.0	---	108	80-120%	---	---	
1,2-Dichloroethane (EDC)	21.9	---	0.400	ug/L	1	20.0	---	109	80-120%	---	---	
1,1-Dichloroethene	21.9	---	0.400	ug/L	1	20.0	---	109	80-120%	---	---	
cis-1,2-Dichloroethene	21.6	---	0.400	ug/L	1	20.0	---	108	80-120%	---	---	
trans-1,2-Dichloroethene	21.2	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
1,2-Dichloropropane	21.1	---	0.500	ug/L	1	20.0	---	105	80-120%	---	---	
1,3-Dichloropropane	21.3	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
2,2-Dichloropropane	20.5	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
1,1-Dichloropropene	21.8	---	1.00	ug/L	1	20.0	---	109	80-120%	---	---	
cis-1,3-Dichloropropene	22.0	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
trans-1,3-Dichloropropene	22.9	---	1.00	ug/L	1	20.0	---	115	80-120%	---	---	
Hexachlorobutadiene	19.4	---	5.00	ug/L	1	20.0	---	97	80-120%	---	---	
Methylene chloride	19.7	---	10.0	ug/L	1	20.0	---	98	80-120%	---	---	
1,1,1,2-Tetrachloroethane	18.8	---	0.400	ug/L	1	20.0	---	94	80-120%	---	---	
1,1,2,2-Tetrachloroethane	21.8	---	0.500	ug/L	1	20.0	---	109	80-120%	---	---	
Tetrachloroethene (PCE)	19.7	---	0.400	ug/L	1	20.0	---	99	80-120%	---	---	
1,2,3-Trichlorobenzene	20.6	---	2.00	ug/L	1	20.0	---	103	80-120%	---	---	
1,1,2-Trichloroethane	20.1	---	0.500	ug/L	1	20.0	---	101	80-120%	---	---	
1,2,4-Trichlorobenzene	19.3	---	2.00	ug/L	1	20.0	---	96	80-120%	---	---	
1,1,1-Trichloroethane	20.5	---	0.400	ug/L	1	20.0	---	102	80-120%	---	---	
Trichloroethene (TCE)	18.8	---	0.400	ug/L	1	20.0	---	94	80-120%	---	---	
Trichlorofluoromethane	22.1	---	2.00	ug/L	1	20.0	---	110	80-120%	---	---	
1,2,3-Trichloropropane	21.0	---	1.00	ug/L	1	20.0	---	105	80-120%	---	---	
Vinyl chloride	20.5	---	0.400	ug/L	1	20.0	---	102	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 97 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0785-DUP1)						Prepared: 03/22/23 14:00 Analyzed: 03/23/23 06:49						
QC Source Sample: Non-SDG (A3C0672-02)												
Bromobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Duplicate (23C0785-DUP1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 06:49									
QC Source Sample: Non-SDG (A3C0672-02)												
Bromochloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromoform	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromomethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Chlorobenzene	1650	---	10.0	ug/L	20	---	1590	---	---	4	30%	
Chloroethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Chloroform	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Chloromethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	Q-54f
2-Chlorotoluene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
Dibromomethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	10.0	ug/L	20	---	6.80	---	---	***	30%	
1,4-Dichlorobenzene	297	---	10.0	ug/L	20	---	287	---	---	3	30%	
Dichlorodifluoromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Methylene chloride	ND	---	200	ug/L	20	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Duplicate (23C0785-DUP1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 06:49									
QC Source Sample: Non-SDG (A3C0672-02)												
1,1,2,2-Tetrachloroethane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
Trichlorofluoromethane	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0785-MS1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:20									
QC Source Sample: Non-SDG (A3C0672-09)												
EPA 8260D												
Bromobenzene	18.0	---	0.500	ug/L	1	20.0	ND	90	80-120%	---	---	
Bromochloromethane	26.0	---	1.00	ug/L	1	20.0	ND	130	78-123%	---	---	Q-54d
Bromodichloromethane	22.3	---	1.00	ug/L	1	20.0	ND	112	79-125%	---	---	
Bromoform	20.3	---	1.00	ug/L	1	20.0	ND	101	66-130%	---	---	
Bromomethane	26.7	---	5.00	ug/L	1	20.0	ND	133	53-141%	---	---	
Carbon tetrachloride	24.2	---	1.00	ug/L	1	20.0	ND	121	72-136%	---	---	
Chlorobenzene	22.0	---	0.500	ug/L	1	20.0	2.24	99	80-120%	---	---	
Chloroethane	28.7	---	5.00	ug/L	1	20.0	ND	144	60-138%	---	---	Q-54a
Chloroform	20.8	---	1.00	ug/L	1	20.0	ND	104	79-124%	---	---	
Chloromethane	14.7	---	5.00	ug/L	1	20.0	ND	74	50-139%	---	---	Q-54f
2-Chlorotoluene	20.1	---	1.00	ug/L	1	20.0	ND	100	79-122%	---	---	
4-Chlorotoluene	21.3	---	1.00	ug/L	1	20.0	ND	106	78-122%	---	---	
Dibromochloromethane	20.6	---	1.00	ug/L	1	20.0	ND	103	74-126%	---	---	
1,2-Dibromo-3-chloropropane	17.9	---	5.00	ug/L	1	20.0	ND	90	62-128%	---	---	
1,2-Dibromoethane (EDB)	19.8	---	0.500	ug/L	1	20.0	ND	99	77-121%	---	---	
Dibromomethane	20.8	---	1.00	ug/L	1	20.0	ND	104	79-123%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	--	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Matrix Spike (23C0785-MS1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:20									
QC Source Sample: Non-SDG (A3C0672-09)												
1,2-Dichlorobenzene	19.4	---	0.500	ug/L	1	20.0	ND	97	80-120%	---	---	
1,3-Dichlorobenzene	20.1	---	0.500	ug/L	1	20.0	ND	100	80-120%	---	---	
1,4-Dichlorobenzene	18.6	---	0.500	ug/L	1	20.0	ND	93	79-120%	---	---	
Dichlorodifluoromethane	21.9	---	1.00	ug/L	1	20.0	ND	109	32-152%	---	---	
1,1-Dichloroethane	23.2	---	0.400	ug/L	1	20.0	ND	116	77-125%	---	---	
1,2-Dichloroethane (EDC)	22.7	---	0.400	ug/L	1	20.0	ND	113	73-128%	---	---	
1,1-Dichloroethene	24.5	---	0.400	ug/L	1	20.0	ND	122	71-131%	---	---	
cis-1,2-Dichloroethene	22.8	---	0.400	ug/L	1	20.0	0.890	109	78-123%	---	---	
trans-1,2-Dichloroethene	22.5	---	0.400	ug/L	1	20.0	ND	113	75-124%	---	---	
1,2-Dichloropropane	21.6	---	0.500	ug/L	1	20.0	ND	108	78-122%	---	---	
1,3-Dichloropropane	21.2	---	1.00	ug/L	1	20.0	ND	106	80-120%	---	---	
2,2-Dichloropropane	20.2	---	1.00	ug/L	1	20.0	ND	101	60-139%	---	---	
1,1-Dichloropropene	23.4	---	1.00	ug/L	1	20.0	ND	117	79-125%	---	---	
cis-1,3-Dichloropropene	18.9	---	1.00	ug/L	1	20.0	ND	94	75-124%	---	---	
trans-1,3-Dichloropropene	22.6	---	1.00	ug/L	1	20.0	ND	113	73-127%	---	---	
Hexachlorobutadiene	19.7	---	5.00	ug/L	1	20.0	ND	98	66-134%	---	---	
Methylene chloride	20.4	---	10.0	ug/L	1	20.0	ND	102	74-124%	---	---	
1,1,1,2-Tetrachloroethane	19.3	---	0.400	ug/L	1	20.0	ND	96	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	21.6	---	0.500	ug/L	1	20.0	ND	108	71-121%	---	---	
Tetrachloroethene (PCE)	22.1	---	0.400	ug/L	1	20.0	1.00	106	74-129%	---	---	
1,2,3-Trichlorobenzene	20.1	---	2.00	ug/L	1	20.0	ND	100	69-129%	---	---	
1,1,2-Trichloroethane	20.0	---	0.500	ug/L	1	20.0	ND	100	80-120%	---	---	
1,2,4-Trichlorobenzene	18.5	---	2.00	ug/L	1	20.0	ND	92	69-130%	---	---	
1,1,1-Trichloroethane	22.4	---	0.400	ug/L	1	20.0	ND	112	74-131%	---	---	
Trichloroethene (TCE)	19.7	---	0.400	ug/L	1	20.0	0.560	96	79-123%	---	---	
Trichlorofluoromethane	25.7	---	2.00	ug/L	1	20.0	ND	128	65-141%	---	---	
1,2,3-Trichloropropane	19.8	---	1.00	ug/L	1	20.0	ND	99	73-122%	---	---	
Vinyl chloride	23.2	---	0.400	ug/L	1	20.0	ND	116	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>92 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike Dup (23C0785-MSD1)	Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:42
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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Matrix Spike Dup (23C0785-MSD1)						Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:42						
QC Source Sample: Non-SDG (A3C0672-09)												
Bromobenzene	17.8	---	0.500	ug/L	1	20.0	ND	89	80-120%	1	30%	
Bromochloromethane	25.1	---	1.00	ug/L	1	20.0	ND	126	78-123%	3	30%	Q-54d
Bromodichloromethane	21.3	---	1.00	ug/L	1	20.0	ND	106	79-125%	5	30%	
Bromoform	19.3	---	1.00	ug/L	1	20.0	ND	96	66-130%	5	30%	
Bromomethane	25.8	---	5.00	ug/L	1	20.0	ND	129	53-141%	3	30%	
Carbon tetrachloride	23.2	---	1.00	ug/L	1	20.0	ND	116	72-136%	4	30%	
Chlorobenzene	21.1	---	0.500	ug/L	1	20.0	2.24	94	80-120%	4	30%	
Chloroethane	29.3	---	5.00	ug/L	1	20.0	ND	146	60-138%	2	30%	Q-54a
Chloroform	20.2	---	1.00	ug/L	1	20.0	ND	101	79-124%	3	30%	
Chloromethane	15.0	---	5.00	ug/L	1	20.0	ND	75	50-139%	2	30%	Q-54f
2-Chlorotoluene	19.7	---	1.00	ug/L	1	20.0	ND	99	79-122%	2	30%	
4-Chlorotoluene	21.0	---	1.00	ug/L	1	20.0	ND	105	78-122%	1	30%	
Dibromochloromethane	19.5	---	1.00	ug/L	1	20.0	ND	97	74-126%	6	30%	
1,2-Dibromo-3-chloropropane	18.3	---	5.00	ug/L	1	20.0	ND	92	62-128%	2	30%	
1,2-Dibromoethane (EDB)	19.2	---	0.500	ug/L	1	20.0	ND	96	77-121%	3	30%	
Dibromomethane	19.9	---	1.00	ug/L	1	20.0	ND	99	79-123%	4	30%	
1,2-Dichlorobenzene	19.2	---	0.500	ug/L	1	20.0	ND	96	80-120%	1	30%	
1,3-Dichlorobenzene	19.5	---	0.500	ug/L	1	20.0	ND	98	80-120%	3	30%	
1,4-Dichlorobenzene	18.3	---	0.500	ug/L	1	20.0	ND	91	79-120%	2	30%	
Dichlorodifluoromethane	21.6	---	1.00	ug/L	1	20.0	ND	108	32-152%	1	30%	
1,1-Dichloroethane	22.3	---	0.400	ug/L	1	20.0	ND	112	77-125%	4	30%	
1,2-Dichloroethane (EDC)	21.7	---	0.400	ug/L	1	20.0	ND	108	73-128%	5	30%	
1,1-Dichloroethene	23.8	---	0.400	ug/L	1	20.0	ND	119	71-131%	3	30%	
cis-1,2-Dichloroethene	22.6	---	0.400	ug/L	1	20.0	0.890	108	78-123%	0.9	30%	
trans-1,2-Dichloroethene	22.2	---	0.400	ug/L	1	20.0	ND	111	75-124%	1	30%	
1,2-Dichloropropane	21.0	---	0.500	ug/L	1	20.0	ND	105	78-122%	3	30%	
1,3-Dichloropropane	20.5	---	1.00	ug/L	1	20.0	ND	102	80-120%	3	30%	
2,2-Dichloropropane	19.4	---	1.00	ug/L	1	20.0	ND	97	60-139%	4	30%	
1,1-Dichloropropene	22.8	---	1.00	ug/L	1	20.0	ND	114	79-125%	3	30%	
cis-1,3-Dichloropropene	18.8	---	1.00	ug/L	1	20.0	ND	94	75-124%	0.6	30%	
trans-1,3-Dichloropropene	21.9	---	1.00	ug/L	1	20.0	ND	110	73-127%	3	30%	
Hexachlorobutadiene	20.1	---	5.00	ug/L	1	20.0	ND	101	66-134%	2	30%	
Methylene chloride	19.8	---	10.0	ug/L	1	20.0	ND	99	74-124%	3	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Matrix Spike Dup (23C0785-MSD1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:42									
<u>QC Source Sample: Non-SDG (A3C0672-09)</u>												
1,1,1,2-Tetrachloroethane	18.4	---	0.400	ug/L	1	20.0	ND	92	78-124%	5	30%	
1,1,2,2-Tetrachloroethane	21.4	---	0.500	ug/L	1	20.0	ND	107	71-121%	1	30%	
Tetrachloroethene (PCE)	21.1	---	0.400	ug/L	1	20.0	1.00	101	74-129%	4	30%	
1,2,3-Trichlorobenzene	20.3	---	2.00	ug/L	1	20.0	ND	101	69-129%	0.8	30%	
1,1,2-Trichloroethane	19.2	---	0.500	ug/L	1	20.0	ND	96	80-120%	4	30%	
1,2,4-Trichlorobenzene	18.8	---	2.00	ug/L	1	20.0	ND	94	69-130%	2	30%	
1,1,1-Trichloroethane	21.7	---	0.400	ug/L	1	20.0	ND	108	74-131%	3	30%	
Trichloroethene (TCE)	19.0	---	0.400	ug/L	1	20.0	0.560	92	79-123%	4	30%	
Trichlorofluoromethane	23.5	---	2.00	ug/L	1	20.0	ND	118	65-141%	9	30%	
1,2,3-Trichloropropane	19.9	---	1.00	ug/L	1	20.0	ND	100	73-122%	0.3	30%	
Vinyl chloride	23.5	---	0.400	ug/L	1	20.0	ND	117	58-137%	1	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 97 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
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QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0645 - Method Prep: Aq						Water						
Blank (23C0645-BLK1)			Prepared: 03/16/23 15:24 Analyzed: 03/16/23 19:03									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0645-BS1)			Prepared: 03/16/23 15:24 Analyzed: 03/16/23 19:04									
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.06	---	0.0200	mg/L	1	2.00	---	103	90-111%	---	---	
Matrix Spike (23C0645-MS1)			Prepared: 03/16/23 15:24 Analyzed: 03/16/23 19:12									
<u>QC Source Sample: Non-SDG (A3C0446-01)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.54	---	0.0250	mg/L	1	2.50	0.0300	100	90-111%	---	---	
Matrix Spike Dup (23C0645-MSD1)			Prepared: 03/16/23 15:24 Analyzed: 03/16/23 19:13									
<u>QC Source Sample: Non-SDG (A3C0446-01)</u>												
Ammonia as N	2.44	---	0.0250	mg/L	1	2.50	0.0300	96	90-111%	4	13%	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0730 - Method Prep: Aq						Water						
Blank (23C0730-BLK1)			Prepared: 03/20/23 09:22 Analyzed: 03/20/23 12:06									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0730-BS1)			Prepared: 03/20/23 09:22 Analyzed: 03/20/23 12:08									
<u>SM 4500-NH3 G</u>												
Ammonia as N	1.83	---	0.0200	mg/L	1	2.00	---	91	90-111%	---	---	
Matrix Spike (23C0730-MS1)			Prepared: 03/20/23 09:22 Analyzed: 03/20/23 15:27									
<u>QC Source Sample: Non-SDG (A3C0608-02)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	12.6	---	0.100	mg/L	5	10.0	3.14	95	90-111%	---	---	
Matrix Spike Dup (23C0730-MSD1)			Prepared: 03/20/23 09:22 Analyzed: 03/20/23 15:28									
<u>QC Source Sample: Non-SDG (A3C0608-02)</u>												
Ammonia as N	13.2	---	0.100	mg/L	5	10.0	3.14	100	90-111%	4	13%	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0802 - Method Prep: Aq						Water						
Blank (23C0802-BLK1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 14:56									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0802-BS1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 14:57									
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.03	---	0.0200	mg/L	1	2.00	---	102	90-111%	---	---	
Matrix Spike (23C0802-MS1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 15:35									
<u>QC Source Sample: Non-SDG (A3C0606-05)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.49	---	0.0250	mg/L	1	2.50	0.0450	98	90-111%	---	---	
Matrix Spike Dup (23C0802-MSD1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 15:36									
<u>QC Source Sample: Non-SDG (A3C0606-05)</u>												
Ammonia as N	2.50	---	0.0250	mg/L	1	2.50	0.0450	98	90-111%	0.3	13%	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0626 - Method Prep: Aq						Water						
Blank (23C0626-BLK2)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 15:11									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	Q-16
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	Q-16
LCS (23C0626-BS2)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 15:32									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	2.07	---	0.250	mg/L	1	2.00	---	103	90-110%	---	---	Q-16
Nitrite-Nitrogen	2.03	---	0.250	mg/L	1	2.00	---	101	90-110%	---	---	Q-16
Duplicate (23C0626-DUP1)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 19:08									
<u>QC Source Sample: Non-SDG (A3C0576-03)</u>												
Nitrate-Nitrogen	1.09	---	0.250	mg/L	1	---	1.09	---	---	0.08	3%	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Duplicate (23C0626-DUP2)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 23:48									
<u>QC Source Sample: Non-SDG (A3C0576-12)</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	0.239	---	---	***	3%	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Matrix Spike (23C0626-MS1)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 19:29									
<u>QC Source Sample: Non-SDG (A3C0576-03)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	3.68	---	0.312	mg/L	1	2.50	1.09	104	87-112%	---	---	
Nitrite-Nitrogen	2.56	---	0.312	mg/L	1	2.50	ND	102	90-114%	---	---	
Matrix Spike (23C0626-MS2)			Prepared: 03/16/23 11:46 Analyzed: 03/17/23 00:09									
<u>QC Source Sample: Non-SDG (A3C0576-12)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	3.04	---	0.312	mg/L	1	2.50	0.239	112	87-112%	---	---	
Nitrite-Nitrogen	2.74	---	0.312	mg/L	1	2.50	ND	110	90-114%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0630 - Method Prep: Aq						Water						
Blank (23C0630-BLK1)			Prepared: 03/16/23 12:02 Analyzed: 03/17/23 07:20									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
LCS (23C0630-BS1)			Prepared: 03/16/23 12:02 Analyzed: 03/17/23 07:42									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	2.14	---	0.250	mg/L	1	2.00	---	107	90-110%	---	---	
Nitrite-Nitrogen	2.10	---	0.250	mg/L	1	2.00	---	105	90-110%	---	---	
Duplicate (23C0630-DUP1)			Prepared: 03/16/23 12:02 Analyzed: 03/17/23 13:08									
<u>QC Source Sample: Non-SDG (A3C0527-02)</u>												
Nitrate-Nitrogen	2.55	---	0.250	mg/L	1	---	2.56	---	---	0.2	3%	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Duplicate (23C0630-DUP2)			Prepared: 03/16/23 12:02 Analyzed: 03/17/23 15:19									
<u>QC Source Sample: Non-SDG (A3C0537-02)</u>												
Nitrate-Nitrogen	0.319	---	0.250	mg/L	1	---	0.321	---	---	0.8	3%	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Matrix Spike (23C0630-MS1)			Prepared: 03/16/23 12:02 Analyzed: 03/17/23 13:30									
<u>QC Source Sample: Non-SDG (A3C0527-02)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	5.48	---	0.312	mg/L	1	2.50	2.56	117	87-112%	---	---	Q-01
Nitrite-Nitrogen	2.88	---	0.312	mg/L	1	2.50	ND	115	90-114%	---	---	Q-01
Matrix Spike (23C0630-MS2)			Prepared: 03/16/23 12:02 Analyzed: 03/17/23 16:24									
<u>QC Source Sample: Non-SDG (A3C0537-02)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	2.82	---	0.312	mg/L	1	2.50	0.321	100	87-112%	---	---	
Nitrite-Nitrogen	2.48	---	0.312	mg/L	1	2.50	ND	99	90-114%	---	---	

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SAMPLE PREPARATION INFORMATION

Halogenated Volatile Organic Compounds by EPA 8260D

Prep: EPA 5030C					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0660</u>							
A3C0505-01	Water	EPA 8260D	03/14/23 08:31	03/17/23 11:43	5mL/5mL	5mL/5mL	1.00
A3C0505-02	Water	EPA 8260D	03/14/23 09:40	03/17/23 11:43	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C0661</u>							
A3C0505-03	Water	EPA 8260D	03/14/23 10:46	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
A3C0505-04	Water	EPA 8260D	03/14/23 10:46	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
A3C0505-05	Water	EPA 8260D	03/14/23 12:09	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
A3C0505-06	Water	EPA 8260D	03/14/23 12:09	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
A3C0505-07	Water	EPA 8260D	03/14/23 14:12	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
A3C0505-08	Water	EPA 8260D	03/14/23 09:30	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
A3C0505-09	Water	EPA 8260D	03/14/23 10:46	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
A3C0505-10	Water	EPA 8260D	03/14/23 14:57	03/17/23 13:00	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C0768</u>							
A3C0505-05RE1	Water	EPA 8260D	03/14/23 12:09	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0505-06RE1	Water	EPA 8260D	03/14/23 12:09	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0505-07RE1	Water	EPA 8260D	03/14/23 14:12	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0505-08RE1	Water	EPA 8260D	03/14/23 09:30	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0505-09RE1	Water	EPA 8260D	03/14/23 10:46	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0505-10RE1	Water	EPA 8260D	03/14/23 14:57	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C0785</u>							
A3C0505-06RE2	Water	EPA 8260D	03/14/23 12:09	03/22/23 14:00	5mL/5mL	5mL/5mL	1.00

Ammonia by Gas Diffusion and Colorimetric Detection

Prep: Method Prep: Aq					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0645</u>							
A3C0505-01RE1	Water	SM 4500-NH3 G	03/14/23 08:31	03/16/23 15:24	10mL/10mL	10mL/10mL	1.00
A3C0505-02RE1	Water	SM 4500-NH3 G	03/14/23 09:40	03/16/23 15:24	10mL/10mL	10mL/10mL	1.00
A3C0505-03	Water	SM 4500-NH3 G	03/14/23 10:46	03/16/23 15:24	10mL/10mL	10mL/10mL	1.00
<u>Batch: 23C0730</u>							
A3C0505-04	Water	SM 4500-NH3 G	03/14/23 10:46	03/20/23 09:22	10mL/10mL	10mL/10mL	1.00
A3C0505-07	Water	SM 4500-NH3 G	03/14/23 14:12	03/20/23 09:22	10mL/10mL	10mL/10mL	1.00
A3C0505-08	Water	SM 4500-NH3 G	03/14/23 09:30	03/20/23 09:22	10mL/10mL	10mL/10mL	1.00
A3C0505-09	Water	SM 4500-NH3 G	03/14/23 10:46	03/20/23 09:22	10mL/10mL	10mL/10mL	1.00

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SAMPLE PREPARATION INFORMATION

Ammonia by Gas Diffusion and Colorimetric Detection

<u>Prep: Method Prep: Ag</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
A3C0505-10	Water	SM 4500-NH3 G	03/14/23 14:57	03/20/23 09:22	10mL/10mL	10mL/10mL	1.00
<u>Batch: 23C0802</u>							
A3C0505-05RE2	Water	SM 4500-NH3 G	03/14/23 12:09	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0505-06RE2	Water	SM 4500-NH3 G	03/14/23 12:09	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00

Anions by Ion Chromatography

<u>Prep: Method Prep: Ag</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0626</u>							
A3C0505-01	Water	EPA 300.0	03/14/23 08:31	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-02	Water	EPA 300.0	03/14/23 09:40	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-03	Water	EPA 300.0	03/14/23 10:46	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-03RE1	Water	EPA 300.0	03/14/23 10:46	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-04	Water	EPA 300.0	03/14/23 10:46	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-04RE1	Water	EPA 300.0	03/14/23 10:46	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-05RE1	Water	EPA 300.0	03/14/23 12:09	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-05RE2	Water	EPA 300.0	03/14/23 12:09	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-07RE1	Water	EPA 300.0	03/14/23 14:12	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0505-10	Water	EPA 300.0	03/14/23 14:57	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C0630</u>							
A3C0505-06RE1	Water	EPA 300.0	03/14/23 12:09	03/16/23 12:02	5mL/5mL	5mL/5mL	1.00
A3C0505-06RE2	Water	EPA 300.0	03/14/23 12:09	03/16/23 12:02	5mL/5mL	5mL/5mL	1.00
A3C0505-08	Water	EPA 300.0	03/14/23 09:30	03/16/23 12:02	5mL/5mL	5mL/5mL	1.00
A3C0505-09	Water	EPA 300.0	03/14/23 10:46	03/16/23 12:02	5mL/5mL	5mL/5mL	1.00

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QUALIFIER DEFINITIONS

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

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- H-01** Analyzed outside the recommended holding time.
- Q-01** Spike recovery and/or RPD is outside acceptance limits.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-54** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by . The results are reported as Estimated Values.
- Q-54a** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +10%. The results are reported as Estimated Values.
- Q-54b** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +16%. The results are reported as Estimated Values.
- Q-54c** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +3%. The results are reported as Estimated Values.
- Q-54d** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +4%. The results are reported as Estimated Values.
- Q-54e** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -12%. The results are reported as Estimated Values.
- Q-54f** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -16%. The results are reported as Estimated Values.
- Q-54g** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -17%. The results are reported as Estimated Values.
- Q-54h** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -32%. The results are reported as Estimated Values.
- Q-54i** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -4%. The results are reported as Estimated Values.
- Q-54j** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -45%. The results are reported as Estimated Values.
- Q-55** Daily CCV/LCS recovery for this analyte was below the +/-20% criteria listed in EPA 8260, however there is adequate sensitivity to ensure detection at the reporting level.
- Q-56** Daily CCV/LCS recovery for this analyte was above the +/-20% criteria listed in EPA 8260
- R-01** The Reporting Limit for this analyte has been raised to account for matrix interference.
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- V-01** Sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: [none] Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0505 - 04 04 23 1538
---	---	---

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) may not be 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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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

Table with 3 columns: Client info (GeoEngineers - Portland), Project info (Project: Nustar-Vancouver-GWM - 2023), and Report ID (A3C0505 - 04 04 23 1538).

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.

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.

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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Handwritten signature of Darrell Auvil

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

Table with 3 columns: Client info (GeoEngineers - Portland), Project info (Project: Nustar-Vancouver-GWM - 2023), and Report ID (A3C0505 - 04 04 23 1538).

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

Table header with columns: 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 provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Handwritten signature of Darrell Auvil

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland
5820 S Kelly Ave Unit B
Portland, OR 97239
Project: Nustar-Vancouver-GWM - 2023
Project Number: [none]
Project Manager: Stephanie Bosze-Salisbury
Report ID: A3C0505 - 04 04 23 1538

APEX LABS COOLER RECEIPT FORM

Client: GeoEngineers Element WO#: A3 A3C0505

Project/Project #: Van Main 1Q23 GWM

Delivery Info:

Date/time received: 3/14/23 @ 1557 By: SAT

Delivered by: Apex X Client ESS FedEx UPS Radio Morgan SDS Evergreen Other

Cooler Inspection Date/time inspected: 3/14/23 @ 1740 By: SAT

Chain of Custody included? Yes X No

Signed/dated by client? Yes X No

Table with 7 columns: Cooler #1 to Cooler #7. Rows include Temperature (2.8), Custody seals (N), Received on ice (Y), Temp. blanks (Y), Ice type (Gel), Condition (N).

Cooler out of temp? (Y/N) Possible reason why:

Green dots applied to out of temperature samples? Yes/No

Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: 3/14/23 @ 1858 By: AKK

All samples intact? Yes X No Comments:

Bottle labels/COCs agree? Yes X No X Comments: MW-21i-105 thru EW-1 No date on col, containers read 3/14/23. TB provided, not on col.

COC/container discrepancies form initiated? Yes No X

Containers/volumes received appropriate for analysis? Yes X No Comments:

Do VOA vials have visible headspace? Yes X No NA

Comments MW-21i-105 43 HS, TB # 3249 11 HS

Water samples: pH checked: Yes X No NA pH appropriate? Yes X No NA

Comments:

Additional information:

Labeled by: AKK Witness: AKK Cooler Inspected by: AKK

Form Y-003 R-00

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.

Signature of Darrell Auvil

Darrell Auvil, Client Services Manager

April 5, 2023

Apex Laboratories
ATTN: Darrell Auvil
6700 S.W. Sandburg St.
Tigard, OR 97223



LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C,
ASTM D1946, RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: A3C0505
Lab Number: P032103-01/02

Enclosed are results for sample(s) received 3/21/23 by Air Technology Laboratories. Sample was received intact and chilled to 5° C. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

A handwritten signature in blue ink, appearing to read "M. Johnson".

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

SUBCONTRACT ORDER

Apex Laboratories

A3C0505

P032183-21/02

65

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Air Technology Laboratories, Inc
18501 E. Gale Ave Suite 130
City of Industry, CA 91748
Phone : (626) 964-4032
Fax: (626) 964-5832

No date on CoC, containers read 3/14/23

Sample Name: MW-7

Water

Sampled: 03/14/23 10:46

(A3C0505-03)

Analysis	Due	Expires	Comments
----------	-----	---------	----------

RSK 175 Preserved (Meth, Eth, Eth) (Sub) 03/27/23 17:00 03/28/23 10:46 air tech lab

Containers Supplied:

(D)40 mL VOA - HCL

(E)40 mL VOA - HCL

61

No date on CoC, containers read 3/14/23

Sample Name: MW-19

Water

Sampled: 03/14/23 12:09

(A3C0505-05)

Analysis	Due	Expires	Comments
----------	-----	---------	----------

RSK 175 Preserved (Meth, Eth, Eth) (Sub) 03/27/23 17:00 03/28/23 12:09 air tech lab

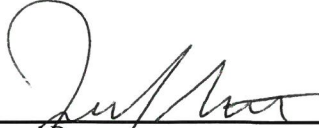
Containers Supplied:

(D)40 mL VOA - HCL

(E)40 mL VOA - HCL

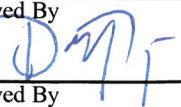
62

5°C

Released By  Date 3/20/23 ¹⁴⁰⁵

Received By UPS (Shipper) Date

Released By UPS (Shipper) Date 3/21/23

Received By  Date 3/21/23 1016



ANALYTICAL REPORT

Apex Laboratories, LLC

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

Tuesday, April 4, 2023
Stephanie Bosze-Salisbury
GeoEngineers - Portland
5820 S Kelly Ave Unit B
Portland, OR 97239

RE: A3C0576 - Nustar-Vancouver-GWM - 2023 - 019001-009-004

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 A3C0576, which was received by the laboratory on 3/15/2023 at 4:02:00PM.

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

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

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler 3.3 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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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	--	---

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-16	A3C0576-01	Water	03/15/23 13:52	03/15/23 16:02
MW-10	A3C0576-02	Water	03/15/23 12:30	03/15/23 16:02
MW-25i	A3C0576-03	Water	03/15/23 11:41	03/15/23 16:02
MW-17	A3C0576-04	Water	03/15/23 10:40	03/15/23 16:02
MW-14	A3C0576-05	Water	03/15/23 09:39	03/15/23 16:02
MW-26	A3C0576-06	Water	03/15/23 08:47	03/15/23 16:02
MW-8	A3C0576-07	Water	03/15/23 13:28	03/15/23 16:02
Ex	A3C0576-08	Water	03/15/23 12:17	03/15/23 16:02
MW-5	A3C0576-09	Water	03/15/23 11:17	03/15/23 16:02
MW-24i	A3C0576-10	Water	03/15/23 09:11	03/15/23 16:02
MW-21i-40	A3C0576-11	Water	03/15/23 08:14	03/15/23 16:02
MW-20i	A3C0576-12	Water	03/15/23 14:17	03/15/23 16:02

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0768		
MW-16 (A3C0576-01)								
Bromobenzene	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/21/23 05:31	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
cis-1,2-Dichloroethene	16.6	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/21/23 05:31	EPA 8260D	

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0768		
MW-16 (A3C0576-01)								
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
Tetrachloroethene (PCE)	57.0	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,1,1-Trichloroethane	0.420	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
Trichloroethene (TCE)	7.52	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/21/23 05:31	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/21/23 05:31	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/21/23 05:31	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 05:31</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 05:31</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 05:31</i>	<i>EPA 8260D</i>
			Matrix: Water			Batch: 23C0768		
MW-10 (A3C0576-02)								
Bromobenzene	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/21/23 05:53	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0768		
MW-10 (A3C0576-02)								
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/21/23 05:53	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
Tetrachloroethene (PCE)	2.40	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
Trichloroethene (TCE)	2.09	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/21/23 05:53	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/21/23 05:53	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/21/23 05:53	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 05:53</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 05:53</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 05:53</i>	<i>EPA 8260D</i>

			Matrix: Water			Batch: 23C0768		
MW-25i (A3C0576-03)								
Bromobenzene	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-25i (A3C0576-03)			Matrix: Water			Batch: 23C0768		
Bromoform	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/21/23 06:15	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/21/23 06:15	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-25i (A3C0576-03)			Matrix: Water			Batch: 23C0768		
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/21/23 06:15	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/21/23 06:15	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/21/23 06:15	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/21/23 06:15	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 06:15</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 06:15</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 06:15</i>	<i>EPA 8260D</i>
MW-17 (A3C0576-04)			Matrix: Water			Batch: 23C0768		
Bromobenzene	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/21/23 06:37	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0768		
MW-17 (A3C0576-04)								
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
cis-1,2-Dichloroethene	4.61	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/21/23 06:37	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
Tetrachloroethene (PCE)	1.33	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/21/23 06:37	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
Trichloroethene (TCE)	3.13	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/21/23 06:37	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/21/23 06:37	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/21/23 06:37	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>105 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>03/21/23 06:37</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>102 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/21/23 06:37</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>98 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/21/23 06:37</i>	<i>EPA 8260D</i>

			Matrix: Water			Batch: 23C0768		
MW-14 (A3C0576-05)								
Bromobenzene	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water		Batch: 23C0768			
MW-14 (A3C0576-05)								
Chlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/21/23 07:00	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
1,1-Dichloroethane	3.15	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
1,1-Dichloroethene	1.57	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
cis-1,2-Dichloroethene	58.8	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
trans-1,2-Dichloroethene	1.59	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/21/23 07:00	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
Tetrachloroethene (PCE)	146	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 07:00	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 07:00	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-14 (A3C0576-05)			Matrix: Water			Batch: 23C0768		
1,1,1-Trichloroethane	0.740	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/21/23 07:00	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:00	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/21/23 07:00	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 107 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 07:00</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 07:00</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 07:00</i>	<i>EPA 8260D</i>
MW-14 (A3C0576-05RE1)			Matrix: Water			Batch: 23C0785		
Trichloroethene (TCE)	223	---	4.00	ug/L	10	03/23/23 02:44	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/23/23 02:44</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 02:44</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 02:44</i>	<i>EPA 8260D</i>
MW-26 (A3C0576-06)			Matrix: Water			Batch: 23C0768		
Bromobenzene	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
Bromochloromethane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Bromodichloromethane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Bromoform	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Bromomethane	ND	---	25.0	ug/L	5	03/21/23 08:07	EPA 8260D	
Carbon tetrachloride	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Chlorobenzene	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
Chloroethane	ND	---	25.0	ug/L	5	03/21/23 08:07	EPA 8260D	
Chloroform	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Chloromethane	ND	---	25.0	ug/L	5	03/21/23 08:07	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
4-Chlorotoluene	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Dibromochloromethane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	25.0	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
Dibromomethane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2-Dichlorobenzene	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
1,3-Dichlorobenzene	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
1,4-Dichlorobenzene	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0768		
MW-26 (A3C0576-06)								
Dichlorodifluoromethane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,1-Dichloroethane	2.70	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,1-Dichloroethene	ND	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
cis-1,2-Dichloroethene	35.9	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2-Dichloropropane	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
1,3-Dichloropropane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
2,2-Dichloropropane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,1-Dichloropropene	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Hexachlorobutadiene	ND	---	25.0	ug/L	5	03/21/23 08:07	EPA 8260D	
Methylene chloride	ND	---	50.0	ug/L	5	03/21/23 08:07	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
Tetrachloroethene (PCE)	161	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	10.0	ug/L	5	03/21/23 08:07	EPA 8260D	
1,1,2-Trichloroethane	ND	---	2.50	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	10.0	ug/L	5	03/21/23 08:07	EPA 8260D	
1,1,1-Trichloroethane	ND	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Trichloroethene (TCE)	203	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Trichlorofluoromethane	ND	---	10.0	ug/L	5	03/21/23 08:07	EPA 8260D	
1,2,3-Trichloropropane	ND	---	5.00	ug/L	5	03/21/23 08:07	EPA 8260D	
Vinyl chloride	ND	---	2.00	ug/L	5	03/21/23 08:07	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 108 %</i>		<i>Limits: 80-120 %</i>	1	03/21/23 08:07	EPA 8260D	
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		80-120 %	1	03/21/23 08:07	EPA 8260D	
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		80-120 %	1	03/21/23 08:07	EPA 8260D	

			Matrix: Water			Batch: 23C0768		
MW-8 (A3C0576-07)								
Bromobenzene	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0768		
MW-8 (A3C0576-07)								
Bromomethane	ND	---	5.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/21/23 07:22	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/21/23 07:22	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/21/23 07:22	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0768		
MW-8 (A3C0576-07)								
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/21/23 07:22	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:22	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/21/23 07:22	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/21/23 07:22</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 07:22</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/21/23 07:22</i>	<i>EPA 8260D</i>
			Matrix: Water			Batch: 23C0785		
MW-8 (A3C0576-07RE1)								
Tetrachloroethene (PCE)	3.49	---	0.400	ug/L	1	03/23/23 01:37	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 102 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/23/23 01:37</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 01:37</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 01:37</i>	<i>EPA 8260D</i>
			Matrix: Water			Batch: 23C0768		
Ex (A3C0576-08)								
Bromobenzene	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Bromochloromethane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Bromodichloromethane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Bromoform	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Bromomethane	ND	---	250	ug/L	50	03/21/23 09:14	EPA 8260D	
Carbon tetrachloride	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Chlorobenzene	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Chloroethane	ND	---	250	ug/L	50	03/21/23 09:14	EPA 8260D	
Chloroform	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Chloromethane	ND	---	250	ug/L	50	03/21/23 09:14	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
4-Chlorotoluene	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Dibromochloromethane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	250	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Dibromomethane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2-Dichlorobenzene	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Ex (A3C0576-08)			Matrix: Water			Batch: 23C0768		
1,3-Dichlorobenzene	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,4-Dichlorobenzene	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Dichlorodifluoromethane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,1-Dichloroethane	ND	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,1-Dichloroethene	ND	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
cis-1,2-Dichloroethene	677	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2-Dichloropropane	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,3-Dichloropropane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
2,2-Dichloropropane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,1-Dichloropropene	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Hexachlorobutadiene	ND	---	250	ug/L	50	03/21/23 09:14	EPA 8260D	
Methylene chloride	ND	---	500	ug/L	50	03/21/23 09:14	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Tetrachloroethene (PCE)	2860	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	100	ug/L	50	03/21/23 09:14	EPA 8260D	
1,1,2-Trichloroethane	ND	---	25.0	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	100	ug/L	50	03/21/23 09:14	EPA 8260D	
1,1,1-Trichloroethane	ND	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Trichloroethene (TCE)	276	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Trichlorofluoromethane	ND	---	100	ug/L	50	03/21/23 09:14	EPA 8260D	
1,2,3-Trichloropropane	ND	---	50.0	ug/L	50	03/21/23 09:14	EPA 8260D	
Vinyl chloride	ND	---	20.0	ug/L	50	03/21/23 09:14	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/21/23 09:14</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/21/23 09:14</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/21/23 09:14</i>	<i>EPA 8260D</i>	

MW-5 (A3C0576-09RE1)			Matrix: Water			Batch: 23C0785		
Bromobenzene	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0785		
MW-5 (A3C0576-09RE1)								
Bromodichloromethane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/23/23 01:59	EPA 8260D	Q-54d
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,1-Dichloroethane	2.34	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
cis-1,2-Dichloroethene	59.5	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/23/23 01:59	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-5 (A3C0576-09RE1)			Matrix: Water			Batch: 23C0785		
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/23/23 01:59	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/23/23 01:59	EPA 8260D	
Vinyl chloride	10.5	---	0.400	ug/L	1	03/23/23 01:59	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 99 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/23/23 01:59</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>103 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/23/23 01:59</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/23/23 01:59</i>	<i>EPA 8260D</i>	

MW-24i (A3C0576-10)			Matrix: Water			Batch: 23C0768		
Bromobenzene	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/21/23 07:44	EPA 8260D	Q-54e
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-24i (A3C0576-10)			Matrix: Water			Batch: 23C0768		
1,1-Dichloroethane	1.04	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
cis-1,2-Dichloroethene	15.9	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/21/23 07:44	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
Tetrachloroethene (PCE)	16.1	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 07:44	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/21/23 07:44	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
Trichloroethene (TCE)	7.95	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/21/23 07:44	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/21/23 07:44	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/21/23 07:44	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/21/23 07:44</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/21/23 07:44</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>	<i>1</i>	<i>03/21/23 07:44</i>	<i>EPA 8260D</i>	

MW-21i-40 (A3C0576-11)			Matrix: Water			Batch: 23C0785		
Bromobenzene	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/23/23 00:52	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-21i-40 (A3C0576-11)			Matrix: Water			Batch: 23C0785		
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/23/23 00:52	EPA 8260D	Q-54d
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,1-Dichloroethane	1.50	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
cis-1,2-Dichloroethene	30.7	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/23/23 00:52	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	
Tetrachloroethene (PCE)	23.2	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/23/23 00:52	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-21i-40 (A3C0576-11)			Matrix: Water			Batch: 23C0785		
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
Trichloroethene (TCE)	11.0	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/23/23 00:52	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/23/23 00:52	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/23/23 00:52	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/23/23 00:52</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 00:52</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 00:52</i>	<i>EPA 8260D</i>
MW-20i (A3C0576-12)			Matrix: Water			Batch: 23C0785		
Bromobenzene	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/23/23 01:14	EPA 8260D	Q-54d
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	

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ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-20i (A3C0576-12)			Matrix: Water			Batch: 23C0785		
cis-1,2-Dichloroethene	6.97	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/23/23 01:14	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
Tetrachloroethene (PCE)	7.44	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
Trichloroethene (TCE)	1.15	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/23/23 01:14	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/23/23 01:14	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/23/23 01:14	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/23/23 01:14</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 01:14</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/23/23 01:14</i>	<i>EPA 8260D</i>

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ANALYTICAL REPORT

Apex Laboratories, LLC
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 503-718-2323
 ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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ANALYTICAL SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water		Batch: 23C0802		
Ammonia as N	ND	---	0.0200	mg/L	1	03/21/23 15:00	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
Ammonia as N	18.2	---	0.200	mg/L	10	03/21/23 15:02	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0731		
Ammonia as N	ND	---	0.0200	mg/L	1	03/20/23 16:22	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0731		
Ammonia as N	4.92	---	0.0200	mg/L	1	03/20/23 16:24	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
Ammonia as N	8.69	---	0.0400	mg/L	2	03/21/23 15:03	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0896		
Ammonia as N	112	---	1.00	mg/L	50	03/23/23 12:41	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0896		
Ammonia as N	ND	---	0.0200	mg/L	1	03/23/23 12:44	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0896		
Ex (A3C0576-08RE5)	46.9	---	0.400	mg/L	20	03/23/23 12:45	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
Ammonia as N	1.52	---	0.0200	mg/L	1	03/21/23 15:12	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
Ammonia as N	ND	---	0.0200	mg/L	1	03/21/23 15:21	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
Ammonia as N	ND	---	0.0200	mg/L	1	03/21/23 15:23	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
Ammonia as N	ND	---	0.0200	mg/L	1	03/21/23 15:24	SM 4500-NH3 G	

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-16 (A3C0576-01)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	25.8	---	1.25	mg/L	5	03/16/23 17:20	EPA 300.0	
MW-16 (A3C0576-01RE1)				Matrix: Water				
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 00:52	EPA 300.0	
MW-10 (A3C0576-02RE1)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	415	---	12.5	mg/L	50	03/17/23 00:31	EPA 300.0	
MW-10 (A3C0576-02RE2)				Matrix: Water				
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 01:14	EPA 300.0	
MW-25i (A3C0576-03)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	1.09	---	0.250	mg/L	1	03/16/23 18:46	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 18:46	EPA 300.0	
MW-17 (A3C0576-04)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 19:51	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 19:51	EPA 300.0	
MW-14 (A3C0576-05)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	299	---	12.5	mg/L	50	03/16/23 20:12	EPA 300.0	
MW-14 (A3C0576-05RE1)				Matrix: Water				
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 01:36	EPA 300.0	
MW-26 (A3C0576-06)				Matrix: Water				
Batch: 23C0626								
Nitrate-Nitrogen	406	---	12.5	mg/L	50	03/16/23 20:34	EPA 300.0	

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-26 (A3C0576-06RE1) Matrix: Water								
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 01:57	EPA 300.0	
MW-8 (A3C0576-07) Matrix: Water								
Batch: 23C0626								
Nitrate-Nitrogen	220	---	12.5	mg/L	50	03/16/23 20:55	EPA 300.0	
MW-8 (A3C0576-07RE1) Matrix: Water								
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 03:02	EPA 300.0	
Ex (A3C0576-08) Matrix: Water								
Batch: 23C0626								
Nitrate-Nitrogen	48.8	---	5.00	mg/L	20	03/16/23 21:17	EPA 300.0	
Ex (A3C0576-08RE1) Matrix: Water								
Batch: 23C0626								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 03:23	EPA 300.0	
MW-5 (A3C0576-09) Matrix: Water								
Batch: 23C0626								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 21:38	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 21:38	EPA 300.0	
MW-24i (A3C0576-10) Matrix: Water								
Batch: 23C0626								
Nitrate-Nitrogen	6.22	---	0.250	mg/L	1	03/16/23 22:43	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 22:43	EPA 300.0	
MW-21i-40 (A3C0576-11) Matrix: Water								
Batch: 23C0626								
Nitrate-Nitrogen	4.76	---	0.250	mg/L	1	03/16/23 23:05	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 23:05	EPA 300.0	
MW-20i (A3C0576-12) Matrix: Water								
Batch: 23C0626								

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
MW-20i (A3C0576-12)				Matrix: Water					
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 23:26	EPA 300.0		
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/16/23 23:26	EPA 300.0		

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ANALYTICAL SAMPLE RESULTS

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water		Batch: 23C0788		
MW-14 (A3C0576-05)								
Total Organic Carbon	1.43	---	1.00	mg/L	1	03/22/23 09:18	SM 5310 C	
				Matrix: Water		Batch: 23C0788		
MW-26 (A3C0576-06)								
Total Organic Carbon	2.21	---	1.00	mg/L	1	03/22/23 10:49	SM 5310 C	
				Matrix: Water		Batch: 23C0788		
Ex (A3C0576-08)								
Total Organic Carbon	4.46	---	1.00	mg/L	1	03/22/23 11:21	SM 5310 C	
				Matrix: Water		Batch: 23C0788		
MW-24i (A3C0576-10)								
Total Organic Carbon	ND	---	1.00	mg/L	1	03/22/23 11:52	SM 5310 C	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Blank (23C0768-BLK1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 00:41									
<u>EPA 8260D</u>												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

Q-54e

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Blank (23C0768-BLK1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 00:41									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0768-BS1)			Prepared: 03/20/23 15:48 Analyzed: 03/20/23 23:57									
EPA 8260D												
Bromobenzene	17.8	---	0.500	ug/L	1	20.0	---	89	80-120%	---	---	
Bromochloromethane	24.8	---	1.00	ug/L	1	20.0	---	124	80-120%	---	---	Q-56
Bromodichloromethane	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Bromoform	19.4	---	1.00	ug/L	1	20.0	---	97	80-120%	---	---	
Bromomethane	22.0	---	5.00	ug/L	1	20.0	---	110	80-120%	---	---	
Carbon tetrachloride	20.7	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
Chlorobenzene	19.0	---	0.500	ug/L	1	20.0	---	95	80-120%	---	---	
Chloroethane	27.3	---	5.00	ug/L	1	20.0	---	136	80-120%	---	---	Q-56
Chloroform	19.7	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
Chloromethane	12.7	---	5.00	ug/L	1	20.0	---	63	80-120%	---	---	Q-54
2-Chlorotoluene	19.6	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
4-Chlorotoluene	20.7	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
Dibromochloromethane	19.5	---	1.00	ug/L	1	20.0	---	97	80-120%	---	---	
1,2-Dibromo-3-chloropropane	18.1	---	5.00	ug/L	1	20.0	---	90	80-120%	---	---	
1,2-Dibromoethane (EDB)	19.6	---	0.500	ug/L	1	20.0	---	98	80-120%	---	---	
Dibromomethane	20.1	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
1,2-Dichlorobenzene	18.9	---	0.500	ug/L	1	20.0	---	94	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
LCS (23C0768-BS1)			Prepared: 03/20/23 15:48 Analyzed: 03/20/23 23:57									
1,3-Dichlorobenzene	19.4	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
1,4-Dichlorobenzene	17.9	---	0.500	ug/L	1	20.0	---	90	80-120%	---	---	
Dichlorodifluoromethane	18.5	---	1.00	ug/L	1	20.0	---	93	80-120%	---	---	
1,1-Dichloroethane	21.2	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
1,2-Dichloroethane (EDC)	21.3	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
1,1-Dichloroethene	21.3	---	0.400	ug/L	1	20.0	---	107	80-120%	---	---	
cis-1,2-Dichloroethene	21.2	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
trans-1,2-Dichloroethene	20.9	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
1,2-Dichloropropane	20.6	---	0.500	ug/L	1	20.0	---	103	80-120%	---	---	
1,3-Dichloropropane	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
2,2-Dichloropropane	20.0	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
1,1-Dichloropropene	21.3	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
cis-1,3-Dichloropropene	21.1	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
trans-1,3-Dichloropropene	22.1	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
Hexachlorobutadiene	17.0	---	5.00	ug/L	1	20.0	---	85	80-120%	---	---	
Methylene chloride	19.9	---	10.0	ug/L	1	20.0	---	99	80-120%	---	---	
1,1,1,2-Tetrachloroethane	18.5	---	0.400	ug/L	1	20.0	---	93	80-120%	---	---	
1,1,2,2-Tetrachloroethane	20.9	---	0.500	ug/L	1	20.0	---	105	80-120%	---	---	
Tetrachloroethene (PCE)	19.1	---	0.400	ug/L	1	20.0	---	96	80-120%	---	---	
1,2,3-Trichlorobenzene	19.4	---	2.00	ug/L	1	20.0	---	97	80-120%	---	---	
1,1,2-Trichloroethane	19.2	---	0.500	ug/L	1	20.0	---	96	80-120%	---	---	
1,2,4-Trichlorobenzene	18.2	---	2.00	ug/L	1	20.0	---	91	80-120%	---	---	
1,1,1-Trichloroethane	20.1	---	0.400	ug/L	1	20.0	---	101	80-120%	---	---	
Trichloroethene (TCE)	18.7	---	0.400	ug/L	1	20.0	---	93	80-120%	---	---	
Trichlorofluoromethane	21.2	---	2.00	ug/L	1	20.0	---	106	80-120%	---	---	
1,2,3-Trichloropropane	19.7	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
Vinyl chloride	20.7	---	0.400	ug/L	1	20.0	---	103	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0768-DUP1)	Prepared: 03/20/23 15:48 Analyzed: 03/21/23 08:29
QC Source Sample: MW-26 (A3C0576-06)	
EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Duplicate (23C0768-DUP1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 08:29									
QC Source Sample: MW-26 (A3C0576-06)												
Bromobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Bromochloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromoform	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromomethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Chloroethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Chloroform	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Chloromethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	Q-54e
2-Chlorotoluene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Dibromomethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloroethane	3.10	---	2.00	ug/L	5	---	2.70	---	---	14	30%	
1,2-Dichloroethane (EDC)	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	41.2	---	2.00	ug/L	5	---	35.9	---	---	14	30%	
trans-1,2-Dichloroethene	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Methylene chloride	ND	---	50.0	ug/L	5	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Duplicate (23C0768-DUP1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 08:29									
QC Source Sample: MW-26 (A3C0576-06)												
1,1,1,2-Tetrachloroethane	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,1,2,2-Tetrachloroethane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	185	---	2.00	ug/L	5	---	161	---	---	14	30%	
1,2,3-Trichlorobenzene	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	2.00	ug/L	5	---	1.55	---	---	***	30%	
Trichloroethene (TCE)	233	---	2.00	ug/L	5	---	203	---	---	14	30%	
Trichlorofluoromethane	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 108 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0768-MS1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 09:58									
QC Source Sample: Non-SDG (A3C0565-09RE1)												
EPA 8260D												
Bromobenzene	19.0	---	0.500	ug/L	1	20.0	ND	95	80-120%	---	---	
Bromochloromethane	27.7	---	1.00	ug/L	1	20.0	ND	139	78-123%	---	---	Q-54c
Bromodichloromethane	23.3	---	1.00	ug/L	1	20.0	ND	116	79-125%	---	---	
Bromoform	21.2	---	1.00	ug/L	1	20.0	ND	106	66-130%	---	---	
Bromomethane	27.1	---	5.00	ug/L	1	20.0	ND	135	53-141%	---	---	
Carbon tetrachloride	25.5	---	1.00	ug/L	1	20.0	ND	127	72-136%	---	---	
Chlorobenzene	21.0	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
Chloroethane	30.2	---	5.00	ug/L	1	20.0	ND	151	60-138%	---	---	Q-54b
Chloroform	22.0	---	1.00	ug/L	1	20.0	ND	110	79-124%	---	---	
Chloromethane	16.5	---	5.00	ug/L	1	20.0	ND	82	50-139%	---	---	Q-54e
2-Chlorotoluene	21.0	---	1.00	ug/L	1	20.0	ND	105	79-122%	---	---	
4-Chlorotoluene	22.3	---	1.00	ug/L	1	20.0	ND	111	78-122%	---	---	
Dibromochloromethane	21.2	---	1.00	ug/L	1	20.0	ND	106	74-126%	---	---	
1,2-Dibromo-3-chloropropane	19.7	---	5.00	ug/L	1	20.0	ND	99	62-128%	---	---	
1,2-Dibromoethane (EDB)	20.6	---	0.500	ug/L	1	20.0	ND	103	77-121%	---	---	

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Matrix Spike (23C0768-MS1)			Prepared: 03/20/23 15:48 Analyzed: 03/21/23 09:58									
QC Source Sample: Non-SDG (A3C0565-09RE1)												
Dibromomethane	21.9	---	1.00	ug/L	1	20.0	ND	110	79-123%	---	---	
1,2-Dichlorobenzene	20.4	---	0.500	ug/L	1	20.0	ND	102	80-120%	---	---	
1,3-Dichlorobenzene	21.0	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
1,4-Dichlorobenzene	19.5	---	0.500	ug/L	1	20.0	ND	98	79-120%	---	---	
Dichlorodifluoromethane	24.3	---	1.00	ug/L	1	20.0	ND	121	32-152%	---	---	
1,1-Dichloroethane	24.3	---	0.400	ug/L	1	20.0	ND	122	77-125%	---	---	
1,2-Dichloroethane (EDC)	23.8	---	0.400	ug/L	1	20.0	ND	119	73-128%	---	---	
1,1-Dichloroethene	25.6	---	0.400	ug/L	1	20.0	ND	128	71-131%	---	---	
cis-1,2-Dichloroethene	23.1	---	0.400	ug/L	1	20.0	ND	115	78-123%	---	---	
trans-1,2-Dichloroethene	23.3	---	0.400	ug/L	1	20.0	ND	117	75-124%	---	---	
1,2-Dichloropropane	22.8	---	0.500	ug/L	1	20.0	ND	114	78-122%	---	---	
1,3-Dichloropropane	21.9	---	1.00	ug/L	1	20.0	ND	109	80-120%	---	---	
2,2-Dichloropropane	19.2	---	1.00	ug/L	1	20.0	ND	96	60-139%	---	---	
1,1-Dichloropropene	24.4	---	1.00	ug/L	1	20.0	ND	122	79-125%	---	---	
cis-1,3-Dichloropropene	19.3	---	1.00	ug/L	1	20.0	ND	97	75-124%	---	---	
trans-1,3-Dichloropropene	23.3	---	1.00	ug/L	1	20.0	ND	116	73-127%	---	---	
Hexachlorobutadiene	19.8	---	5.00	ug/L	1	20.0	ND	99	66-134%	---	---	
Methylene chloride	21.7	---	10.0	ug/L	1	20.0	ND	108	74-124%	---	---	
1,1,1,2-Tetrachloroethane	20.1	---	0.400	ug/L	1	20.0	ND	101	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	23.1	---	0.500	ug/L	1	20.0	ND	115	71-121%	---	---	
Tetrachloroethene (PCE)	21.6	---	0.400	ug/L	1	20.0	ND	108	74-129%	---	---	
1,2,3-Trichlorobenzene	20.6	---	2.00	ug/L	1	20.0	ND	103	69-129%	---	---	
1,1,2-Trichloroethane	21.0	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
1,2,4-Trichlorobenzene	19.2	---	2.00	ug/L	1	20.0	ND	96	69-130%	---	---	
1,1,1-Trichloroethane	23.6	---	0.400	ug/L	1	20.0	ND	118	74-131%	---	---	
Trichloroethene (TCE)	20.8	---	0.400	ug/L	1	20.0	ND	104	79-123%	---	---	
Trichlorofluoromethane	27.0	---	2.00	ug/L	1	20.0	ND	135	65-141%	---	---	
1,2,3-Trichloropropane	21.4	---	1.00	ug/L	1	20.0	ND	107	73-122%	---	---	
Vinyl chloride	25.4	---	0.400	ug/L	1	20.0	ND	127	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>91 %</i>		<i>80-120 %</i>		<i>"</i>						

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Matrix Spike Dup (23C0768-MSD1)						Prepared: 03/20/23 15:48 Analyzed: 03/21/23 10:21						
QC Source Sample: Non-SDG (A3C0565-09RE1)												
Bromobenzene	20.1	---	0.500	ug/L	1	20.0	ND	100	80-120%	5	30%	
Bromochloromethane	28.8	---	1.00	ug/L	1	20.0	ND	144	78-123%	4	30%	Q-54c
Bromodichloromethane	24.0	---	1.00	ug/L	1	20.0	ND	120	79-125%	3	30%	
Bromoform	21.7	---	1.00	ug/L	1	20.0	ND	109	66-130%	3	30%	
Bromomethane	25.6	---	5.00	ug/L	1	20.0	ND	128	53-141%	6	30%	
Carbon tetrachloride	26.1	---	1.00	ug/L	1	20.0	ND	130	72-136%	2	30%	
Chlorobenzene	21.8	---	0.500	ug/L	1	20.0	ND	109	80-120%	4	30%	
Chloroethane	30.6	---	5.00	ug/L	1	20.0	ND	153	60-138%	1	30%	Q-54b
Chloroform	22.8	---	1.00	ug/L	1	20.0	ND	114	79-124%	3	30%	
Chloromethane	17.7	---	5.00	ug/L	1	20.0	ND	88	50-139%	7	30%	Q-54e
2-Chlorotoluene	22.2	---	1.00	ug/L	1	20.0	ND	111	79-122%	6	30%	
4-Chlorotoluene	24.0	---	1.00	ug/L	1	20.0	ND	120	78-122%	7	30%	
Dibromochloromethane	22.3	---	1.00	ug/L	1	20.0	ND	112	74-126%	5	30%	
1,2-Dibromo-3-chloropropane	20.2	---	5.00	ug/L	1	20.0	ND	101	62-128%	2	30%	
1,2-Dibromoethane (EDB)	21.8	---	0.500	ug/L	1	20.0	ND	109	77-121%	6	30%	
Dibromomethane	22.8	---	1.00	ug/L	1	20.0	ND	114	79-123%	4	30%	
1,2-Dichlorobenzene	21.9	---	0.500	ug/L	1	20.0	ND	109	80-120%	7	30%	
1,3-Dichlorobenzene	22.2	---	0.500	ug/L	1	20.0	ND	111	80-120%	6	30%	
1,4-Dichlorobenzene	20.7	---	0.500	ug/L	1	20.0	ND	104	79-120%	6	30%	
Dichlorodifluoromethane	25.1	---	1.00	ug/L	1	20.0	ND	126	32-152%	4	30%	
1,1-Dichloroethane	25.3	---	0.400	ug/L	1	20.0	ND	126	77-125%	4	30%	Q-01
1,2-Dichloroethane (EDC)	24.6	---	0.400	ug/L	1	20.0	ND	123	73-128%	4	30%	
1,1-Dichloroethene	26.9	---	0.400	ug/L	1	20.0	ND	134	71-131%	5	30%	Q-01
cis-1,2-Dichloroethene	24.2	---	0.400	ug/L	1	20.0	ND	121	78-123%	5	30%	
trans-1,2-Dichloroethene	24.8	---	0.400	ug/L	1	20.0	ND	124	75-124%	6	30%	
1,2-Dichloropropane	23.9	---	0.500	ug/L	1	20.0	ND	120	78-122%	5	30%	
1,3-Dichloropropane	23.3	---	1.00	ug/L	1	20.0	ND	116	80-120%	6	30%	
2,2-Dichloropropane	20.0	---	1.00	ug/L	1	20.0	ND	100	60-139%	4	30%	
1,1-Dichloropropene	26.1	---	1.00	ug/L	1	20.0	ND	130	79-125%	7	30%	Q-01
cis-1,3-Dichloropropene	20.8	---	1.00	ug/L	1	20.0	ND	104	75-124%	7	30%	
trans-1,3-Dichloropropene	24.7	---	1.00	ug/L	1	20.0	ND	123	73-127%	6	30%	
Hexachlorobutadiene	21.5	---	5.00	ug/L	1	20.0	ND	108	66-134%	8	30%	
Methylene chloride	22.5	---	10.0	ug/L	1	20.0	ND	112	74-124%	3	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0768 - EPA 5030C						Water						
Matrix Spike Dup (23C0768-MSD1)						Prepared: 03/20/23 15:48 Analyzed: 03/21/23 10:21						
QC Source Sample: Non-SDG (A3C0565-09RE1)												
1,1,1,2-Tetrachloroethane	20.9	---	0.400	ug/L	1	20.0	ND	105	78-124%	4	30%	
1,1,2,2-Tetrachloroethane	24.1	---	0.500	ug/L	1	20.0	ND	121	71-121%	5	30%	
Tetrachloroethene (PCE)	22.5	---	0.400	ug/L	1	20.0	ND	113	74-129%	4	30%	
1,2,3-Trichlorobenzene	22.7	---	2.00	ug/L	1	20.0	ND	113	69-129%	9	30%	
1,1,2-Trichloroethane	21.7	---	0.500	ug/L	1	20.0	ND	109	80-120%	4	30%	
1,2,4-Trichlorobenzene	20.7	---	2.00	ug/L	1	20.0	ND	103	69-130%	7	30%	
1,1,1-Trichloroethane	24.6	---	0.400	ug/L	1	20.0	ND	123	74-131%	4	30%	
Trichloroethene (TCE)	21.4	---	0.400	ug/L	1	20.0	ND	107	79-123%	3	30%	
Trichlorofluoromethane	27.9	---	2.00	ug/L	1	20.0	ND	140	65-141%	3	30%	
1,2,3-Trichloropropane	22.4	---	1.00	ug/L	1	20.0	ND	112	73-122%	5	30%	
Vinyl chloride	27.2	---	0.400	ug/L	1	20.0	ND	136	58-137%	7	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>93 %</i>		<i>80-120 %</i>		<i>"</i>						

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Blank (23C0785-BLK1)			Prepared: 03/22/23 14:00 Analyzed: 03/22/23 23:45									
<u>EPA 8260D</u>												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	Q-54d
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C												
Water												
Blank (23C0785-BLK1)												
Prepared: 03/22/23 14:00						Analyzed: 03/22/23 23:45						
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0785-BS1)												
Prepared: 03/22/23 14:00						Analyzed: 03/22/23 22:39						
EPA 8260D												
Bromobenzene	18.3	---	0.500	ug/L	1	20.0	---	92	80-120%	---	---	
Bromochloromethane	24.8	---	1.00	ug/L	1	20.0	---	124	80-120%	---	---	Q-56
Bromodichloromethane	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Bromoform	19.9	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
Bromomethane	22.1	---	5.00	ug/L	1	20.0	---	110	80-120%	---	---	
Carbon tetrachloride	21.1	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Chlorobenzene	19.5	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
Chloroethane	26.1	---	5.00	ug/L	1	20.0	---	130	80-120%	---	---	Q-56
Chloroform	19.7	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
Chloromethane	12.8	---	5.00	ug/L	1	20.0	---	64	80-120%	---	---	Q-54d
2-Chlorotoluene	19.9	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
4-Chlorotoluene	21.4	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
Dibromochloromethane	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
1,2-Dibromo-3-chloropropane	19.0	---	5.00	ug/L	1	20.0	---	95	80-120%	---	---	
1,2-Dibromoethane (EDB)	20.4	---	0.500	ug/L	1	20.0	---	102	80-120%	---	---	
Dibromomethane	20.6	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
1,2-Dichlorobenzene	19.6	---	0.500	ug/L	1	20.0	---	98	80-120%	---	---	

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ANALYTICAL REPORT

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
LCS (23C0785-BS1)			Prepared: 03/22/23 14:00 Analyzed: 03/22/23 22:39									
1,3-Dichlorobenzene	20.0	---	0.500	ug/L	1	20.0	---	100	80-120%	---	---	
1,4-Dichlorobenzene	18.5	---	0.500	ug/L	1	20.0	---	92	80-120%	---	---	
Dichlorodifluoromethane	18.1	---	1.00	ug/L	1	20.0	---	90	80-120%	---	---	
1,1-Dichloroethane	21.5	---	0.400	ug/L	1	20.0	---	108	80-120%	---	---	
1,2-Dichloroethane (EDC)	21.9	---	0.400	ug/L	1	20.0	---	109	80-120%	---	---	
1,1-Dichloroethene	21.9	---	0.400	ug/L	1	20.0	---	109	80-120%	---	---	
cis-1,2-Dichloroethene	21.6	---	0.400	ug/L	1	20.0	---	108	80-120%	---	---	
trans-1,2-Dichloroethene	21.2	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
1,2-Dichloropropane	21.1	---	0.500	ug/L	1	20.0	---	105	80-120%	---	---	
1,3-Dichloropropane	21.3	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
2,2-Dichloropropane	20.5	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
1,1-Dichloropropene	21.8	---	1.00	ug/L	1	20.0	---	109	80-120%	---	---	
cis-1,3-Dichloropropene	22.0	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
trans-1,3-Dichloropropene	22.9	---	1.00	ug/L	1	20.0	---	115	80-120%	---	---	
Hexachlorobutadiene	19.4	---	5.00	ug/L	1	20.0	---	97	80-120%	---	---	
Methylene chloride	19.7	---	10.0	ug/L	1	20.0	---	98	80-120%	---	---	
1,1,1,2-Tetrachloroethane	18.8	---	0.400	ug/L	1	20.0	---	94	80-120%	---	---	
1,1,2,2-Tetrachloroethane	21.8	---	0.500	ug/L	1	20.0	---	109	80-120%	---	---	
Tetrachloroethene (PCE)	19.7	---	0.400	ug/L	1	20.0	---	99	80-120%	---	---	
1,2,3-Trichlorobenzene	20.6	---	2.00	ug/L	1	20.0	---	103	80-120%	---	---	
1,1,2-Trichloroethane	20.1	---	0.500	ug/L	1	20.0	---	101	80-120%	---	---	
1,2,4-Trichlorobenzene	19.3	---	2.00	ug/L	1	20.0	---	96	80-120%	---	---	
1,1,1-Trichloroethane	20.5	---	0.400	ug/L	1	20.0	---	102	80-120%	---	---	
Trichloroethene (TCE)	18.8	---	0.400	ug/L	1	20.0	---	94	80-120%	---	---	
Trichlorofluoromethane	22.1	---	2.00	ug/L	1	20.0	---	110	80-120%	---	---	
1,2,3-Trichloropropane	21.0	---	1.00	ug/L	1	20.0	---	105	80-120%	---	---	
Vinyl chloride	20.5	---	0.400	ug/L	1	20.0	---	102	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 97 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0785-DUP1)						Prepared: 03/22/23 14:00 Analyzed: 03/23/23 06:49						
QC Source Sample: Non-SDG (A3C0672-02)												
Bromobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Duplicate (23C0785-DUP1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 06:49									
QC Source Sample: Non-SDG (A3C0672-02)												
Bromochloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromoform	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromomethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Chlorobenzene	1650	---	10.0	ug/L	20	---	1590	---	---	4	30%	
Chloroethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Chloroform	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Chloromethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	Q-54d
2-Chlorotoluene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
Dibromomethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	10.0	ug/L	20	---	6.80	---	---	***	30%	
1,4-Dichlorobenzene	297	---	10.0	ug/L	20	---	287	---	---	3	30%	
Dichlorodifluoromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Methylene chloride	ND	---	200	ug/L	20	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Duplicate (23C0785-DUP1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 06:49									
QC Source Sample: Non-SDG (A3C0672-02)												
1,1,2,2-Tetrachloroethane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
Trichlorofluoromethane	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0785-MS1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:20									
QC Source Sample: Non-SDG (A3C0672-09)												
EPA 8260D												
Bromobenzene	18.0	---	0.500	ug/L	1	20.0	ND	90	80-120%	---	---	
Bromochloromethane	26.0	---	1.00	ug/L	1	20.0	ND	130	78-123%	---	---	Q-54c
Bromodichloromethane	22.3	---	1.00	ug/L	1	20.0	ND	112	79-125%	---	---	
Bromoform	20.3	---	1.00	ug/L	1	20.0	ND	101	66-130%	---	---	
Bromomethane	26.7	---	5.00	ug/L	1	20.0	ND	133	53-141%	---	---	
Carbon tetrachloride	24.2	---	1.00	ug/L	1	20.0	ND	121	72-136%	---	---	
Chlorobenzene	22.0	---	0.500	ug/L	1	20.0	2.24	99	80-120%	---	---	
Chloroethane	28.7	---	5.00	ug/L	1	20.0	ND	144	60-138%	---	---	Q-54a
Chloroform	20.8	---	1.00	ug/L	1	20.0	ND	104	79-124%	---	---	
Chloromethane	14.7	---	5.00	ug/L	1	20.0	ND	74	50-139%	---	---	Q-54d
2-Chlorotoluene	20.1	---	1.00	ug/L	1	20.0	ND	100	79-122%	---	---	
4-Chlorotoluene	21.3	---	1.00	ug/L	1	20.0	ND	106	78-122%	---	---	
Dibromochloromethane	20.6	---	1.00	ug/L	1	20.0	ND	103	74-126%	---	---	
1,2-Dibromo-3-chloropropane	17.9	---	5.00	ug/L	1	20.0	ND	90	62-128%	---	---	
1,2-Dibromoethane (EDB)	19.8	---	0.500	ug/L	1	20.0	ND	99	77-121%	---	---	
Dibromomethane	20.8	---	1.00	ug/L	1	20.0	ND	104	79-123%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Matrix Spike (23C0785-MS1)			Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:20									
QC Source Sample: Non-SDG (A3C0672-09)												
1,2-Dichlorobenzene	19.4	---	0.500	ug/L	1	20.0	ND	97	80-120%	---	---	
1,3-Dichlorobenzene	20.1	---	0.500	ug/L	1	20.0	ND	100	80-120%	---	---	
1,4-Dichlorobenzene	18.6	---	0.500	ug/L	1	20.0	ND	93	79-120%	---	---	
Dichlorodifluoromethane	21.9	---	1.00	ug/L	1	20.0	ND	109	32-152%	---	---	
1,1-Dichloroethane	23.2	---	0.400	ug/L	1	20.0	ND	116	77-125%	---	---	
1,2-Dichloroethane (EDC)	22.7	---	0.400	ug/L	1	20.0	ND	113	73-128%	---	---	
1,1-Dichloroethene	24.5	---	0.400	ug/L	1	20.0	ND	122	71-131%	---	---	
cis-1,2-Dichloroethene	22.8	---	0.400	ug/L	1	20.0	0.890	109	78-123%	---	---	
trans-1,2-Dichloroethene	22.5	---	0.400	ug/L	1	20.0	ND	113	75-124%	---	---	
1,2-Dichloropropane	21.6	---	0.500	ug/L	1	20.0	ND	108	78-122%	---	---	
1,3-Dichloropropane	21.2	---	1.00	ug/L	1	20.0	ND	106	80-120%	---	---	
2,2-Dichloropropane	20.2	---	1.00	ug/L	1	20.0	ND	101	60-139%	---	---	
1,1-Dichloropropene	23.4	---	1.00	ug/L	1	20.0	ND	117	79-125%	---	---	
cis-1,3-Dichloropropene	18.9	---	1.00	ug/L	1	20.0	ND	94	75-124%	---	---	
trans-1,3-Dichloropropene	22.6	---	1.00	ug/L	1	20.0	ND	113	73-127%	---	---	
Hexachlorobutadiene	19.7	---	5.00	ug/L	1	20.0	ND	98	66-134%	---	---	
Methylene chloride	20.4	---	10.0	ug/L	1	20.0	ND	102	74-124%	---	---	
1,1,1,2-Tetrachloroethane	19.3	---	0.400	ug/L	1	20.0	ND	96	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	21.6	---	0.500	ug/L	1	20.0	ND	108	71-121%	---	---	
Tetrachloroethene (PCE)	22.1	---	0.400	ug/L	1	20.0	1.00	106	74-129%	---	---	
1,2,3-Trichlorobenzene	20.1	---	2.00	ug/L	1	20.0	ND	100	69-129%	---	---	
1,1,2-Trichloroethane	20.0	---	0.500	ug/L	1	20.0	ND	100	80-120%	---	---	
1,2,4-Trichlorobenzene	18.5	---	2.00	ug/L	1	20.0	ND	92	69-130%	---	---	
1,1,1-Trichloroethane	22.4	---	0.400	ug/L	1	20.0	ND	112	74-131%	---	---	
Trichloroethene (TCE)	19.7	---	0.400	ug/L	1	20.0	0.560	96	79-123%	---	---	
Trichlorofluoromethane	25.7	---	2.00	ug/L	1	20.0	ND	128	65-141%	---	---	
1,2,3-Trichloropropane	19.8	---	1.00	ug/L	1	20.0	ND	99	73-122%	---	---	
Vinyl chloride	23.2	---	0.400	ug/L	1	20.0	ND	116	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 98 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>92 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike Dup (23C0785-MSD1)	Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:42
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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Matrix Spike Dup (23C0785-MSD1)						Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:42						
QC Source Sample: Non-SDG (A3C0672-09)												
Bromobenzene	17.8	---	0.500	ug/L	1	20.0	ND	89	80-120%	1	30%	
Bromochloromethane	25.1	---	1.00	ug/L	1	20.0	ND	126	78-123%	3	30%	Q-54c
Bromodichloromethane	21.3	---	1.00	ug/L	1	20.0	ND	106	79-125%	5	30%	
Bromoform	19.3	---	1.00	ug/L	1	20.0	ND	96	66-130%	5	30%	
Bromomethane	25.8	---	5.00	ug/L	1	20.0	ND	129	53-141%	3	30%	
Carbon tetrachloride	23.2	---	1.00	ug/L	1	20.0	ND	116	72-136%	4	30%	
Chlorobenzene	21.1	---	0.500	ug/L	1	20.0	2.24	94	80-120%	4	30%	
Chloroethane	29.3	---	5.00	ug/L	1	20.0	ND	146	60-138%	2	30%	Q-54a
Chloroform	20.2	---	1.00	ug/L	1	20.0	ND	101	79-124%	3	30%	
Chloromethane	15.0	---	5.00	ug/L	1	20.0	ND	75	50-139%	2	30%	Q-54d
2-Chlorotoluene	19.7	---	1.00	ug/L	1	20.0	ND	99	79-122%	2	30%	
4-Chlorotoluene	21.0	---	1.00	ug/L	1	20.0	ND	105	78-122%	1	30%	
Dibromochloromethane	19.5	---	1.00	ug/L	1	20.0	ND	97	74-126%	6	30%	
1,2-Dibromo-3-chloropropane	18.3	---	5.00	ug/L	1	20.0	ND	92	62-128%	2	30%	
1,2-Dibromoethane (EDB)	19.2	---	0.500	ug/L	1	20.0	ND	96	77-121%	3	30%	
Dibromomethane	19.9	---	1.00	ug/L	1	20.0	ND	99	79-123%	4	30%	
1,2-Dichlorobenzene	19.2	---	0.500	ug/L	1	20.0	ND	96	80-120%	1	30%	
1,3-Dichlorobenzene	19.5	---	0.500	ug/L	1	20.0	ND	98	80-120%	3	30%	
1,4-Dichlorobenzene	18.3	---	0.500	ug/L	1	20.0	ND	91	79-120%	2	30%	
Dichlorodifluoromethane	21.6	---	1.00	ug/L	1	20.0	ND	108	32-152%	1	30%	
1,1-Dichloroethane	22.3	---	0.400	ug/L	1	20.0	ND	112	77-125%	4	30%	
1,2-Dichloroethane (EDC)	21.7	---	0.400	ug/L	1	20.0	ND	108	73-128%	5	30%	
1,1-Dichloroethene	23.8	---	0.400	ug/L	1	20.0	ND	119	71-131%	3	30%	
cis-1,2-Dichloroethene	22.6	---	0.400	ug/L	1	20.0	0.890	108	78-123%	0.9	30%	
trans-1,2-Dichloroethene	22.2	---	0.400	ug/L	1	20.0	ND	111	75-124%	1	30%	
1,2-Dichloropropane	21.0	---	0.500	ug/L	1	20.0	ND	105	78-122%	3	30%	
1,3-Dichloropropane	20.5	---	1.00	ug/L	1	20.0	ND	102	80-120%	3	30%	
2,2-Dichloropropane	19.4	---	1.00	ug/L	1	20.0	ND	97	60-139%	4	30%	
1,1-Dichloropropene	22.8	---	1.00	ug/L	1	20.0	ND	114	79-125%	3	30%	
cis-1,3-Dichloropropene	18.8	---	1.00	ug/L	1	20.0	ND	94	75-124%	0.6	30%	
trans-1,3-Dichloropropene	21.9	---	1.00	ug/L	1	20.0	ND	110	73-127%	3	30%	
Hexachlorobutadiene	20.1	---	5.00	ug/L	1	20.0	ND	101	66-134%	2	30%	
Methylene chloride	19.8	---	10.0	ug/L	1	20.0	ND	99	74-124%	3	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0785 - EPA 5030C						Water						
Matrix Spike Dup (23C0785-MSD1)						Prepared: 03/22/23 14:00 Analyzed: 03/23/23 05:42						
QC Source Sample: Non-SDG (A3C0672-09)												
1,1,1,2-Tetrachloroethane	18.4	---	0.400	ug/L	1	20.0	ND	92	78-124%	5	30%	
1,1,2,2-Tetrachloroethane	21.4	---	0.500	ug/L	1	20.0	ND	107	71-121%	1	30%	
Tetrachloroethene (PCE)	21.1	---	0.400	ug/L	1	20.0	1.00	101	74-129%	4	30%	
1,2,3-Trichlorobenzene	20.3	---	2.00	ug/L	1	20.0	ND	101	69-129%	0.8	30%	
1,1,2-Trichloroethane	19.2	---	0.500	ug/L	1	20.0	ND	96	80-120%	4	30%	
1,2,4-Trichlorobenzene	18.8	---	2.00	ug/L	1	20.0	ND	94	69-130%	2	30%	
1,1,1-Trichloroethane	21.7	---	0.400	ug/L	1	20.0	ND	108	74-131%	3	30%	
Trichloroethene (TCE)	19.0	---	0.400	ug/L	1	20.0	0.560	92	79-123%	4	30%	
Trichlorofluoromethane	23.5	---	2.00	ug/L	1	20.0	ND	118	65-141%	9	30%	
1,2,3-Trichloropropane	19.9	---	1.00	ug/L	1	20.0	ND	100	73-122%	0.3	30%	
Vinyl chloride	23.5	---	0.400	ug/L	1	20.0	ND	117	58-137%	1	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 97 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

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---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0731 - Method Prep: Aq						Water						
Blank (23C0731-BLK1)			Prepared: 03/20/23 09:28 Analyzed: 03/20/23 15:49									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0731-BS1)			Prepared: 03/20/23 09:28 Analyzed: 03/20/23 15:51									
<u>SM 4500-NH3 G</u>												
Ammonia as N	1.95	---	0.0200	mg/L	1	2.00	---	98	90-111%	---	---	
Matrix Spike (23C0731-MS1)			Prepared: 03/20/23 09:28 Analyzed: 03/20/23 16:07									
<u>QC Source Sample: Non-SDG (A3C0527-04)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.24	---	0.0250	mg/L	1	2.50	ND	89	90-111%	---	---	Q-01
Matrix Spike Dup (23C0731-MSD1)			Prepared: 03/20/23 09:28 Analyzed: 03/20/23 16:09									
<u>QC Source Sample: Non-SDG (A3C0527-04)</u>												
Ammonia as N	2.37	---	0.0250	mg/L	1	2.50	ND	95	90-111%	6	13%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0802 - Method Prep: Aq						Water						
Blank (23C0802-BLK1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 14:56									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0802-BS1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 14:57									
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.03	---	0.0200	mg/L	1	2.00	---	102	90-111%	---	---	
Matrix Spike (23C0802-MS1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 15:35									
<u>QC Source Sample: Non-SDG (A3C0606-05)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.49	---	0.0250	mg/L	1	2.50	0.0450	98	90-111%	---	---	
Matrix Spike Dup (23C0802-MSD1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 15:36									
<u>QC Source Sample: Non-SDG (A3C0606-05)</u>												
Ammonia as N	2.50	---	0.0250	mg/L	1	2.50	0.0450	98	90-111%	0.3	13%	

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---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0896 - Method Prep: Aq						Water						
Blank (23C0896-BLK1)			Prepared: 03/23/23 09:24 Analyzed: 03/23/23 12:36									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0896-BS1)			Prepared: 03/23/23 09:24 Analyzed: 03/23/23 12:38									
<u>SM 4500-NH3 G</u>												
Ammonia as N	1.92	---	0.0200	mg/L	1	2.00	---	96	90-111%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0626 - Method Prep: Aq						Water						
Blank (23C0626-BLK2)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 15:11									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	Q-16
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	Q-16
LCS (23C0626-BS2)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 15:32									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	2.07	---	0.250	mg/L	1	2.00	---	103	90-110%	---	---	Q-16
Nitrite-Nitrogen	2.03	---	0.250	mg/L	1	2.00	---	101	90-110%	---	---	Q-16
Duplicate (23C0626-DUP1)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 19:08									
<u>QC Source Sample: MW-25i (A3C0576-03)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	1.09	---	0.250	mg/L	1	---	1.09	---	---	0.08	3%	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Duplicate (23C0626-DUP2)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 23:48									
<u>QC Source Sample: MW-20i (A3C0576-12)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	0.239	---	---	***	3%	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Matrix Spike (23C0626-MS1)			Prepared: 03/16/23 11:46 Analyzed: 03/16/23 19:29									
<u>QC Source Sample: MW-25i (A3C0576-03)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	3.68	---	0.312	mg/L	1	2.50	1.09	104	87-112%	---	---	
Nitrite-Nitrogen	2.56	---	0.312	mg/L	1	2.50	ND	102	90-114%	---	---	
Matrix Spike (23C0626-MS2)			Prepared: 03/16/23 11:46 Analyzed: 03/17/23 00:09									
<u>QC Source Sample: MW-20i (A3C0576-12)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	3.04	---	0.312	mg/L	1	2.50	0.239	112	87-112%	---	---	
Nitrite-Nitrogen	2.74	---	0.312	mg/L	1	2.50	ND	110	90-114%	---	---	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0788 - Method Prep: Aq						Water						
Blank (23C0788-BLK1)			Prepared: 03/21/23 09:12 Analyzed: 03/21/23 22:22									
<u>SM 5310 C</u>												
Total Organic Carbon	ND	---	1.00	mg/L	1	---	---	---	---	---	---	
LCS (23C0788-BS1)			Prepared: 03/21/23 09:12 Analyzed: 03/21/23 22:52									
<u>SM 5310 C</u>												
Total Organic Carbon	10.3	---	1.00	mg/L	1	10.0	---	103	90-114%	---	---	
Matrix Spike (23C0788-MS2)			Prepared: 03/21/23 09:12 Analyzed: 03/22/23 12:22									
<u>QC Source Sample: MW-24i (A3C0576-10)</u>												
<u>SM 5310 C</u>												
Total Organic Carbon	11.0	---	1.01	mg/L	1	10.0	ND	110	85-115%	---	---	
Matrix Spike (23C0788-MS3)			Prepared: 03/21/23 09:12 Analyzed: 03/23/23 15:36									
<u>QC Source Sample: Non-SDG (A3C0470-01RE1)</u>												
<u>SM 5310 C</u>												
Total Organic Carbon	60.4	---	4.04	mg/L	4	40.0	21.1	98	85-115%	---	---	H-06, Q-16
Matrix Spike Dup (23C0788-MSD2)			Prepared: 03/21/23 09:12 Analyzed: 03/22/23 12:52									
<u>QC Source Sample: MW-24i (A3C0576-10)</u>												
<u>SM 5310 C</u>												
Total Organic Carbon	10.8	---	1.01	mg/L	1	10.0	ND	108	85-115%	2	15%	
Matrix Spike Dup (23C0788-MSD3)			Prepared: 03/21/23 09:12 Analyzed: 03/23/23 16:06									
<u>QC Source Sample: Non-SDG (A3C0470-01RE1)</u>												
<u>SM 5310 C</u>												
Total Organic Carbon	62.2	---	4.04	mg/L	4	40.0	21.1	103	85-115%	3	15%	H-06, Q-16

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ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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SAMPLE PREPARATION INFORMATION

Halogenated Volatile Organic Compounds by EPA 8260D

<u>Prep: EPA 5030C</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0768</u>							
A3C0576-01	Water	EPA 8260D	03/15/23 13:52	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-02	Water	EPA 8260D	03/15/23 12:30	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-03	Water	EPA 8260D	03/15/23 11:41	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-04	Water	EPA 8260D	03/15/23 10:40	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-05	Water	EPA 8260D	03/15/23 09:39	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-06	Water	EPA 8260D	03/15/23 08:47	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-07	Water	EPA 8260D	03/15/23 13:28	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-08	Water	EPA 8260D	03/15/23 12:17	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
A3C0576-10	Water	EPA 8260D	03/15/23 09:11	03/20/23 15:49	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C0785</u>							
A3C0576-05RE1	Water	EPA 8260D	03/15/23 09:39	03/22/23 14:00	5mL/5mL	5mL/5mL	1.00
A3C0576-07RE1	Water	EPA 8260D	03/15/23 13:28	03/22/23 14:00	5mL/5mL	5mL/5mL	1.00
A3C0576-09RE1	Water	EPA 8260D	03/15/23 11:17	03/22/23 14:00	5mL/5mL	5mL/5mL	1.00
A3C0576-11	Water	EPA 8260D	03/15/23 08:14	03/22/23 14:00	5mL/5mL	5mL/5mL	1.00
A3C0576-12	Water	EPA 8260D	03/15/23 14:17	03/22/23 14:00	5mL/5mL	5mL/5mL	1.00

Ammonia by Gas Diffusion and Colorimetric Detection

<u>Prep: Method Prep: Aq</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0731</u>							
A3C0576-03	Water	SM 4500-NH3 G	03/15/23 11:41	03/20/23 09:28	10mL/10mL	10mL/10mL	1.00
A3C0576-04	Water	SM 4500-NH3 G	03/15/23 10:40	03/20/23 09:28	10mL/10mL	10mL/10mL	1.00
<u>Batch: 23C0802</u>							
A3C0576-01	Water	SM 4500-NH3 G	03/15/23 13:52	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0576-02	Water	SM 4500-NH3 G	03/15/23 12:30	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0576-05RE1	Water	SM 4500-NH3 G	03/15/23 09:39	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0576-09RE1	Water	SM 4500-NH3 G	03/15/23 11:17	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0576-10RE1	Water	SM 4500-NH3 G	03/15/23 09:11	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0576-11RE1	Water	SM 4500-NH3 G	03/15/23 08:14	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0576-12RE1	Water	SM 4500-NH3 G	03/15/23 14:17	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
<u>Batch: 23C0896</u>							
A3C0576-06RE5	Water	SM 4500-NH3 G	03/15/23 08:47	03/23/23 09:24	10mL/10mL	10mL/10mL	1.00
A3C0576-07RE2	Water	SM 4500-NH3 G	03/15/23 13:28	03/23/23 09:24	10mL/10mL	10mL/10mL	1.00
A3C0576-08RE5	Water	SM 4500-NH3 G	03/15/23 12:17	03/23/23 09:24	10mL/10mL	10mL/10mL	1.00

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ANALYTICAL REPORT

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SAMPLE PREPARATION INFORMATION

Ammonia by Gas Diffusion and Colorimetric Detection

Prep: Method Prep: Ag					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor

Anions by Ion Chromatography

Prep: Method Prep: Ag					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 23C0626							
A3C0576-01	Water	EPA 300.0	03/15/23 13:52	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-01RE1	Water	EPA 300.0	03/15/23 13:52	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-02RE1	Water	EPA 300.0	03/15/23 12:30	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-02RE2	Water	EPA 300.0	03/15/23 12:30	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-03	Water	EPA 300.0	03/15/23 11:41	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-04	Water	EPA 300.0	03/15/23 10:40	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-05	Water	EPA 300.0	03/15/23 09:39	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-05RE1	Water	EPA 300.0	03/15/23 09:39	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-06	Water	EPA 300.0	03/15/23 08:47	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-06RE1	Water	EPA 300.0	03/15/23 08:47	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-07	Water	EPA 300.0	03/15/23 13:28	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-07RE1	Water	EPA 300.0	03/15/23 13:28	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-08	Water	EPA 300.0	03/15/23 12:17	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-08RE1	Water	EPA 300.0	03/15/23 12:17	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-09	Water	EPA 300.0	03/15/23 11:17	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-10	Water	EPA 300.0	03/15/23 09:11	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-11	Water	EPA 300.0	03/15/23 08:14	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00
A3C0576-12	Water	EPA 300.0	03/15/23 14:17	03/16/23 11:46	5mL/5mL	5mL/5mL	1.00

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Prep: Method Prep: Ag					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 23C0788							
A3C0576-05	Water	SM 5310 C	03/15/23 09:39	03/21/23 09:12	40mL/40mL	40mL/40mL	1.00
A3C0576-06	Water	SM 5310 C	03/15/23 08:47	03/21/23 09:12	40mL/40mL	40mL/40mL	1.00
A3C0576-08	Water	SM 5310 C	03/15/23 12:17	03/21/23 09:12	40mL/40mL	40mL/40mL	1.00
A3C0576-10	Water	SM 5310 C	03/15/23 09:11	03/21/23 09:12	40mL/40mL	40mL/40mL	1.00

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ANALYTICAL REPORT

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Table with 3 columns: Client/Location, Project, and Report ID. Client: GeoEngineers - Portland, 5820 S Kelly Ave Unit B, Portland, OR 97239. Project: Nustar-Vancouver-GWM - 2023, Project Number: 019001-009-004, Project Manager: Stephanie Bosze-Salisbury. Report ID: A3C0576 - 04 04 23 1556.

QUALIFIER DEFINITIONS

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

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- H-06 This sample was received, or the analysis requested, outside the recommended holding time.
Q-01 Spike recovery and/or RPD is outside acceptance limits.
Q-16 Reanalysis of an original Batch QC sample.
Q-54 Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by . The results are reported as Estimated Values.
Q-54a Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +10%. The results are reported as Estimated Values.
Q-54b Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +16%. The results are reported as Estimated Values.
Q-54c Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +4%. The results are reported as Estimated Values.
Q-54d Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -16%. The results are reported as Estimated Values.
Q-54e Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -17%. The results are reported as Estimated Values.
Q-56 Daily CCV/LCS recovery for this analyte was above the +/-20% criteria listed in EPA 8260
TEMP Sample was received outside of recommended temperature. See Case Narrative.

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Darrell Auvil, Client Services Manager



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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
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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) may not be 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

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.

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

Table with 3 columns: Client info (GeoEngineers - Portland), Project info (Project: Nustar-Vancouver-GWM - 2023), and Report ID (A3C0576 - 04 04 23 1556).

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.

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.

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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Handwritten signature of Darrell Auvil

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Table with 3 columns: Client info (GeoEngineers - Portland), Project info (Project: Nustar-Vancouver-GWM - 2023), and Report ID (A3C0576 - 04 04 23 1556).

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

Table header with columns: 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 provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Handwritten signature of Darrell Auvil

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland Project: **Nustar-Vancouver-GWM - 2023**
5820 S Kelly Ave Unit B Project Number: **019001-009-004**
Portland, OR 97239 Project Manager: **Stephanie Bosze-Salisbury** **Report ID:**
A3C0576 - 04 04 23 1556

CHAIN OF CUSTODY

APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Lab # 19005940 coc 2 of 2

Company: GeoEngineers Project Mgr: Stephanie Salisbury Project Name: Nustar Van 1000 1823 Project #:
Address: 5820 S Kelly Ave Portland, OR Phone: U Email: S.Salisbury@GeoEng.com

Sampled by: JEFF RUSSELL / SAM RUSSELL

Site Location: State WA County _____

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-CID	NWTPH-DX	NWTPH-GX	8260 RTEK	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Semi-Volat Full List	8082 PCBs	8081 Pesticides	RCRA Metals (8)	Priority Metals (13) Al, Sb, As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Hg, Mn, Mo, Ni, K, Se, Ag, Na, Ti, V, Zn	TOTAL DISS. TCIP	TCIP Metals (8)	RSLTS/DOC	NO3/NO2	MFB	Hold Sample	Frozen Archive
MW-8	3/15/23	1228	W	5					X												X			
EX		1217		7					X												X			
MW-5		1117		5					X												X			
MW-241		0911		7					X												X			
MW-211-110		0814		5					X												X			
MW-201		1417	Y	5					X												X			

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 5 Day Standard Other: _____

SPECIAL INSTRUCTIONS:
ASK for Methane, ethane, ethene, ethene
Analyze for HVOES same as last 4022
event

RELINQUISHED BY: Signature: Sam Russell Date: 3/15/23
Printed Name: Sam Russell Time: _____
Company: GeoEngineers

RECEIVED BY: Signature: Sharon Thompson Date: 3/15/23
Printed Name: Sharon Thompson 1602 Time: _____
Company: Apex Labs

Form Y-002 R-00

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0576 - 04 04 23 1556
---	---	---

APEX LABS COOLER RECEIPT FORM

Client: Geo Engineers Element WO#: A3 C0576

Project/Project #: NUSTAR VAN MAIN 1Q23 GWM

Delivery Info:
 Date/time received: 3/15/23 @ 1602 By: SAT
 Delivered by: Apex Client ESS FedEx UPS Radio Morgan SDS Evergreen Other

Cooler Inspection Date/time inspected: 3/15/23 @ 1750 By: SAT
 Chain of Custody included? Yes No
 Signed/dated by client? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>3.3</u>						
Custody seals? (Y/N)	<u>N</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>Y</u>						
Ice type: (Gel/Real/Other)	<u>Real</u>						
Condition (In/Out):	<u>IN</u>						

Cooler out of temp? (Y/) Possible reason why: _____
 Green dots applied to out of temperature samples? Yes/ No
 Out of temperature samples form initiated? Yes/ No
Sample Inspection: Date/time inspected: 3/15/23 @ 1915 By: AKK
 All samples intact? Yes No Comments: _____

 Bottle labels/COCs agree? Yes No Comments: _____

 COC/container discrepancies form initiated? Yes No
 Containers/volumes received appropriate for analysis? Yes No Comments: _____

 Do VOA vials have visible headspace? Yes No NA acc 3/15/23
 Comments: _____
 Water samples: pH checked: Yes No NA pH appropriate? Yes No NA
 Comments: _____

Additional information:

 Labeled by: AKK Witness: AAW Cooler Inspected by: AKK Form Y-003 R-00

Apex Laboratories

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Darrell Auvil, Client Services Manager

April 5, 2023

Apex Laboratories
ATTN: Darrell Auvil
6700 S.W. Sandburg St.
Tigard, OR 97223



LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C,
ASTM D1946, RSK-175
TX Cert T104704450-14-6
EPA Methods TO14A, TO15
UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: A3C0576
Lab Number: P032104-01/04

Enclosed are results for sample(s) received 3/21/23 by Air Technology Laboratories. Sample was received intact and chilled to 5° C. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

A handwritten signature in blue ink that appears to read "M Johnson".

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

SUBCONTRACT ORDER

Apex Laboratories

A3C0576

AS 3/15/23

W P032104-0/04

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Air Technology Laboratories, Inc
18501 E. Gale Ave Suite 130
City of Industry, CA 91748
Phone :(626) 964-4032
Fax: (626) 964-5832

Sample Name: MW-14 Water Sampled: 03/15/23 09:39 (A3C0576-05)

Table with 4 columns: Analysis, Due, Expires, Comments. Row 1: RSK 175 Preserved (Meth, Eth, Eth) (Sub) 03/28/23 17:00 03/29/23 09:39 air tech lab. Includes Containers Supplied: (F)40 mL VOA - HCL, (G)40 mL VOA - HCL.

Sample Name: MW-26 Water Sampled: 03/15/23 08:47 (A3C0576-06)

Table with 4 columns: Analysis, Due, Expires, Comments. Row 1: RSK 175 Preserved (Meth, Eth, Eth) (Sub) 03/28/23 17:00 03/29/23 08:47 air tech lab. Includes Containers Supplied: (F)40 mL VOA - HCL, (G)40 mL VOA - HCL.

Sample Name: Ex Water Sampled: 03/15/23 12:17 (A3C0576-08)

Table with 4 columns: Analysis, Due, Expires, Comments. Row 1: RSK 175 Preserved (Meth, Eth, Eth) (Sub) 03/28/23 17:00 03/29/23 12:17 air tech lab. Includes Containers Supplied: (F)40 mL VOA - HCL, (G)40 mL VOA - HCL.

Sample Name: MW-24i Water Sampled: 03/15/23 09:11 (A3C0576-10)

Table with 4 columns: Analysis, Due, Expires, Comments. Row 1: RSK 175 Preserved (Meth, Eth, Eth) (Sub) 03/28/23 17:00 03/29/23 09:11 air tech lab. Includes Containers Supplied: (F)40 mL VOA - HCL, (G)40 mL VOA - HCL.

Standard TAT

5°C

Released By [Signature] Date 3/20/23 Received By [Signature] Date 3/21/23
Released By [Signature] Date 3/21/23 Received By [Signature] Date 3/21/23

QC Batch No: 230327GC8A1

Matrix: Water

Reporting Units: ug/L

RSK 175
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK		LCS		LCSD						
Date/Time Analyzed:	3/27/23 10:06		3/27/23 9:32		3/27/23 9:50						
Analyst Initials:	RC		RC		RC						
Dilution Factor:	1.0		1.0		1.0						
								Limits			
ANALYTE	Result ug/L	RL ug/L	SPIKE AMT. ug/L	Result ug/L	% Rec.	Result ug/L	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Ethene	ND	1.0	1,150	1,330	116	1,240	108	7.0	70	130	30
Ethane	ND	1.0	1,200	1,360	111	1,290	105	5.2	70	130	30
Methane	ND	1.0	650	724	111	684	105	5.7	70	130	30

ND = Not Detected (below RL)

RL = Reporting Limit

Reviewed/Approved By: Mark Johnson
Mark Johnson
Operations Manager

Date 4/4/23

The cover letter is an integral part of this analytical report





ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

Monday, April 17, 2023
Stephanie Bosze-Salisbury
GeoEngineers - Portland
5820 S Kelly Ave Unit B
Portland, OR 97239

RE: A3C0644 - Nustar-Vancouver-GWM - 2023 - 019001-009-004

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 A3C0644, which was received by the laboratory on 3/16/2023 at 4:00:00PM.

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

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

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler 1.2 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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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

GeoEngineers - Portland

5820 S Kelly Ave Unit B

Portland, OR 97239

Project: **Nustar-Vancouver-GWM - 2023**

Project Number: **019001-009-004**

Project Manager: **Stephanie Bosze-Salisbury**

Report ID:

A3C0644 - 04 17 23 1648

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-24d	A3C0644-01	Water	03/16/23 13:45	03/16/23 16:00
MGMS3-3(60)	A3C0644-02	Water	03/16/23 12:38	03/16/23 16:00
MGMS3-4(40)	A3C0644-03	Water	03/16/23 11:50	03/16/23 16:00
MGMS3-4(40)DUP	A3C0644-04	Water	03/16/23 11:50	03/16/23 16:00
MGMS1-2(60)	A3C0644-05	Water	03/16/23 10:56	03/16/23 16:00
MGMS1-3(40)	A3C0644-06	Water	03/16/23 10:10	03/16/23 16:00
MGMS2-3(60)	A3C0644-07	Water	03/16/23 09:08	03/16/23 16:00
MGMS2-4(40)	A3C0644-08	Water	03/16/23 08:22	03/16/23 16:00
S-1	A3C0644-09	Water	03/16/23 08:12	03/16/23 16:00
MW-22i	A3C0644-10	Water	03/16/23 09:13	03/16/23 16:00
MW-12	A3C0644-11	Water	03/16/23 11:08	03/16/23 16:00
MW-12 DUP	A3C0644-12	Water	03/16/23 11:08	03/16/23 16:00
MW-3	A3C0644-13	Water	03/16/23 12:18	03/16/23 16:00
MW-2	A3C0644-14	Water	03/16/23 13:27	03/16/23 16:00
MW-13	A3C0644-15	Water	03/16/23 10:12	03/16/23 16:00

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL CASE NARRATIVE

A3C0644 **Apex Laboratories**

Amended Report Revision 1:

Additional TOC Analysis-

This report supersedes all previous reports.

The final report has been amended to report additional Total Organic Carbon (TOC) by SM 5310C for five samples.

Darrell Auvil
Client Services Manager
4/17/2023

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-24d (A3C0644-01)				Matrix: Water		Batch: 23C0904		
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 04:48	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 04:48	EPA 8260D	

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0904		
MW-24d (A3C0644-01)								
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 04:48	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 04:48	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/24/23 04:48	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 102 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/24/23 04:48</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>104 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 04:48</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 04:48</i>	<i>EPA 8260D</i>	

			Matrix: Water			Batch: 23C1003		
MGMS3-3(60) (A3C0644-02RE1)								
Bromobenzene	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/25/23 19:05	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS3-3(60) (A3C0644-02RE1)				Matrix: Water		Batch: 23C1003		
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
cis-1,2-Dichloroethene	19.3	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/25/23 19:05	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
Tetrachloroethene (PCE)	2.73	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
Trichloroethene (TCE)	2.92	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/25/23 19:05	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/25/23 19:05	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/25/23 19:05	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/25/23 19:05</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 19:05</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 19:05</i>	<i>EPA 8260D</i>

MGMS3-4(40) (A3C0644-03)				Matrix: Water		Batch: 23C0967		
Bromobenzene	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
Bromochloromethane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Bromodichloromethane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS3-4(40) (A3C0644-03)			Matrix: Water			Batch: 23C0967		
Bromoform	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Bromomethane	ND	---	50.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Carbon tetrachloride	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Chlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
Chloroethane	ND	---	50.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Chloroform	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Chloromethane	ND	---	50.0	ug/L	10	03/24/23 17:13	EPA 8260D	
2-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
4-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Dibromochloromethane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	50.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
Dibromomethane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,2-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,3-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,4-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
Dichlorodifluoromethane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,1-Dichloroethane	9.90	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,1-Dichloroethene	ND	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
cis-1,2-Dichloroethene	374	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,2-Dichloropropane	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,3-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
2,2-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,1-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Hexachlorobutadiene	ND	---	50.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Methylene chloride	ND	---	100	ug/L	10	03/24/23 17:13	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS3-4(40) (A3C0644-03)			Matrix: Water			Batch: 23C0967		
1,2,3-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,1,2-Trichloroethane	ND	---	5.00	ug/L	10	03/24/23 17:13	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,1,1-Trichloroethane	ND	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
Trichloroethene (TCE)	ND	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
Trichlorofluoromethane	ND	---	20.0	ug/L	10	03/24/23 17:13	EPA 8260D	
1,2,3-Trichloropropane	ND	---	10.0	ug/L	10	03/24/23 17:13	EPA 8260D	
Vinyl chloride	270	---	4.00	ug/L	10	03/24/23 17:13	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 17:13</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 17:13</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 17:13</i>	<i>EPA 8260D</i>

MGMS3-4(40)DUP (A3C0644-04)			Matrix: Water			Batch: 23C0967		
Bromobenzene	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
Bromochloromethane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Bromodichloromethane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Bromoform	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Bromomethane	ND	---	50.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Carbon tetrachloride	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Chlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
Chloroethane	ND	---	50.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Chloroform	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Chloromethane	ND	---	50.0	ug/L	10	03/24/23 17:40	EPA 8260D	
2-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
4-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Dibromochloromethane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	50.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
Dibromomethane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,2-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,3-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,4-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
Dichlorodifluoromethane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,1-Dichloroethane	10.2	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS3-4(40)DUP (A3C0644-04)				Matrix: Water		Batch: 23C0967		
1,2-Dichloroethane (EDC)	ND	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,1-Dichloroethene	ND	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
cis-1,2-Dichloroethene	394	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,2-Dichloropropane	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,3-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
2,2-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,1-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Hexachlorobutadiene	ND	---	50.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Methylene chloride	ND	---	100	ug/L	10	03/24/23 17:40	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,1,2-Trichloroethane	ND	---	5.00	ug/L	10	03/24/23 17:40	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,1,1-Trichloroethane	ND	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
Trichloroethene (TCE)	ND	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
Trichlorofluoromethane	ND	---	20.0	ug/L	10	03/24/23 17:40	EPA 8260D	
1,2,3-Trichloropropane	ND	---	10.0	ug/L	10	03/24/23 17:40	EPA 8260D	
Vinyl chloride	298	---	4.00	ug/L	10	03/24/23 17:40	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 17:40</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 17:40</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 17:40</i>	<i>EPA 8260D</i>

MGMS1-2(60) (A3C0644-05)				Matrix: Water		Batch: 23C0904		
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS1-2(60) (A3C0644-05)				Matrix: Water		Batch: 23C0904		
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 05:33	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
1,1-Dichloroethane	2.88	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
cis-1,2-Dichloroethene	21.4	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 05:33	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
Tetrachloroethene (PCE)	25.2	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 05:33	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 05:33	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS1-2(60) (A3C0644-05)			Matrix: Water			Batch: 23C0904		
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
Trichloroethene (TCE)	11.8	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 05:33	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 05:33	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/24/23 05:33	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 05:33</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 05:33</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 05:33</i>	<i>EPA 8260D</i>
MGMS1-3(40) (A3C0644-06)			Matrix: Water			Batch: 23C0967		
Bromobenzene	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
Bromochloromethane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Bromodichloromethane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Bromoform	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Bromomethane	ND	---	50.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Carbon tetrachloride	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Chlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
Chloroethane	ND	---	50.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Chloroform	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Chloromethane	ND	---	50.0	ug/L	10	03/24/23 18:07	EPA 8260D	
2-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
4-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Dibromochloromethane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	50.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
Dibromomethane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,2-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,3-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,4-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
Dichlorodifluoromethane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,1-Dichloroethane	113	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,1-Dichloroethene	22.6	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
trans-1,2-Dichloroethene	45.9	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS1-3(40) (A3C0644-06)			Matrix: Water		Batch: 23C0967			
1,2-Dichloropropane	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,3-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
2,2-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,1-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Hexachlorobutadiene	ND	---	50.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Methylene chloride	ND	---	100	ug/L	10	03/24/23 18:07	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
Tetrachloroethene (PCE)	161	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,1,2-Trichloroethane	ND	---	5.00	ug/L	10	03/24/23 18:07	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,1,1-Trichloroethane	ND	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
Trichloroethene (TCE)	428	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
Trichlorofluoromethane	ND	---	20.0	ug/L	10	03/24/23 18:07	EPA 8260D	
1,2,3-Trichloropropane	ND	---	10.0	ug/L	10	03/24/23 18:07	EPA 8260D	
Vinyl chloride	42.6	---	4.00	ug/L	10	03/24/23 18:07	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 18:07</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 18:07</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>106 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 18:07</i>	<i>EPA 8260D</i>

MGMS1-3(40) (A3C0644-06RE1)			Matrix: Water		Batch: 23C1003			
cis-1,2-Dichloroethene	2920	---	40.0	ug/L	100	03/25/23 19:32	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/25/23 19:32</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 19:32</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 19:32</i>	<i>EPA 8260D</i>

MGMS2-3(60) (A3C0644-07)			Matrix: Water		Batch: 23C0904			
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS2-3(60) (A3C0644-07)			Matrix: Water			Batch: 23C0904		
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 05:55	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
1,1-Dichloroethane	0.450	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
cis-1,2-Dichloroethene	9.02	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 05:55	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
Tetrachloroethene (PCE)	8.98	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 05:55	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS2-3(60) (A3C0644-07)			Matrix: Water			Batch: 23C0904		
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 05:55	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
Trichloroethene (TCE)	4.33	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 05:55	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 05:55	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/24/23 05:55	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 05:55</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 05:55</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 05:55</i>	<i>EPA 8260D</i>

MGMS2-4(40) (A3C0644-08)			Matrix: Water			Batch: 23C0967		
Bromobenzene	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
Bromochloromethane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Bromodichloromethane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Bromoform	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Bromomethane	ND	---	50.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Carbon tetrachloride	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Chlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
Chloroethane	ND	---	50.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Chloroform	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Chloromethane	ND	---	50.0	ug/L	10	03/24/23 18:34	EPA 8260D	
2-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
4-Chlorotoluene	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Dibromochloromethane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	50.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
Dibromomethane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,3-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,4-Dichlorobenzene	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
Dichlorodifluoromethane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,1-Dichloroethane	17.7	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS2-4(40) (A3C0644-08)			Matrix: Water			Batch: 23C0967		
1,1-Dichloroethene	10.0	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
cis-1,2-Dichloroethene	311	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2-Dichloropropane	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,3-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
2,2-Dichloropropane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,1-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Hexachlorobutadiene	ND	---	50.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Methylene chloride	ND	---	100	ug/L	10	03/24/23 18:34	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
Tetrachloroethene (PCE)	299	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,1,2-Trichloroethane	ND	---	5.00	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	20.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,1,1-Trichloroethane	ND	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
Trichloroethene (TCE)	169	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
Trichlorofluoromethane	ND	---	20.0	ug/L	10	03/24/23 18:34	EPA 8260D	
1,2,3-Trichloropropane	ND	---	10.0	ug/L	10	03/24/23 18:34	EPA 8260D	
Vinyl chloride	ND	---	4.00	ug/L	10	03/24/23 18:34	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 18:34</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 18:34</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 18:34</i>	<i>EPA 8260D</i>

S-1 (A3C0644-09)			Matrix: Water			Batch: 23C0904		
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
S-1 (A3C0644-09)			Matrix: Water			Batch: 23C0904		
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 06:17	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
cis-1,2-Dichloroethene	0.450	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 06:17	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
Tetrachloroethene (PCE)	0.870	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
S-1 (A3C0644-09)			Matrix: Water			Batch: 23C0904		
Trichloroethene (TCE)	0.460	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 06:17	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 06:17	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/24/23 06:17	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 102 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 06:17</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 06:17</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 06:17</i>	<i>EPA 8260D</i>
MW-22i (A3C0644-10)			Matrix: Water			Batch: 23C0904		
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 06:39	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,1-Dichloroethane	0.640	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
cis-1,2-Dichloroethene	17.4	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-22i (A3C0644-10)			Matrix: Water			Batch: 23C0904		
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 06:39	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
Tetrachloroethene (PCE)	3.81	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 06:39	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
Trichloroethene (TCE)	6.63	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 06:39	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 06:39	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/24/23 06:39	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 06:39</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 06:39</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 06:39</i>	<i>EPA 8260D</i>

MW-12 (A3C0644-11)			Matrix: Water			Batch: 23C0904		
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 09:37	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water		Batch: 23C0904			
MW-12 (A3C0644-11)								
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,1-Dichloroethane	89.1	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
1,1-Dichloroethene	2.23	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
trans-1,2-Dichloroethene	1.35	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 09:37	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 09:37	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
Tetrachloroethene (PCE)	2.51	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
Trichloroethene (TCE)	4.11	---	0.400	ug/L	1	03/24/23 09:37	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 09:37	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 09:37	EPA 8260D	

Surrogate: 1,4-Difluorobenzene (Surr) Recovery: 99 % Limits: 80-120 % 1 03/24/23 09:37 EPA 8260D

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Darrell Auvil, Client Services Manager



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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-12 (A3C0644-11)			Matrix: Water			Batch: 23C0904		
<i>Surrogate: Toluene-d8 (Surr)</i>		<i>Recovery: 103 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>1</i>	<i>03/24/23 09:37</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>1</i>	<i>03/24/23 09:37</i>	<i>EPA 8260D</i>	
MW-12 (A3C0644-11RE1)			Matrix: Water			Batch: 23C1003		CONT
cis-1,2-Dichloroethene	563	---	20.0	ug/L	50	03/25/23 20:53	EPA 8260D	
Vinyl chloride	1210	---	20.0	ug/L	50	03/25/23 20:53	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>1</i>	<i>03/25/23 20:53</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>	<i>80-120 %</i>	<i>1</i>	<i>1</i>	<i>03/25/23 20:53</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>		<i>104 %</i>	<i>80-120 %</i>	<i>1</i>	<i>1</i>	<i>03/25/23 20:53</i>	<i>EPA 8260D</i>	
MW-12 DUP (A3C0644-12)			Matrix: Water			Batch: 23C0904		
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 09:59	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,1-Dichloroethane	88.3	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	
1,1-Dichloroethene	2.23	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-12 DUP (A3C0644-12)			Matrix: Water			Batch: 23C0904		
trans-1,2-Dichloroethene	1.55	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 09:59	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 09:59	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
Tetrachloroethene (PCE)	2.43	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	
Trichloroethene (TCE)	4.06	---	0.400	ug/L	1	03/24/23 09:59	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 09:59	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 09:59	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 99 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/24/23 09:59</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>102 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 09:59</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 09:59</i>	<i>EPA 8260D</i>	

MW-12 DUP (A3C0644-12RE1)			Matrix: Water			Batch: 23C1003		
cis-1,2-Dichloroethene	576	---	20.0	ug/L	50	03/25/23 21:20	EPA 8260D	
Vinyl chloride	1300	---	20.0	ug/L	50	03/25/23 21:20	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 99 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/25/23 21:20</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>103 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 21:20</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>105 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 21:20</i>	<i>EPA 8260D</i>	

MW-3 (A3C0644-13)			Matrix: Water			Batch: 23C0904		
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0904		
MW-3 (A3C0644-13)								
Bromoform	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 07:01	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 07:01	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
1,1-Dichloroethane	0.940	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D	
cis-1,2-Dichloroethene	35.1	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D	
trans-1,2-Dichloroethene	1.34	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D	
1,2-Dichloropropane	0.980	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 07:01	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 07:01	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D	
Tetrachloroethene (PCE)	144	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
				Matrix: Water					
				Batch: 23C0904					
MW-3 (A3C0644-13)									
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 07:01	EPA 8260D		
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 07:01	EPA 8260D		
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 07:01	EPA 8260D		
1,1,1-Trichloroethane	1.79	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D		
Trichloroethene (TCE)	31.7	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D		
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 07:01	EPA 8260D		
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:01	EPA 8260D		
Vinyl chloride	ND	---	0.400	ug/L	1	03/24/23 07:01	EPA 8260D		
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 103 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/24/23 07:01</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 07:01</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/24/23 07:01</i>	<i>EPA 8260D</i>	

				Matrix: Water					
				Batch: 23C0904					
MW-2 (A3C0644-14)									
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D		
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Bromoform	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D		
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Chloroform	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 07:24	EPA 8260D		
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 07:24	EPA 8260D		
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D		
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D		
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D		
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D		
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D		
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D		

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0904		
MW-2 (A3C0644-14)								
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 07:24	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 07:24	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 07:24	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 07:24	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 07:24	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 07:24	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:24	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/24/23 07:24	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 103 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/24/23 07:24</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>103 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 07:24</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>97 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 07:24</i>	<i>EPA 8260D</i>	

			Matrix: Water			Batch: 23C0904		
MW-13 (A3C0644-15)								
Bromobenzene	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-13 (A3C0644-15)			Matrix: Water			Batch: 23C0904		
Chlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/24/23 07:46	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/24/23 07:46	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
1,1-Dichloroethane	22.3	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	Q-42
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	
1,1-Dichloroethene	8.08	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	Q-42
cis-1,2-Dichloroethene	145	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	
trans-1,2-Dichloroethene	2.90	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/24/23 07:46	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/24/23 07:46	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
Tetrachloroethene (PCE)	0.680	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 07:46	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/24/23 07:46	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/24/23 07:46	EPA 8260D	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-13 (A3C0644-15)			Matrix: Water			Batch: 23C0904		
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	
Trichloroethene (TCE)	1.19	---	0.400	ug/L	1	03/24/23 07:46	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/24/23 07:46	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/24/23 07:46	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 98 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/24/23 07:46</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>103 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 07:46</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>99 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/24/23 07:46</i>	<i>EPA 8260D</i>	
MW-13 (A3C0644-15RE1)			Matrix: Water			Batch: 23C1003		
Vinyl chloride	268	---	4.00	ug/L	10	03/25/23 20:26	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 99 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/25/23 20:26</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>102 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 20:26</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>104 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 20:26</i>	<i>EPA 8260D</i>	

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---	---	---

ANALYTICAL SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water		Batch: 23C0802		
MW-24d (A3C0644-01)								
Ammonia as N	0.123	---	0.0200	mg/L	1	03/21/23 15:39	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
MGMS3-3(60) (A3C0644-02)								
Ammonia as N	ND	---	0.0200	mg/L	1	03/21/23 15:48	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
MGMS3-4(40) (A3C0644-03)								
Ammonia as N	4.30	---	0.0200	mg/L	1	03/21/23 15:50	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0802		
MGMS3-4(40)DUP (A3C0644-04)								
Ammonia as N	4.28	---	0.0200	mg/L	1	03/21/23 15:51	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0896		
MGMS1-2(60) (A3C0644-05)								
Ammonia as N	1.87	---	0.0200	mg/L	1	03/23/23 12:48	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0896		
MGMS1-3(40) (A3C0644-06)								
Ammonia as N	199	---	1.00	mg/L	50	03/23/23 12:50	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0896		
MGMS2-3(60) (A3C0644-07)								
Ammonia as N	ND	---	0.0200	mg/L	1	03/23/23 12:53	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0956		
MGMS2-4(40) (A3C0644-08RE1)								
Ammonia as N	57.3	---	0.400	mg/L	20	03/24/23 15:32	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0896		
S-1 (A3C0644-09)								
Ammonia as N	ND	---	0.0200	mg/L	1	03/23/23 12:56	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0956		
MW-22i (A3C0644-10RE1)								
Ammonia as N	0.358	---	0.0200	mg/L	1	03/24/23 15:35	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0956		
MW-12 (A3C0644-11RE2)								
Ammonia as N	139	---	1.00	mg/L	50	03/24/23 15:37	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0956		
MW-12 DUP (A3C0644-12RE2)								
Ammonia as N	151	---	1.00	mg/L	50	03/24/23 15:40	SM 4500-NH3 G	
				Matrix: Water		Batch: 23C0956		
MW-3 (A3C0644-13RE2)								
				Matrix: Water		Batch: 23C0956		

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ANALYTICAL SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-3 (A3C0644-13RE2)				Matrix: Water		Batch: 23C0956		
Ammonia as N	ND	---	0.0200	mg/L	1	03/24/23 15:44	SM 4500-NH3 G	
MW-2 (A3C0644-14RE2)				Matrix: Water		Batch: 23C0956		
Ammonia as N	9.65	---	0.100	mg/L	5	03/24/23 15:46	SM 4500-NH3 G	
MW-13 (A3C0644-15RE2)				Matrix: Water		Batch: 23C0956		
Ammonia as N	32.1	---	0.200	mg/L	10	03/24/23 15:47	SM 4500-NH3 G	

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
MW-24d (A3C0644-01)					Matrix: Water				
Batch: 23C0700									
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 23:16	EPA 300.0		
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 23:16	EPA 300.0		
MGMS3-3(60) (A3C0644-02)					Matrix: Water				
Batch: 23C0700									
Nitrate-Nitrogen	1.00	---	0.250	mg/L	1	03/17/23 23:38	EPA 300.0	Q-42	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/17/23 23:38	EPA 300.0		
MGMS3-4(40) (A3C0644-03)					Matrix: Water				
Batch: 23C0700									
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 00:42	EPA 300.0		
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 00:42	EPA 300.0		
MGMS3-4(40)DUP (A3C0644-04)					Matrix: Water				
Batch: 23C0700									
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 01:04	EPA 300.0		
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 01:04	EPA 300.0		
MGMS1-2(60) (A3C0644-05)					Matrix: Water				
Batch: 23C0700									
Nitrate-Nitrogen	4.31	---	0.250	mg/L	1	03/18/23 01:26	EPA 300.0		
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 01:26	EPA 300.0		
MGMS1-3(40) (A3C0644-06)					Matrix: Water				
Batch: 23C0700									
Nitrate-Nitrogen	25.2	---	2.50	mg/L	10	03/18/23 01:47	EPA 300.0		
MGMS1-3(40) (A3C0644-06RE1)					Matrix: Water				
Batch: 23C0700									
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 14:44	EPA 300.0	H-01	
MGMS2-3(60) (A3C0644-07)					Matrix: Water				
Batch: 23C0700									
Nitrate-Nitrogen	1.21	---	0.250	mg/L	1	03/18/23 02:52	EPA 300.0		
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 02:52	EPA 300.0		

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MGMS2-4(40) (A3C0644-08)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	44.8	---	5.00	mg/L	20	03/18/23 03:13	EPA 300.0	
MGMS2-4(40) (A3C0644-08RE1)				Matrix: Water				
Batch: 23C0700								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 03:35	EPA 300.0	
S-1 (A3C0644-09)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	2.26	---	0.250	mg/L	1	03/18/23 03:56	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 03:56	EPA 300.0	
MW-22i (A3C0644-10)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 04:18	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 04:18	EPA 300.0	
MW-12 (A3C0644-11)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 04:40	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 04:40	EPA 300.0	
MW-12 DUP (A3C0644-12)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 05:01	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 05:01	EPA 300.0	
MW-3 (A3C0644-13)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 05:23	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 05:23	EPA 300.0	
MW-2 (A3C0644-14)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 05:44	EPA 300.0	

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
MW-2 (A3C0644-14)				Matrix: Water					
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 05:44	EPA 300.0		
MW-13 (A3C0644-15RE1)				Matrix: Water					
Batch: 23C0700									
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/21/23 06:01	EPA 300.0	H-01	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/21/23 06:01	EPA 300.0	H-01	

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ANALYTICAL SAMPLE RESULTS

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water		Batch: 23D0342		
MGMS3-4(40) (A3C0644-03)								
Total Organic Carbon	3.92	---	1.00	mg/L	1	04/10/23 22:40	SM 5310 C	
				Matrix: Water		Batch: 23D0342		
MGMS1-3(40) (A3C0644-06)								
Total Organic Carbon	4.84	---	1.00	mg/L	1	04/10/23 23:10	SM 5310 C	
				Matrix: Water		Batch: 23D0342		
MGMS2-4(40) (A3C0644-08)								
Total Organic Carbon	4.63	---	1.00	mg/L	1	04/10/23 23:40	SM 5310 C	
				Matrix: Water		Batch: 23D0342		
MW-12 (A3C0644-11RE1)								
Total Organic Carbon	22.9	---	2.00	mg/L	2	04/11/23 16:03	SM 5310 C	
				Matrix: Water		Batch: 23D0342		
MW-13 (A3C0644-15RE1)								
Total Organic Carbon	4.95	---	1.00	mg/L	1	04/11/23 16:34	SM 5310 C	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0904 - EPA 5030C						Water						
Blank (23C0904-BLK1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 01:06									
EPA 8260D												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0904 - EPA 5030C						Water						
Blank (23C0904-BLK1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 01:06									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0904-BS1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 00:21									
EPA 8260D												
Bromobenzene	17.2	---	0.500	ug/L	1	20.0	---	86	80-120%	---	---	
Bromochloromethane	23.6	---	1.00	ug/L	1	20.0	---	118	80-120%	---	---	
Bromodichloromethane	20.3	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
Bromoform	19.0	---	1.00	ug/L	1	20.0	---	95	80-120%	---	---	
Bromomethane	14.7	---	5.00	ug/L	1	20.0	---	74	80-120%	---	---	Q-55
Carbon tetrachloride	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Chlorobenzene	18.5	---	0.500	ug/L	1	20.0	---	93	80-120%	---	---	
Chloroethane	24.6	---	5.00	ug/L	1	20.0	---	123	80-120%	---	---	Q-56
Chloroform	18.9	---	1.00	ug/L	1	20.0	---	94	80-120%	---	---	
Chloromethane	20.0	---	5.00	ug/L	1	20.0	---	100	80-120%	---	---	
2-Chlorotoluene	18.9	---	1.00	ug/L	1	20.0	---	95	80-120%	---	---	
4-Chlorotoluene	20.1	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
Dibromochloromethane	19.4	---	1.00	ug/L	1	20.0	---	97	80-120%	---	---	
1,2-Dibromo-3-chloropropane	17.5	---	5.00	ug/L	1	20.0	---	88	80-120%	---	---	
1,2-Dibromoethane (EDB)	19.0	---	0.500	ug/L	1	20.0	---	95	80-120%	---	---	
Dibromomethane	18.9	---	1.00	ug/L	1	20.0	---	95	80-120%	---	---	
1,2-Dichlorobenzene	18.5	---	0.500	ug/L	1	20.0	---	93	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0904 - EPA 5030C						Water						
LCS (23C0904-BS1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 00:21									
1,3-Dichlorobenzene	18.8	---	0.500	ug/L	1	20.0	---	94	80-120%	---	---	
1,4-Dichlorobenzene	17.5	---	0.500	ug/L	1	20.0	---	87	80-120%	---	---	
Dichlorodifluoromethane	24.6	---	1.00	ug/L	1	20.0	---	123	80-120%	---	---	Q-56
1,1-Dichloroethane	20.7	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
1,2-Dichloroethane (EDC)	20.8	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
1,1-Dichloroethene	21.5	---	0.400	ug/L	1	20.0	---	108	80-120%	---	---	
cis-1,2-Dichloroethene	20.1	---	0.400	ug/L	1	20.0	---	100	80-120%	---	---	
trans-1,2-Dichloroethene	20.3	---	0.400	ug/L	1	20.0	---	101	80-120%	---	---	
1,2-Dichloropropane	19.7	---	0.500	ug/L	1	20.0	---	98	80-120%	---	---	
1,3-Dichloropropane	20.0	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
2,2-Dichloropropane	19.1	---	1.00	ug/L	1	20.0	---	95	80-120%	---	---	
1,1-Dichloropropene	21.0	---	1.00	ug/L	1	20.0	---	105	80-120%	---	---	
cis-1,3-Dichloropropene	20.2	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
trans-1,3-Dichloropropene	21.8	---	1.00	ug/L	1	20.0	---	109	80-120%	---	---	
Hexachlorobutadiene	18.4	---	5.00	ug/L	1	20.0	---	92	80-120%	---	---	
Methylene chloride	19.0	---	10.0	ug/L	1	20.0	---	95	80-120%	---	---	
1,1,1,2-Tetrachloroethane	18.1	---	0.400	ug/L	1	20.0	---	90	80-120%	---	---	
1,1,2,2-Tetrachloroethane	20.2	---	0.500	ug/L	1	20.0	---	101	80-120%	---	---	
Tetrachloroethene (PCE)	19.4	---	0.400	ug/L	1	20.0	---	97	80-120%	---	---	
1,2,3-Trichlorobenzene	18.8	---	2.00	ug/L	1	20.0	---	94	80-120%	---	---	
1,1,2-Trichloroethane	18.7	---	0.500	ug/L	1	20.0	---	94	80-120%	---	---	
1,2,4-Trichlorobenzene	17.5	---	2.00	ug/L	1	20.0	---	88	80-120%	---	---	
1,1,1-Trichloroethane	20.1	---	0.400	ug/L	1	20.0	---	101	80-120%	---	---	
Trichloroethene (TCE)	17.4	---	0.400	ug/L	1	20.0	---	87	80-120%	---	---	
Trichlorofluoromethane	22.9	---	2.00	ug/L	1	20.0	---	115	80-120%	---	---	
1,2,3-Trichloropropane	19.1	---	1.00	ug/L	1	20.0	---	95	80-120%	---	---	
Vinyl chloride	22.1	---	0.400	ug/L	1	20.0	---	111	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 95 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0904-DUP1)	Prepared: 03/23/23 12:31 Analyzed: 03/24/23 05:10
QC Source Sample: MW-24d (A3C0644-01)	
EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0904 - EPA 5030C						Water						
Duplicate (23C0904-DUP1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 05:10									
QC Source Sample: MW-24d (A3C0644-01)												
Bromobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Bromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromoform	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromomethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Chloroethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Chloroform	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chloromethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dibromomethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Methylene chloride	ND	---	10.0	ug/L	1	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0904 - EPA 5030C						Water						
Duplicate (23C0904-DUP1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 05:10									
QC Source Sample: MW-24d (A3C0644-01)												
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0904-MS1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 08:08									
QC Source Sample: MW-13 (A3C0644-15)												
EPA 8260D												
Bromobenzene	18.6	---	0.500	ug/L	1	20.0	ND	93	80-120%	---	---	
Bromochloromethane	26.4	---	1.00	ug/L	1	20.0	ND	132	78-123%	---	---	Q-01
Bromodichloromethane	22.9	---	1.00	ug/L	1	20.0	ND	115	79-125%	---	---	
Bromoform	21.8	---	1.00	ug/L	1	20.0	ND	109	66-130%	---	---	
Bromomethane	21.4	---	5.00	ug/L	1	20.0	ND	107	53-141%	---	---	Q-54b
Carbon tetrachloride	24.8	---	1.00	ug/L	1	20.0	ND	124	72-136%	---	---	
Chlorobenzene	20.9	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
Chloroethane	28.5	---	5.00	ug/L	1	20.0	ND	142	60-138%	---	---	Q-54
Chloroform	21.4	---	1.00	ug/L	1	20.0	ND	107	79-124%	---	---	
Chloromethane	24.3	---	5.00	ug/L	1	20.0	ND	121	50-139%	---	---	
2-Chlorotoluene	20.5	---	1.00	ug/L	1	20.0	ND	103	79-122%	---	---	
4-Chlorotoluene	22.1	---	1.00	ug/L	1	20.0	ND	111	78-122%	---	---	
Dibromochloromethane	21.5	---	1.00	ug/L	1	20.0	ND	108	74-126%	---	---	
1,2-Dibromo-3-chloropropane	18.9	---	5.00	ug/L	1	20.0	ND	94	62-128%	---	---	
1,2-Dibromoethane (EDB)	20.8	---	0.500	ug/L	1	20.0	ND	104	77-121%	---	---	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0904 - EPA 5030C						Water						
Matrix Spike (23C0904-MS1)			Prepared: 03/23/23 12:31 Analyzed: 03/24/23 08:08									
QC Source Sample: MW-13 (A3C0644-15)												
Dibromomethane	21.2	---	1.00	ug/L	1	20.0	ND	106	79-123%	---	---	
1,2-Dichlorobenzene	20.1	---	0.500	ug/L	1	20.0	ND	100	80-120%	---	---	
1,3-Dichlorobenzene	20.6	---	0.500	ug/L	1	20.0	ND	103	80-120%	---	---	
1,4-Dichlorobenzene	19.2	---	0.500	ug/L	1	20.0	ND	96	79-120%	---	---	
Dichlorodifluoromethane	27.6	---	1.00	ug/L	1	20.0	ND	138	32-152%	---	---	Q-54
1,1-Dichloroethane	47.7	---	0.400	ug/L	1	20.0	22.3	127	77-125%	---	---	Q-01
1,2-Dichloroethane (EDC)	23.6	---	0.400	ug/L	1	20.0	ND	118	73-128%	---	---	
1,1-Dichloroethene	35.1	---	0.400	ug/L	1	20.0	8.08	135	71-131%	---	---	Q-01
cis-1,2-Dichloroethene	183	---	0.400	ug/L	1	20.0	145	190	78-123%	---	---	Q-03
trans-1,2-Dichloroethene	25.7	---	0.400	ug/L	1	20.0	2.90	114	75-124%	---	---	
1,2-Dichloropropane	21.4	---	0.500	ug/L	1	20.0	ND	107	78-122%	---	---	
1,3-Dichloropropane	21.6	---	1.00	ug/L	1	20.0	ND	108	80-120%	---	---	
2,2-Dichloropropane	18.4	---	1.00	ug/L	1	20.0	ND	92	60-139%	---	---	
1,1-Dichloropropene	23.3	---	1.00	ug/L	1	20.0	ND	116	79-125%	---	---	
cis-1,3-Dichloropropene	18.6	---	1.00	ug/L	1	20.0	ND	93	75-124%	---	---	
trans-1,3-Dichloropropene	23.6	---	1.00	ug/L	1	20.0	ND	118	73-127%	---	---	
Hexachlorobutadiene	20.4	---	5.00	ug/L	1	20.0	ND	102	66-134%	---	---	
Methylene chloride	20.5	---	10.0	ug/L	1	20.0	ND	103	74-124%	---	---	
1,1,1,2-Tetrachloroethane	20.5	---	0.400	ug/L	1	20.0	ND	103	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	22.8	---	0.500	ug/L	1	20.0	ND	114	71-121%	---	---	
Tetrachloroethene (PCE)	22.5	---	0.400	ug/L	1	20.0	0.680	109	74-129%	---	---	
1,2,3-Trichlorobenzene	20.4	---	2.00	ug/L	1	20.0	ND	102	69-129%	---	---	
1,1,2-Trichloroethane	20.6	---	0.500	ug/L	1	20.0	ND	103	80-120%	---	---	
1,2,4-Trichlorobenzene	18.4	---	2.00	ug/L	1	20.0	ND	92	69-130%	---	---	
1,1,1-Trichloroethane	23.1	---	0.400	ug/L	1	20.0	ND	116	74-131%	---	---	
Trichloroethene (TCE)	20.7	---	0.400	ug/L	1	20.0	1.19	98	79-123%	---	---	
Trichlorofluoromethane	26.2	---	2.00	ug/L	1	20.0	ND	131	65-141%	---	---	
1,2,3-Trichloropropane	21.2	---	1.00	ug/L	1	20.0	ND	106	73-122%	---	---	
Vinyl chloride	420	---	0.400	ug/L	1	20.0	364	279	58-137%	---	---	E, Q-03
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 95 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>92 %</i>		<i>80-120 %</i>		<i>"</i>						

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0967 - EPA 5030C						Water						
Blank (23C0967-BLK1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 12:16									
EPA 8260D												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0967 - EPA 5030C						Water						
Blank (23C0967-BLK1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 12:16									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C0967-BS1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 11:15									
EPA 8260D												
Bromobenzene	19.2	---	0.500	ug/L	1	20.0	---	96	80-120%	---	---	
Bromochloromethane	20.1	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
Bromodichloromethane	22.6	---	1.00	ug/L	1	20.0	---	113	80-120%	---	---	
Bromoform	17.3	---	1.00	ug/L	1	20.0	---	87	80-120%	---	---	
Bromomethane	21.8	---	5.00	ug/L	1	20.0	---	109	80-120%	---	---	
Carbon tetrachloride	22.0	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
Chlorobenzene	19.5	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
Chloroethane	15.5	---	5.00	ug/L	1	20.0	---	77	80-120%	---	---	ICV-01, Q-55
Chloroform	19.9	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
Chloromethane	18.2	---	5.00	ug/L	1	20.0	---	91	80-120%	---	---	
2-Chlorotoluene	19.8	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
4-Chlorotoluene	19.8	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
Dibromochloromethane	18.3	---	1.00	ug/L	1	20.0	---	92	80-120%	---	---	
1,2-Dibromo-3-chloropropane	19.1	---	5.00	ug/L	1	20.0	---	96	80-120%	---	---	
1,2-Dibromoethane (EDB)	22.0	---	0.500	ug/L	1	20.0	---	110	80-120%	---	---	
Dibromomethane	21.6	---	1.00	ug/L	1	20.0	---	108	80-120%	---	---	
1,2-Dichlorobenzene	20.5	---	0.500	ug/L	1	20.0	---	103	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0967 - EPA 5030C						Water						
LCS (23C0967-BS1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 11:15									
1,3-Dichlorobenzene	20.3	---	0.500	ug/L	1	20.0	---	101	80-120%	---	---	
1,4-Dichlorobenzene	19.4	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
Dichlorodifluoromethane	20.8	---	1.00	ug/L	1	20.0	---	104	80-120%	---	---	
1,1-Dichloroethane	19.9	---	0.400	ug/L	1	20.0	---	100	80-120%	---	---	
1,2-Dichloroethane (EDC)	20.2	---	0.400	ug/L	1	20.0	---	101	80-120%	---	---	
1,1-Dichloroethene	20.4	---	0.400	ug/L	1	20.0	---	102	80-120%	---	---	
cis-1,2-Dichloroethene	20.0	---	0.400	ug/L	1	20.0	---	100	80-120%	---	---	
trans-1,2-Dichloroethene	20.3	---	0.400	ug/L	1	20.0	---	101	80-120%	---	---	
1,2-Dichloropropane	19.8	---	0.500	ug/L	1	20.0	---	99	80-120%	---	---	
1,3-Dichloropropane	20.6	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
2,2-Dichloropropane	21.1	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
1,1-Dichloropropene	21.5	---	1.00	ug/L	1	20.0	---	108	80-120%	---	---	
cis-1,3-Dichloropropene	21.0	---	1.00	ug/L	1	20.0	---	105	80-120%	---	---	
trans-1,3-Dichloropropene	19.4	---	1.00	ug/L	1	20.0	---	97	80-120%	---	---	
Hexachlorobutadiene	23.8	---	5.00	ug/L	1	20.0	---	119	80-120%	---	---	
Methylene chloride	19.6	---	10.0	ug/L	1	20.0	---	98	80-120%	---	---	
1,1,1,2-Tetrachloroethane	22.0	---	0.400	ug/L	1	20.0	---	110	80-120%	---	---	
1,1,2,2-Tetrachloroethane	20.8	---	0.500	ug/L	1	20.0	---	104	80-120%	---	---	
Tetrachloroethene (PCE)	20.7	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
1,2,3-Trichlorobenzene	19.6	---	2.00	ug/L	1	20.0	---	98	80-120%	---	---	
1,1,2-Trichloroethane	20.3	---	0.500	ug/L	1	20.0	---	101	80-120%	---	---	
1,2,4-Trichlorobenzene	20.1	---	2.00	ug/L	1	20.0	---	101	80-120%	---	---	
1,1,1-Trichloroethane	21.2	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
Trichloroethene (TCE)	19.9	---	0.400	ug/L	1	20.0	---	99	80-120%	---	---	
Trichlorofluoromethane	23.2	---	2.00	ug/L	1	20.0	---	116	80-120%	---	---	
1,2,3-Trichloropropane	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
Vinyl chloride	20.9	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>95 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0967-DUP1) Prepared: 03/24/23 10:20 Analyzed: 03/24/23 16:46

QC Source Sample: MGMS3-3(60) (A3C0644-02)
EPA 8260D

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0967 - EPA 5030C						Water						
Duplicate (23C0967-DUP1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 16:46									
QC Source Sample: MGMS3-3(60) (A3C0644-02)												
Bromobenzene	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
Bromochloromethane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Bromoform	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Bromomethane	ND	---	50.0	ug/L	10	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
Chloroethane	ND	---	50.0	ug/L	10	---	ND	---	---	---	30%	
Chloroform	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Chloromethane	ND	---	50.0	ug/L	10	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	50.0	ug/L	10	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
Dibromomethane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	18.8	---	4.00	ug/L	10	---	18.6	---	---	1	30%	
trans-1,2-Dichloroethene	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	50.0	ug/L	10	---	ND	---	---	---	30%	
Methylene chloride	ND	---	100	ug/L	10	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



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AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0967 - EPA 5030C						Water						
Duplicate (23C0967-DUP1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 16:46									
QC Source Sample: MGMS3-3(60) (A3C0644-02)												
1,1,1,2-Tetrachloroethane	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
1,1,2,2-Tetrachloroethane	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	4.00	ug/L	10	---	2.90	---	---	***	30%	
1,2,3-Trichlorobenzene	ND	---	20.0	ug/L	10	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	20.0	ug/L	10	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	4.00	ug/L	10	---	3.00	---	---	***	30%	
Trichlorofluoromethane	ND	---	20.0	ug/L	10	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0967-MS1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 22:10									
QC Source Sample: Non-SDG (A3C0822-05)												
EPA 8260D												
Bromobenzene	20.5	---	0.500	ug/L	1	20.0	ND	103	80-120%	---	---	
Bromochloromethane	21.9	---	1.00	ug/L	1	20.0	ND	110	78-123%	---	---	
Bromodichloromethane	23.7	---	1.00	ug/L	1	20.0	ND	119	79-125%	---	---	
Bromoform	17.1	---	1.00	ug/L	1	20.0	ND	85	66-130%	---	---	
Bromomethane	23.3	---	5.00	ug/L	1	20.0	ND	117	53-141%	---	---	
Carbon tetrachloride	22.6	---	1.00	ug/L	1	20.0	ND	113	72-136%	---	---	
Chlorobenzene	21.0	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
Chloroethane	18.4	---	5.00	ug/L	1	20.0	ND	92	60-138%	---	---	ICV-01, Q-54a
Chloroform	21.5	---	1.00	ug/L	1	20.0	ND	107	79-124%	---	---	
Chloromethane	21.6	---	5.00	ug/L	1	20.0	ND	108	50-139%	---	---	
2-Chlorotoluene	21.6	---	1.00	ug/L	1	20.0	ND	108	79-122%	---	---	
4-Chlorotoluene	21.6	---	1.00	ug/L	1	20.0	ND	108	78-122%	---	---	
Dibromochloromethane	18.8	---	1.00	ug/L	1	20.0	ND	94	74-126%	---	---	
1,2-Dibromo-3-chloropropane	19.7	---	5.00	ug/L	1	20.0	ND	98	62-128%	---	---	

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Darrell Auvil, Client Services Manager



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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0967 - EPA 5030C						Water						
Matrix Spike (23C0967-MS1)			Prepared: 03/24/23 10:20 Analyzed: 03/24/23 22:10									
QC Source Sample: Non-SDG (A3C0822-05)												
1,2-Dibromoethane (EDB)	22.7	---	0.500	ug/L	1	20.0	ND	113	77-121%	---	---	
Dibromomethane	23.0	---	1.00	ug/L	1	20.0	ND	115	79-123%	---	---	
1,2-Dichlorobenzene	22.2	---	0.500	ug/L	1	20.0	ND	111	80-120%	---	---	
1,3-Dichlorobenzene	21.8	---	0.500	ug/L	1	20.0	ND	109	80-120%	---	---	
1,4-Dichlorobenzene	20.9	---	0.500	ug/L	1	20.0	ND	105	79-120%	---	---	
Dichlorodifluoromethane	22.0	---	1.00	ug/L	1	20.0	ND	110	32-152%	---	---	
1,1-Dichloroethane	22.0	---	0.400	ug/L	1	20.0	ND	110	77-125%	---	---	
1,2-Dichloroethane (EDC)	21.9	---	0.400	ug/L	1	20.0	ND	110	73-128%	---	---	
1,1-Dichloroethene	22.6	---	0.400	ug/L	1	20.0	ND	113	71-131%	---	---	
cis-1,2-Dichloroethene	22.0	---	0.400	ug/L	1	20.0	ND	110	78-123%	---	---	
trans-1,2-Dichloroethene	22.6	---	0.400	ug/L	1	20.0	ND	113	75-124%	---	---	
1,2-Dichloropropane	21.6	---	0.500	ug/L	1	20.0	ND	108	78-122%	---	---	
1,3-Dichloropropane	21.7	---	1.00	ug/L	1	20.0	ND	109	80-120%	---	---	
2,2-Dichloropropane	17.6	---	1.00	ug/L	1	20.0	ND	88	60-139%	---	---	
1,1-Dichloropropene	23.6	---	1.00	ug/L	1	20.0	ND	118	79-125%	---	---	
cis-1,3-Dichloropropene	20.6	---	1.00	ug/L	1	20.0	ND	103	75-124%	---	---	
trans-1,3-Dichloropropene	19.0	---	1.00	ug/L	1	20.0	ND	95	73-127%	---	---	
Hexachlorobutadiene	24.0	---	5.00	ug/L	1	20.0	ND	120	66-134%	---	---	
Methylene chloride	20.6	---	10.0	ug/L	1	20.0	ND	103	74-124%	---	---	
1,1,1,2-Tetrachloroethane	22.8	---	0.400	ug/L	1	20.0	ND	114	78-124%	---	---	
1,1,2,2-Tetrachloroethane	22.4	---	0.500	ug/L	1	20.0	ND	112	71-121%	---	---	
Tetrachloroethene (PCE)	22.0	---	0.400	ug/L	1	20.0	ND	110	74-129%	---	---	
1,2,3-Trichlorobenzene	21.1	---	2.00	ug/L	1	20.0	ND	106	69-129%	---	---	
1,1,2-Trichloroethane	21.4	---	0.500	ug/L	1	20.0	ND	107	80-120%	---	---	
1,2,4-Trichlorobenzene	21.8	---	2.00	ug/L	1	20.0	ND	109	69-130%	---	---	
1,1,1-Trichloroethane	22.6	---	0.400	ug/L	1	20.0	ND	113	74-131%	---	---	
Trichloroethene (TCE)	21.6	---	0.400	ug/L	1	20.0	ND	108	79-123%	---	---	
Trichlorofluoromethane	25.1	---	2.00	ug/L	1	20.0	ND	125	65-141%	---	---	
1,2,3-Trichloropropane	21.4	---	1.00	ug/L	1	20.0	ND	107	73-122%	---	---	
Vinyl chloride	23.3	---	0.400	ug/L	1	20.0	ND	117	58-137%	---	---	

Surr: 1,4-Difluorobenzene (Surr)	Recovery: 100 %	Limits: 80-120 %	Dilution: 1x
Toluene-d8 (Surr)	100 %	80-120 %	"
4-Bromofluorobenzene (Surr)	95 %	80-120 %	"

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Darrell Auvil, Client Services Manager



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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0967 - EPA 5030C							Water					

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C1003 - EPA 5030C						Water						
Blank (23C1003-BLK1)			Prepared: 03/25/23 10:44 Analyzed: 03/25/23 15:55									
EPA 8260D												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	

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Darrell Auvil, Client Services Manager



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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C1003 - EPA 5030C						Water						
Blank (23C1003-BLK1)			Prepared: 03/25/23 10:44 Analyzed: 03/25/23 15:55									
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>"</i>						

LCS (23C1003-BS1)			Prepared: 03/25/23 10:44 Analyzed: 03/25/23 15:01									
EPA 8260D												
Bromobenzene	19.2	---	0.500	ug/L	1	20.0	---	96	80-120%	---	---	
Bromochloromethane	20.7	---	1.00	ug/L	1	20.0	---	104	80-120%	---	---	
Bromodichloromethane	22.8	---	1.00	ug/L	1	20.0	---	114	80-120%	---	---	
Bromoform	16.4	---	1.00	ug/L	1	20.0	---	82	80-120%	---	---	
Bromomethane	22.9	---	5.00	ug/L	1	20.0	---	115	80-120%	---	---	
Carbon tetrachloride	20.5	---	1.00	ug/L	1	20.0	---	103	80-120%	---	---	
Chlorobenzene	19.8	---	0.500	ug/L	1	20.0	---	99	80-120%	---	---	
Chloroethane	16.3	---	5.00	ug/L	1	20.0	---	81	80-120%	---	---	ICV-01
Chloroform	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
Chloromethane	20.4	---	5.00	ug/L	1	20.0	---	102	80-120%	---	---	
2-Chlorotoluene	19.8	---	1.00	ug/L	1	20.0	---	99	80-120%	---	---	
4-Chlorotoluene	20.2	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
Dibromochloromethane	18.0	---	1.00	ug/L	1	20.0	---	90	80-120%	---	---	
1,2-Dibromo-3-chloropropane	18.9	---	5.00	ug/L	1	20.0	---	94	80-120%	---	---	
1,2-Dibromoethane (EDB)	22.0	---	0.500	ug/L	1	20.0	---	110	80-120%	---	---	
Dibromomethane	21.8	---	1.00	ug/L	1	20.0	---	109	80-120%	---	---	
1,2-Dichlorobenzene	20.8	---	0.500	ug/L	1	20.0	---	104	80-120%	---	---	

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Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C1003 - EPA 5030C						Water						
LCS (23C1003-BS1)			Prepared: 03/25/23 10:44 Analyzed: 03/25/23 15:01									
1,3-Dichlorobenzene	20.4	---	0.500	ug/L	1	20.0	---	102	80-120%	---	---	
1,4-Dichlorobenzene	19.6	---	0.500	ug/L	1	20.0	---	98	80-120%	---	---	
Dichlorodifluoromethane	21.0	---	1.00	ug/L	1	20.0	---	105	80-120%	---	---	
1,1-Dichloroethane	20.5	---	0.400	ug/L	1	20.0	---	103	80-120%	---	---	
1,2-Dichloroethane (EDC)	20.8	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
1,1-Dichloroethene	20.7	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
cis-1,2-Dichloroethene	20.8	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
trans-1,2-Dichloroethene	20.9	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
1,2-Dichloropropane	20.3	---	0.500	ug/L	1	20.0	---	101	80-120%	---	---	
1,3-Dichloropropane	21.3	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
2,2-Dichloropropane	19.6	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
1,1-Dichloropropene	21.5	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
cis-1,3-Dichloropropene	20.5	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
trans-1,3-Dichloropropene	19.2	---	1.00	ug/L	1	20.0	---	96	80-120%	---	---	
Hexachlorobutadiene	23.4	---	5.00	ug/L	1	20.0	---	117	80-120%	---	---	
Methylene chloride	19.8	---	10.0	ug/L	1	20.0	---	99	80-120%	---	---	
1,1,1,2-Tetrachloroethane	21.7	---	0.400	ug/L	1	20.0	---	108	80-120%	---	---	
1,1,2,2-Tetrachloroethane	21.4	---	0.500	ug/L	1	20.0	---	107	80-120%	---	---	
Tetrachloroethene (PCE)	20.3	---	0.400	ug/L	1	20.0	---	102	80-120%	---	---	
1,2,3-Trichlorobenzene	19.6	---	2.00	ug/L	1	20.0	---	98	80-120%	---	---	
1,1,2-Trichloroethane	20.8	---	0.500	ug/L	1	20.0	---	104	80-120%	---	---	
1,2,4-Trichlorobenzene	20.3	---	2.00	ug/L	1	20.0	---	102	80-120%	---	---	
1,1,1-Trichloroethane	20.6	---	0.400	ug/L	1	20.0	---	103	80-120%	---	---	
Trichloroethene (TCE)	20.0	---	0.400	ug/L	1	20.0	---	100	80-120%	---	---	
Trichlorofluoromethane	23.5	---	2.00	ug/L	1	20.0	---	118	80-120%	---	---	
1,2,3-Trichloropropane	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
Vinyl chloride	21.8	---	0.400	ug/L	1	20.0	---	109	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>93 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C1003-DUP1)						Prepared: 03/25/23 10:44 Analyzed: 03/26/23 00:29						H-01
QC Source Sample: Non-SDG (A3C0252-01)												
Bromobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C1003 - EPA 5030C						Water						
Duplicate (23C1003-DUP1)						Prepared: 03/25/23 10:44 Analyzed: 03/26/23 00:29						H-01
QC Source Sample: Non-SDG (A3C0252-01)												
Bromochloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromoform	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Bromomethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
Chloroethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Chloroform	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Chloromethane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
Dibromomethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	100	ug/L	20	---	ND	---	---	---	30%	
Methylene chloride	ND	---	200	ug/L	20	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes	
Batch 23C1003 - EPA 5030C						Water							
Duplicate (23C1003-DUP1)			Prepared: 03/25/23 10:44 Analyzed: 03/26/23 00:29						H-01				
QC Source Sample: Non-SDG (A3C0252-01)													
1,1,2,2-Tetrachloroethane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%		
Tetrachloroethene (PCE)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%		
1,2,3-Trichlorobenzene	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%		
1,1,2-Trichloroethane	ND	---	10.0	ug/L	20	---	ND	---	---	---	30%		
1,2,4-Trichlorobenzene	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%		
1,1,1-Trichloroethane	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%		
Trichloroethene (TCE)	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%		
Trichlorofluoromethane	ND	---	40.0	ug/L	20	---	ND	---	---	---	30%		
1,2,3-Trichloropropane	ND	---	20.0	ug/L	20	---	ND	---	---	---	30%		
Vinyl chloride	ND	---	8.00	ug/L	20	---	ND	---	---	---	30%		
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>							
<i>Toluene-d8 (Surr)</i>		<i>101 %</i>		<i>80-120 %</i>		<i>"</i>							
<i>4-Bromofluorobenzene (Surr)</i>		<i>97 %</i>		<i>80-120 %</i>		<i>"</i>							

Duplicate (23C1003-DUP2)			Prepared: 03/25/23 10:44 Analyzed: 03/25/23 22:41									
QC Source Sample: Non-SDG (A3C0875-02)												
Bromobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Bromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromofrom	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Bromomethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Chloroethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Chloroform	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Chloromethane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dibromomethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C1003 - EPA 5030C						Water						
Duplicate (23C1003-DUP2)			Prepared: 03/25/23 10:44 Analyzed: 03/25/23 22:41									
QC Source Sample: Non-SDG (A3C0875-02)												
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	ND	---	---	---	30%	
Methylene chloride	ND	---	10.0	ug/L	1	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	0.400	ug/L	1	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C1003-MS1) Prepared: 03/25/23 10:44 Analyzed: 03/26/23 02:44 **H-01**

QC Source Sample: Non-SDG (A3C0252-08)

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C1003 - EPA 5030C						Water						
Matrix Spike (23C1003-MS1)						Prepared: 03/25/23 10:44 Analyzed: 03/26/23 02:44						H-01
QC Source Sample: Non-SDG (A3C0252-08)												
EPA 8260D												
Bromobenzene	1030	---	25.0	ug/L	50	1000	ND	103	80-120%	---	---	
Bromochloromethane	1060	---	50.0	ug/L	50	1000	ND	106	78-123%	---	---	
Bromodichloromethane	1180	---	50.0	ug/L	50	1000	ND	118	79-125%	---	---	
Bromoform	822	---	50.0	ug/L	50	1000	ND	82	66-130%	---	---	
Bromomethane	1390	---	250	ug/L	50	1000	ND	139	53-141%	---	---	
Carbon tetrachloride	1090	---	50.0	ug/L	50	1000	ND	109	72-136%	---	---	
Chlorobenzene	1050	---	25.0	ug/L	50	1000	ND	105	80-120%	---	---	
Chloroethane	1090	---	250	ug/L	50	1000	ND	109	60-138%	---	---	ICV-01
Chloroform	1080	---	50.0	ug/L	50	1000	ND	108	79-124%	---	---	
Chloromethane	1190	---	250	ug/L	50	1000	ND	119	50-139%	---	---	
2-Chlorotoluene	1060	---	50.0	ug/L	50	1000	ND	106	79-122%	---	---	
4-Chlorotoluene	1060	---	50.0	ug/L	50	1000	ND	106	78-122%	---	---	
Dibromochloromethane	920	---	50.0	ug/L	50	1000	ND	92	74-126%	---	---	
1,2-Dibromo-3-chloropropane	948	---	250	ug/L	50	1000	ND	95	62-128%	---	---	
1,2-Dibromoethane (EDB)	1140	---	25.0	ug/L	50	1000	ND	114	77-121%	---	---	
Dibromomethane	1140	---	50.0	ug/L	50	1000	ND	114	79-123%	---	---	
1,2-Dichlorobenzene	1110	---	25.0	ug/L	50	1000	ND	111	80-120%	---	---	
1,3-Dichlorobenzene	1090	---	25.0	ug/L	50	1000	ND	109	80-120%	---	---	
1,4-Dichlorobenzene	1030	---	25.0	ug/L	50	1000	ND	103	79-120%	---	---	
Dichlorodifluoromethane	1290	---	50.0	ug/L	50	1000	ND	129	32-152%	---	---	
1,1-Dichloroethane	1080	---	20.0	ug/L	50	1000	ND	108	77-125%	---	---	
1,2-Dichloroethane (EDC)	1070	---	20.0	ug/L	50	1000	ND	107	73-128%	---	---	
1,1-Dichloroethene	1140	---	20.0	ug/L	50	1000	ND	114	71-131%	---	---	
cis-1,2-Dichloroethene	1080	---	20.0	ug/L	50	1000	ND	108	78-123%	---	---	
trans-1,2-Dichloroethene	1120	---	20.0	ug/L	50	1000	ND	112	75-124%	---	---	
1,2-Dichloropropane	1060	---	25.0	ug/L	50	1000	ND	106	78-122%	---	---	
1,3-Dichloropropane	1090	---	50.0	ug/L	50	1000	ND	109	80-120%	---	---	
2,2-Dichloropropane	750	---	50.0	ug/L	50	1000	ND	75	60-139%	---	---	
1,1-Dichloropropene	1180	---	50.0	ug/L	50	1000	ND	118	79-125%	---	---	
cis-1,3-Dichloropropene	1000	---	50.0	ug/L	50	1000	ND	100	75-124%	---	---	
trans-1,3-Dichloropropene	908	---	50.0	ug/L	50	1000	ND	91	73-127%	---	---	
Hexachlorobutadiene	1240	---	250	ug/L	50	1000	ND	124	66-134%	---	---	

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Darrell Auvil, Client Services Manager



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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C1003 - EPA 5030C						Water						
Matrix Spike (23C1003-MS1)						Prepared: 03/25/23 10:44 Analyzed: 03/26/23 02:44						H-01
QC Source Sample: Non-SDG (A3C0252-08)												
Methylene chloride	1040	---	500	ug/L	50	1000	ND	104	74-124%	---	---	
1,1,1,2-Tetrachloroethane	1100	---	20.0	ug/L	50	1000	ND	110	78-124%	---	---	
1,1,2,2-Tetrachloroethane	1090	---	25.0	ug/L	50	1000	ND	109	71-121%	---	---	
Tetrachloroethene (PCE)	1140	---	20.0	ug/L	50	1000	ND	114	74-129%	---	---	
1,2,3-Trichlorobenzene	1040	---	100	ug/L	50	1000	ND	104	69-129%	---	---	
1,1,2-Trichloroethane	1070	---	25.0	ug/L	50	1000	ND	107	80-120%	---	---	
1,2,4-Trichlorobenzene	1070	---	100	ug/L	50	1000	ND	107	69-130%	---	---	
1,1,1-Trichloroethane	1100	---	20.0	ug/L	50	1000	ND	110	74-131%	---	---	
Trichloroethene (TCE)	1090	---	20.0	ug/L	50	1000	ND	109	79-123%	---	---	
Trichlorofluoromethane	1370	---	100	ug/L	50	1000	ND	137	65-141%	---	---	
1,2,3-Trichloropropane	1060	---	50.0	ug/L	50	1000	ND	106	73-122%	---	---	
Vinyl chloride	1320	---	20.0	ug/L	50	1000	ND	132	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 99 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>99 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>95 %</i>		<i>80-120 %</i>		<i>"</i>						

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---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0802 - Method Prep: Aq						Water						
Blank (23C0802-BLK1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 14:56									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0802-BS1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 14:57									
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.03	---	0.0200	mg/L	1	2.00	---	102	90-111%	---	---	
Matrix Spike (23C0802-MS1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 15:35									
<u>QC Source Sample: Non-SDG (A3C0606-05)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.49	---	0.0250	mg/L	1	2.50	0.0450	98	90-111%	---	---	
Matrix Spike Dup (23C0802-MSD1)			Prepared: 03/21/23 10:31 Analyzed: 03/21/23 15:36									
<u>QC Source Sample: Non-SDG (A3C0606-05)</u>												
Ammonia as N	2.50	---	0.0250	mg/L	1	2.50	0.0450	98	90-111%	0.3	13%	

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 503-718-2323
 ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0896 - Method Prep: Aq						Water						
Blank (23C0896-BLK1)			Prepared: 03/23/23 09:24 Analyzed: 03/23/23 12:36									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0896-BS1)			Prepared: 03/23/23 09:24 Analyzed: 03/23/23 12:38									
<u>SM 4500-NH3 G</u>												
Ammonia as N	1.92	---	0.0200	mg/L	1	2.00	---	96	90-111%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0956 - Method Prep: Aq						Water						
Blank (23C0956-BLK1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 15:28									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0956-BS1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 15:29									
<u>SM 4500-NH3 G</u>												
Ammonia as N	1.94	---	0.0200	mg/L	1	2.00	---	97	90-111%	---	---	
Matrix Spike (23C0956-MS1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 16:02									
<u>QC Source Sample: Non-SDG (A3C0668-01)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.55	---	0.0250	mg/L	1	2.50	ND	102	90-111%	---	---	
Matrix Spike Dup (23C0956-MSD1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 16:04									
<u>QC Source Sample: Non-SDG (A3C0668-01)</u>												
Ammonia as N	2.62	---	0.0250	mg/L	1	2.50	ND	105	90-111%	3	13%	

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---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0700 - Method Prep: Aq						Water						
Blank (23C0700-BLK1)			Prepared: 03/17/23 16:05 Analyzed: 03/17/23 22:33									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
LCS (23C0700-BS1)			Prepared: 03/17/23 16:05 Analyzed: 03/17/23 22:55									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	1.94	---	0.250	mg/L	1	2.00	---	97	90-110%	---	---	
Nitrite-Nitrogen	1.92	---	0.250	mg/L	1	2.00	---	96	90-110%	---	---	
Duplicate (23C0700-DUP1)			Prepared: 03/17/23 16:05 Analyzed: 03/17/23 23:59									
<u>QC Source Sample: MGMS3-3(60) (A3C0644-02)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	1.18	---	0.250	mg/L	1	---	1.00	---	---	17	3%	Q-02
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Duplicate (23C0700-DUP2)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 09:41									
<u>QC Source Sample: Non-SDG (A3C0668-04RE2)</u>												
Nitrite-Nitrogen	0.624	---	0.250	mg/L	1	---	0.619	---	---	0.8	10%	
Duplicate (23C0700-DUP3)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 08:37									
<u>QC Source Sample: Non-SDG (A3C0668-04)</u>												
Nitrate-Nitrogen	34.6	---	5.00	mg/L	20	---	35.0	---	---	1	3%	Q-16
Matrix Spike (23C0700-MS1)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 00:21									
<u>QC Source Sample: MGMS3-3(60) (A3C0644-02)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	3.44	---	0.312	mg/L	1	2.50	1.00	97	87-112%	---	---	
Nitrite-Nitrogen	2.41	---	0.312	mg/L	1	2.50	ND	96	90-114%	---	---	
Matrix Spike (23C0700-MS2)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 10:03									
<u>QC Source Sample: Non-SDG (A3C0668-04RE2)</u>												
<u>EPA 300.0</u>												

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---	--	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0700 - Method Prep: Aq						Water						
Matrix Spike (23C0700-MS2)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 10:03									
<u>QC Source Sample: Non-SDG (A3C0668-04RE2)</u>												
Nitrite-Nitrogen	2.99	---	0.312	mg/L	1	2.50	0.619	95	90-114%	---	---	
Matrix Spike (23C0700-MS3)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 08:58									
<u>QC Source Sample: Non-SDG (A3C0668-04)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	73.4	---	5.00	mg/L	20	40.0	35.0	96	87-112%	---	---	Q-16

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---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0342 - Method Prep: Aq						Water						
Blank (23D0342-BLK1)			Prepared: 04/10/23 14:19 Analyzed: 04/10/23 20:34									
<u>SM 5310 C</u>												
Total Organic Carbon	ND	---	1.00	mg/L	1	---	---	---	---	---	---	
LCS (23D0342-BS1)			Prepared: 04/10/23 14:19 Analyzed: 04/10/23 21:04									
<u>SM 5310 C</u>												
Total Organic Carbon	10.5	---	1.00	mg/L	1	10.0	---	105	90-114%	---	---	
Matrix Spike (23D0342-MS1)			Prepared: 04/10/23 14:19 Analyzed: 04/11/23 02:43									
<u>QC Source Sample: Non-SDG (A3D0822-01)</u>												
<u>SM 5310 C</u>												
Total Organic Carbon	15.2	---	1.01	mg/L	1	10.0	4.97	103	85-115%	---	---	
Matrix Spike Dup (23D0342-MSD1)			Prepared: 04/10/23 14:19 Analyzed: 04/11/23 03:14									
<u>QC Source Sample: Non-SDG (A3D0822-01)</u>												
Total Organic Carbon	14.9	---	1.01	mg/L	1	10.0	4.97	100	85-115%	2	15%	

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SAMPLE PREPARATION INFORMATION

Halogenated Volatile Organic Compounds by EPA 8260D

Prep: EPA 5030C					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0904</u>							
A3C0644-01	Water	EPA 8260D	03/16/23 13:45	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-05	Water	EPA 8260D	03/16/23 10:56	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-07	Water	EPA 8260D	03/16/23 09:08	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-09	Water	EPA 8260D	03/16/23 08:12	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-10	Water	EPA 8260D	03/16/23 09:13	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-11	Water	EPA 8260D	03/16/23 11:08	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-12	Water	EPA 8260D	03/16/23 11:08	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-13	Water	EPA 8260D	03/16/23 12:18	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-14	Water	EPA 8260D	03/16/23 13:27	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
A3C0644-15	Water	EPA 8260D	03/16/23 10:12	03/23/23 12:31	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C0967</u>							
A3C0644-03	Water	EPA 8260D	03/16/23 11:50	03/24/23 10:20	5mL/5mL	5mL/5mL	1.00
A3C0644-04	Water	EPA 8260D	03/16/23 11:50	03/24/23 10:20	5mL/5mL	5mL/5mL	1.00
A3C0644-06	Water	EPA 8260D	03/16/23 10:10	03/24/23 10:20	5mL/5mL	5mL/5mL	1.00
A3C0644-08	Water	EPA 8260D	03/16/23 08:22	03/24/23 10:20	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C1003</u>							
A3C0644-02RE1	Water	EPA 8260D	03/16/23 12:38	03/25/23 10:44	5mL/5mL	5mL/5mL	1.00
A3C0644-06RE1	Water	EPA 8260D	03/16/23 10:10	03/25/23 10:44	5mL/5mL	5mL/5mL	1.00
A3C0644-11RE1	Water	EPA 8260D	03/16/23 11:08	03/25/23 10:44	5mL/5mL	5mL/5mL	1.00
A3C0644-12RE1	Water	EPA 8260D	03/16/23 11:08	03/25/23 10:44	5mL/5mL	5mL/5mL	1.00
A3C0644-15RE1	Water	EPA 8260D	03/16/23 10:12	03/25/23 10:44	5mL/5mL	5mL/5mL	1.00

Ammonia by Gas Diffusion and Colorimetric Detection

Prep: Method Prep: Aq					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0802</u>							
A3C0644-01	Water	SM 4500-NH3 G	03/16/23 13:45	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0644-02	Water	SM 4500-NH3 G	03/16/23 12:38	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0644-03	Water	SM 4500-NH3 G	03/16/23 11:50	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
A3C0644-04	Water	SM 4500-NH3 G	03/16/23 11:50	03/21/23 10:31	10mL/10mL	10mL/10mL	1.00
<u>Batch: 23C0896</u>							
A3C0644-05	Water	SM 4500-NH3 G	03/16/23 10:56	03/23/23 09:24	10mL/10mL	10mL/10mL	1.00
A3C0644-06	Water	SM 4500-NH3 G	03/16/23 10:10	03/23/23 09:24	10mL/10mL	10mL/10mL	1.00
A3C0644-07	Water	SM 4500-NH3 G	03/16/23 09:08	03/23/23 09:24	10mL/10mL	10mL/10mL	1.00

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GeoEngineers - Portland

5820 S Kelly Ave Unit B

Portland, OR 97239

Project: **Nustar-Vancouver-GWM - 2023**

Project Number: **019001-009-004**

Project Manager: **Stephanie Bosze-Salisbury**

Report ID:

A3C0644 - 04 17 23 1648

SAMPLE PREPARATION INFORMATION

Ammonia by Gas Diffusion and Colorimetric Detection

Prep: Method Prep: Ag

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A3C0644-09	Water	SM 4500-NH3 G	03/16/23 08:12	03/23/23 09:24	10mL/10mL	10mL/10mL	1.00
Batch: 23C0956							
A3C0644-08RE1	Water	SM 4500-NH3 G	03/16/23 08:22	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0644-10RE1	Water	SM 4500-NH3 G	03/16/23 09:13	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0644-11RE2	Water	SM 4500-NH3 G	03/16/23 11:08	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0644-12RE2	Water	SM 4500-NH3 G	03/16/23 11:08	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0644-13RE2	Water	SM 4500-NH3 G	03/16/23 12:18	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0644-14RE2	Water	SM 4500-NH3 G	03/16/23 13:27	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0644-15RE2	Water	SM 4500-NH3 G	03/16/23 10:12	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00

Anions by Ion Chromatography

Prep: Method Prep: Ag

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23C0700							
A3C0644-01	Water	EPA 300.0	03/16/23 13:45	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-02	Water	EPA 300.0	03/16/23 12:38	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-03	Water	EPA 300.0	03/16/23 11:50	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-04	Water	EPA 300.0	03/16/23 11:50	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-05	Water	EPA 300.0	03/16/23 10:56	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-06	Water	EPA 300.0	03/16/23 10:10	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-06RE1	Water	EPA 300.0	03/16/23 10:10	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-07	Water	EPA 300.0	03/16/23 09:08	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-08	Water	EPA 300.0	03/16/23 08:22	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-08RE1	Water	EPA 300.0	03/16/23 08:22	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-09	Water	EPA 300.0	03/16/23 08:12	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-10	Water	EPA 300.0	03/16/23 09:13	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-11	Water	EPA 300.0	03/16/23 11:08	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-12	Water	EPA 300.0	03/16/23 11:08	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-13	Water	EPA 300.0	03/16/23 12:18	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-14	Water	EPA 300.0	03/16/23 13:27	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0644-15RE1	Water	EPA 300.0	03/16/23 10:12	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Prep: Method Prep: Ag

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
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Portland, OR 97239

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Project Number: **019001-009-004**

Project Manager: **Stephanie Bosze-Salisbury**

Report ID:

A3C0644 - 04 17 23 1648

SAMPLE PREPARATION INFORMATION

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Prep: Method Prep: Ag

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23D0342</u>							
A3C0644-03	Water	SM 5310 C	03/16/23 11:50	04/10/23 14:19	40mL/40mL	40mL/40mL	1.00
A3C0644-06	Water	SM 5310 C	03/16/23 10:10	04/10/23 14:19	40mL/40mL	40mL/40mL	1.00
A3C0644-08	Water	SM 5310 C	03/16/23 08:22	04/10/23 14:19	40mL/40mL	40mL/40mL	1.00
A3C0644-11RE1	Water	SM 5310 C	03/16/23 11:08	04/10/23 14:19	40mL/40mL	40mL/40mL	1.00
A3C0644-15RE1	Water	SM 5310 C	03/16/23 10:12	04/10/23 14:19	40mL/40mL	40mL/40mL	1.00

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
---	---	---

QUALIFIER DEFINITIONS

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

Apex Laboratories

- CONT** The Sample Container provided for this analysis was not provided by Apex Laboratories, and has not been verified as part of the Quality System.
- E** Estimated Value. The result is above the calibration range of the instrument.
- H-01** Analyzed outside the recommended holding time.
- ICV-01** Estimated Result. Initial Calibration Verification (ICV) failed high. There is no effect on non-detect results.
- Q-01** Spike recovery and/or RPD is outside acceptance limits.
- Q-02** Spike recovery is outside of established control limits due to matrix interference.
- Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-42** Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- Q-54** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +3%. The results are reported as Estimated Values.
- Q-54a** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -3%. The results are reported as Estimated Values.
- Q-54b** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -6%. The results are reported as Estimated Values.
- Q-55** Daily CCV/LCS recovery for this analyte was below the +/-20% criteria listed in EPA 8260, however there is adequate sensitivity to ensure detection at the reporting level.
- Q-56** Daily CCV/LCS recovery for this analyte was above the +/-20% criteria listed in EPA 8260

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

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

Table with 3 columns: Client info (GeoEngineers - Portland), Project info (Project: Nustar-Vancouver-GWM - 2023), and Report ID (A3C0644 - 04 17 23 1648).

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.
"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected.
"" Results without 'wet' or 'dry' designation are not normally dry weight corrected.

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) may not be included in this report.

Miscellaneous Notes:

- " --- " QC results are not applicable.
" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available.

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to 1/2 the Reporting Limit (RL).
-For Blank hits falling between 1/2 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.
For further details, please request a copy of this document.

Apex Laboratories

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Handwritten signature of Darrell Auvil



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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.

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.

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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Handwritten signature of Darrell Auvil

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0644 - 04 17 23 1648
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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	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
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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 provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland Project: **Nustar-Vancouver-GWM - 2023**
5820 S Kelly Ave Unit B Project Number: **019001-009-004**
Portland, OR 97239 Project Manager: **Stephanie Bosze-Salisbury** **Report ID:**
A3C0644 - 04 17 23 1648

CHAIN OF CUSTODY

APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Company: **Geo Eng Meters** Project Mgr: **Stephanie Salisbury** Project Name: **Nustar GWM** Lab # **A3C0644** coc **2** of **2**
Address: **5820 S Kelly Ave, Portland, OR** Email: **ssa@salisburygeoengmeters.com**

Sampled by: **Sam Russell / Jeff Pratt** Phone: _____

Site Location: _____
State: **WA** County: _____

DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-CID	NWTPH-DX	NWTPH-GX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Sema-Vols Full List	8082 PCBs	8081 Pesticides	RCRA Metals (9)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, K, Mg, Mn, Mo, Ni, P, Se, Ag, Na, Ti, V, Zn, TCIP	TCIP Metals (8)	Risk + MTH NO3/NO2	Hold Sample	Frozen Archive
3/16/23	10:07	W	7				X	X	X									X		
	1:08		5				X	X	X									X		
	12:18		5				X	X	X									X		
	1:27		5				X	X	X									X		
	1:02		7				X	X	X									X		

SPECIAL INSTRUCTIONS:
+ Methane, ethane, ethane
* Same list of HUCs as 4022 event.

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 5 Day Standard Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: Sam Russell Printed Name: Sam Russell Company: Geo Eng Meters	RECEIVED BY: Signature: [Signature] Printed Name: Andy Montoya Company: Apex	Date: 3/16/23	Date: 3/16/23
Time: 1600	Time: 0600		

Form Y-002 R-00

Apex Laboratories

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: <u>019001-009-004</u> Project Manager: <u>Stephanie Bosze-Salisbury</u>	Report ID: <u>A3C0644 - 04 17 23 1648</u>
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APEX LABS COOLER RECEIPT FORM

Client: Geo Engineers Element WO#: A3 COL44

Project/Project #: Vaa Main 1223 GWM

Delivery Info:

Date/time received: 3/16/23@1600 By: AJM

Delivered by: Apex Client ESS FedEx UPS Radio Morgan SDS Evergreen Other

Cooler Inspection Date/time inspected: 3/16/23@1754 By: AJM

Chain of Custody included? Yes No

Signed/dated by client? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>1.2</u>						
Custody seals? (Y/N)	<u>N</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>Y</u>						
Ice type: (Gel/Real/Other)	<u>Gel</u>						
Condition (In/Out):	<u>In</u>						

Cooler out of temp? (Y/N) Possible reason why:

Green dots applied to out of temperature samples? Yes No

Out of temperature samples form initiated? Yes No

Sample Inspection: Date/time inspected: 3/16/23 @ 19:15 By: SPM

All samples intact? Yes No Comments: _____

Bottle labels/COCs agree? Yes No Comments: _____

COC/container discrepancies form initiated? Yes No

Containers/volumes received appropriate for analysis? Yes No Comments: _____

Do VOA vials have visible headspace? Yes No NA

Comments: _____

Water samples: pH checked: Yes No NA pH appropriate? Yes No NA

Comments: _____

Additional information: _____

Labeled by: AJV

Witness: AJM

Cooler Inspected by: AJM

Form Y-003 R-00

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

Wednesday, April 5, 2023
Stephanie Bosze-Salisbury
GeoEngineers - Portland
5820 S Kelly Ave Unit B
Portland, OR 97239

RE: A3C0668 - Nustar-Vancouver-GWM - 2023 - 019001-009-004

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 A3C0668, which was received by the laboratory on 3/17/2023 at 1:20:00PM.

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

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

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler 3.9 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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Darrell Auvil, Client Services Manager



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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	--	---

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-18i	A3C0668-01	Water	03/17/23 08:24	03/17/23 13:20
MW-32s	A3C0668-02	Water	03/17/23 09:18	03/17/23 13:20
MW-32i	A3C0668-03	Water	03/17/23 09:57	03/17/23 13:20
MW-1	A3C0668-04	Water	03/17/23 10:15	03/17/23 13:20
MW-9	A3C0668-05	Water	03/17/23 09:18	03/17/23 13:20
MP-1	A3C0668-06	Water	03/17/23 08:11	03/17/23 13:20

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---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-18i (A3C0668-01)			Matrix: Water			Batch: 23C0990		
Bromobenzene	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/25/23 04:56	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/25/23 04:56	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-18i (A3C0668-01)			Matrix: Water			Batch: 23C0990		
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
Tetrachloroethene (PCE)	0.650	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/25/23 04:56	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/25/23 04:56	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/25/23 04:56	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/25/23 04:56</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 04:56</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>106 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 04:56</i>	<i>EPA 8260D</i>
MW-32s (A3C0668-02)			Matrix: Water			Batch: 23C0990		
Bromobenzene	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/25/23 05:23	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	

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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0990		
MW-32s (A3C0668-02)								
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/25/23 05:23	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/25/23 05:23	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/25/23 05:23	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/25/23 05:23	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 100 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/25/23 05:23</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>102 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 05:23</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>104 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 05:23</i>	<i>EPA 8260D</i>	

			Matrix: Water			Batch: 23C0990		
MW-32i (A3C0668-03)								
Bromobenzene	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-32i (A3C0668-03)				Matrix: Water		Batch: 23C0990		
Bromoform	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/25/23 05:50	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,1-Dichloroethane	ND	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
cis-1,2-Dichloroethene	1.93	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/25/23 05:50	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
Tetrachloroethene (PCE)	3.68	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-32i (A3C0668-03)			Matrix: Water			Batch: 23C0990		
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/25/23 05:50	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
Trichloroethene (TCE)	1.43	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/25/23 05:50	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/25/23 05:50	EPA 8260D	
Vinyl chloride	ND	---	0.400	ug/L	1	03/25/23 05:50	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/25/23 05:50</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 05:50</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 05:50</i>	<i>EPA 8260D</i>

MW-1 (A3C0668-04)			Matrix: Water			Batch: 23C0990		
Bromobenzene	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/25/23 06:17	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,1-Dichloroethane	3.92	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0990		
MW-1 (A3C0668-04)								
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
1,1-Dichloroethene	0.510	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
cis-1,2-Dichloroethene	68.7	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
trans-1,2-Dichloroethene	1.07	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/25/23 06:17	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
Tetrachloroethene (PCE)	14.0	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/25/23 06:17	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
Trichloroethene (TCE)	13.4	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/25/23 06:17	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/25/23 06:17	EPA 8260D	
Vinyl chloride	0.820	---	0.400	ug/L	1	03/25/23 06:17	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/25/23 06:17</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 06:17</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 06:17</i>	<i>EPA 8260D</i>

			Matrix: Water			Batch: 23C0990		
MW-9 (A3C0668-05)								
Bromobenzene	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
Bromochloromethane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Bromodichloromethane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Bromoform	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Bromomethane	ND	---	5.00	ug/L	1	03/25/23 06:44	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-9 (A3C0668-05)				Matrix: Water		Batch: 23C0990		
Carbon tetrachloride	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Chlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
Chloroethane	ND	---	5.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Chloroform	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Chloromethane	ND	---	5.00	ug/L	1	03/25/23 06:44	EPA 8260D	
2-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
4-Chlorotoluene	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Dibromochloromethane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
Dibromomethane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,1-Dichloroethane	0.990	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
1,1-Dichloroethene	ND	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
cis-1,2-Dichloroethene	40.2	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
trans-1,2-Dichloroethene	2.17	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
1,2-Dichloropropane	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
1,3-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
2,2-Dichloropropane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,1-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Hexachlorobutadiene	ND	---	5.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Methylene chloride	ND	---	10.0	ug/L	1	03/25/23 06:44	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	
Tetrachloroethene (PCE)	176	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	03/25/23 06:44	EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0990		
MW-9 (A3C0668-05)								
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,1,1-Trichloroethane	3.06	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
Trichloroethene (TCE)	66.6	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	03/25/23 06:44	EPA 8260D	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	03/25/23 06:44	EPA 8260D	
Vinyl chloride	0.720	---	0.400	ug/L	1	03/25/23 06:44	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>1</i>	<i>03/25/23 06:44</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 06:44</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>1</i>	<i>03/25/23 06:44</i>	<i>EPA 8260D</i>
			Matrix: Water			Batch: 23C0990		
MP-1 (A3C0668-06)								
Bromobenzene	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
Bromochloromethane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Bromodichloromethane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Bromoform	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Bromomethane	ND	---	25.0	ug/L	5	03/25/23 07:11	EPA 8260D	
Carbon tetrachloride	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Chlorobenzene	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
Chloroethane	ND	---	25.0	ug/L	5	03/25/23 07:11	EPA 8260D	
Chloroform	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Chloromethane	ND	---	25.0	ug/L	5	03/25/23 07:11	EPA 8260D	
2-Chlorotoluene	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
4-Chlorotoluene	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Dibromochloromethane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2-Dibromo-3-chloropropane	ND	---	25.0	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
Dibromomethane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2-Dichlorobenzene	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
1,3-Dichlorobenzene	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
1,4-Dichlorobenzene	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
Dichlorodifluoromethane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,1-Dichloroethane	ND	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,1-Dichloroethene	ND	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	

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ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	---	---

ANALYTICAL SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
			Matrix: Water			Batch: 23C0990		
MP-1 (A3C0668-06)								
cis-1,2-Dichloroethene	11.1	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
trans-1,2-Dichloroethene	ND	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2-Dichloropropane	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
1,3-Dichloropropane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
2,2-Dichloropropane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,1-Dichloropropene	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
cis-1,3-Dichloropropene	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
trans-1,3-Dichloropropene	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Hexachlorobutadiene	ND	---	25.0	ug/L	5	03/25/23 07:11	EPA 8260D	
Methylene chloride	ND	---	50.0	ug/L	5	03/25/23 07:11	EPA 8260D	
1,1,1,2-Tetrachloroethane	ND	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,1,1,2,2-Tetrachloroethane	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
Tetrachloroethene (PCE)	199	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2,3-Trichlorobenzene	ND	---	10.0	ug/L	5	03/25/23 07:11	EPA 8260D	
1,1,2-Trichloroethane	ND	---	2.50	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2,4-Trichlorobenzene	ND	---	10.0	ug/L	5	03/25/23 07:11	EPA 8260D	
1,1,1-Trichloroethane	ND	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Trichloroethene (TCE)	26.1	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Trichlorofluoromethane	ND	---	10.0	ug/L	5	03/25/23 07:11	EPA 8260D	
1,2,3-Trichloropropane	ND	---	5.00	ug/L	5	03/25/23 07:11	EPA 8260D	
Vinyl chloride	ND	---	2.00	ug/L	5	03/25/23 07:11	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>			<i>Recovery: 100 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>03/25/23 07:11</i>	<i>EPA 8260D</i>	
<i>Toluene-d8 (Surr)</i>			<i>102 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 07:11</i>	<i>EPA 8260D</i>	
<i>4-Bromofluorobenzene (Surr)</i>			<i>104 %</i>	<i>80-120 %</i>	<i>1</i>	<i>03/25/23 07:11</i>	<i>EPA 8260D</i>	

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Darrell Auvil, Client Services Manager



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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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ANALYTICAL SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-18i (A3C0668-01)				Matrix: Water		Batch: 23C0956		
Ammonia as N	ND	---	0.0200	mg/L	1	03/24/23 16:01	SM 4500-NH3 G	
MW-32s (A3C0668-02)				Matrix: Water		Batch: 23C0956		
Ammonia as N	ND	---	0.0200	mg/L	1	03/24/23 16:07	SM 4500-NH3 G	
MW-32i (A3C0668-03)				Matrix: Water		Batch: 23C0956		
Ammonia as N	ND	---	0.0220	mg/L	1	03/24/23 16:08	SM 4500-NH3 G	R-01
MW-1 (A3C0668-04RE2)				Matrix: Water		Batch: 23C0956		
Ammonia as N	154	---	2.00	mg/L	100	03/24/23 18:01	SM 4500-NH3 G	
MW-9 (A3C0668-05RE1)				Matrix: Water		Batch: 23C0956		
Ammonia as N	14.5	---	0.200	mg/L	10	03/24/23 17:41	SM 4500-NH3 G	
MP-1 (A3C0668-06RE3)				Matrix: Water		Batch: 23C0956		
Ammonia as N	2.25	---	0.0400	mg/L	2	03/24/23 17:44	SM 4500-NH3 G	

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-18i (A3C0668-01)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 07:11	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 07:11	EPA 300.0	
MW-32s (A3C0668-02)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 07:32	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 07:32	EPA 300.0	
MW-32i (A3C0668-03)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	1.70	---	0.250	mg/L	1	03/18/23 07:54	EPA 300.0	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 07:54	EPA 300.0	
MW-1 (A3C0668-04)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	35.0	---	5.00	mg/L	20	03/18/23 08:15	EPA 300.0	
MW-1 (A3C0668-04RE2)				Matrix: Water				
Batch: 23C0700								
Nitrite-Nitrogen	0.619	---	0.250	mg/L	1	03/20/23 18:31	EPA 300.0	H-01
MW-9 (A3C0668-05RE1)				Matrix: Water				
Batch: 23C0700								
Nitrate-Nitrogen	329	---	12.5	mg/L	50	03/20/23 18:09	EPA 300.0	H-01
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 11:29	EPA 300.0	
MP-1 (A3C0668-06)				Matrix: Water				
Batch: 23C0701								
Nitrate-Nitrogen	30.6	---	5.00	mg/L	20	03/18/23 12:34	EPA 300.0	
MP-1 (A3C0668-06RE1)				Matrix: Water				
Batch: 23C0701								
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	03/18/23 13:39	EPA 300.0	

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ANALYTICAL SAMPLE RESULTS

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
				Matrix: Water	Batch: 23C0788			
Total Organic Carbon	1.01	---	1.00	mg/L	1	03/22/23 13:23	SM 5310 C	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C						Water						
Blank (23C0990-BLK1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 01:46									
EPA 8260D												
Bromobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Bromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Bromodichloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Bromoform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Bromomethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	---
Carbon tetrachloride	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Chlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Chloroethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	---
Chloroform	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Chloromethane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	---
2-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
4-Chlorotoluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Dibromochloromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
1,2-Dibromo-3-chloropropane	ND	---	5.00	ug/L	1	---	---	---	---	---	---	---
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Dibromomethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
1,2-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
1,3-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
1,4-Dichlorobenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
Dichlorodifluoromethane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
1,1-Dichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	---
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	---
1,1-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	---
cis-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	---
trans-1,2-Dichloroethene	ND	---	0.400	ug/L	1	---	---	---	---	---	---	---
1,2-Dichloropropane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	---
1,3-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
2,2-Dichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
1,1-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
trans-1,3-Dichloropropene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	---
Hexachlorobutadiene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	---
Methylene chloride	ND	---	10.0	ug/L	1	---	---	---	---	---	---	---

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C												
Water												
Blank (23C0990-BLK1)												
Prepared: 03/24/23 13:33 Analyzed: 03/25/23 01:46												
1,1,1,2-Tetrachloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr) Recovery: 99 % Limits: 80-120 % Dilution: 1x</i> <i>Toluene-d8 (Surr) 102 % 80-120 % "</i> <i>4-Bromofluorobenzene (Surr) 104 % 80-120 % "</i>												

LCS (23C0990-BS1)												
Prepared: 03/24/23 13:33 Analyzed: 03/25/23 00:52												
EPA 8260D												
Bromobenzene	19.2	---	0.500	ug/L	1	20.0	---	96	80-120%	---	---	
Bromochloromethane	21.2	---	1.00	ug/L	1	20.0	---	106	80-120%	---	---	
Bromodichloromethane	22.8	---	1.00	ug/L	1	20.0	---	114	80-120%	---	---	
Bromoform	16.2	---	1.00	ug/L	1	20.0	---	81	80-120%	---	---	
Bromomethane	23.0	---	5.00	ug/L	1	20.0	---	115	80-120%	---	---	
Carbon tetrachloride	21.4	---	1.00	ug/L	1	20.0	---	107	80-120%	---	---	
Chlorobenzene	19.9	---	0.500	ug/L	1	20.0	---	100	80-120%	---	---	
Chloroethane	17.1	---	5.00	ug/L	1	20.0	---	86	80-120%	---	---	ICV-01
Chloroform	20.7	---	1.00	ug/L	1	20.0	---	104	80-120%	---	---	
Chloromethane	20.7	---	5.00	ug/L	1	20.0	---	104	80-120%	---	---	
2-Chlorotoluene	20.2	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
4-Chlorotoluene	20.3	---	1.00	ug/L	1	20.0	---	101	80-120%	---	---	
Dibromochloromethane	17.7	---	1.00	ug/L	1	20.0	---	88	80-120%	---	---	
1,2-Dibromo-3-chloropropane	18.3	---	5.00	ug/L	1	20.0	---	92	80-120%	---	---	
1,2-Dibromoethane (EDB)	22.0	---	0.500	ug/L	1	20.0	---	110	80-120%	---	---	
Dibromomethane	22.0	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
1,2-Dichlorobenzene	21.0	---	0.500	ug/L	1	20.0	---	105	80-120%	---	---	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C						Water						
LCS (23C0990-BS1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 00:52									
1,3-Dichlorobenzene	20.7	---	0.500	ug/L	1	20.0	---	103	80-120%	---	---	
1,4-Dichlorobenzene	19.7	---	0.500	ug/L	1	20.0	---	99	80-120%	---	---	
Dichlorodifluoromethane	21.9	---	1.00	ug/L	1	20.0	---	110	80-120%	---	---	
1,1-Dichloroethane	20.9	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
1,2-Dichloroethane (EDC)	20.9	---	0.400	ug/L	1	20.0	---	104	80-120%	---	---	
1,1-Dichloroethene	21.5	---	0.400	ug/L	1	20.0	---	107	80-120%	---	---	
cis-1,2-Dichloroethene	21.0	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
trans-1,2-Dichloroethene	21.3	---	0.400	ug/L	1	20.0	---	106	80-120%	---	---	
1,2-Dichloropropane	20.5	---	0.500	ug/L	1	20.0	---	102	80-120%	---	---	
1,3-Dichloropropane	21.0	---	1.00	ug/L	1	20.0	---	105	80-120%	---	---	
2,2-Dichloropropane	16.4	---	1.00	ug/L	1	20.0	---	82	80-120%	---	---	
1,1-Dichloropropene	22.3	---	1.00	ug/L	1	20.0	---	111	80-120%	---	---	
cis-1,3-Dichloropropene	19.9	---	1.00	ug/L	1	20.0	---	100	80-120%	---	---	
trans-1,3-Dichloropropene	18.2	---	1.00	ug/L	1	20.0	---	91	80-120%	---	---	
Hexachlorobutadiene	23.4	---	5.00	ug/L	1	20.0	---	117	80-120%	---	---	
Methylene chloride	20.0	---	10.0	ug/L	1	20.0	---	100	80-120%	---	---	
1,1,1,2-Tetrachloroethane	22.0	---	0.400	ug/L	1	20.0	---	110	80-120%	---	---	
1,1,2,2-Tetrachloroethane	21.1	---	0.500	ug/L	1	20.0	---	106	80-120%	---	---	
Tetrachloroethene (PCE)	21.0	---	0.400	ug/L	1	20.0	---	105	80-120%	---	---	
1,2,3-Trichlorobenzene	19.9	---	2.00	ug/L	1	20.0	---	99	80-120%	---	---	
1,1,2-Trichloroethane	20.7	---	0.500	ug/L	1	20.0	---	103	80-120%	---	---	
1,2,4-Trichlorobenzene	20.4	---	2.00	ug/L	1	20.0	---	102	80-120%	---	---	
1,1,1-Trichloroethane	21.4	---	0.400	ug/L	1	20.0	---	107	80-120%	---	---	
Trichloroethene (TCE)	20.5	---	0.400	ug/L	1	20.0	---	103	80-120%	---	---	
Trichlorofluoromethane	24.6	---	2.00	ug/L	1	20.0	---	123	80-120%	---	---	Q-56
1,2,3-Trichloropropane	20.4	---	1.00	ug/L	1	20.0	---	102	80-120%	---	---	
Vinyl chloride	22.2	---	0.400	ug/L	1	20.0	---	111	80-120%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

Duplicate (23C0990-DUP1)	Prepared: 03/24/23 13:33 Analyzed: 03/25/23 07:38
QC Source Sample: MP-1 (A3C0668-06)	
EPA 8260D	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C						Water						
Duplicate (23C0990-DUP1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 07:38									
QC Source Sample: MP-1 (A3C0668-06)												
Bromobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Bromochloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromoform	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Bromomethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Chloroethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Chloroform	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Chloromethane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Dibromomethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,3-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	9.90	---	2.00	ug/L	5	---	11.1	---	---	11	30%	
trans-1,2-Dichloroethene	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	25.0	ug/L	5	---	ND	---	---	---	30%	
Methylene chloride	ND	---	50.0	ug/L	5	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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ORELAP ID: OR100062

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C						Water						
Duplicate (23C0990-DUP1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 07:38									
QC Source Sample: MP-1 (A3C0668-06)												
1,1,1,2-Tetrachloroethane	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
1,1,2,2-Tetrachloroethane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	187	---	2.00	ug/L	5	---	199	---	---	6	30%	
1,2,3-Trichlorobenzene	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	2.50	ug/L	5	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
Trichloroethene (TCE)	24.3	---	2.00	ug/L	5	---	26.1	---	---	7	30%	
Trichlorofluoromethane	ND	---	10.0	ug/L	5	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	5.00	ug/L	5	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	2.00	ug/L	5	---	ND	---	---	---	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>102 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>		<i>80-120 %</i>		<i>"</i>						

Matrix Spike (23C0990-MS1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 12:08									
QC Source Sample: Non-SDG (A3C0670-02)												
EPA 8260D												
Bromobenzene	20.3	---	0.500	ug/L	1	20.0	ND	102	80-120%	---	---	
Bromochloromethane	22.2	---	1.00	ug/L	1	20.0	ND	111	78-123%	---	---	
Bromodichloromethane	23.8	---	1.00	ug/L	1	20.0	ND	119	79-125%	---	---	
Bromoform	16.0	---	1.00	ug/L	1	20.0	ND	80	66-130%	---	---	
Bromomethane	24.6	---	5.00	ug/L	1	20.0	ND	123	53-141%	---	---	
Carbon tetrachloride	22.3	---	1.00	ug/L	1	20.0	ND	112	72-136%	---	---	
Chlorobenzene	21.1	---	0.500	ug/L	1	20.0	ND	105	80-120%	---	---	
Chloroethane	21.2	---	5.00	ug/L	1	20.0	ND	106	60-138%	---	---	ICV-01
Chloroform	21.7	---	1.00	ug/L	1	20.0	ND	109	79-124%	---	---	
Chloromethane	22.8	---	5.00	ug/L	1	20.0	ND	114	50-139%	---	---	
2-Chlorotoluene	21.5	---	1.00	ug/L	1	20.0	ND	108	79-122%	---	---	
4-Chlorotoluene	21.4	---	1.00	ug/L	1	20.0	ND	107	78-122%	---	---	
Dibromochloromethane	18.1	---	1.00	ug/L	1	20.0	ND	90	74-126%	---	---	
1,2-Dibromo-3-chloropropane	18.4	---	5.00	ug/L	1	20.0	ND	92	62-128%	---	---	
1,2-Dibromoethane (EDB)	22.6	---	0.500	ug/L	1	20.0	ND	113	77-121%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	---	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C						Water						
Matrix Spike (23C0990-MS1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 12:08									
QC Source Sample: Non-SDG (A3C0670-02)												
Dibromomethane	23.4	---	1.00	ug/L	1	20.0	ND	117	79-123%	---	---	
1,2-Dichlorobenzene	22.2	---	0.500	ug/L	1	20.0	ND	111	80-120%	---	---	
1,3-Dichlorobenzene	21.8	---	0.500	ug/L	1	20.0	ND	109	80-120%	---	---	
1,4-Dichlorobenzene	20.7	---	0.500	ug/L	1	20.0	ND	103	79-120%	---	---	
Dichlorodifluoromethane	23.6	---	1.00	ug/L	1	20.0	ND	118	32-152%	---	---	
1,1-Dichloroethane	22.4	---	0.400	ug/L	1	20.0	ND	112	77-125%	---	---	
1,2-Dichloroethane (EDC)	22.0	---	0.400	ug/L	1	20.0	ND	110	73-128%	---	---	
1,1-Dichloroethene	23.3	---	0.400	ug/L	1	20.0	ND	116	71-131%	---	---	
cis-1,2-Dichloroethene	23.0	---	0.400	ug/L	1	20.0	0.540	112	78-123%	---	---	
trans-1,2-Dichloroethene	22.9	---	0.400	ug/L	1	20.0	ND	114	75-124%	---	---	
1,2-Dichloropropane	21.8	---	0.500	ug/L	1	20.0	ND	109	78-122%	---	---	
1,3-Dichloropropane	21.9	---	1.00	ug/L	1	20.0	ND	109	80-120%	---	---	
2,2-Dichloropropane	12.3	---	1.00	ug/L	1	20.0	ND	62	60-139%	---	---	
1,1-Dichloropropene	23.9	---	1.00	ug/L	1	20.0	ND	120	79-125%	---	---	
cis-1,3-Dichloropropene	19.3	---	1.00	ug/L	1	20.0	ND	97	75-124%	---	---	
trans-1,3-Dichloropropene	17.8	---	1.00	ug/L	1	20.0	ND	89	73-127%	---	---	
Hexachlorobutadiene	22.1	---	5.00	ug/L	1	20.0	ND	110	66-134%	---	---	
Methylene chloride	20.9	---	10.0	ug/L	1	20.0	ND	104	74-124%	---	---	
1,1,1,2-Tetrachloroethane	22.2	---	0.400	ug/L	1	20.0	ND	111	78-124%	---	---	
1,1,1,2,2-Tetrachloroethane	22.4	---	0.500	ug/L	1	20.0	ND	112	71-121%	---	---	
Tetrachloroethene (PCE)	21.8	---	0.400	ug/L	1	20.0	ND	109	74-129%	---	---	
1,2,3-Trichlorobenzene	22.7	---	2.00	ug/L	1	20.0	ND	114	69-129%	---	---	
1,1,2-Trichloroethane	21.3	---	0.500	ug/L	1	20.0	ND	106	80-120%	---	---	
1,2,4-Trichlorobenzene	23.0	---	2.00	ug/L	1	20.0	ND	115	69-130%	---	---	
1,1,1-Trichloroethane	22.4	---	0.400	ug/L	1	20.0	ND	112	74-131%	---	---	
Trichloroethene (TCE)	21.8	---	0.400	ug/L	1	20.0	ND	108	79-123%	---	---	
Trichlorofluoromethane	26.1	---	2.00	ug/L	1	20.0	ND	131	65-141%	---	---	Q-54
1,2,3-Trichloropropane	21.6	---	1.00	ug/L	1	20.0	ND	108	73-122%	---	---	
Vinyl chloride	25.8	---	0.400	ug/L	1	20.0	0.950	124	58-137%	---	---	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>94 %</i>		<i>80-120 %</i>		<i>"</i>						

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ANALYTICAL REPORT

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QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C						Water						
Matrix Spike Dup (23C0990-MSD1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 12:35									
QC Source Sample: Non-SDG (A3C0670-02)												
Bromobenzene	20.2	---	0.500	ug/L	1	20.0	ND	101	80-120%	0.4	30%	
Bromochloromethane	21.8	---	1.00	ug/L	1	20.0	ND	109	78-123%	2	30%	
Bromodichloromethane	24.4	---	1.00	ug/L	1	20.0	ND	122	79-125%	2	30%	
Bromoform	17.0	---	1.00	ug/L	1	20.0	ND	85	66-130%	6	30%	
Bromomethane	23.4	---	5.00	ug/L	1	20.0	ND	117	53-141%	5	30%	
Carbon tetrachloride	22.9	---	1.00	ug/L	1	20.0	ND	115	72-136%	3	30%	
Chlorobenzene	21.1	---	0.500	ug/L	1	20.0	ND	105	80-120%	0	30%	
Chloroethane	20.8	---	5.00	ug/L	1	20.0	ND	104	60-138%	2	30%	ICV-01
Chloroform	21.6	---	1.00	ug/L	1	20.0	ND	108	79-124%	0.5	30%	
Chloromethane	22.6	---	5.00	ug/L	1	20.0	ND	113	50-139%	0.9	30%	
2-Chlorotoluene	21.3	---	1.00	ug/L	1	20.0	ND	107	79-122%	0.9	30%	
4-Chlorotoluene	21.4	---	1.00	ug/L	1	20.0	ND	107	78-122%	0.2	30%	
Dibromochloromethane	18.8	---	1.00	ug/L	1	20.0	ND	94	74-126%	4	30%	
1,2-Dibromo-3-chloropropane	19.1	---	5.00	ug/L	1	20.0	ND	96	62-128%	4	30%	
1,2-Dibromoethane (EDB)	22.6	---	0.500	ug/L	1	20.0	ND	113	77-121%	0.04	30%	
Dibromomethane	22.9	---	1.00	ug/L	1	20.0	ND	114	79-123%	2	30%	
1,2-Dichlorobenzene	22.4	---	0.500	ug/L	1	20.0	ND	112	80-120%	1	30%	
1,3-Dichlorobenzene	21.8	---	0.500	ug/L	1	20.0	ND	109	80-120%	0.1	30%	
1,4-Dichlorobenzene	20.7	---	0.500	ug/L	1	20.0	ND	104	79-120%	0.4	30%	
Dichlorodifluoromethane	21.5	---	1.00	ug/L	1	20.0	ND	108	32-152%	9	30%	
1,1-Dichloroethane	22.0	---	0.400	ug/L	1	20.0	ND	110	77-125%	2	30%	
1,2-Dichloroethane (EDC)	21.8	---	0.400	ug/L	1	20.0	ND	109	73-128%	1	30%	
1,1-Dichloroethene	22.5	---	0.400	ug/L	1	20.0	ND	113	71-131%	3	30%	
cis-1,2-Dichloroethene	22.6	---	0.400	ug/L	1	20.0	0.540	110	78-123%	2	30%	
trans-1,2-Dichloroethene	22.5	---	0.400	ug/L	1	20.0	ND	112	75-124%	2	30%	
1,2-Dichloropropane	21.4	---	0.500	ug/L	1	20.0	ND	107	78-122%	2	30%	
1,3-Dichloropropane	21.9	---	1.00	ug/L	1	20.0	ND	109	80-120%	0.05	30%	
2,2-Dichloropropane	12.1	---	1.00	ug/L	1	20.0	ND	60	60-139%	2	30%	
1,1-Dichloropropene	23.5	---	1.00	ug/L	1	20.0	ND	117	79-125%	2	30%	
cis-1,3-Dichloropropene	19.8	---	1.00	ug/L	1	20.0	ND	99	75-124%	2	30%	
trans-1,3-Dichloropropene	18.1	---	1.00	ug/L	1	20.0	ND	90	73-127%	1	30%	
Hexachlorobutadiene	22.2	---	5.00	ug/L	1	20.0	ND	111	66-134%	0.2	30%	
Methylene chloride	20.5	---	10.0	ug/L	1	20.0	ND	103	74-124%	2	30%	

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	---	---

QUALITY CONTROL (QC) SAMPLE RESULTS

Halogenated Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0990 - EPA 5030C						Water						
Matrix Spike Dup (23C0990-MSD1)			Prepared: 03/24/23 13:33 Analyzed: 03/25/23 12:35									
QC Source Sample: Non-SDG (A3C0670-02)												
1,1,1,2-Tetrachloroethane	22.7	---	0.400	ug/L	1	20.0	ND	114	78-124%	2	30%	
1,1,2,2-Tetrachloroethane	22.0	---	0.500	ug/L	1	20.0	ND	110	71-121%	1	30%	
Tetrachloroethene (PCE)	21.5	---	0.400	ug/L	1	20.0	ND	108	74-129%	1	30%	
1,2,3-Trichlorobenzene	23.2	---	2.00	ug/L	1	20.0	ND	116	69-129%	2	30%	
1,1,2-Trichloroethane	21.5	---	0.500	ug/L	1	20.0	ND	107	80-120%	1	30%	
1,2,4-Trichlorobenzene	23.3	---	2.00	ug/L	1	20.0	ND	117	69-130%	1	30%	
1,1,1-Trichloroethane	22.1	---	0.400	ug/L	1	20.0	ND	110	74-131%	1	30%	
Trichloroethene (TCE)	21.4	---	0.400	ug/L	1	20.0	ND	106	79-123%	2	30%	
Trichlorofluoromethane	25.0	---	2.00	ug/L	1	20.0	ND	125	65-141%	4	30%	Q-54
1,2,3-Trichloropropane	21.3	---	1.00	ug/L	1	20.0	ND	106	73-122%	2	30%	
Vinyl chloride	25.0	---	0.400	ug/L	1	20.0	0.950	120	58-137%	3	30%	
<i>Surr: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>Toluene-d8 (Surr)</i>		<i>100 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>93 %</i>		<i>80-120 %</i>		<i>"</i>						

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QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0896 - Method Prep: Aq						Water						
Blank (23C0896-BLK1)			Prepared: 03/23/23 09:24 Analyzed: 03/23/23 12:36									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0896-BS1)			Prepared: 03/23/23 09:24 Analyzed: 03/23/23 12:38									
<u>SM 4500-NH3 G</u>												
Ammonia as N	1.92	---	0.0200	mg/L	1	2.00	---	96	90-111%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0956 - Method Prep: Aq						Water						
Blank (23C0956-BLK1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 15:28									
<u>SM 4500-NH3 G</u>												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (23C0956-BS1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 15:29									
<u>SM 4500-NH3 G</u>												
Ammonia as N	1.94	---	0.0200	mg/L	1	2.00	---	97	90-111%	---	---	
Matrix Spike (23C0956-MS1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 16:02									
<u>QC Source Sample: MW-18i (A3C0668-01)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.55	---	0.0250	mg/L	1	2.50	ND	102	90-111%	---	---	
Matrix Spike Dup (23C0956-MSD1)			Prepared: 03/24/23 08:11 Analyzed: 03/24/23 16:04									
<u>QC Source Sample: MW-18i (A3C0668-01)</u>												
<u>SM 4500-NH3 G</u>												
Ammonia as N	2.62	---	0.0250	mg/L	1	2.50	ND	105	90-111%	3	13%	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0700 - Method Prep: Aq						Water						
Blank (23C0700-BLK1)			Prepared: 03/17/23 16:05 Analyzed: 03/17/23 22:33									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
LCS (23C0700-BS1)			Prepared: 03/17/23 16:05 Analyzed: 03/17/23 22:55									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	1.94	---	0.250	mg/L	1	2.00	---	97	90-110%	---	---	
Nitrite-Nitrogen	1.92	---	0.250	mg/L	1	2.00	---	96	90-110%	---	---	
Duplicate (23C0700-DUP1)			Prepared: 03/17/23 16:05 Analyzed: 03/17/23 23:59									
<u>QC Source Sample: Non-SDG (A3C0644-02)</u>												
Nitrate-Nitrogen	1.18	---	0.250	mg/L	1	---	1.00	---	---	17	3%	Q-02
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	ND	---	---	---	10%	
Duplicate (23C0700-DUP2)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 09:41									
<u>QC Source Sample: MW-1 (A3C0668-04RE2)</u>												
<u>EPA 300.0</u>												
Nitrite-Nitrogen	0.624	---	0.250	mg/L	1	---	0.619	---	---	0.8	10%	
Duplicate (23C0700-DUP3)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 08:37									
<u>QC Source Sample: MW-1 (A3C0668-04)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	34.6	---	5.00	mg/L	20	---	35.0	---	---	1	3%	Q-16
Matrix Spike (23C0700-MS1)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 00:21									
<u>QC Source Sample: Non-SDG (A3C0644-02)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	3.44	---	0.312	mg/L	1	2.50	1.00	97	87-112%	---	---	
Nitrite-Nitrogen	2.41	---	0.312	mg/L	1	2.50	ND	96	90-114%	---	---	
Matrix Spike (23C0700-MS2)			Prepared: 03/17/23 16:05 Analyzed: 03/18/23 10:03									
<u>QC Source Sample: MW-1 (A3C0668-04RE2)</u>												

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QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0700 - Method Prep: Aq						Water						
Matrix Spike (23C0700-MS2)						Prepared: 03/17/23 16:05 Analyzed: 03/18/23 10:03						
<u>QC Source Sample: MW-1 (A3C0668-04RE2)</u>												
<u>EPA 300.0</u>												
Nitrite-Nitrogen	2.99	---	0.312	mg/L	1	2.50	0.619	95	90-114%	---	---	
Matrix Spike (23C0700-MS3)						Prepared: 03/17/23 16:05 Analyzed: 03/18/23 08:58						
<u>QC Source Sample: MW-1 (A3C0668-04)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	73.4	---	5.00	mg/L	20	40.0	35.0	96	87-112%	---	---	Q-16

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QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0701 - Method Prep: Aq						Water						
Blank (23C0701-BLK1)			Prepared: 03/17/23 16:11 Analyzed: 03/18/23 11:51									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	---	---	---	---	---	
LCS (23C0701-BS1)			Prepared: 03/17/23 16:11 Analyzed: 03/18/23 12:12									
<u>EPA 300.0</u>												
Nitrate-Nitrogen	1.91	---	0.250	mg/L	1	2.00	---	95	90-110%	---	---	
Nitrite-Nitrogen	1.89	---	0.250	mg/L	1	2.00	---	95	90-110%	---	---	
Duplicate (23C0701-DUP1)			Prepared: 03/17/23 16:11 Analyzed: 03/18/23 14:00									
<u>QC Source Sample: MP-1 (A3C0668-06RE1)</u>												
<u>EPA 300.0</u>												
Nitrite-Nitrogen	ND	---	0.250	mg/L	1	---	0.231	---	---	***	10%	
Duplicate (23C0701-DUP2)			Prepared: 03/17/23 16:11 Analyzed: 03/18/23 12:55									
<u>QC Source Sample: MP-1 (A3C0668-06)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	30.6	---	5.00	mg/L	20	---	30.6	---	---	0.02	3%	Q-16
Matrix Spike (23C0701-MS1)			Prepared: 03/17/23 16:11 Analyzed: 03/18/23 14:22									
<u>QC Source Sample: MP-1 (A3C0668-06RE1)</u>												
<u>EPA 300.0</u>												
Nitrite-Nitrogen	2.62	---	0.312	mg/L	1	2.50	0.231	95	90-114%	---	---	
Matrix Spike (23C0701-MS2)			Prepared: 03/17/23 16:11 Analyzed: 03/18/23 13:17									
<u>QC Source Sample: MP-1 (A3C0668-06)</u>												
<u>EPA 300.0</u>												
Nitrate-Nitrogen	69.0	---	5.00	mg/L	20	40.0	30.6	96	87-112%	---	---	Q-16

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QUALITY CONTROL (QC) SAMPLE RESULTS

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0788 - Method Prep: Aq						Water						
Blank (23C0788-BLK1)			Prepared: 03/21/23 09:12 Analyzed: 03/21/23 22:22									
<u>SM 5310 C</u>												
Total Organic Carbon	ND	---	1.00	mg/L	1	---	---	---	---	---	---	
LCS (23C0788-BS1)			Prepared: 03/21/23 09:12 Analyzed: 03/21/23 22:52									
<u>SM 5310 C</u>												
Total Organic Carbon	10.3	---	1.00	mg/L	1	10.0	---	103	90-114%	---	---	
Matrix Spike (23C0788-MS2)			Prepared: 03/21/23 09:12 Analyzed: 03/22/23 12:22									
<u>QC Source Sample: Non-SDG (A3C0576-10)</u>												
<u>SM 5310 C</u>												
Total Organic Carbon	11.0	---	1.01	mg/L	1	10.0	ND	110	85-115%	---	---	
Matrix Spike (23C0788-MS3)			Prepared: 03/21/23 09:12 Analyzed: 03/23/23 15:36									
<u>QC Source Sample: Non-SDG (A3C0470-01RE1)</u>												
<u>SM 5310 C</u>												
Total Organic Carbon	60.4	---	4.04	mg/L	4	40.0	21.1	98	85-115%	---	---	H-06, Q-16
Matrix Spike Dup (23C0788-MSD2)			Prepared: 03/21/23 09:12 Analyzed: 03/22/23 12:52									
<u>QC Source Sample: Non-SDG (A3C0576-10)</u>												
Total Organic Carbon	10.8	---	1.01	mg/L	1	10.0	ND	108	85-115%	2	15%	
Matrix Spike Dup (23C0788-MSD3)			Prepared: 03/21/23 09:12 Analyzed: 03/23/23 16:06									
<u>QC Source Sample: Non-SDG (A3C0470-01RE1)</u>												
Total Organic Carbon	62.2	---	4.04	mg/L	4	40.0	21.1	103	85-115%	3	15%	H-06, Q-16

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SAMPLE PREPARATION INFORMATION

Halogenated Volatile Organic Compounds by EPA 8260D

Prep: EPA 5030C

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23C0990</u>							
A3C0668-01	Water	EPA 8260D	03/17/23 08:24	03/24/23 13:40	5mL/5mL	5mL/5mL	1.00
A3C0668-02	Water	EPA 8260D	03/17/23 09:18	03/24/23 13:40	5mL/5mL	5mL/5mL	1.00
A3C0668-03	Water	EPA 8260D	03/17/23 09:57	03/24/23 13:40	5mL/5mL	5mL/5mL	1.00
A3C0668-04	Water	EPA 8260D	03/17/23 10:15	03/24/23 13:40	5mL/5mL	5mL/5mL	1.00
A3C0668-05	Water	EPA 8260D	03/17/23 09:18	03/24/23 13:40	5mL/5mL	5mL/5mL	1.00
A3C0668-06	Water	EPA 8260D	03/17/23 08:11	03/24/23 13:40	5mL/5mL	5mL/5mL	1.00

Ammonia by Gas Diffusion and Colorimetric Detection

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23C0956</u>							
A3C0668-01	Water	SM 4500-NH3 G	03/17/23 08:24	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0668-02	Water	SM 4500-NH3 G	03/17/23 09:18	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0668-03	Water	SM 4500-NH3 G	03/17/23 09:57	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0668-04RE2	Water	SM 4500-NH3 G	03/17/23 10:15	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0668-05RE1	Water	SM 4500-NH3 G	03/17/23 09:18	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00
A3C0668-06RE3	Water	SM 4500-NH3 G	03/17/23 08:11	03/24/23 08:14	10mL/10mL	10mL/10mL	1.00

Anions by Ion Chromatography

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 23C0700</u>							
A3C0668-01	Water	EPA 300.0	03/17/23 08:24	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0668-02	Water	EPA 300.0	03/17/23 09:18	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0668-03	Water	EPA 300.0	03/17/23 09:57	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0668-04	Water	EPA 300.0	03/17/23 10:15	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0668-04RE2	Water	EPA 300.0	03/17/23 10:15	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
A3C0668-05RE1	Water	EPA 300.0	03/17/23 09:18	03/17/23 16:05	5mL/5mL	5mL/5mL	1.00
<u>Batch: 23C0701</u>							
A3C0668-06	Water	EPA 300.0	03/17/23 08:11	03/17/23 16:11	5mL/5mL	5mL/5mL	1.00
A3C0668-06RE1	Water	EPA 300.0	03/17/23 08:11	03/17/23 16:11	5mL/5mL	5mL/5mL	1.00

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

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SAMPLE PREPARATION INFORMATION

Total Organic Carbon (Non-Purgeable) by Persulfate Oxidation by Standard Method 5310C

<u>Prep: Method Prep: Ag</u>					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
<u>Batch: 23C0788</u>							
A3C0668-06	Water	SM 5310 C	03/17/23 08:11	03/21/23 09:12	40mL/40mL	40mL/40mL	1.00

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
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QUALIFIER DEFINITIONS

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

Apex Laboratories

- H-01** Analyzed outside the recommended holding time.
- H-06** This sample was received, or the analysis requested, outside the recommended holding time.
- ICV-01** Estimated Result. Initial Calibration Verification (ICV) failed high. There is no effect on non-detect results.
- Q-02** Spike recovery is outside of established control limits due to matrix interference.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-54** Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +3%. The results are reported as Estimated Values.
- Q-56** Daily CCV/LCS recovery for this analyte was above the +/-20% criteria listed in EPA 8260
- R-01** The Reporting Limit for this analyte has been raised to account for matrix interference.
- TEMP** Sample was received outside of recommended temperature. See Case Narrative.

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.

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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

GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: <u>Nustar-Vancouver-GWM - 2023</u> Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	--	---

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) may not be 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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Darrell Auvil, Client Services Manager



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503-718-2323
ORELAP ID: OR100062

Table with 3 columns: Client info (GeoEngineers - Portland), Project info (Project: Nustar-Vancouver-GWM - 2023), and Report ID (A3C0668 - 04 05 23 1623)

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.

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.

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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Handwritten signature of Darrell Auvil

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC
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503-718-2323
ORELAP ID: OR100062

Table with 3 columns: Client info (GeoEngineers - Portland), Project info (Project: Nustar-Vancouver-GWM - 2023), and Report ID (A3C0668 - 04 05 23 1623).

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

Table header with columns: 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 provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Handwritten signature of Darrell Auvil

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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GeoEngineers - Portland 5820 S Kelly Ave Unit B Portland, OR 97239	Project: Nustar-Vancouver-GWM - 2023 Project Number: 019001-009-004 Project Manager: Stephanie Bosze-Salisbury	Report ID: A3C0668 - 04 05 23 1623
---	---	--

APEX LABS COOLER RECEIPT FORM

Client: GeoEngineers Element WO#: A3C0668 ⁰⁶⁶⁸ _{3/17/23}

Project/Project #: Van Main 1Q23 GWM

Delivery Info:
Date/time received: 3/17/23 @ 1320 By: JS
Delivered by: Apex Client FedEx UPS Radio Morgan SDS Evergreen Other

Cooler Inspection Date/time inspected: 3/17/23 @ 1322 By: JS
Chain of Custody included? Yes No
Signed/dated by client? Yes No RAM 3/17/23

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>3.9</u>	<u>2.6</u>					
Custody seals? (Y/N)	<u>N</u>	<u>N</u>					
Received on ice? (Y/N)	<u>Y</u>	<u>Y</u>					
Temp. blanks? (Y/N)	<u>Y</u>	<u>Y</u>					
Ice type: (Gel/Real/Other)	<u>real</u>	<u>real</u>					
Condition (In/Out):	<u>In</u>	<u>In</u>					

Cooler out of temp? (Y/N) Possible reason why: _____
Green dots applied to out of temperature samples? Yes No
Out of temperature samples form initiated? Yes No
Sample Inspection: Date/time inspected: 3/17/23 @ 14:10 By: RAM
All samples intact? Yes No Comments: _____
Bottle labels/COCs agree? Yes No Comments: _____
COC/container discrepancies form initiated? Yes No
Containers/volumes received appropriate for analysis? Yes No Comments: _____
Do VOA vials have visible headspace? Yes No NA RAM 3/17/23
Comments: _____
Water samples: pH checked: Yes No NA pH appropriate? Yes No NA
Comments: _____
Additional information:

Labeled by: RAM Witness: APAW Cooler Inspected by: RAM Form Y-003 R-00

Apex Laboratories

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Darrell Auvil, Client Services Manager

April 5, 2023

Apex Laboratories
ATTN: Darrell Auvil
6700 S.W. Sandburg St.
Tigard, OR 97223



LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C,
ASTM D1946, RSK-175
TX Cert T104704450-14-6
EPA Methods TO14A, TO15
UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: A3C0668
Lab Number: P032106-01

Enclosed are results for sample(s) received 3/21/23 by Air Technology Laboratories. Sample was received intact and chilled to 5° C. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the TNI Standards.
- The enclosed results relate only to the sample(s).

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

A handwritten signature in blue ink, appearing to read "M. Johnson", with a checkmark to the right.

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

SUBCONTRACT ORDER

Apex Laboratories

A3C0668

P032106-81

AS 3/17/23

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Air Technology Laboratories, Inc
18501 E. Gale Ave Suite 130
City of Industry, CA 91748
Phone : (626) 964-4032
Fax: (626) 964-5832

Sample Name: MP-1

Water

Sampled: 03/17/23 08:11

(A3C0668-06)

Analysis	Due	Expires	Comments
RSK 175 Preserved (Meth, Eth, Eth) (Sub)	03/30/23 17:00	03/31/23 08:11	air tech lab
<i>Containers Supplied:</i>			
(D)40 mL VOA - HCL			
(E)40 mL VOA - HCL			

01

Standard TAT

5°C

Released By: [Signature]
[Signature]
UPS (Shipper)

Date: 3/20/23 1405

Received By: UPS (Shipper)

Released By _____ Date _____ Received By _____ Date _____

QC Batch No: 230327GC8A1

Matrix: Water

Reporting Units: ug/L

RSK 175
LABORATORY CONTROL SAMPLE SUMMARY

Lab No.:	METHOD BLANK		LCS			LCSD					
Date/Time Analyzed:	3/27/23 10:06		3/27/23 9:32			3/27/23 9:50					
Analyst Initials:	RC		RC			RC					
Dilution Factor:	1.0		1.0			1.0		Limits			
ANALYTE	Result ug/L	RL ug/L	SPIKE AMT. ug/L	Result ug/L	% Rec.	Result ug/L	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Ethene	ND	1.0	1,150	1,330	116	1,240	108	7.0	70	130	30
Ethane	ND	1.0	1,200	1,360	111	1,290	105	5.2	70	130	30
Methane	ND	1.0	650	724	111	684	105	5.7	70	130	30

ND = Not Detected (below RL)

RL = Reporting Limit

Reviewed/Approved By: Mark Johnson
Mark Johnson
Operations Manager

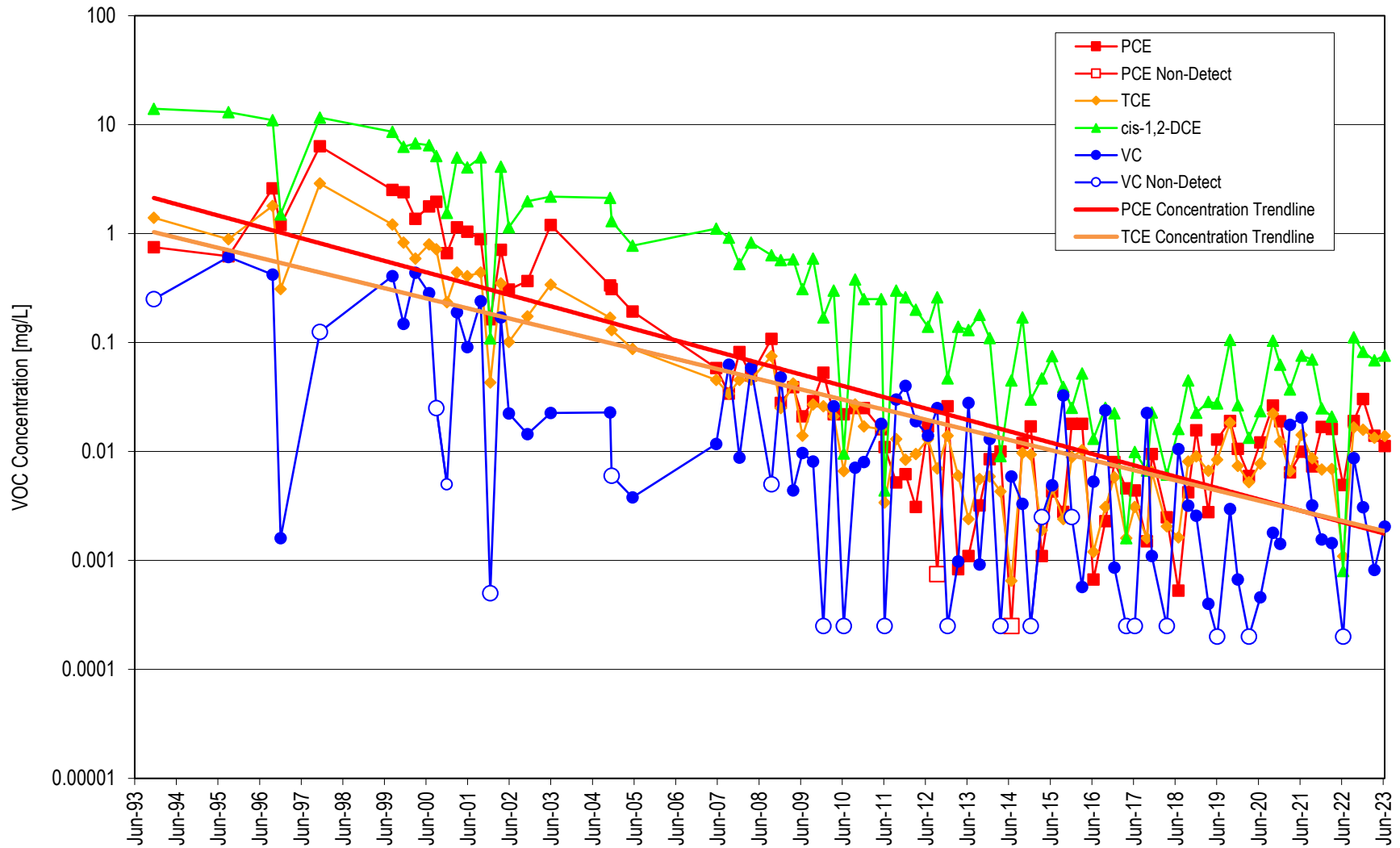
Date 4/4/23

The cover letter is an integral part of this analytical report



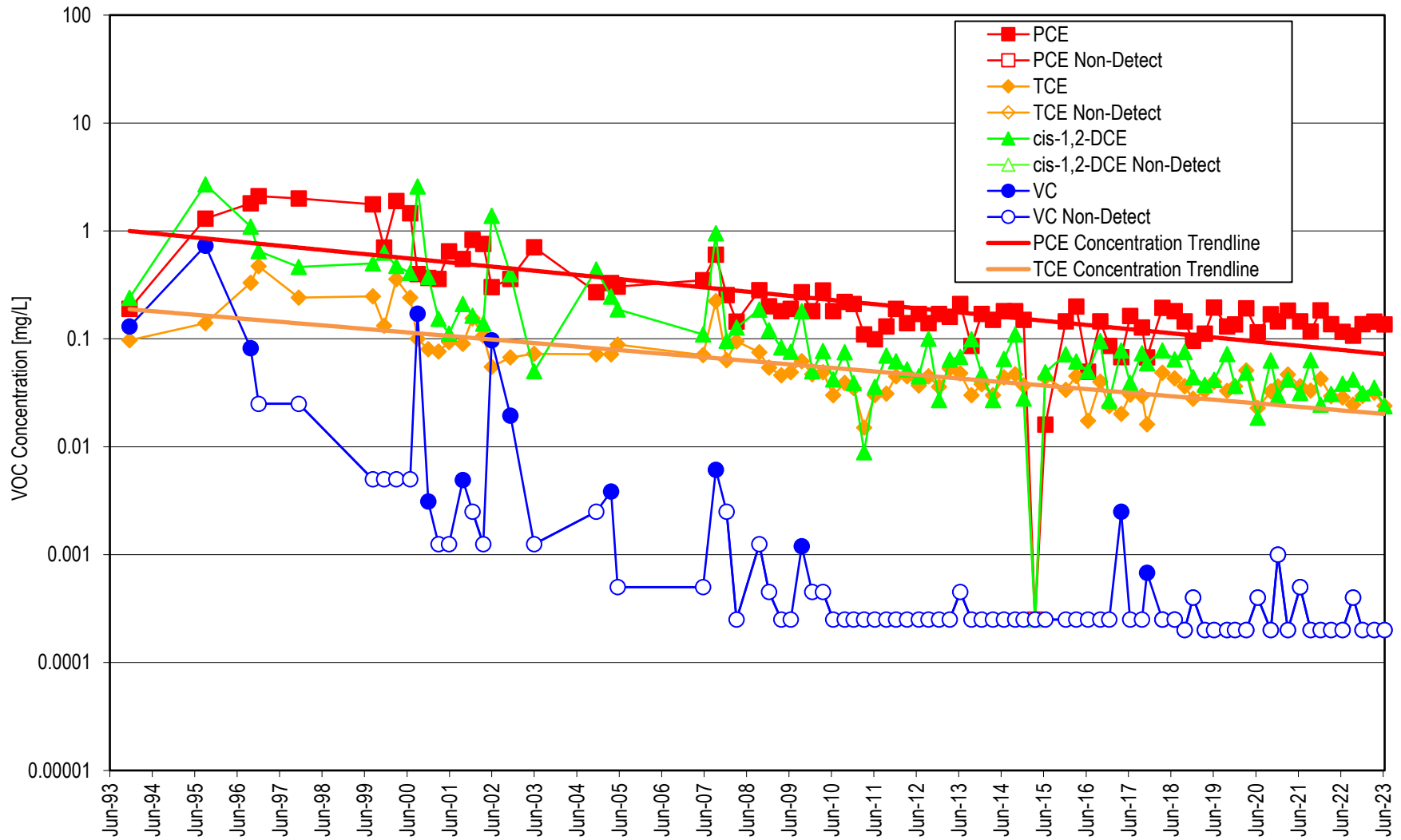
APPENDIX D
HVOC Concentration Trend Plots

VOC Concentrations in MW-1



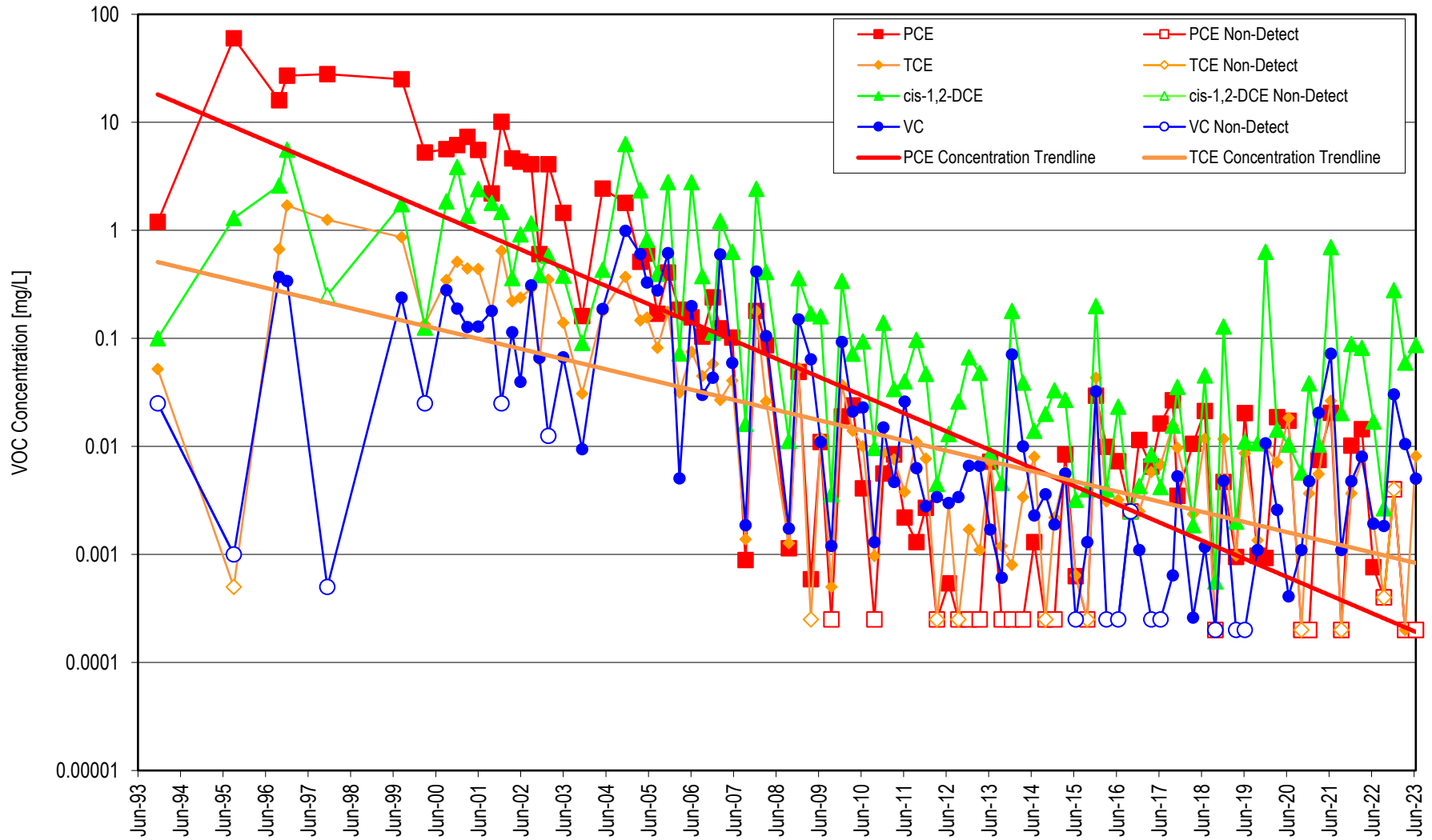
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-3



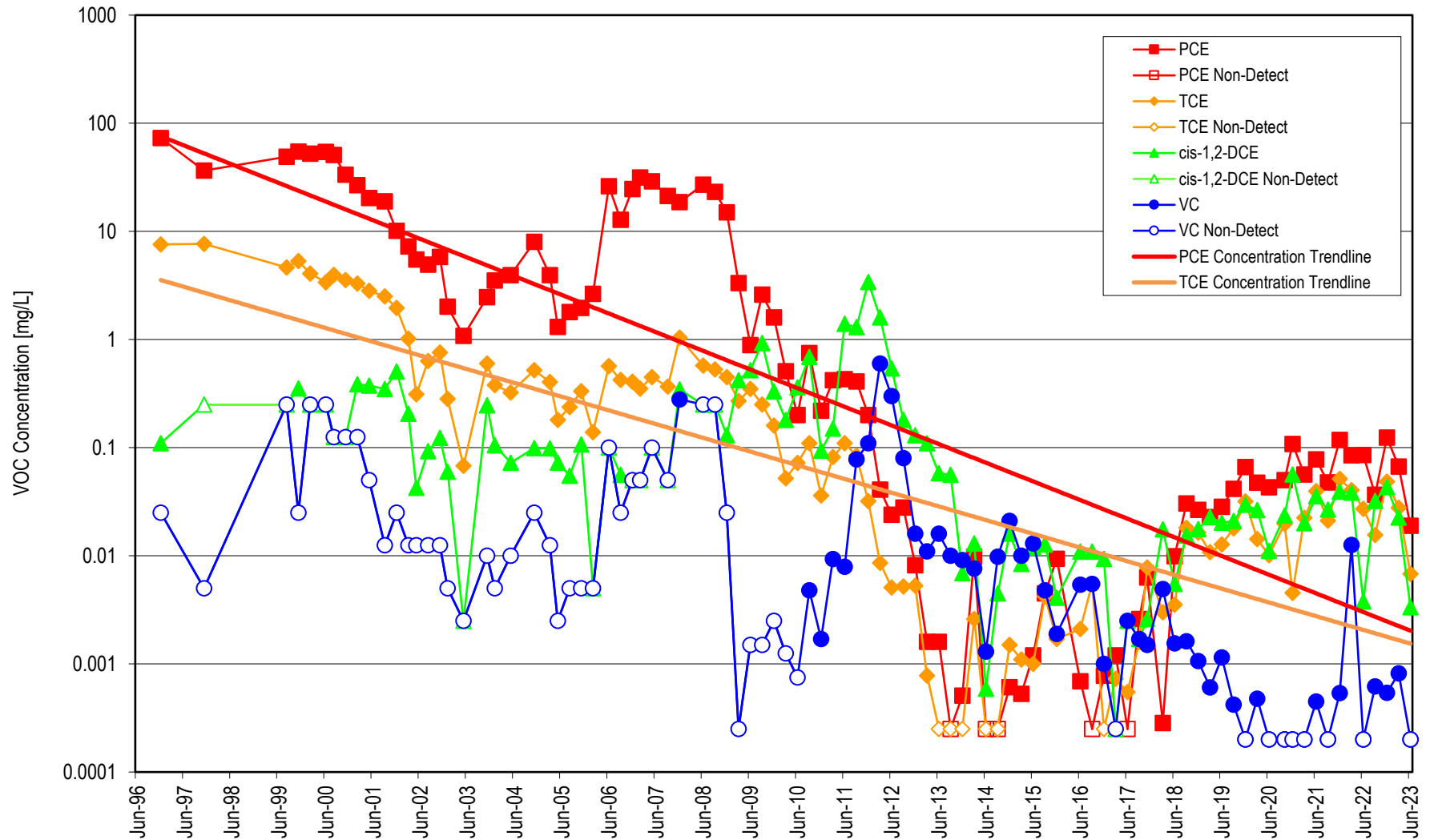
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-5



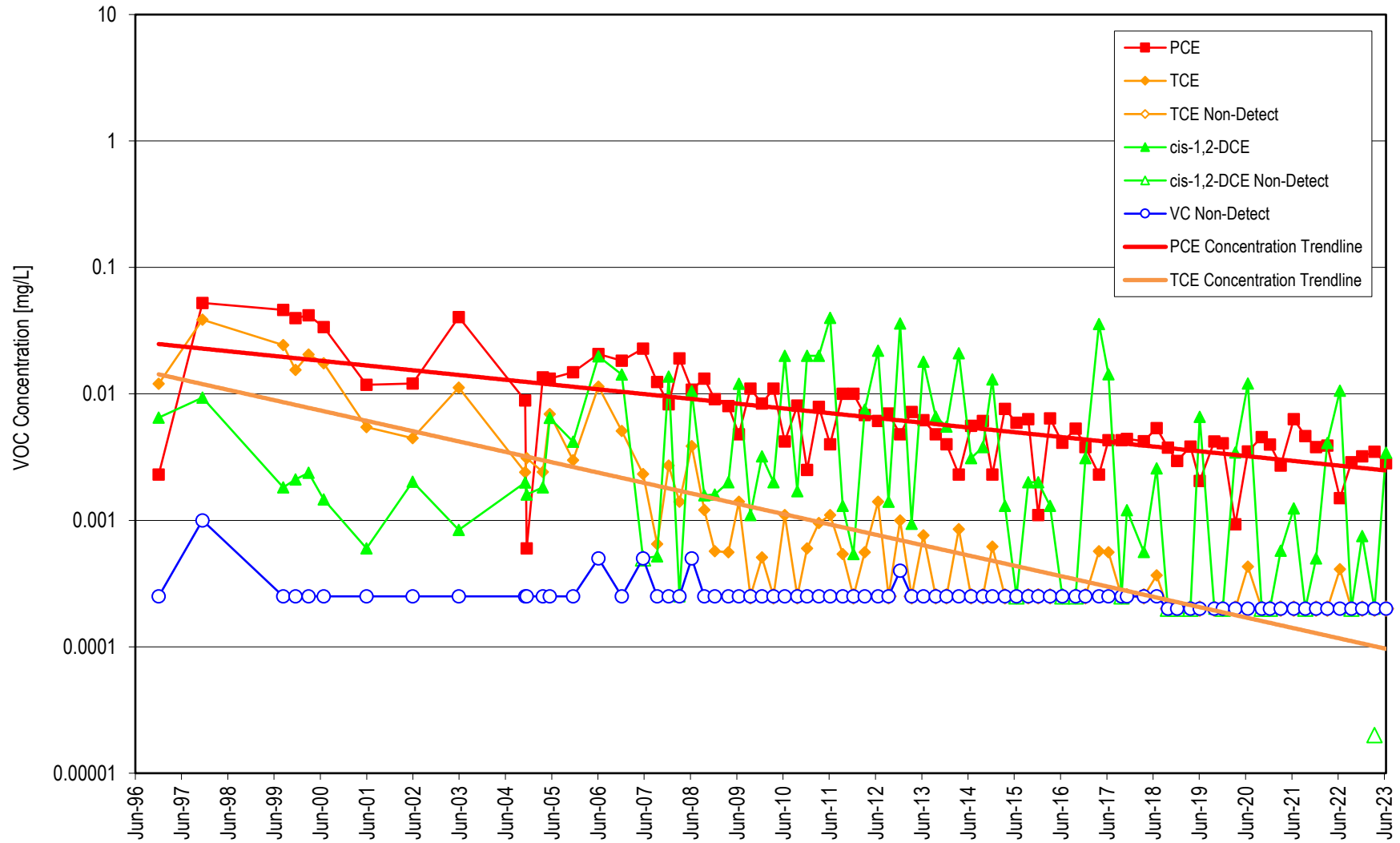
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-7



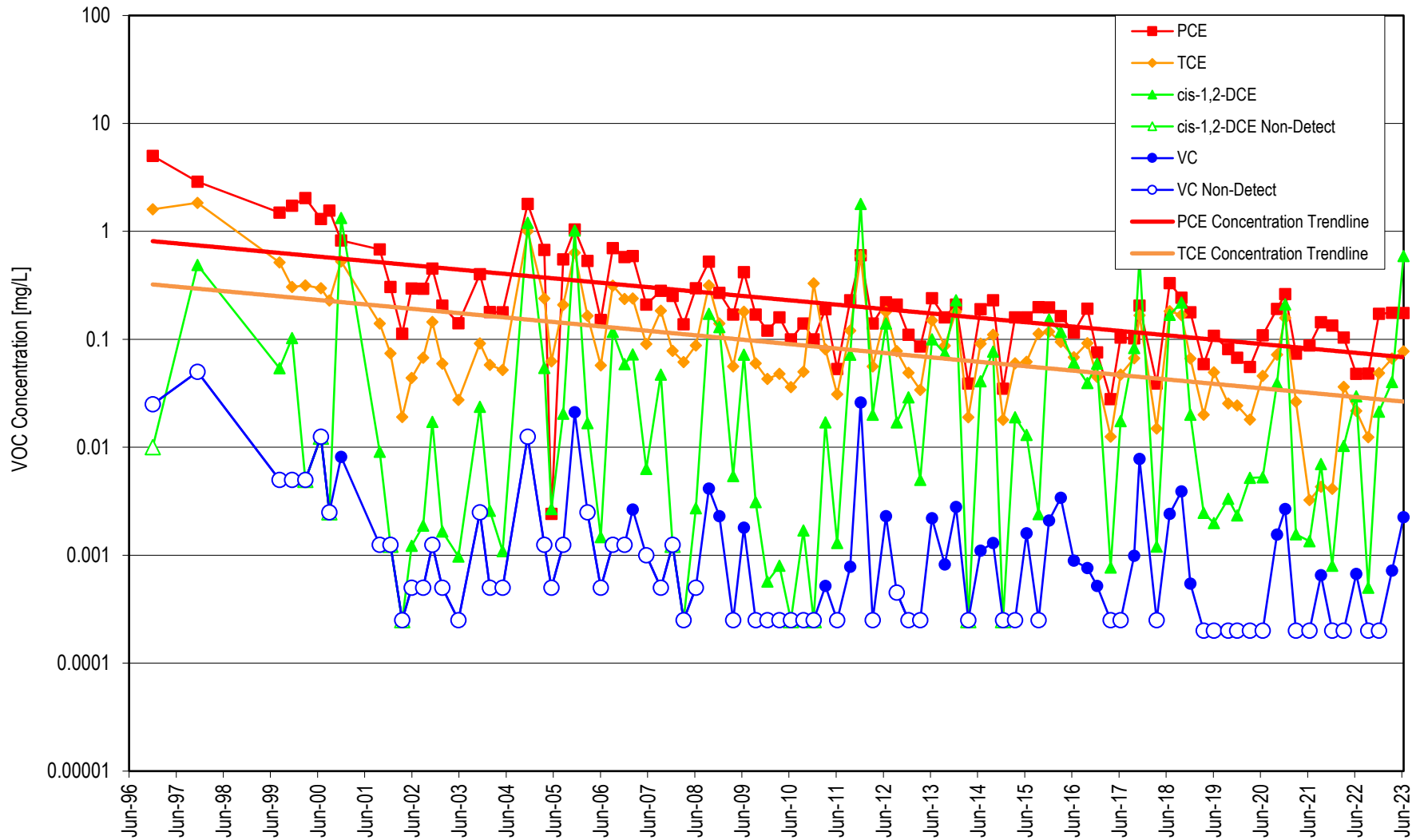
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-8



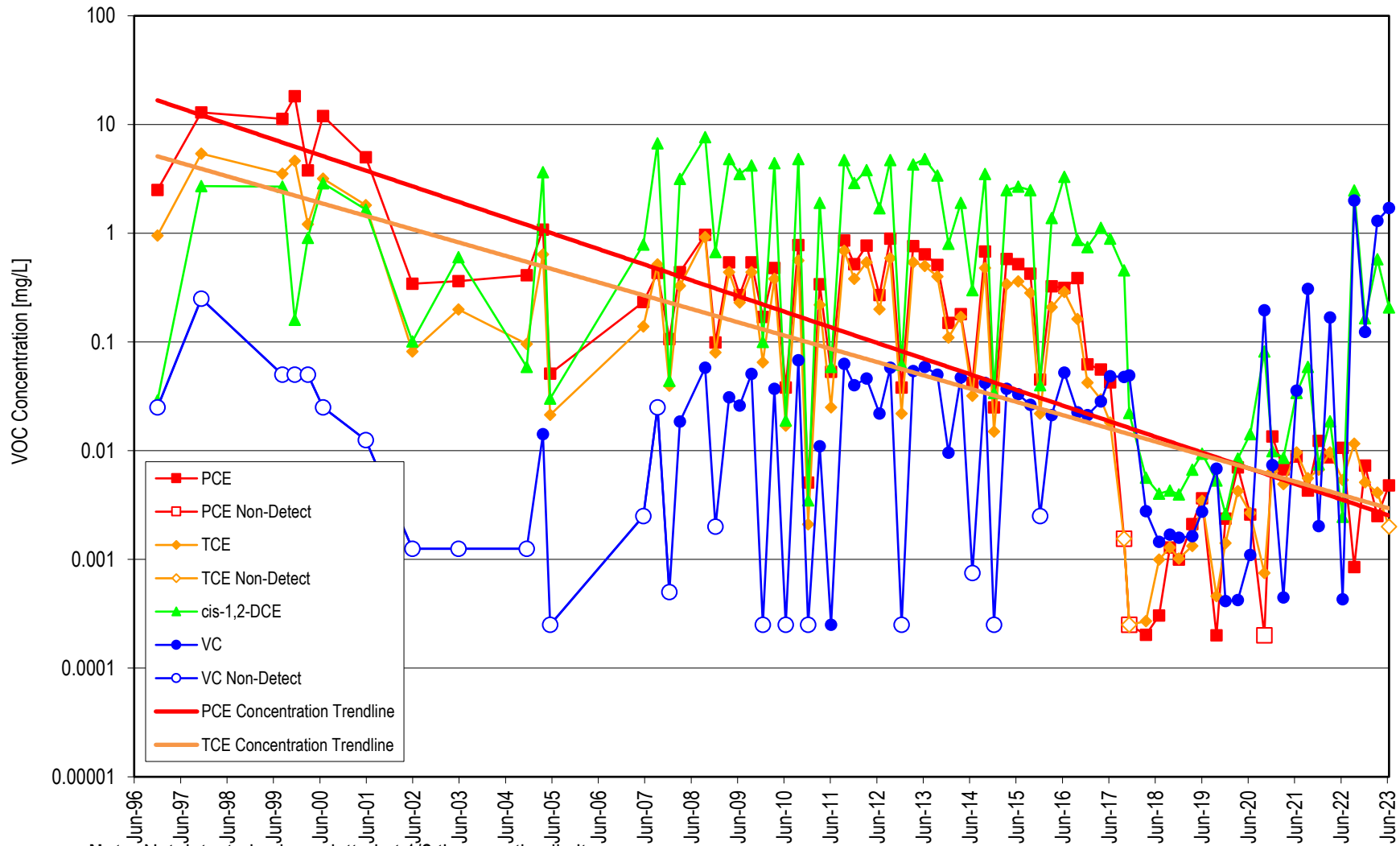
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-9

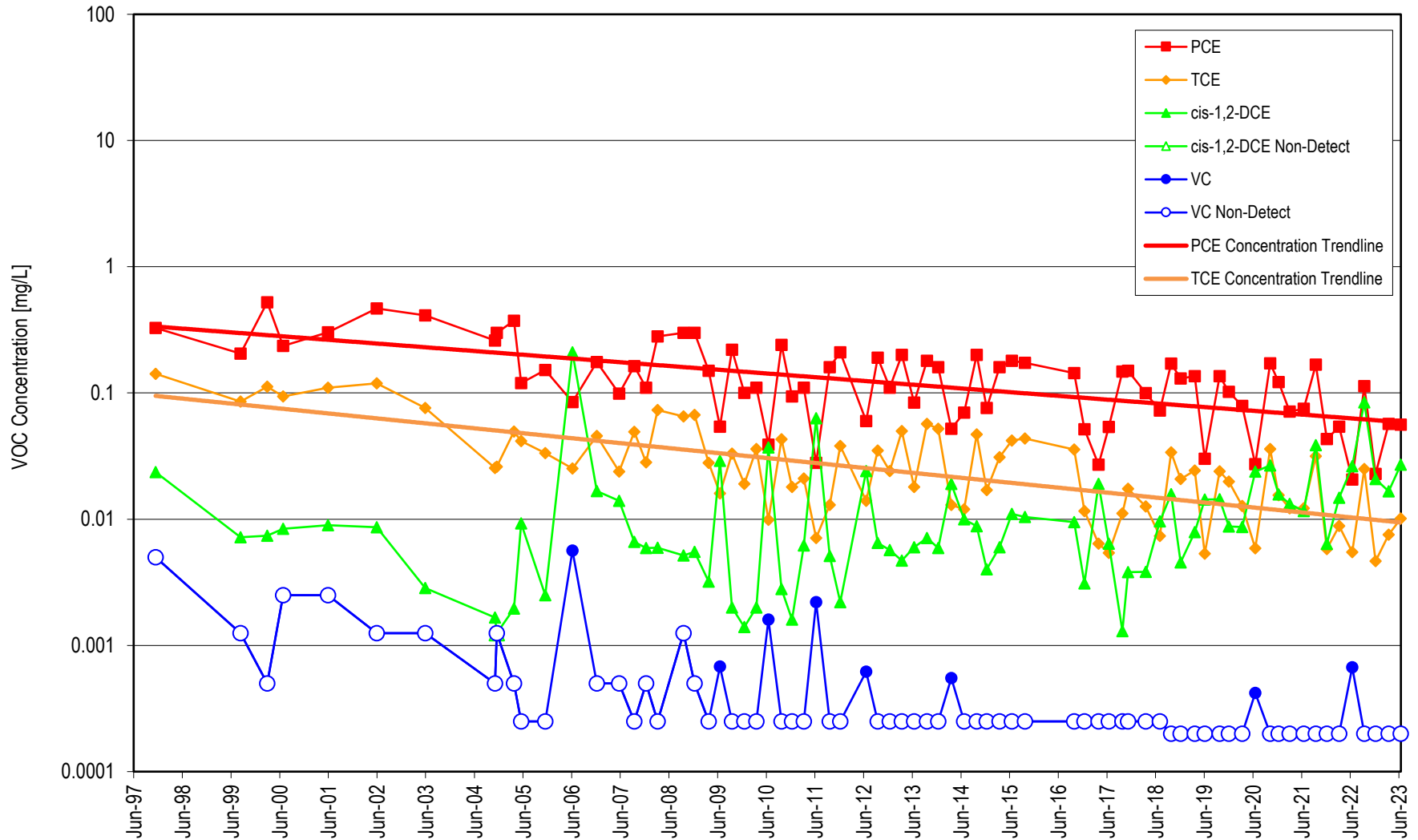


Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-12

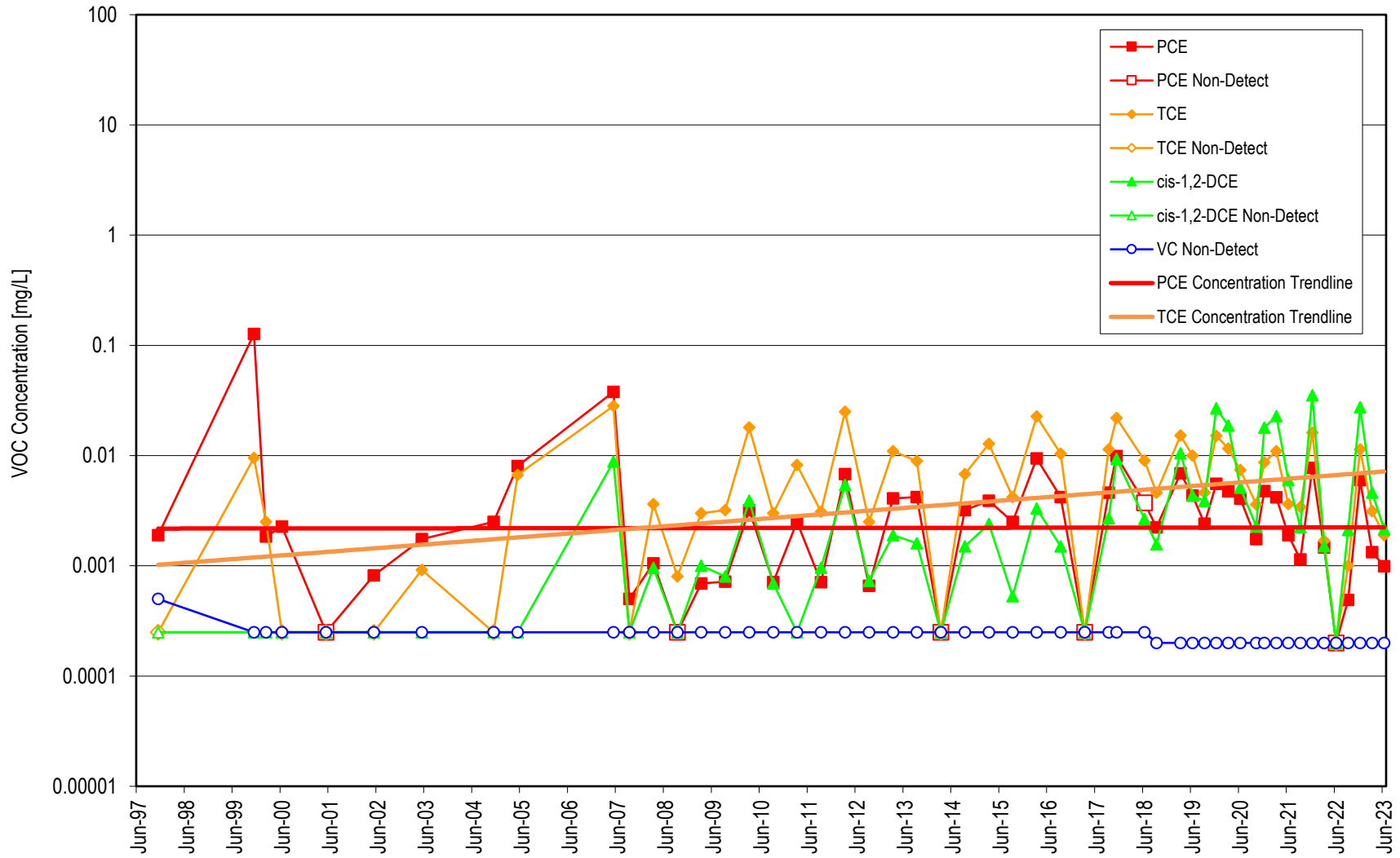


VOC Concentrations in MW-16



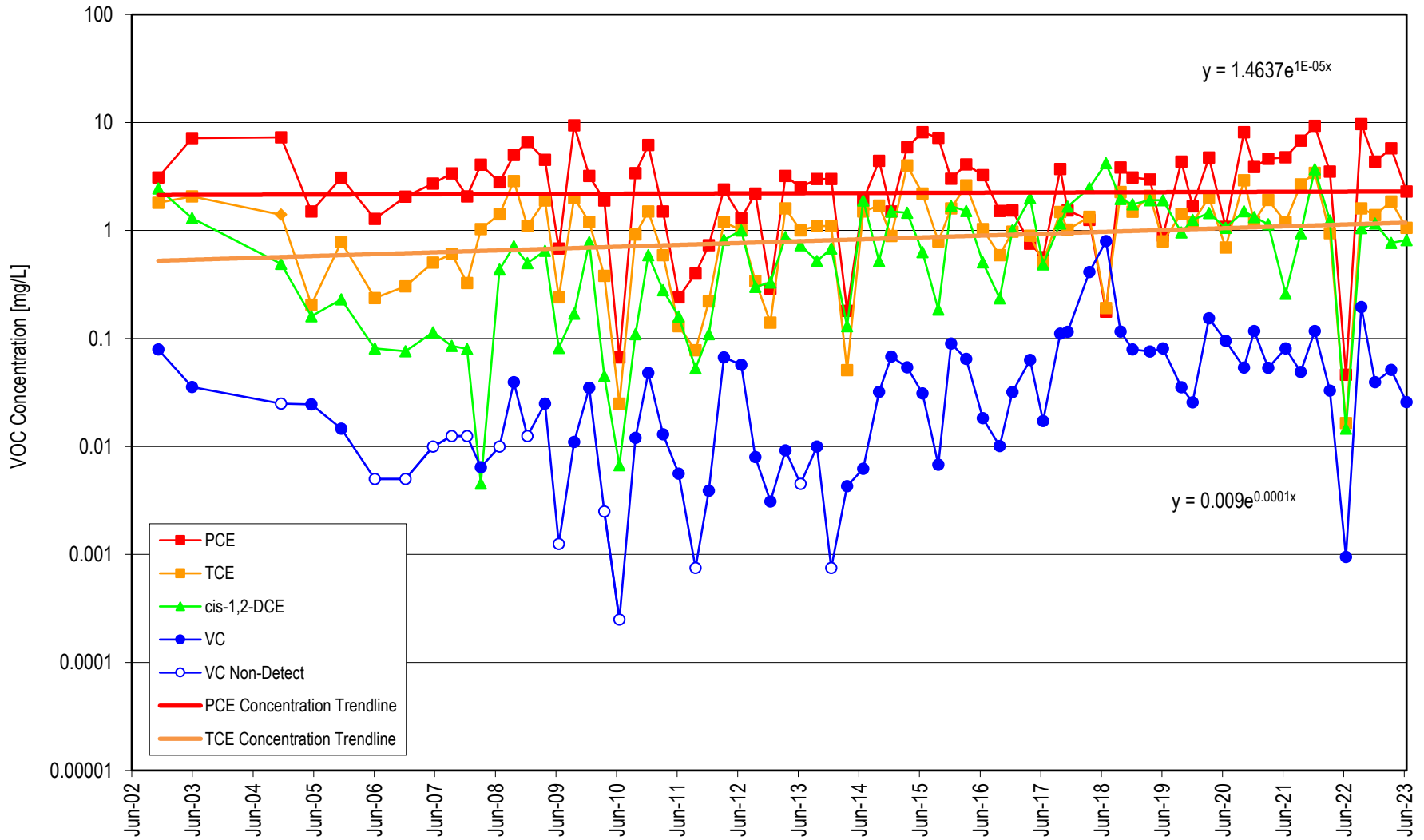
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-17



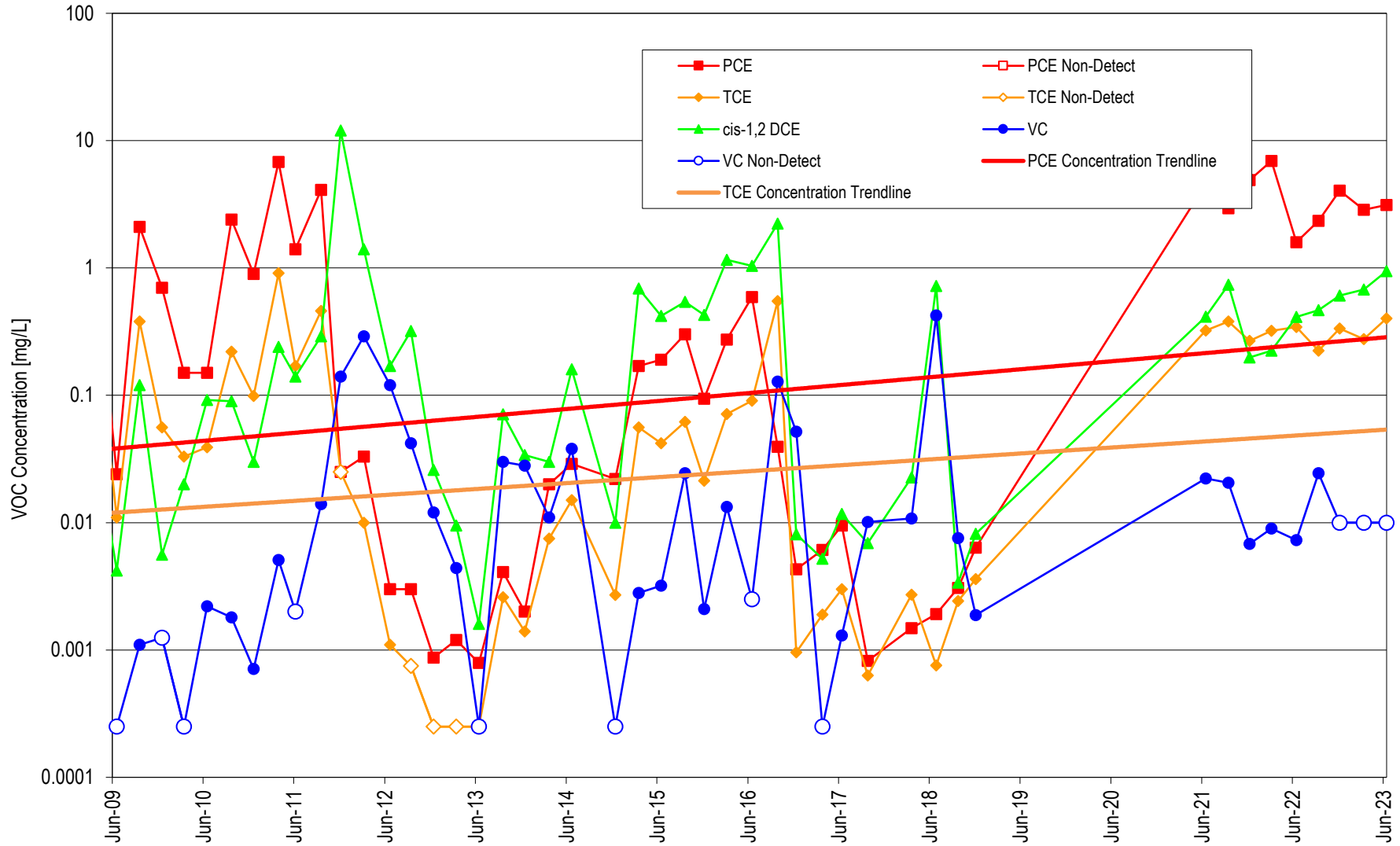
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-19



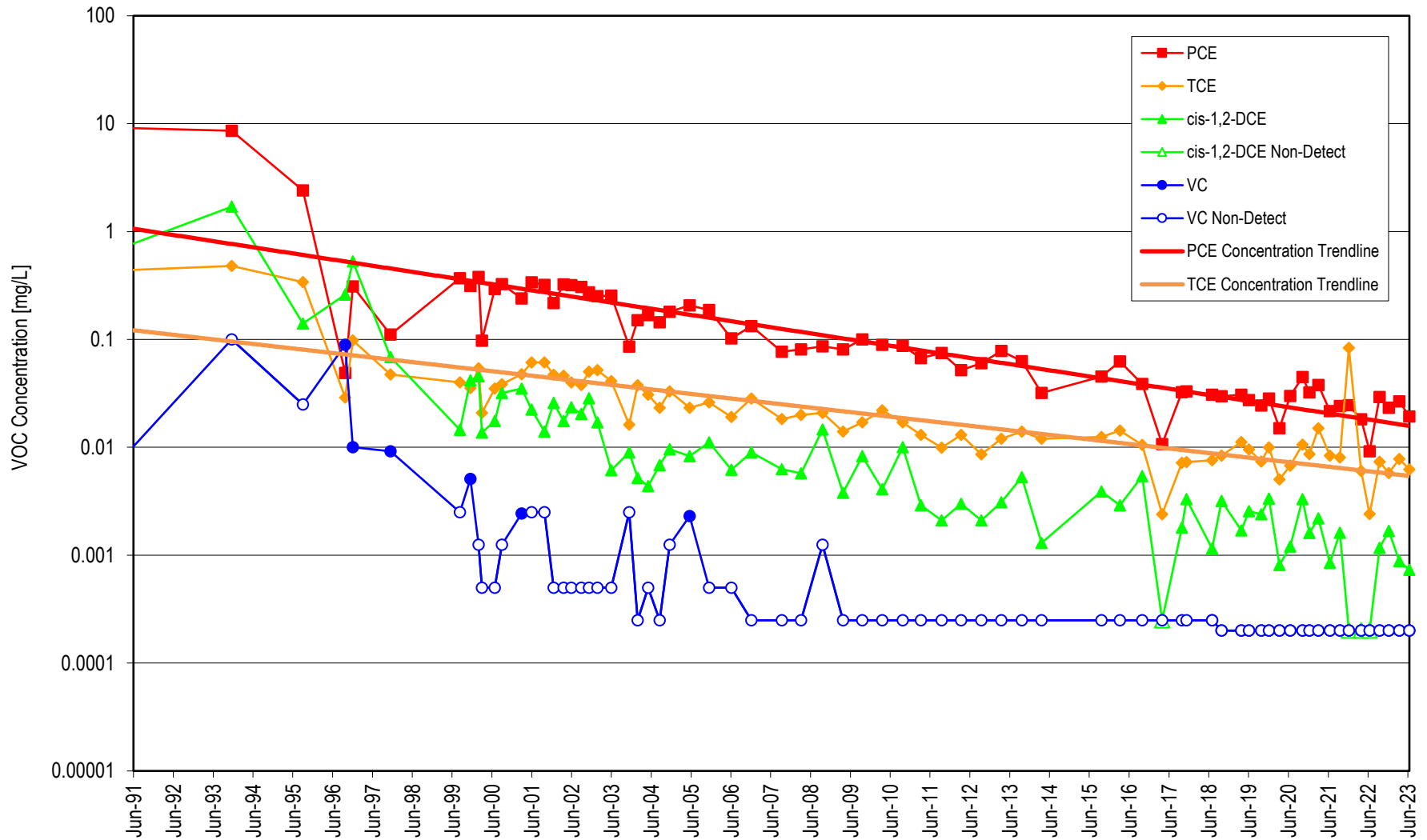
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in EX



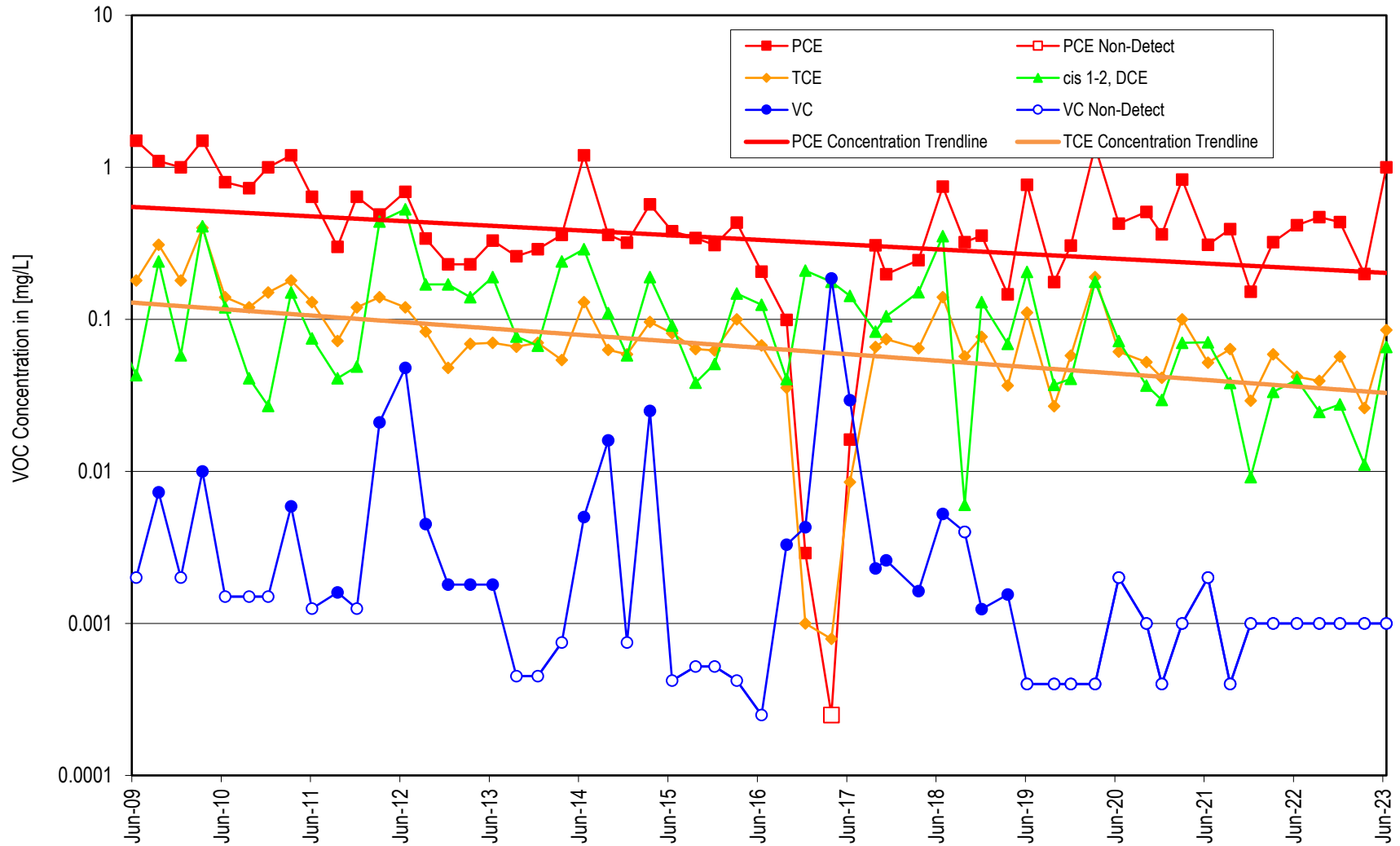
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in EW-1



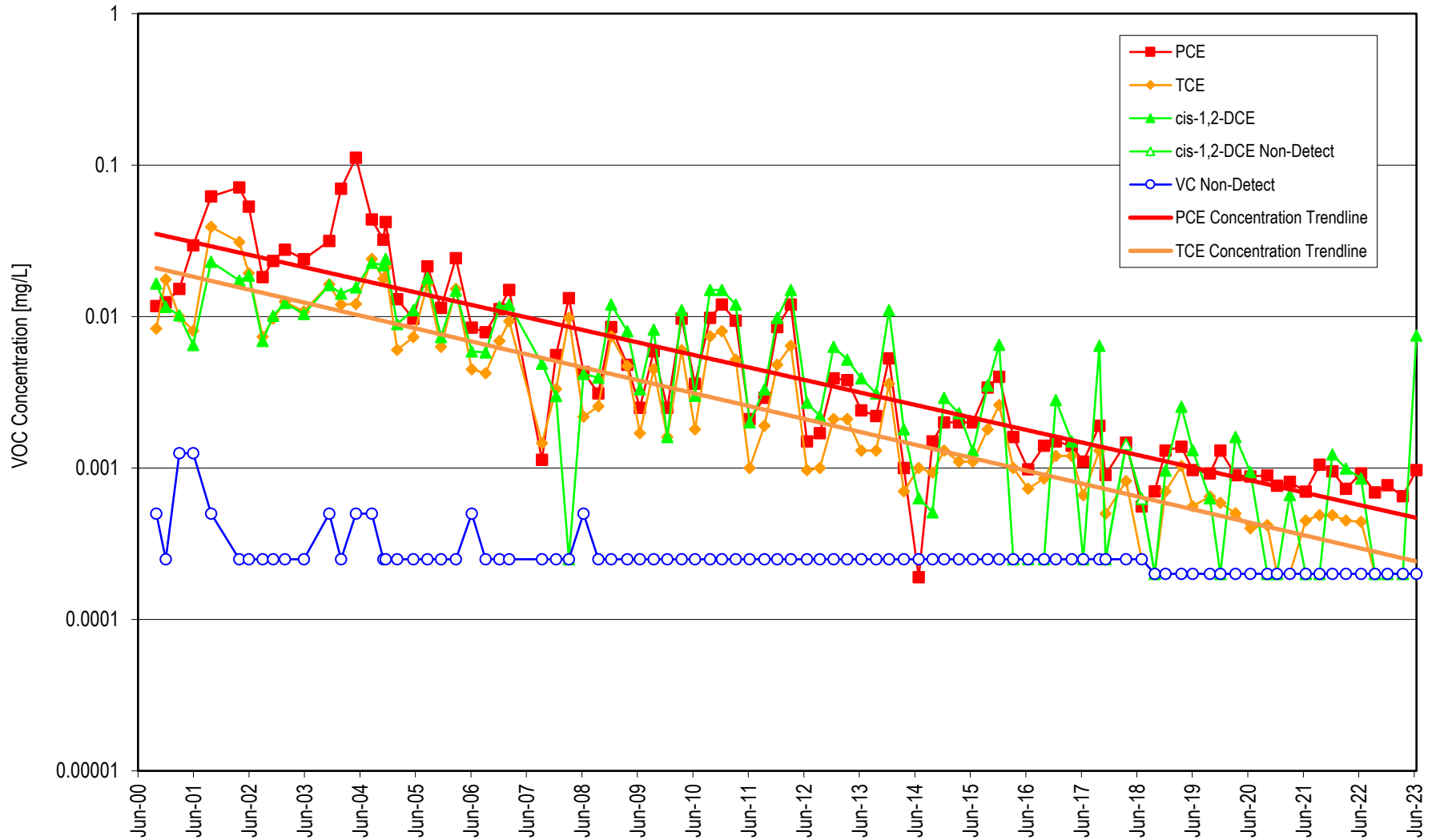
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MP-1



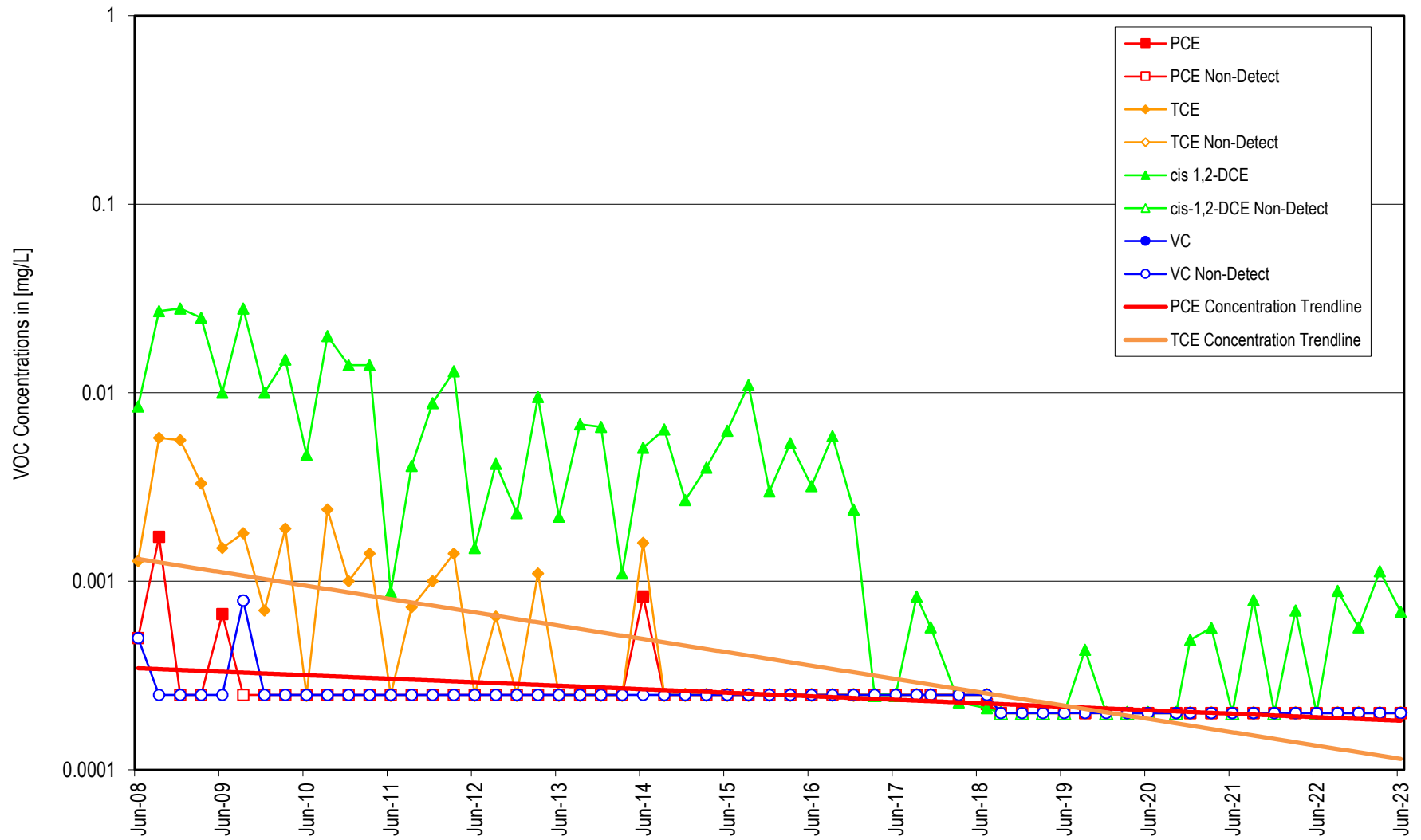
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-18i



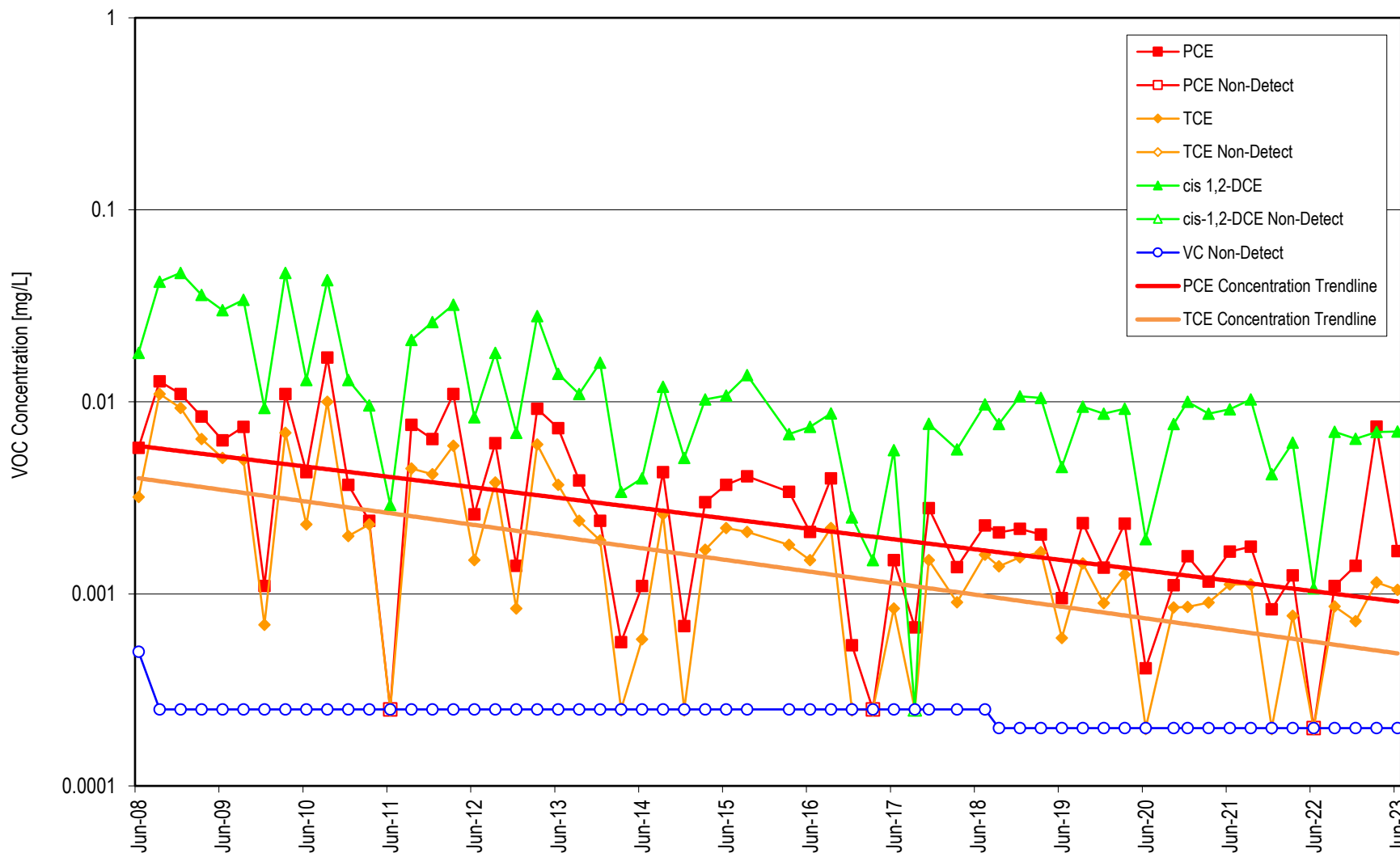
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VOC Concentrations in MW-19i



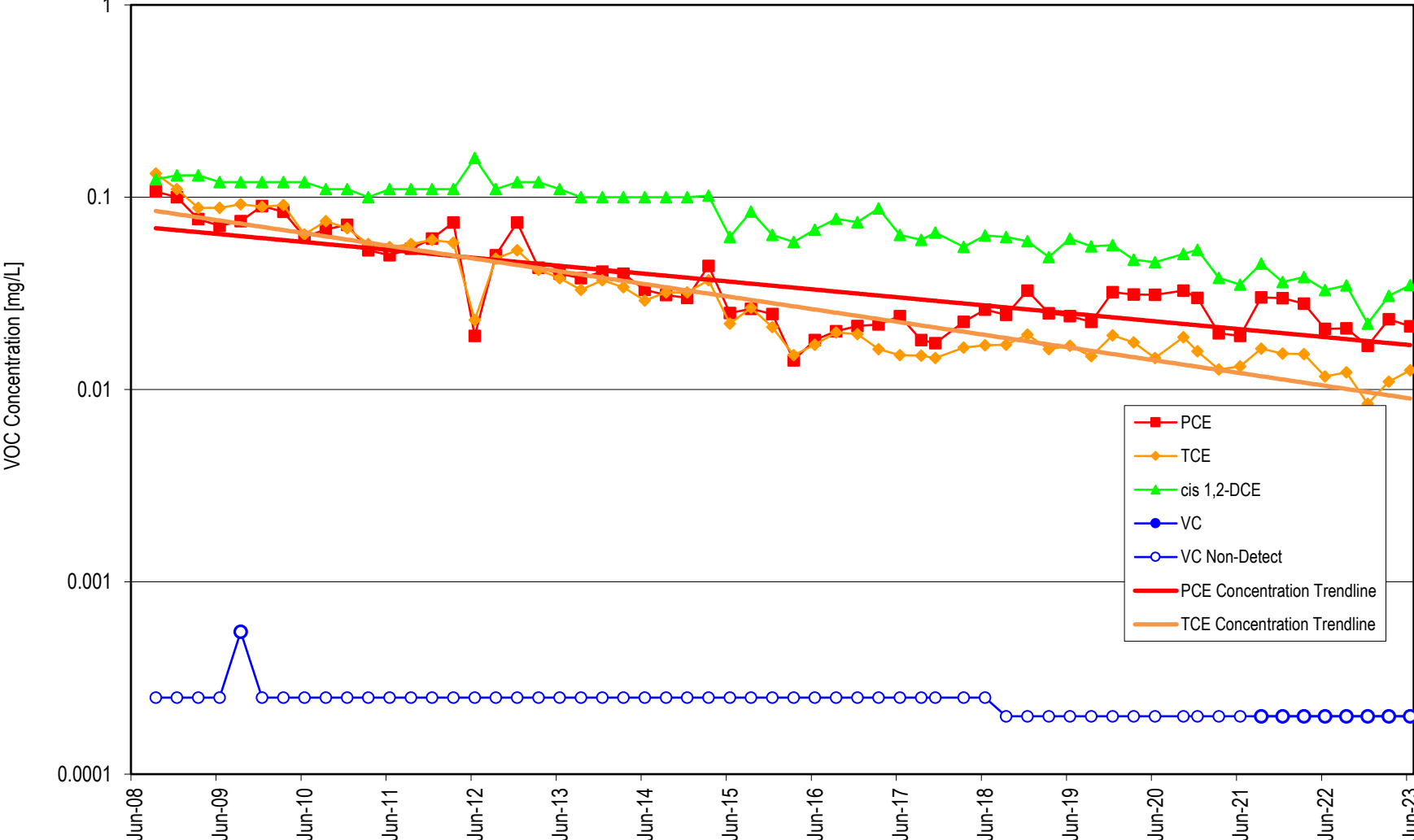
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-20i



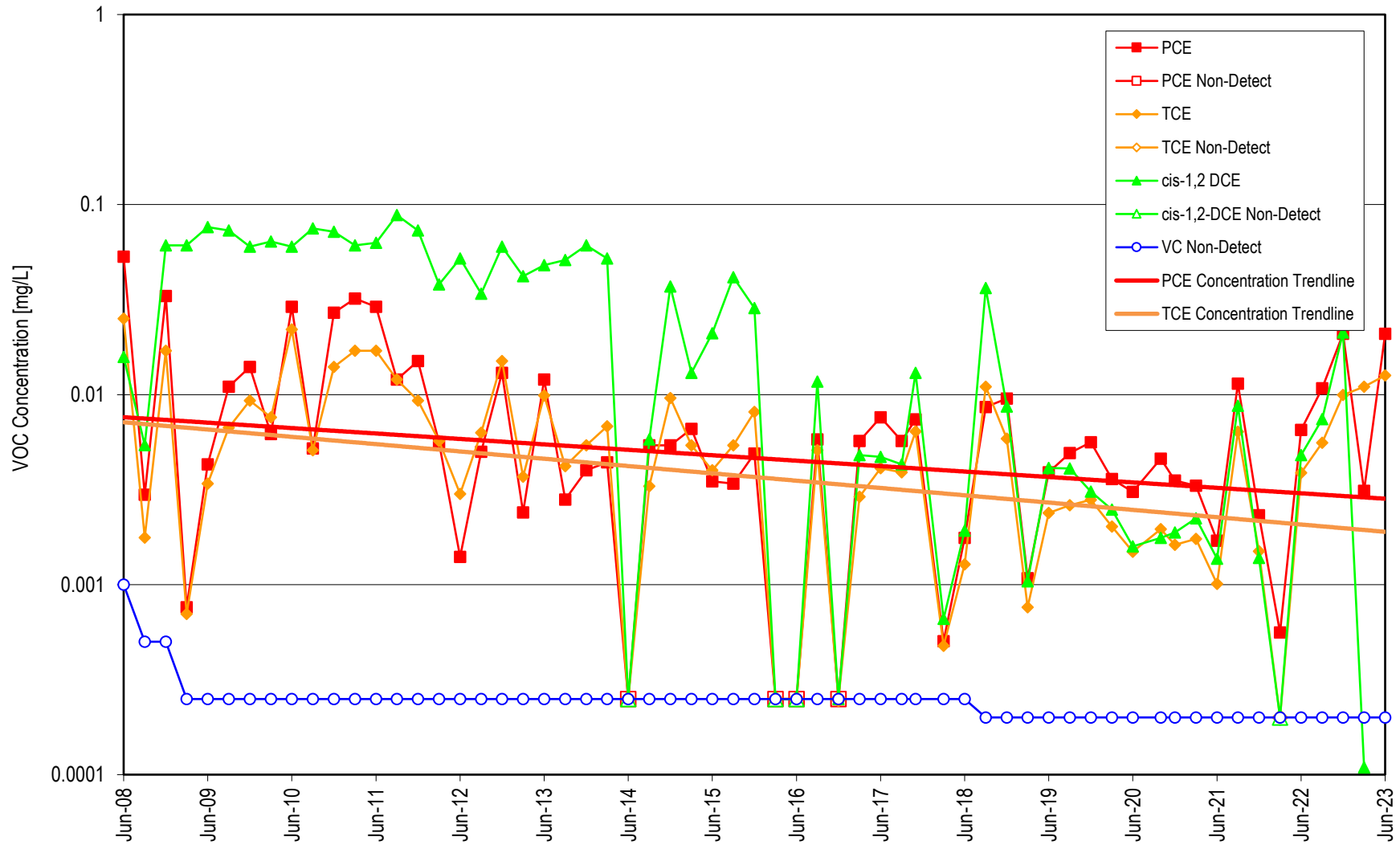
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VOC Concentrations in MW-21i-40



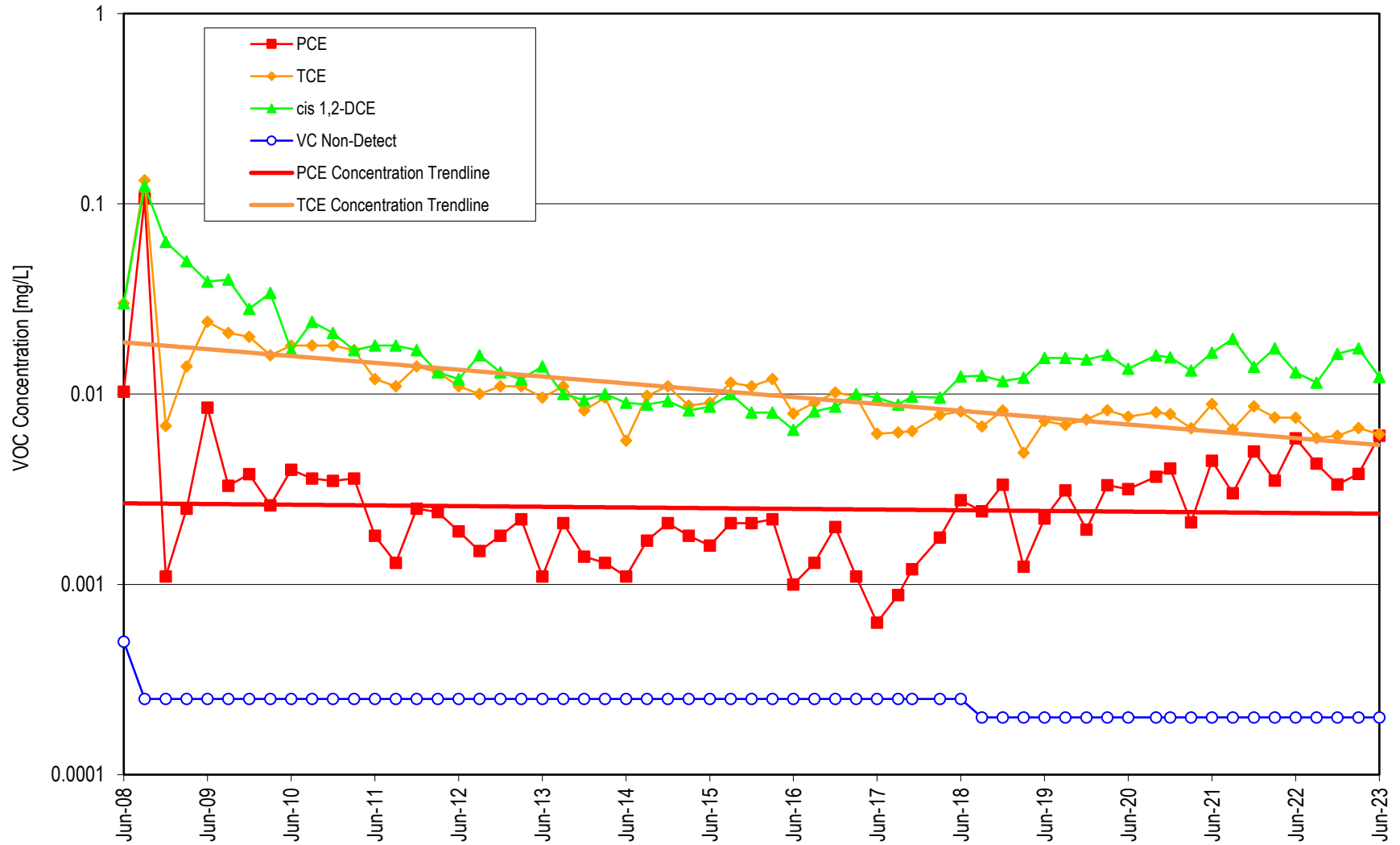
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-21i-105



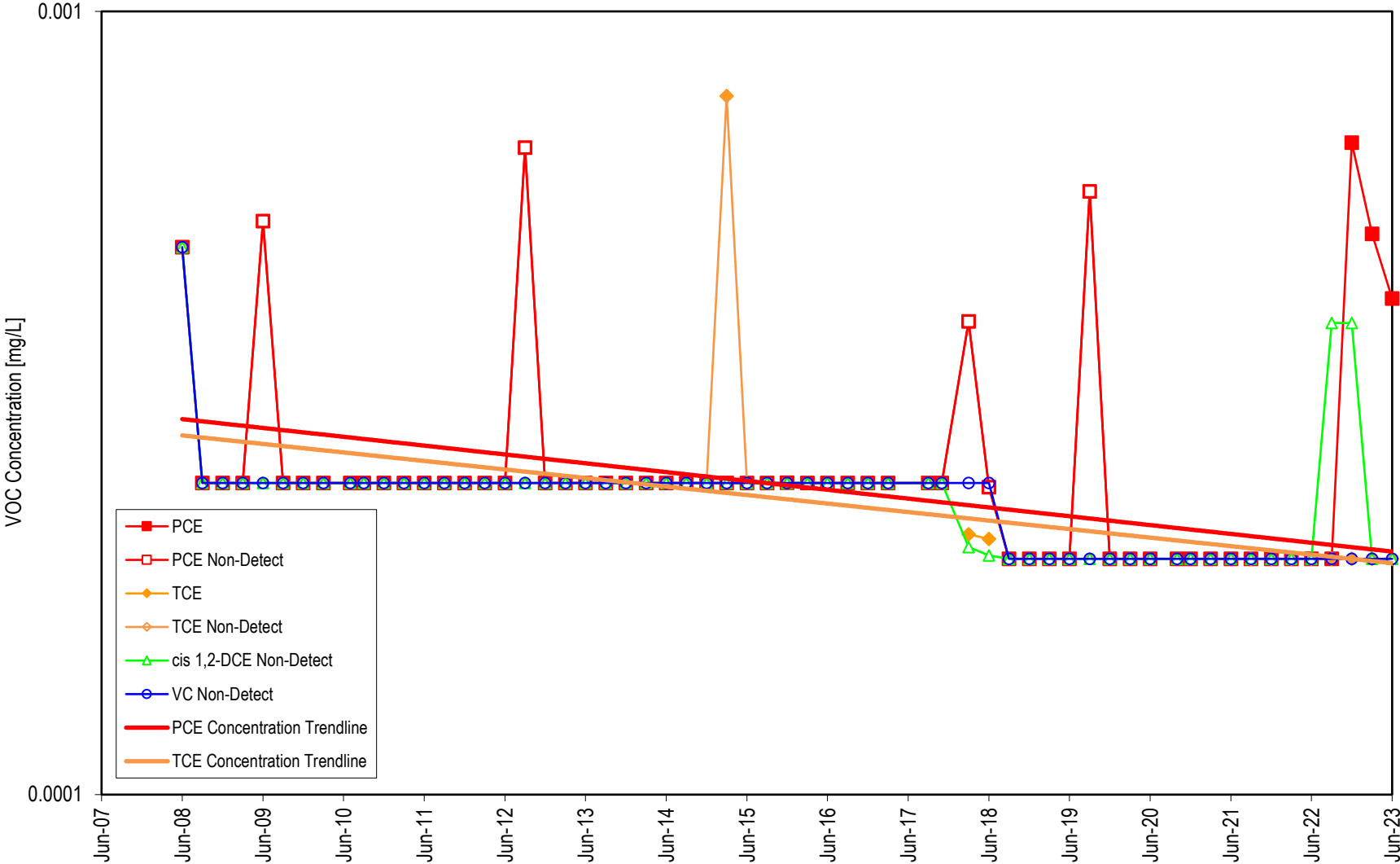
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-22i



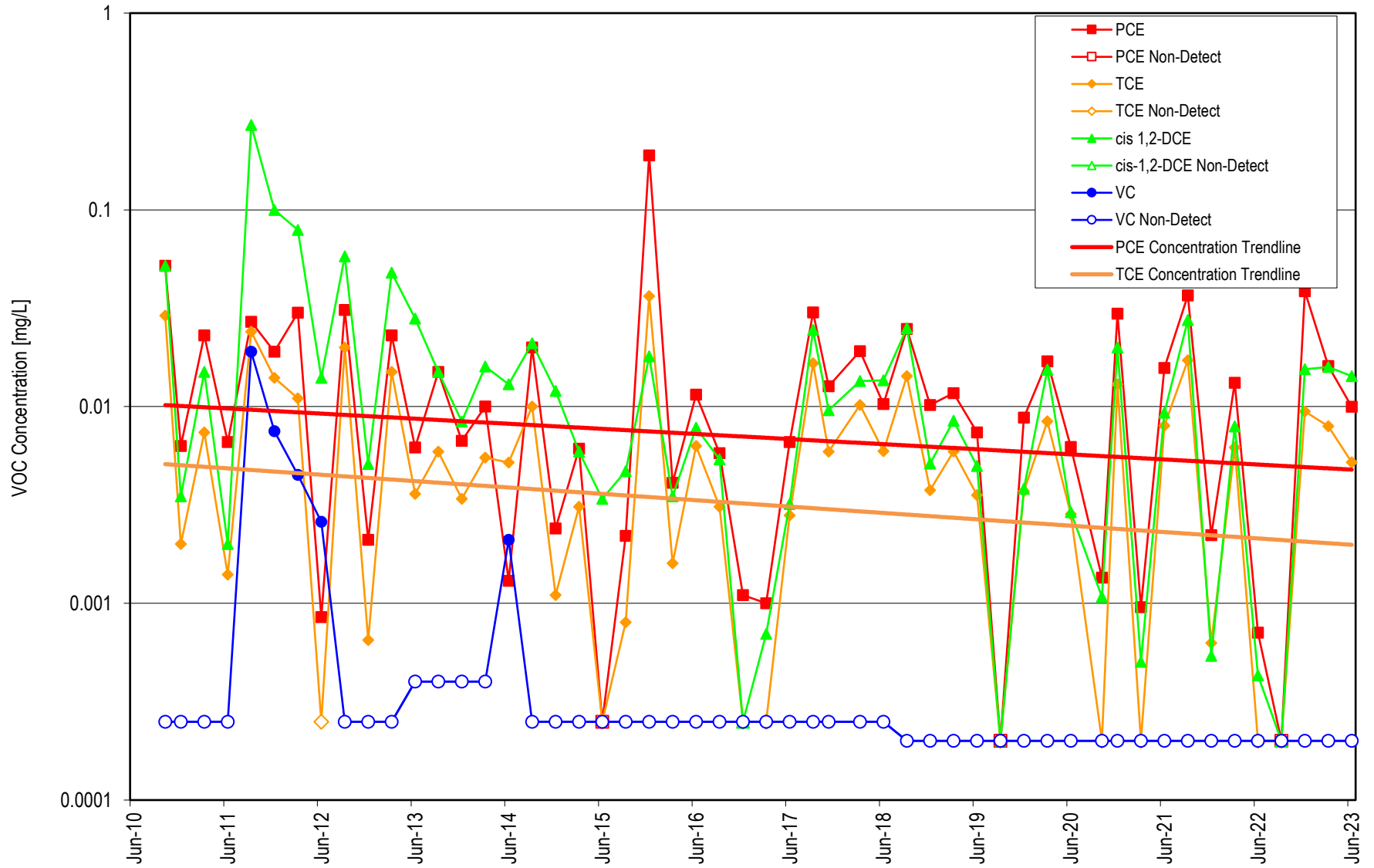
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-23i



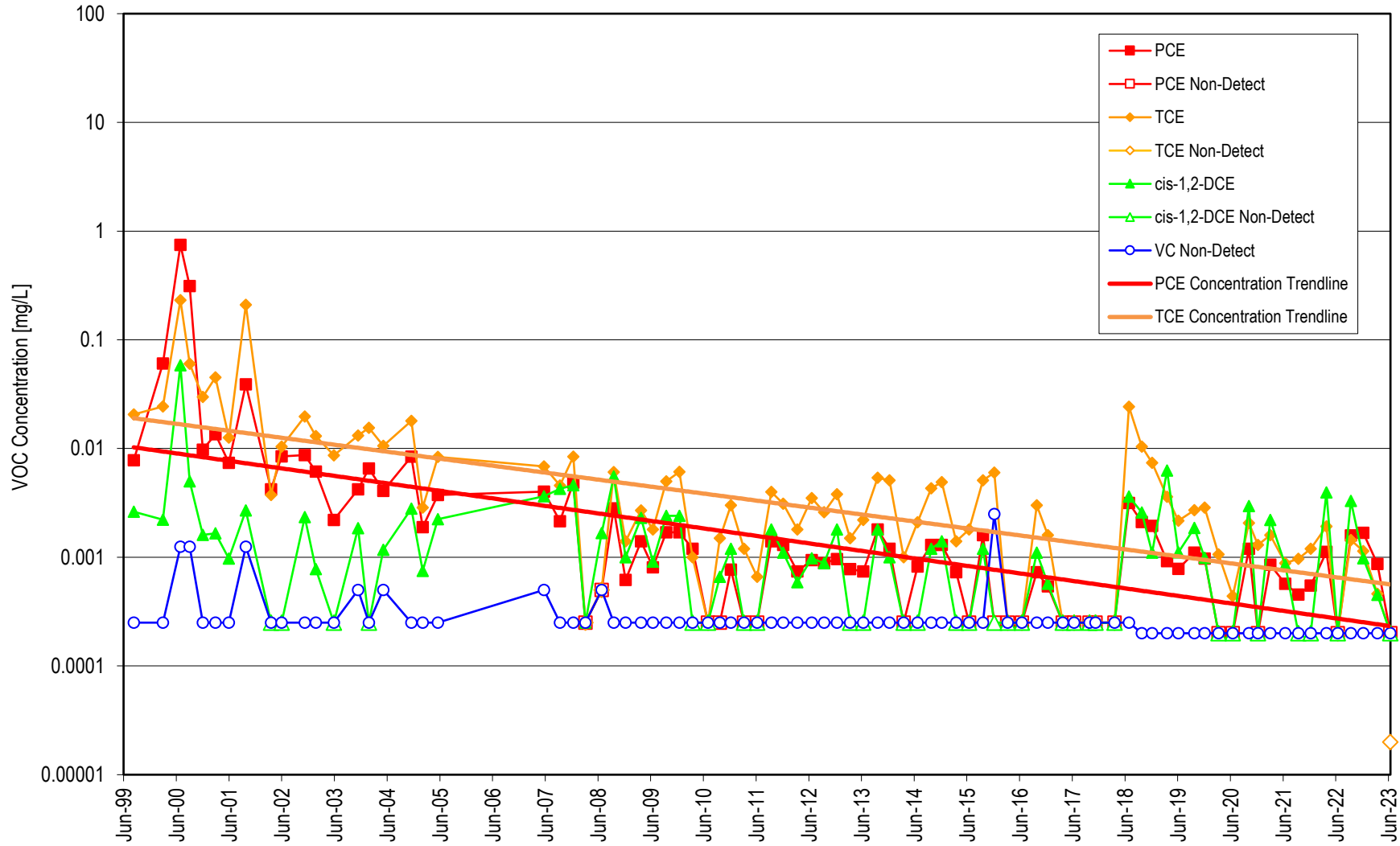
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-24i



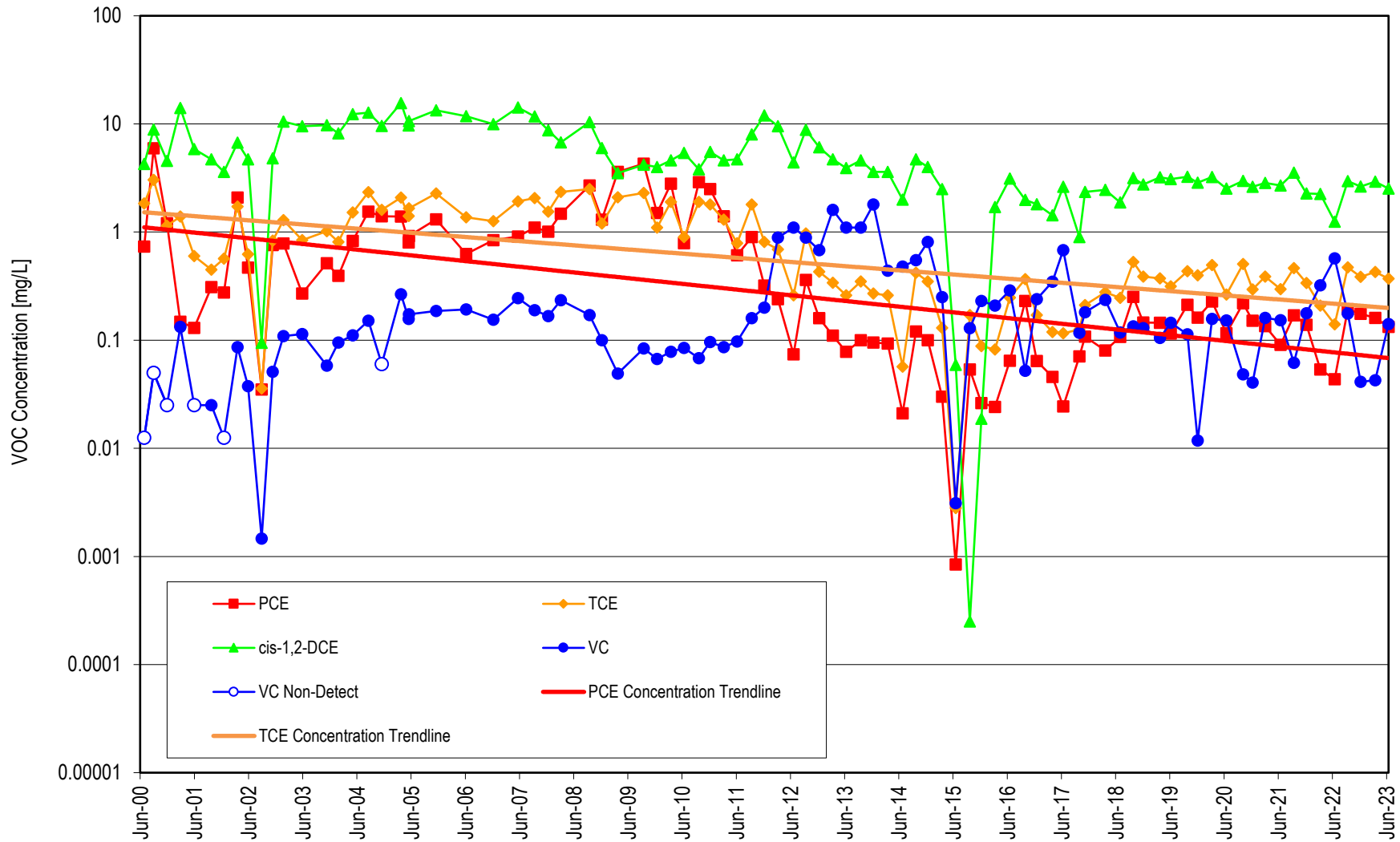
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in S-1



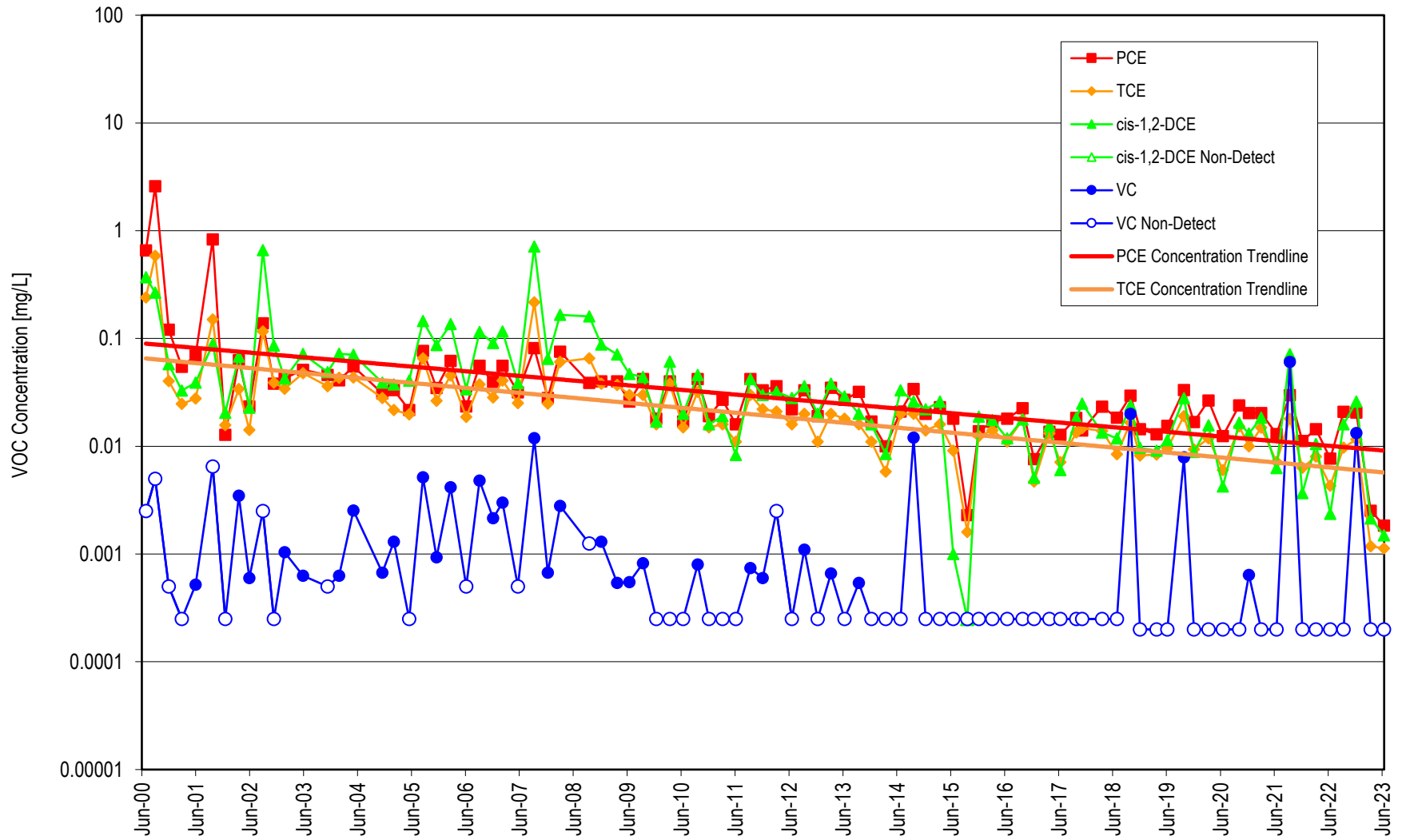
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS1-43



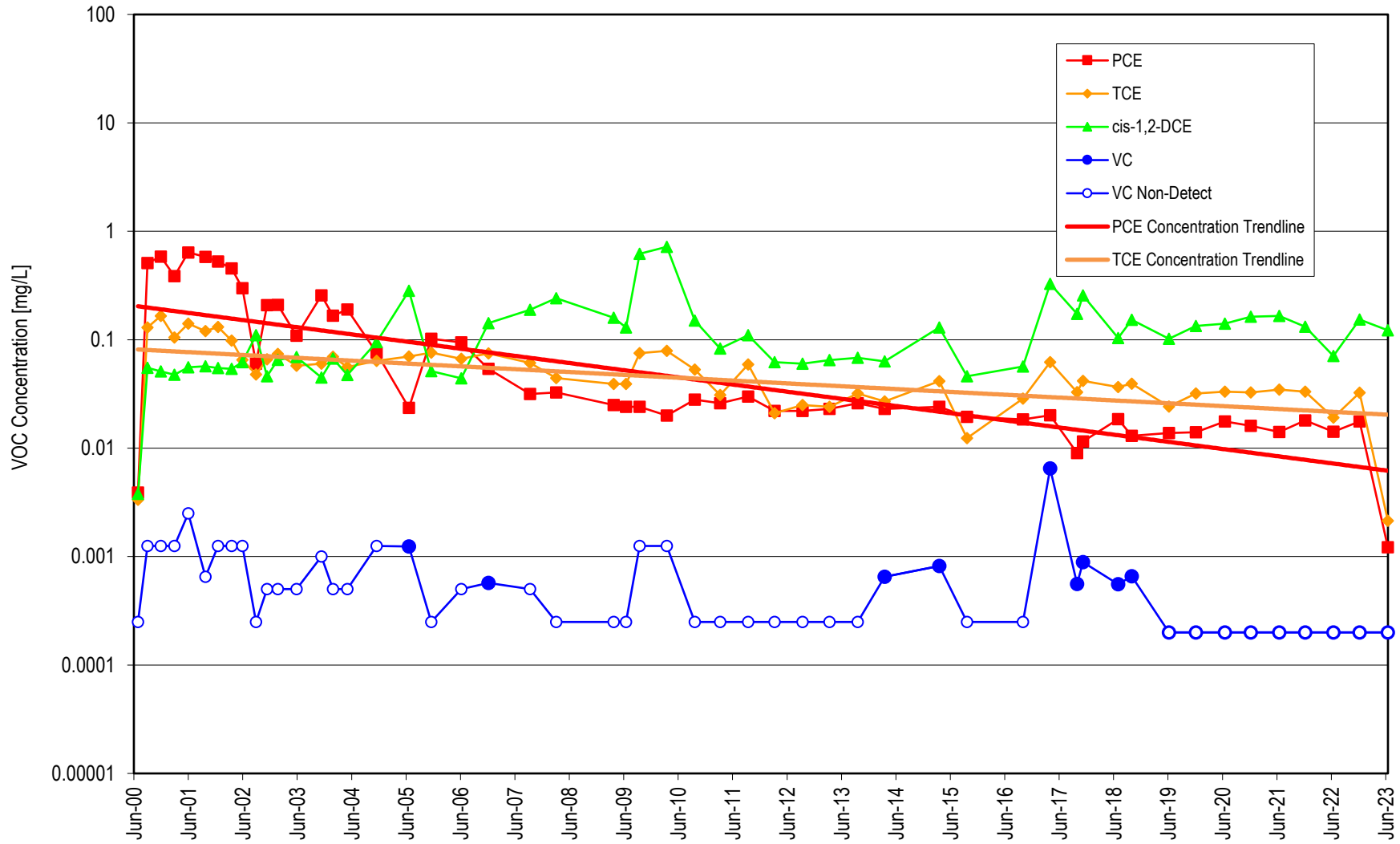
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS1-60



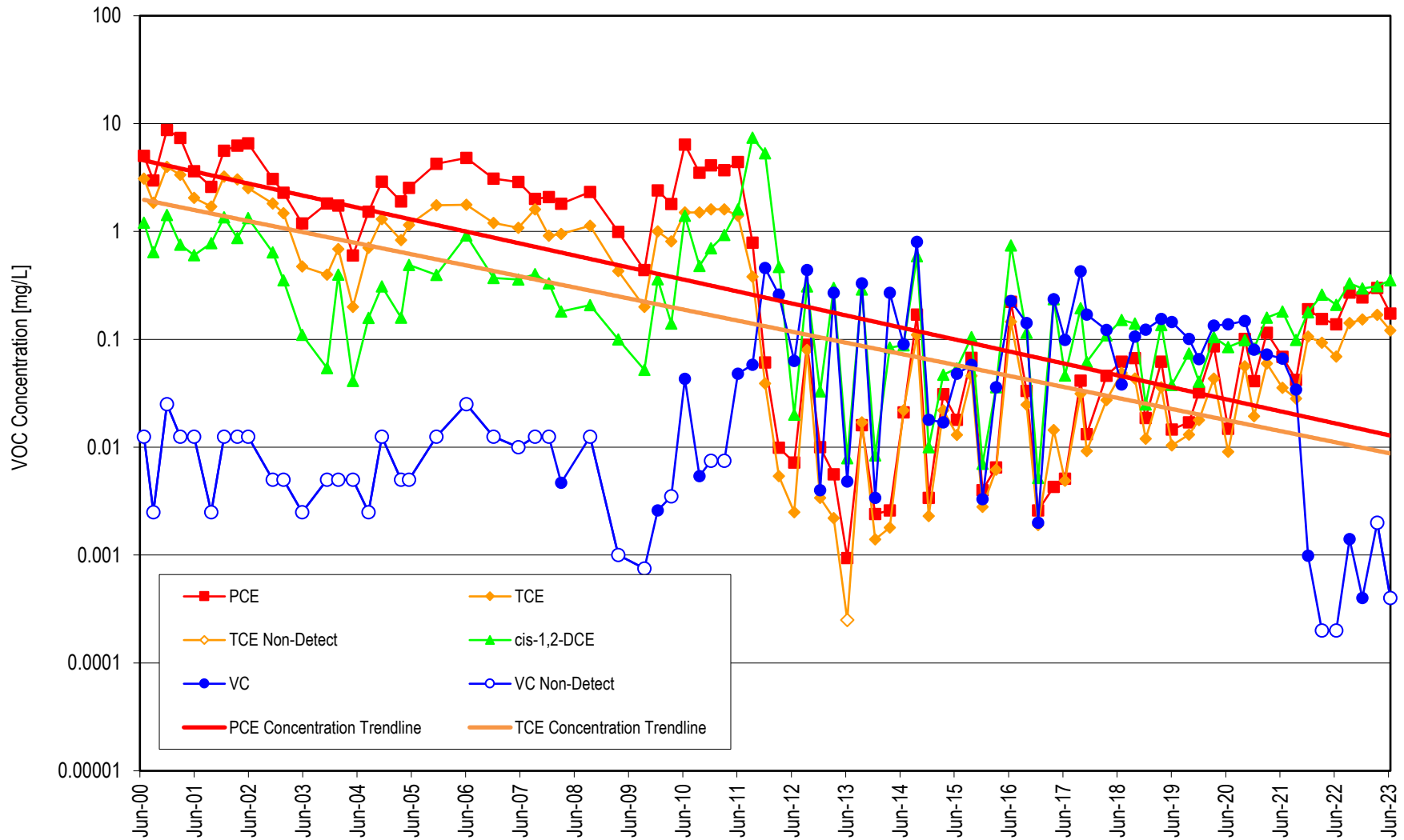
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS1-110



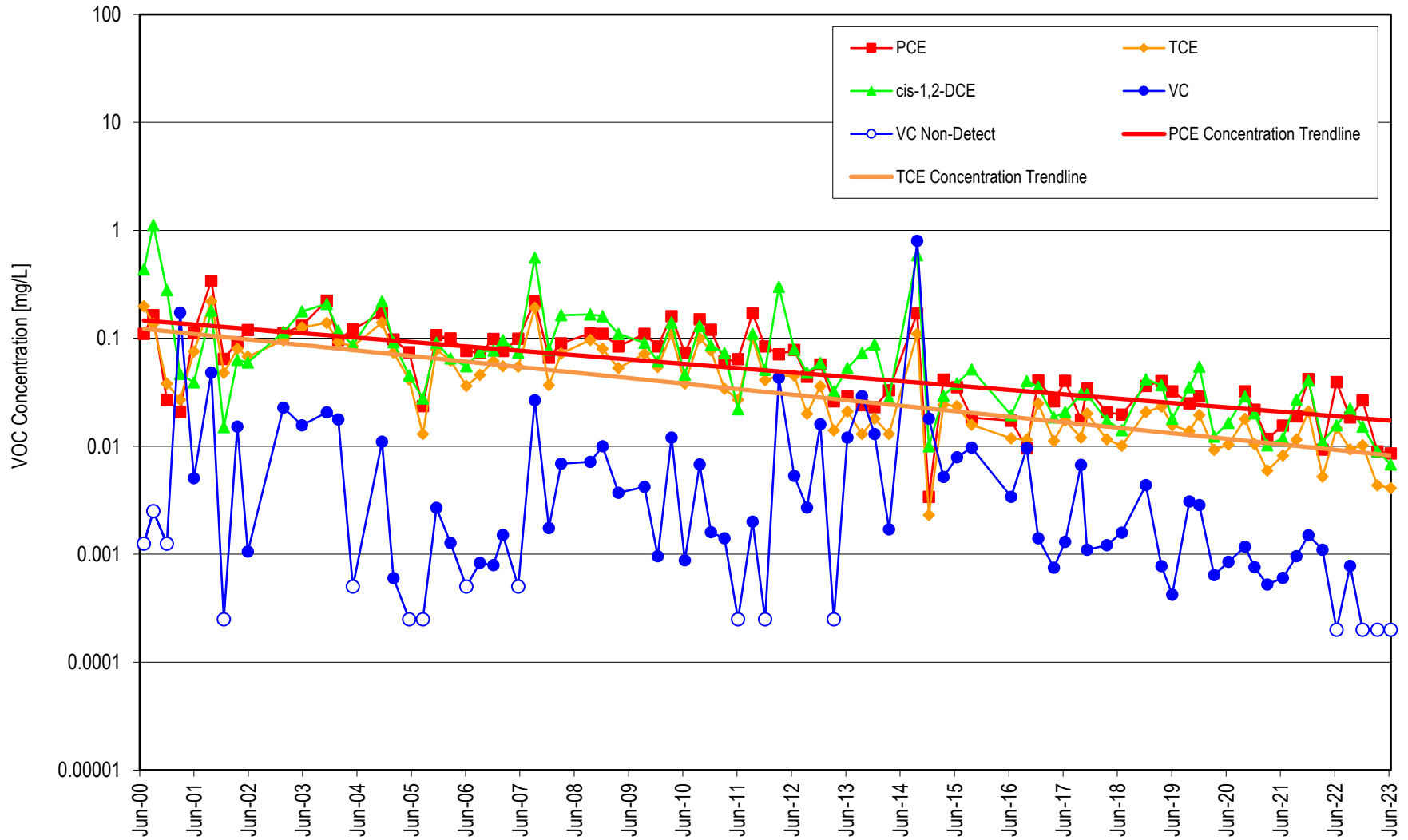
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS2-40



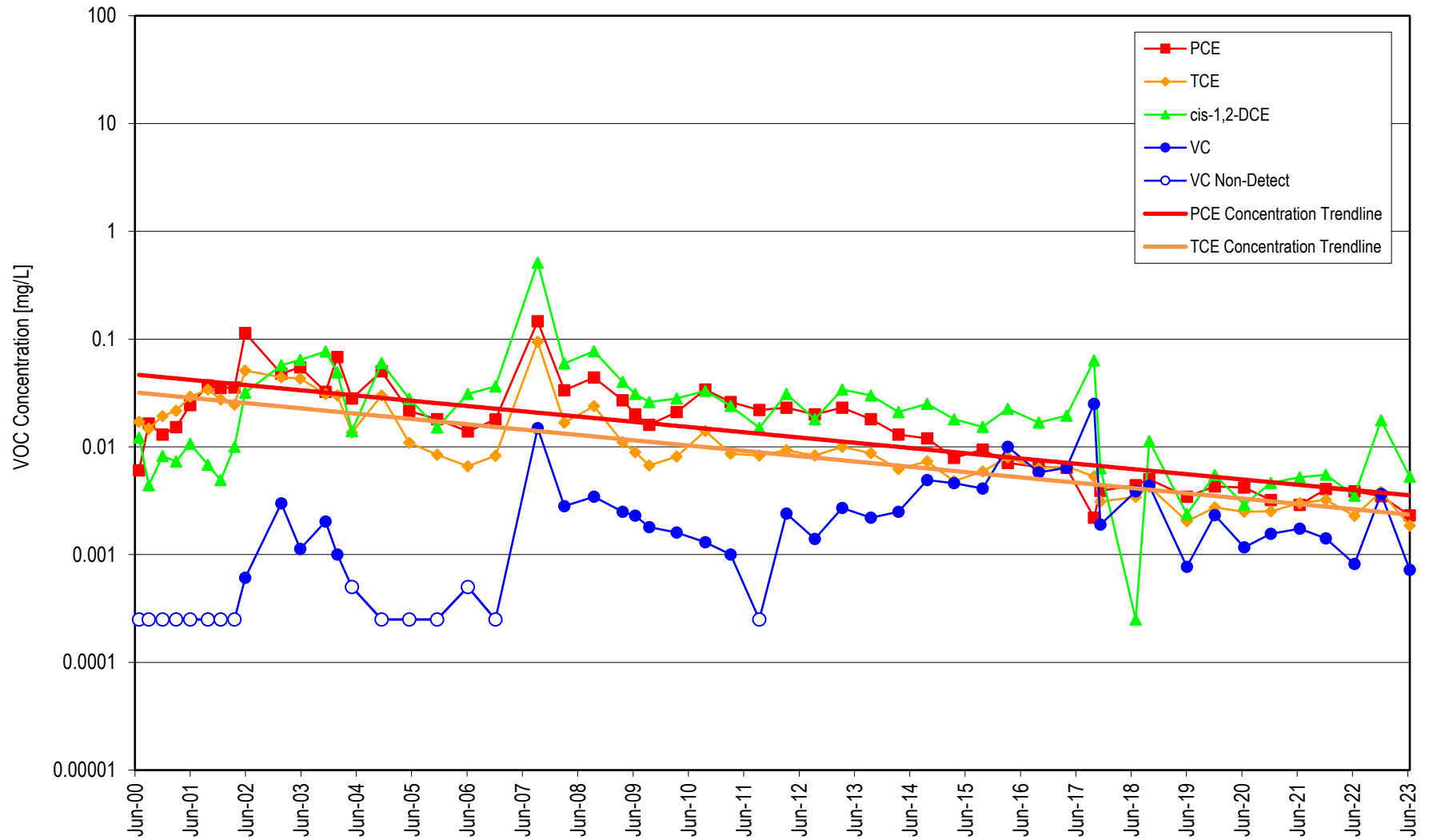
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS2-60



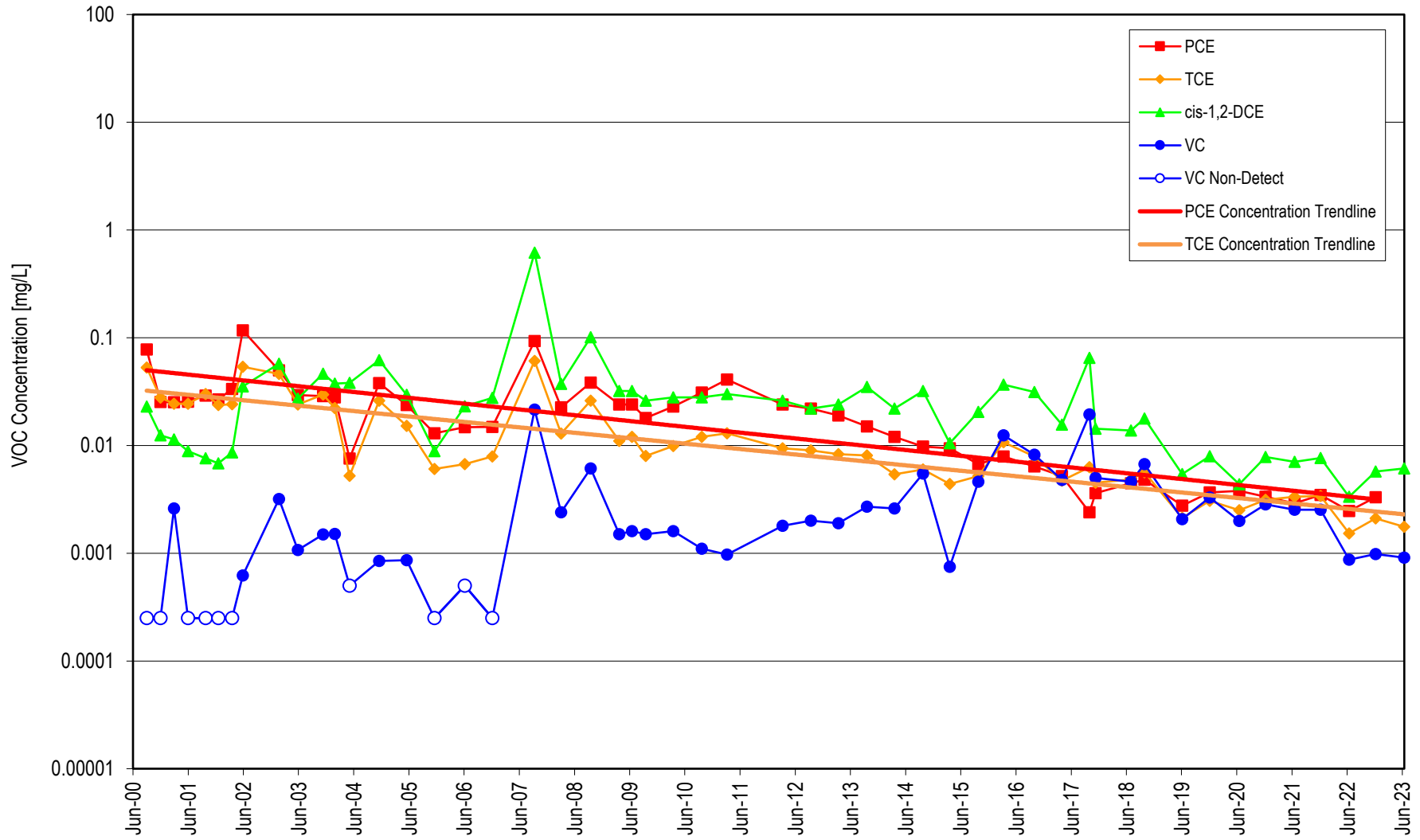
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS2-110



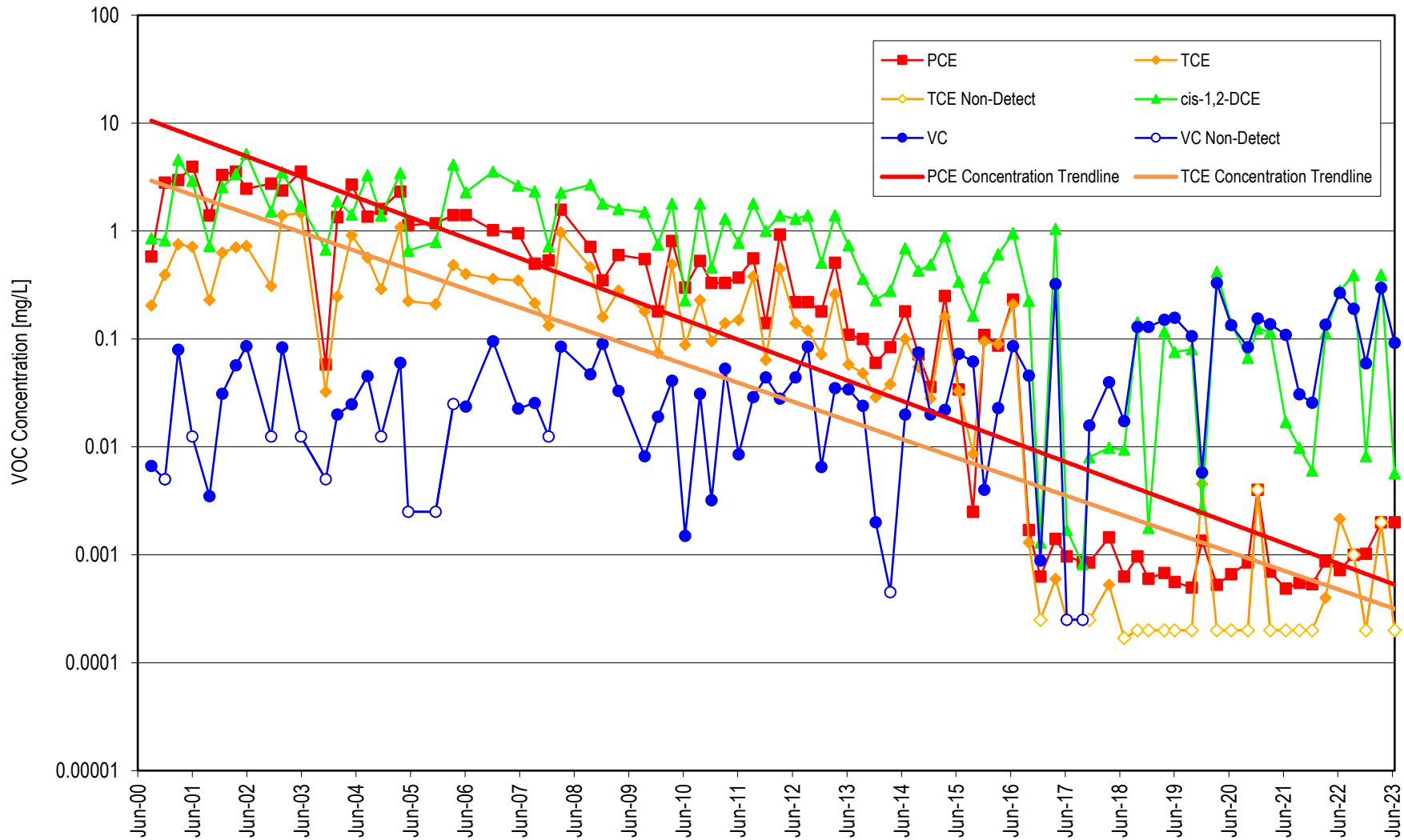
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VOC Concentrations in MGMS2-132



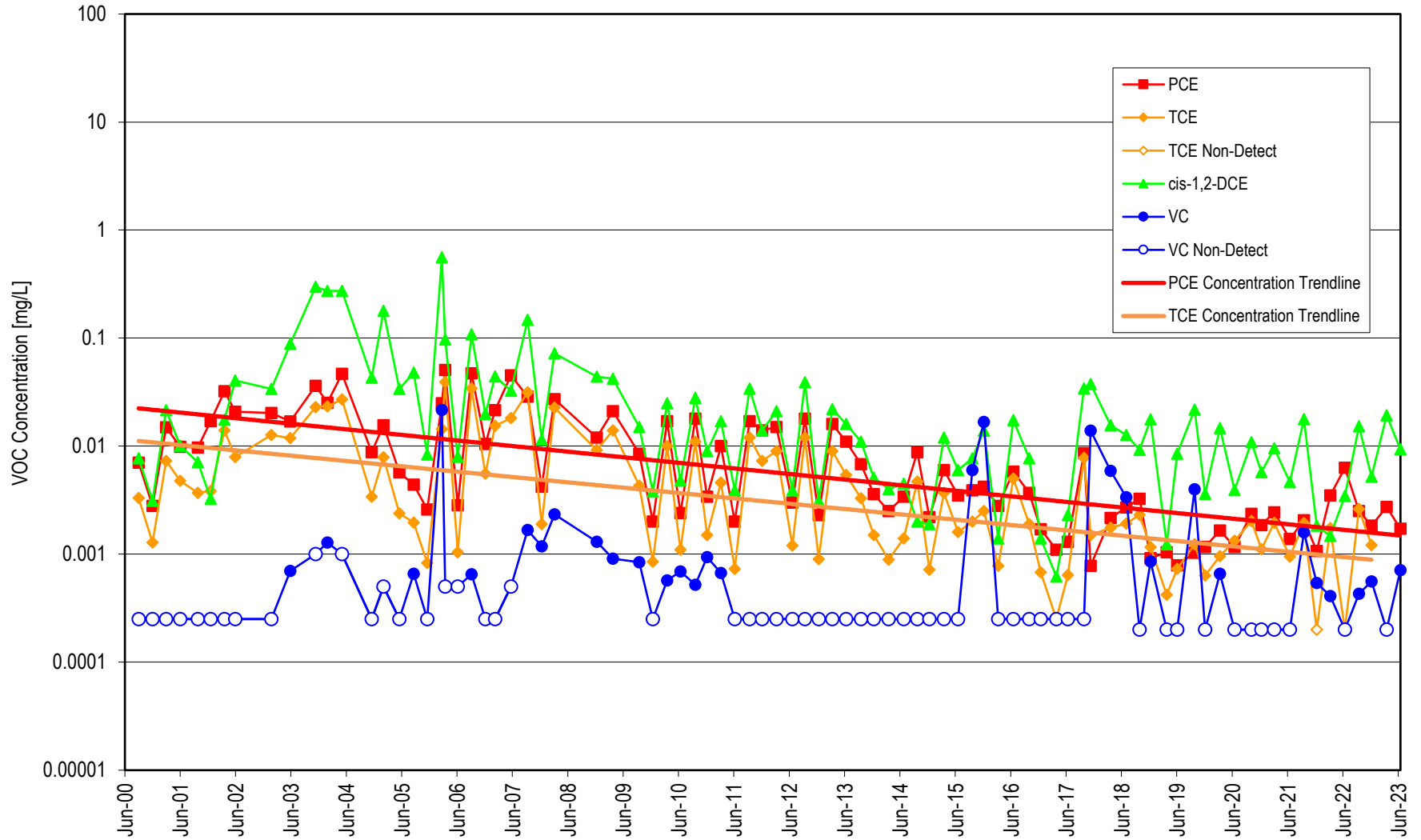
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS3-40



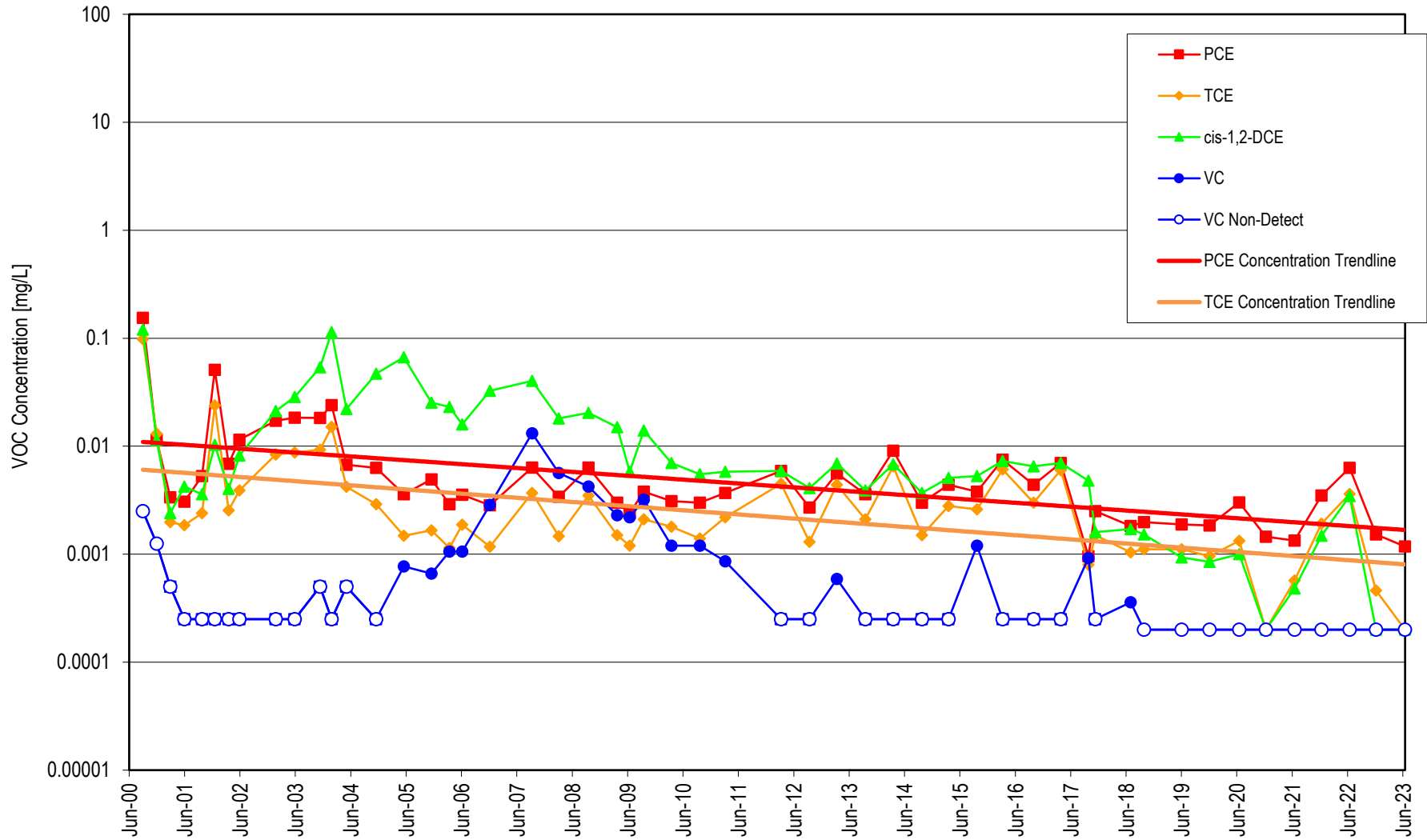
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS3-60



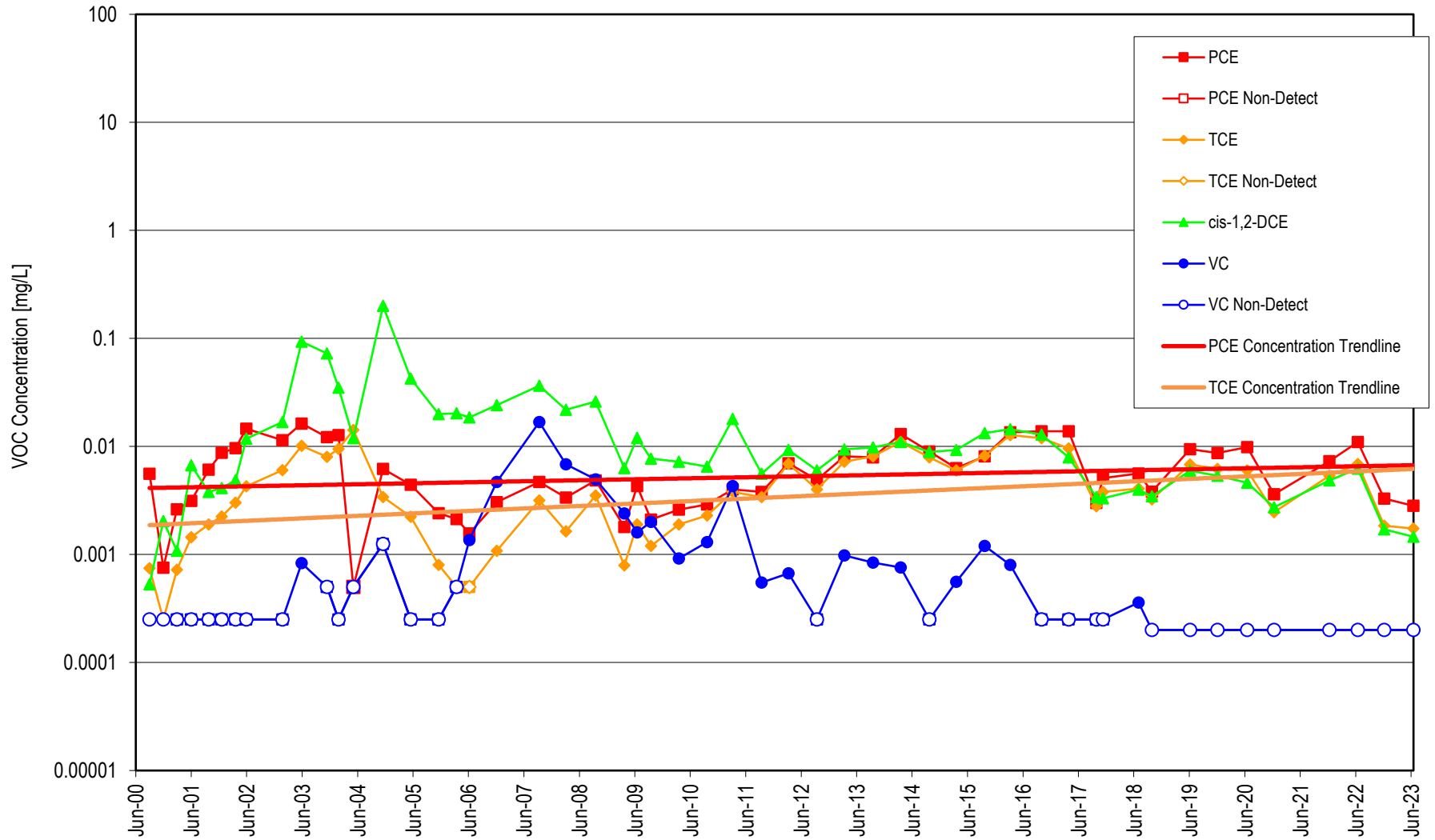
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VOC Concentrations in MGMS3-101



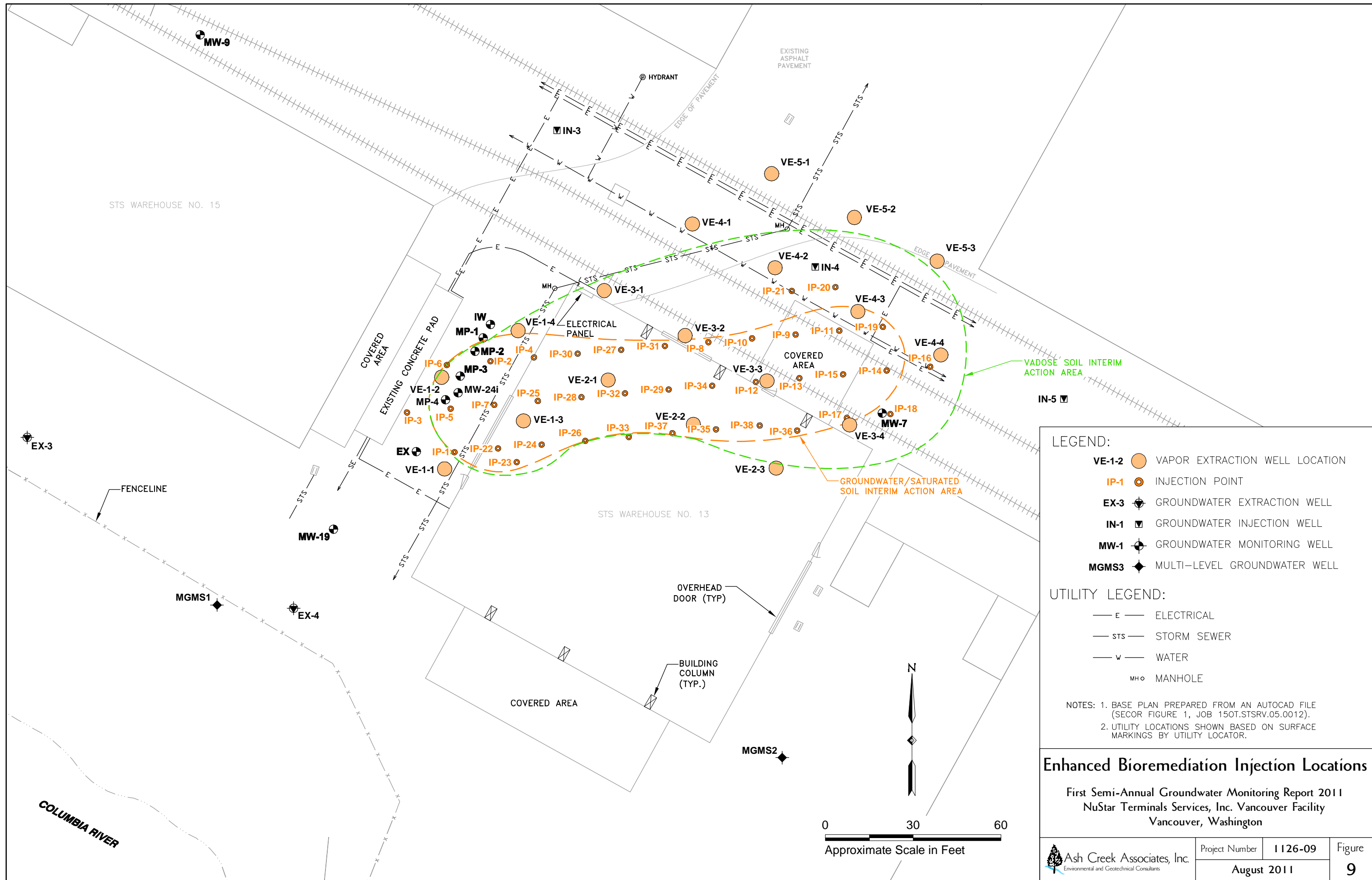
Note: Not detected values plotted at 1/2 the reporting limit.

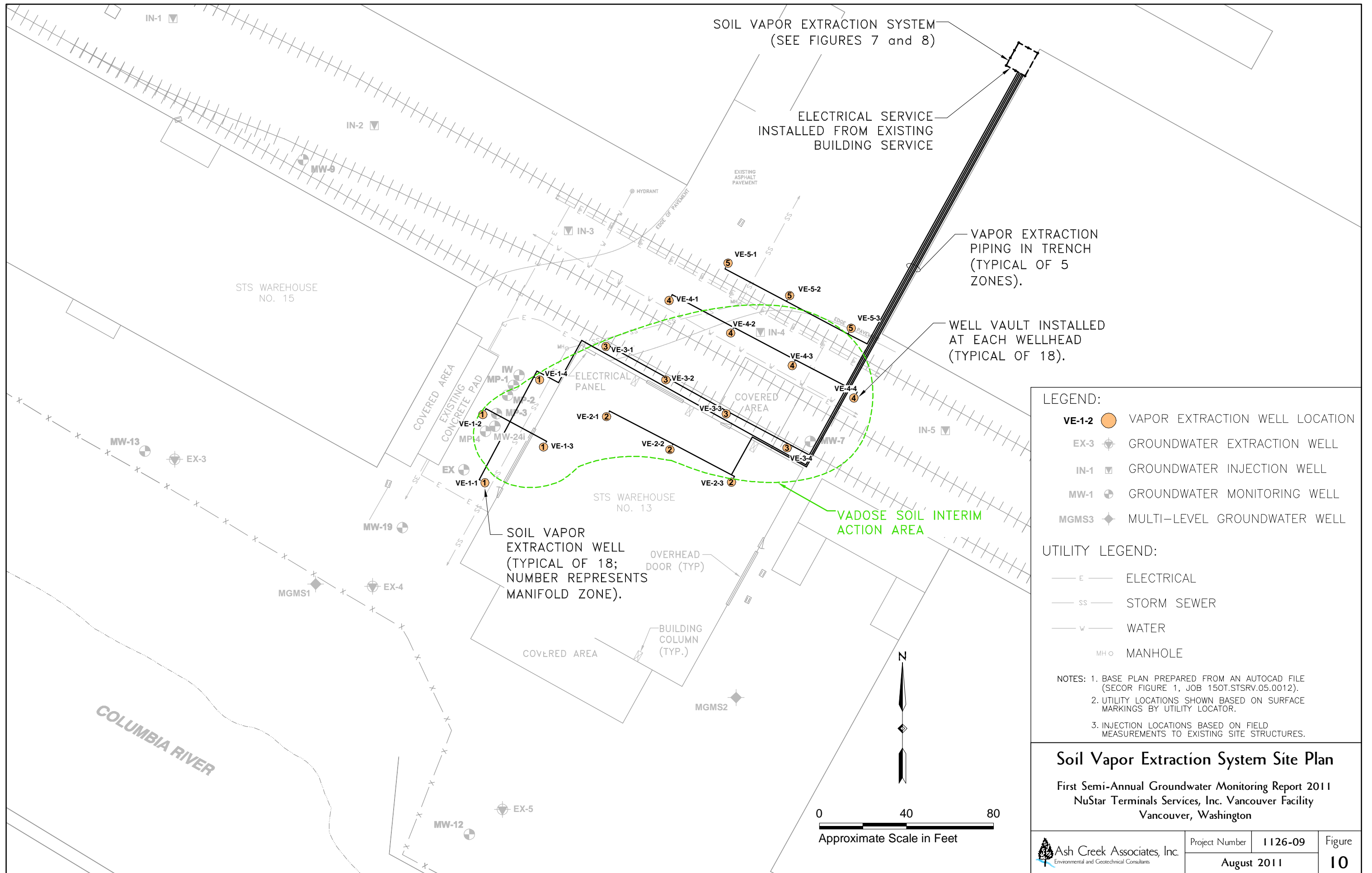
VOC Concentrations in MGMS3-132



Note: Not detected values plotted at 1/2 the reporting limit.

APPENDIX E
2008—SVE and Bioremediation Injection
Layout and Mass Removal Chart





LEGEND:

- VE-1-2** ○ VAPOR EXTRACTION WELL LOCATION
- EX-3** ⊕ GROUNDWATER EXTRACTION WELL
- IN-1** ▽ GROUNDWATER INJECTION WELL
- MW-1** ⊕ GROUNDWATER MONITORING WELL
- MGMS3** ◆ MULTI-LEVEL GROUNDWATER WELL

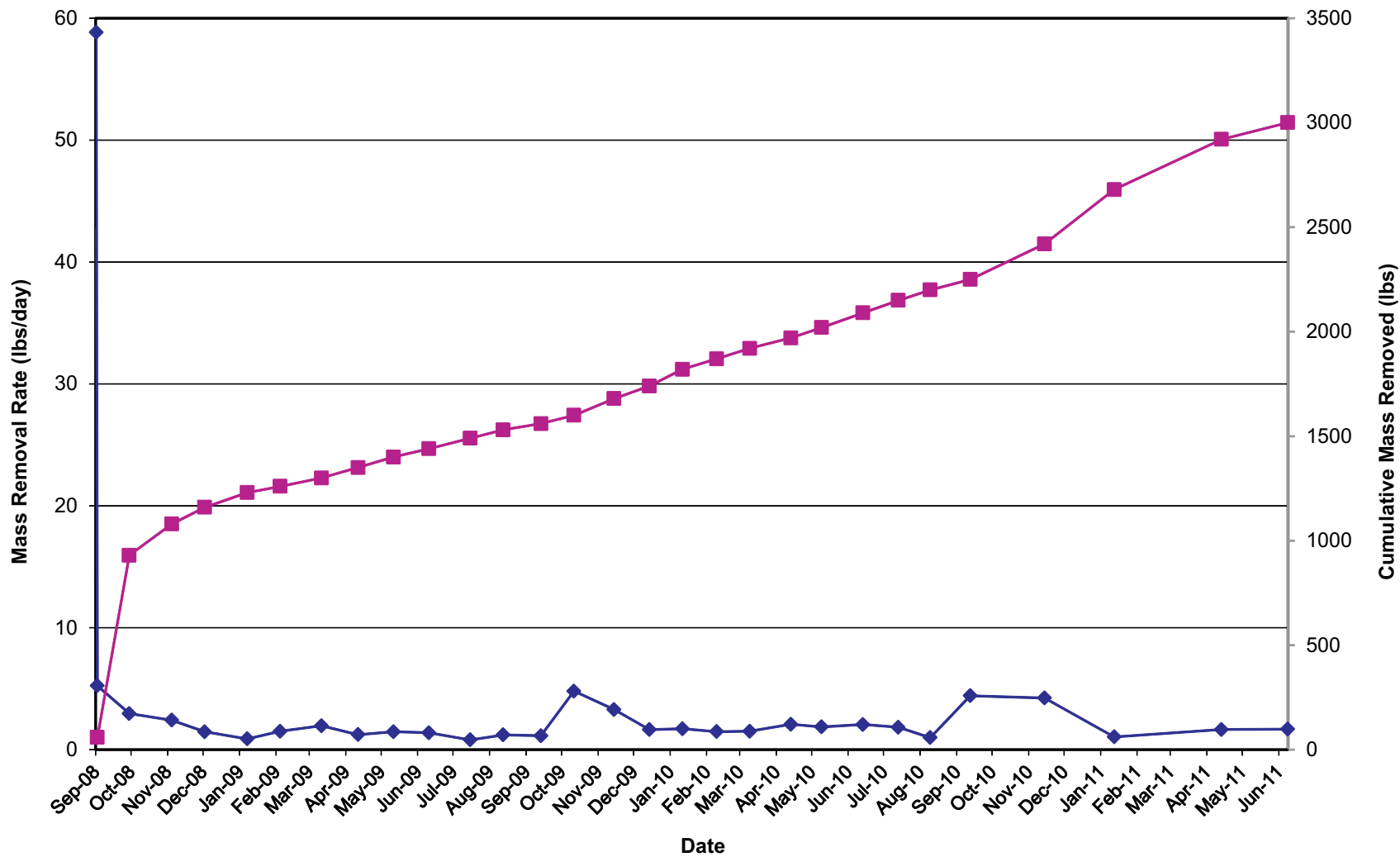
UTILITY LEGEND:

- E — ELECTRICAL
- SS — STORM SEWER
- W — WATER
- MH ○ MANHOLE

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.
3. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.

Soil Vapor Extraction System Site Plan
 First Semi-Annual Groundwater Monitoring Report 2011
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington



Legend:

- ◆ Removal Rate (lbs/day)
- Cumulative Mass Removal

2008 SVE System - VOC Mass Removal

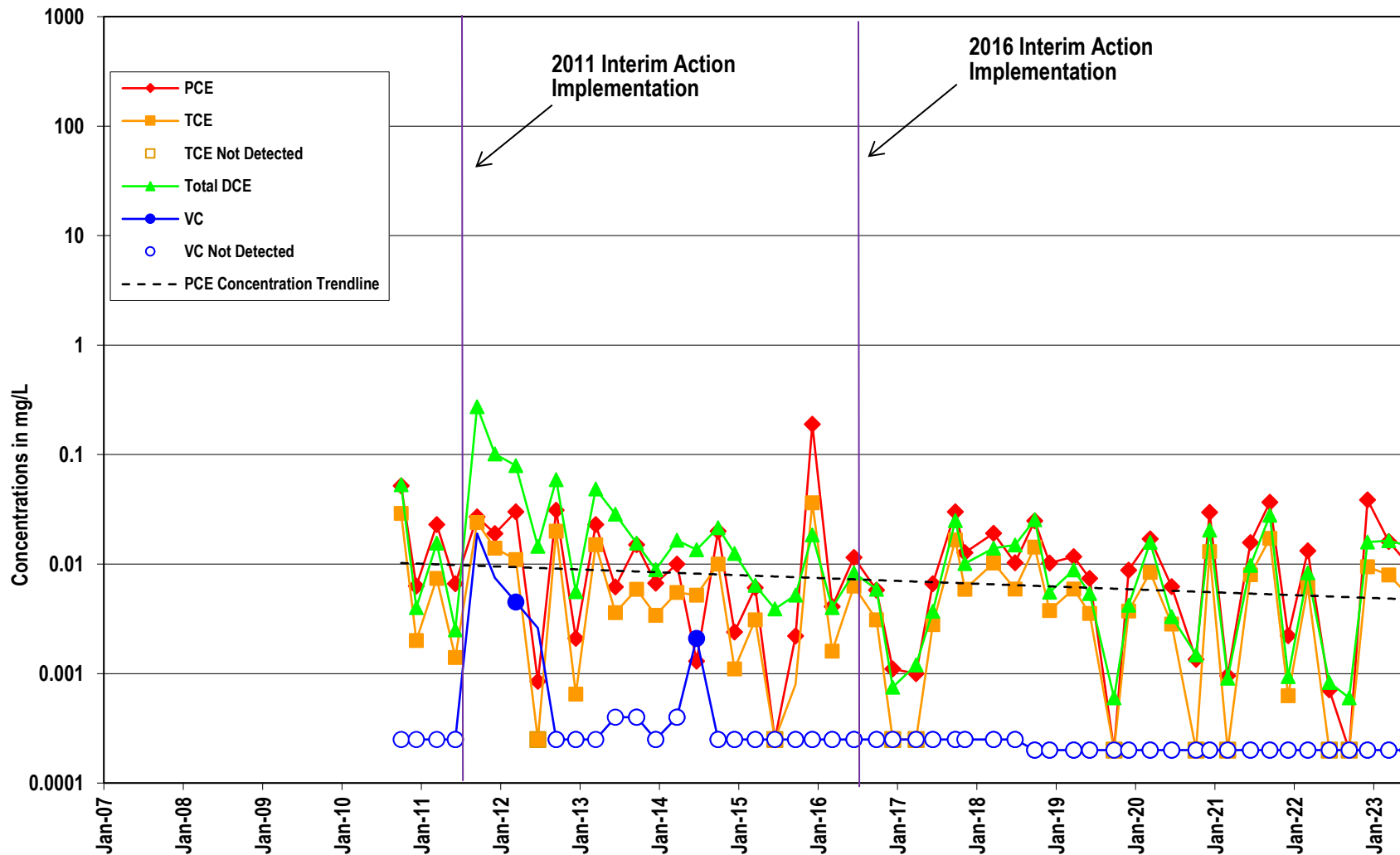
Second Semi-Annual Groundwater Monitoring Report 2011
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington



Project Number	1126-09	Figure 11
January 2012		

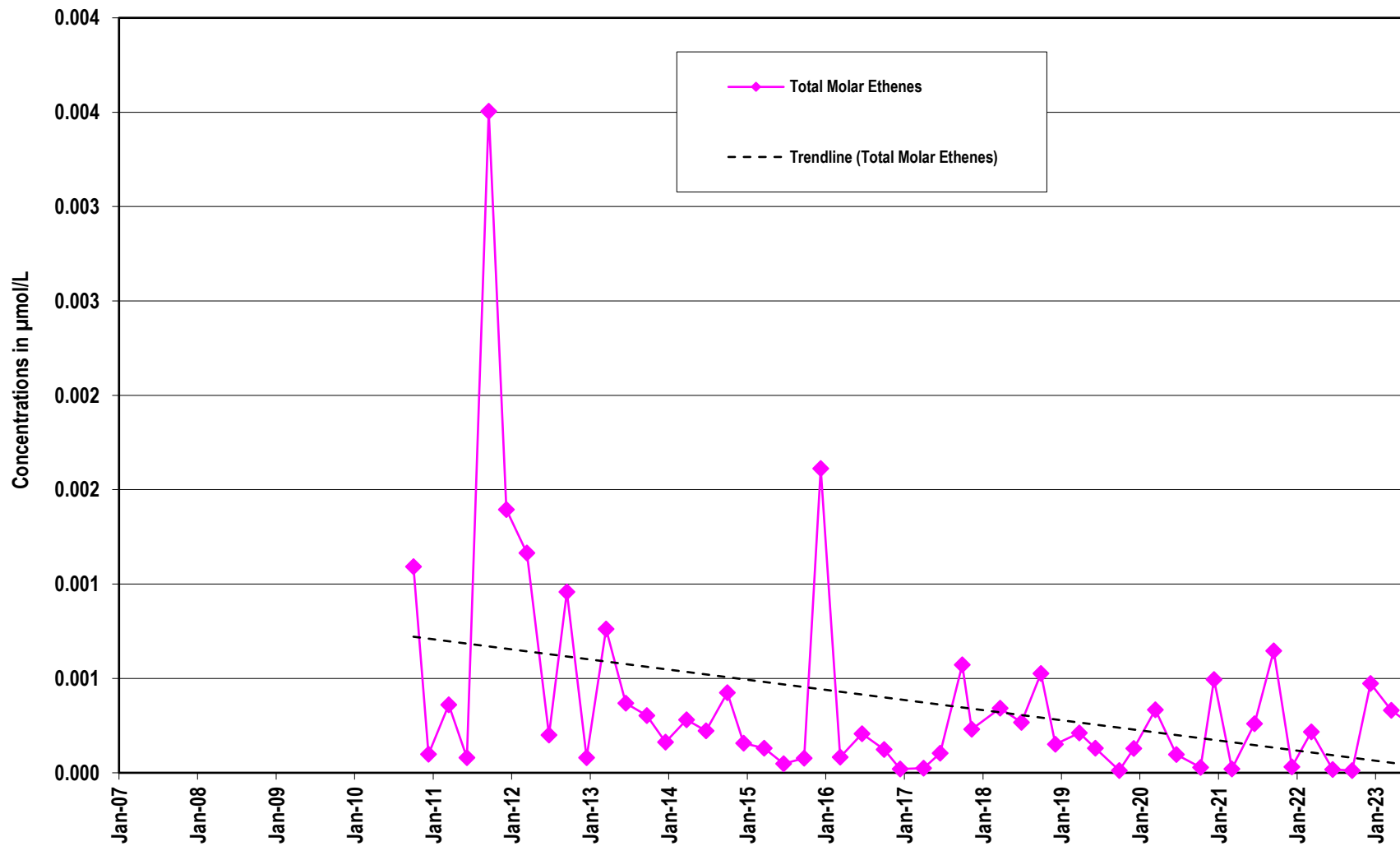
APPENDIX F
Molar Concentration Trend Plots—Interim Action Wells

Interim Action Area - VOC Trends: MW-24i

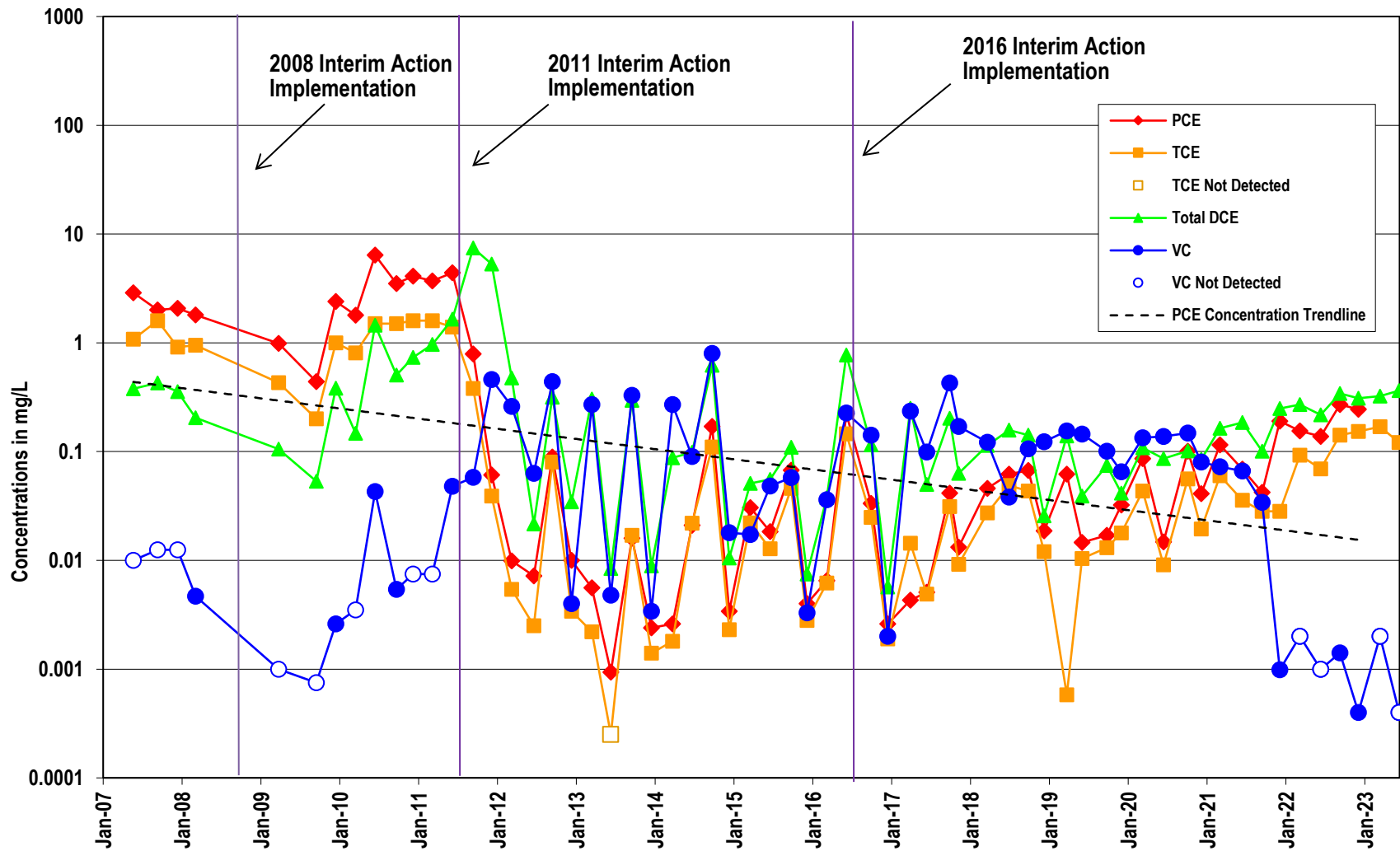


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MW-24i

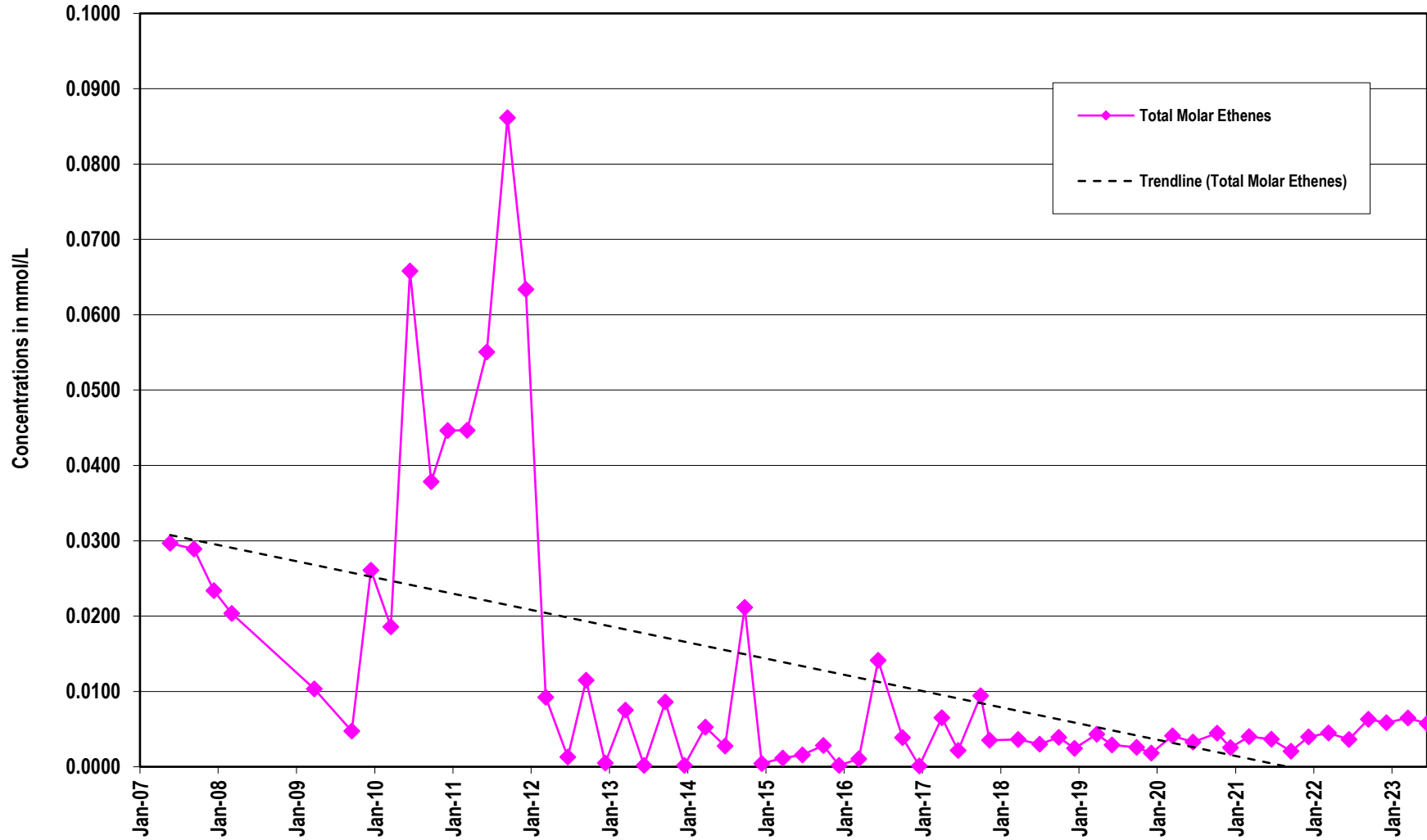


Interim Action Area - VOC Trends: MGMTS2-40

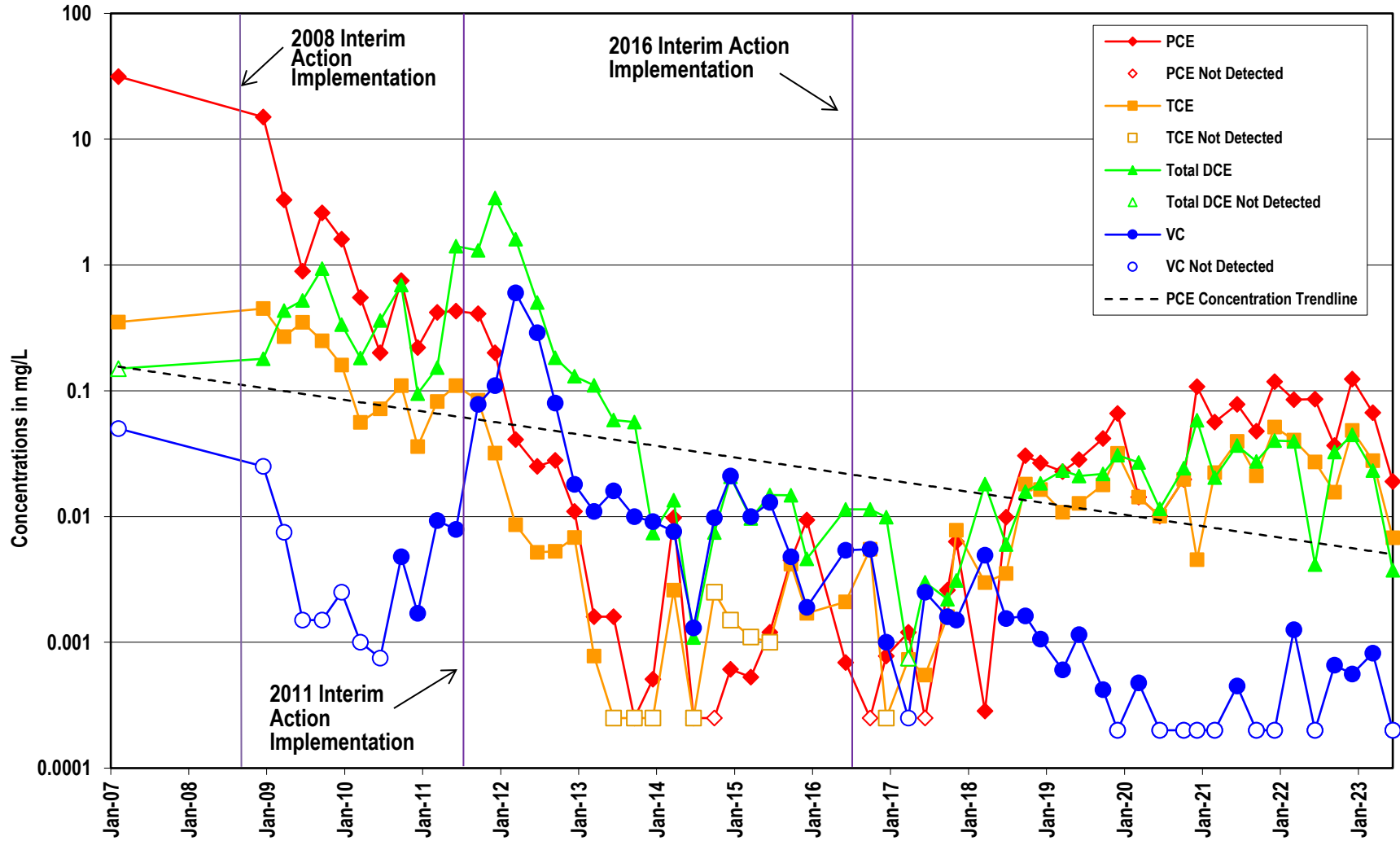


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MGMS2-40

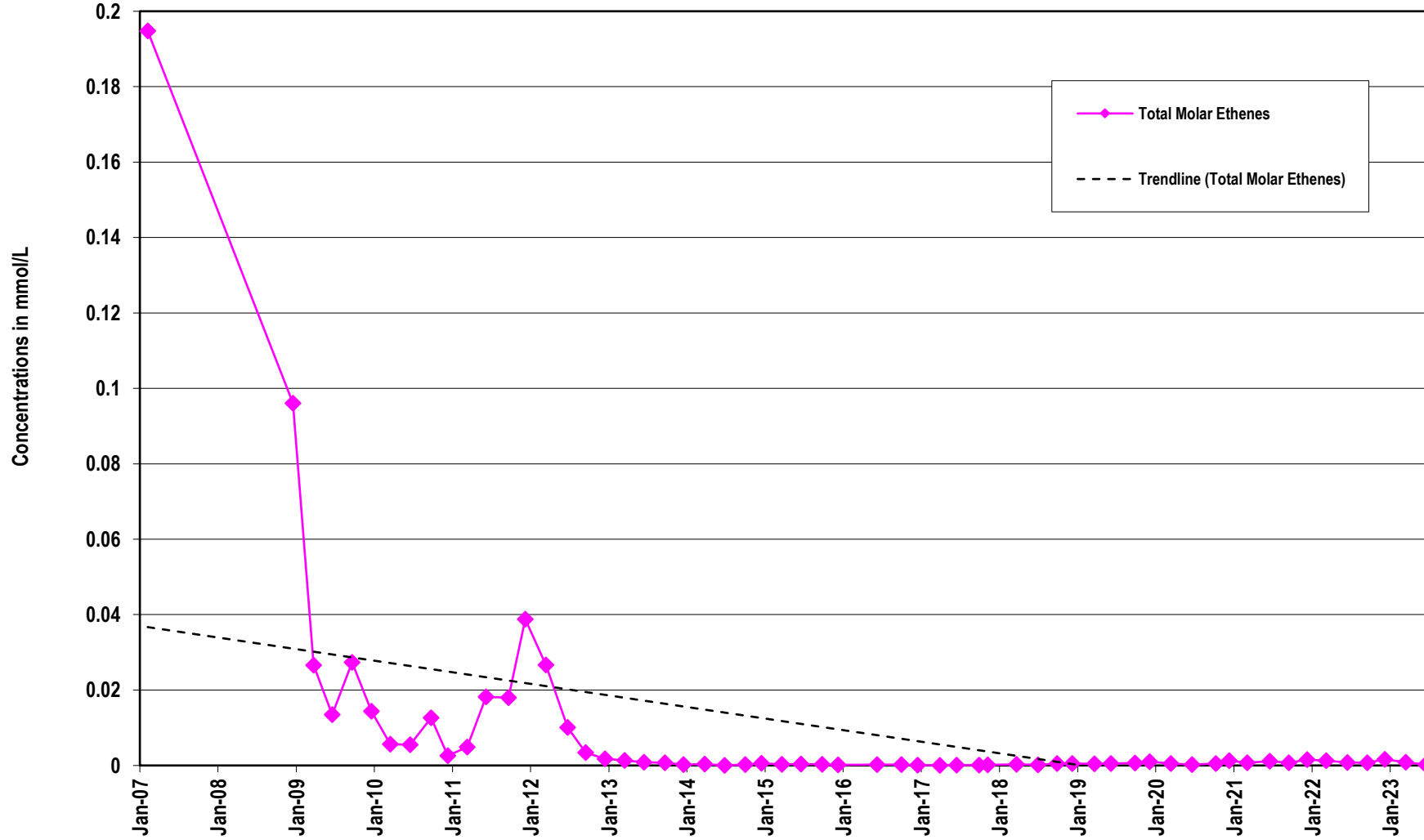


Interim Action Area - VOC Trends: MW-7

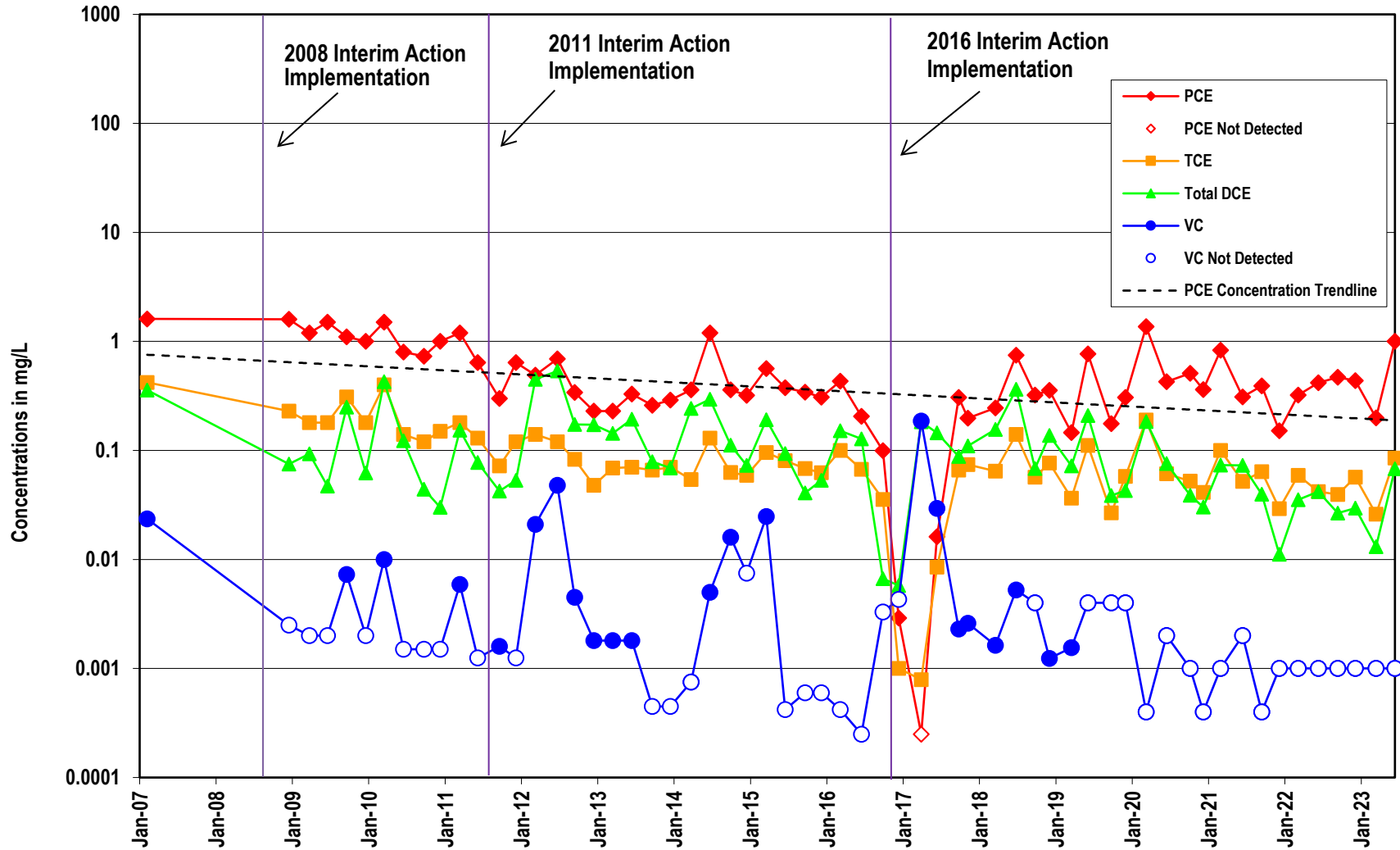


Notes: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MW-7

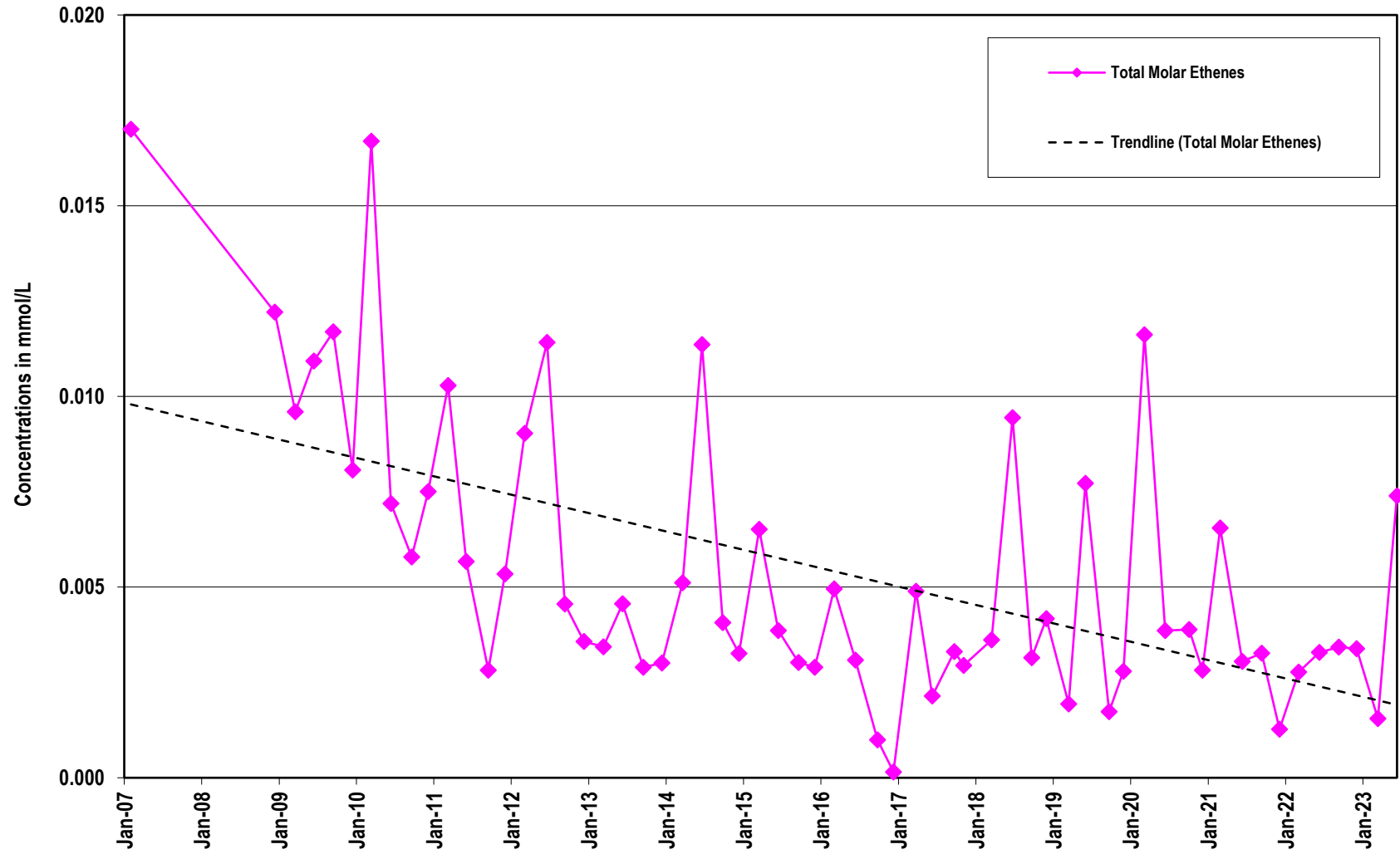


Interim Action Area - VOC Trends: MP-1

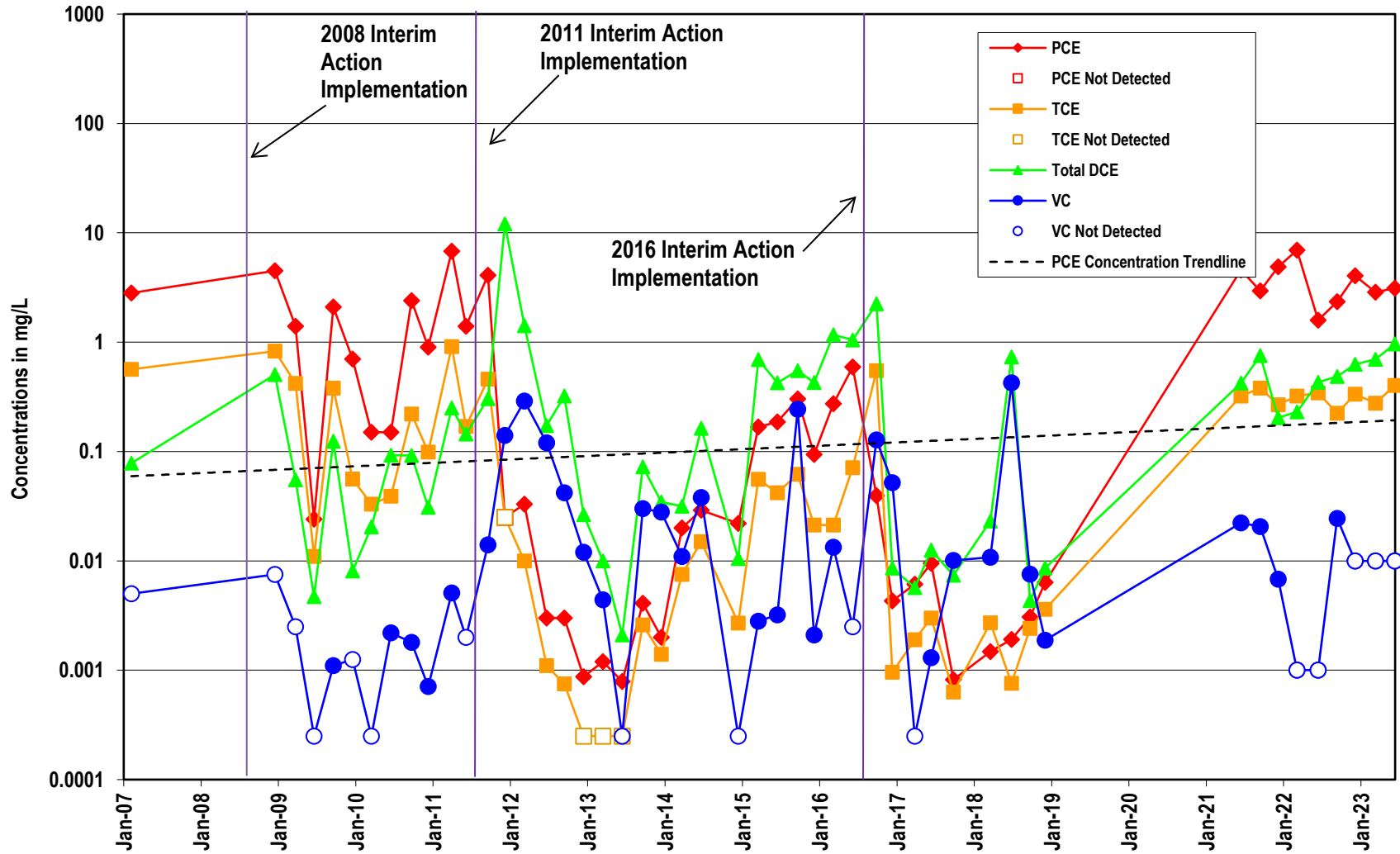


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MP-1

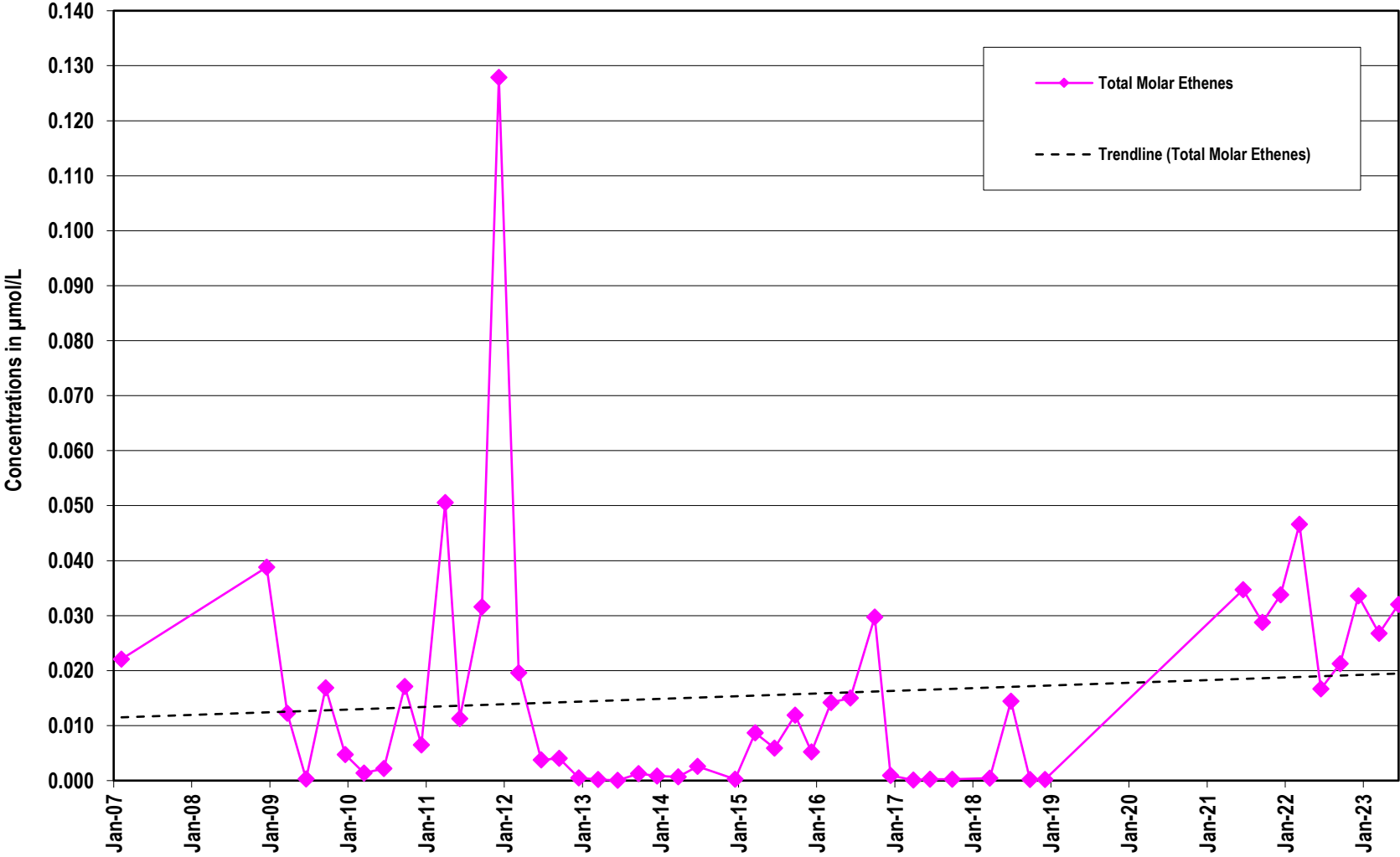


Interim Action Area - VOC Trends: EX

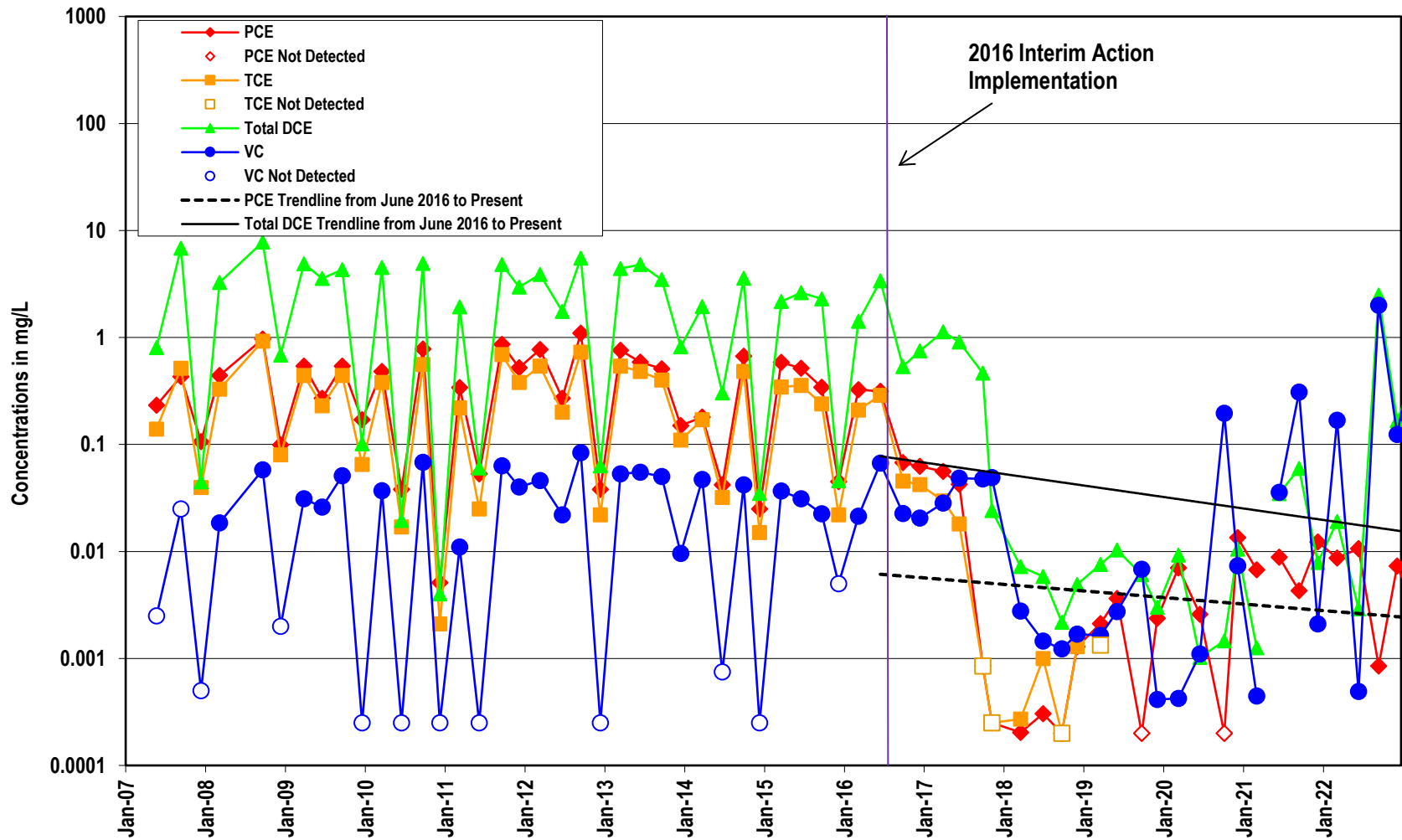


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in EX

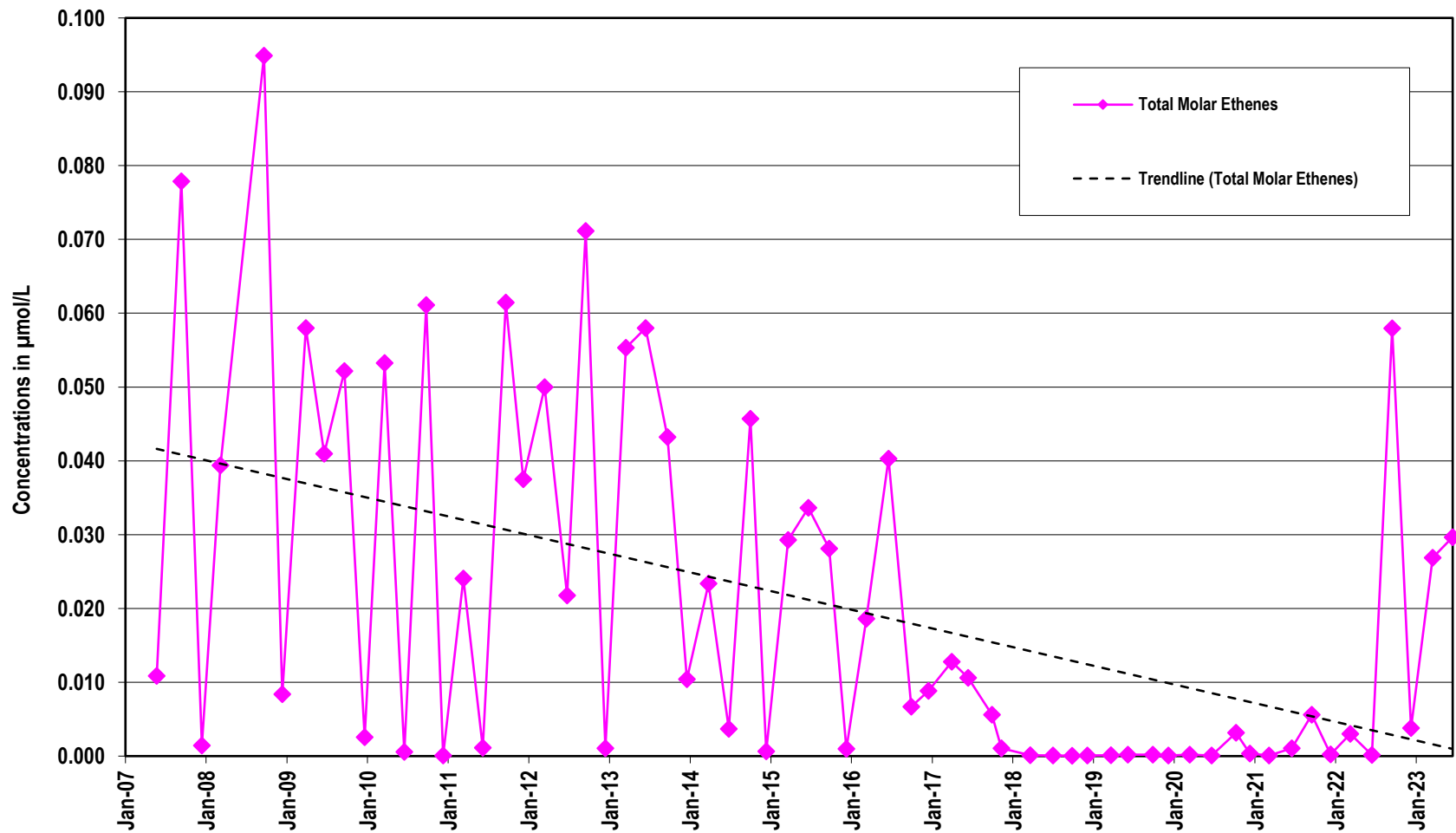


Interim Action Area - VOC Trends: MW-12

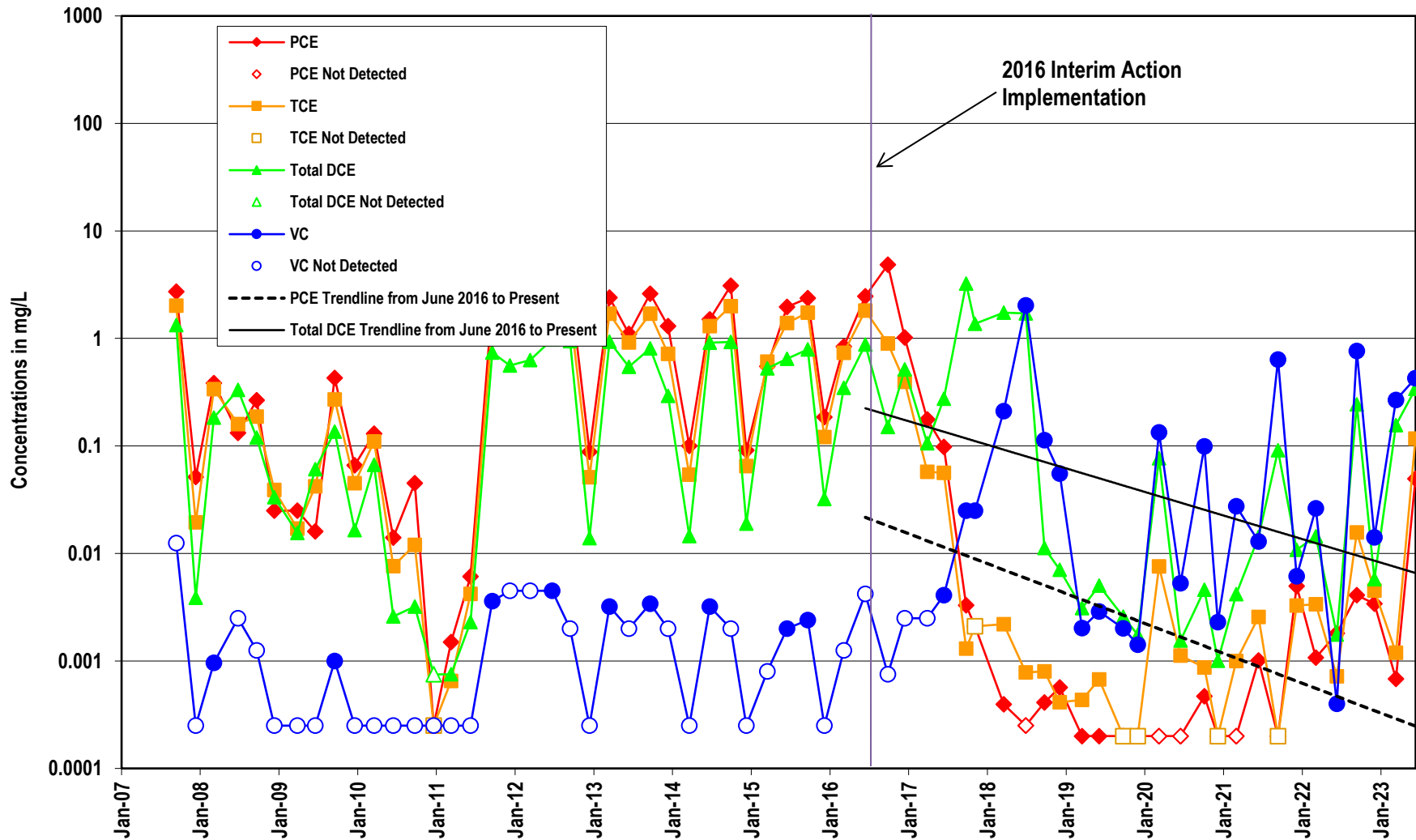


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MW-12

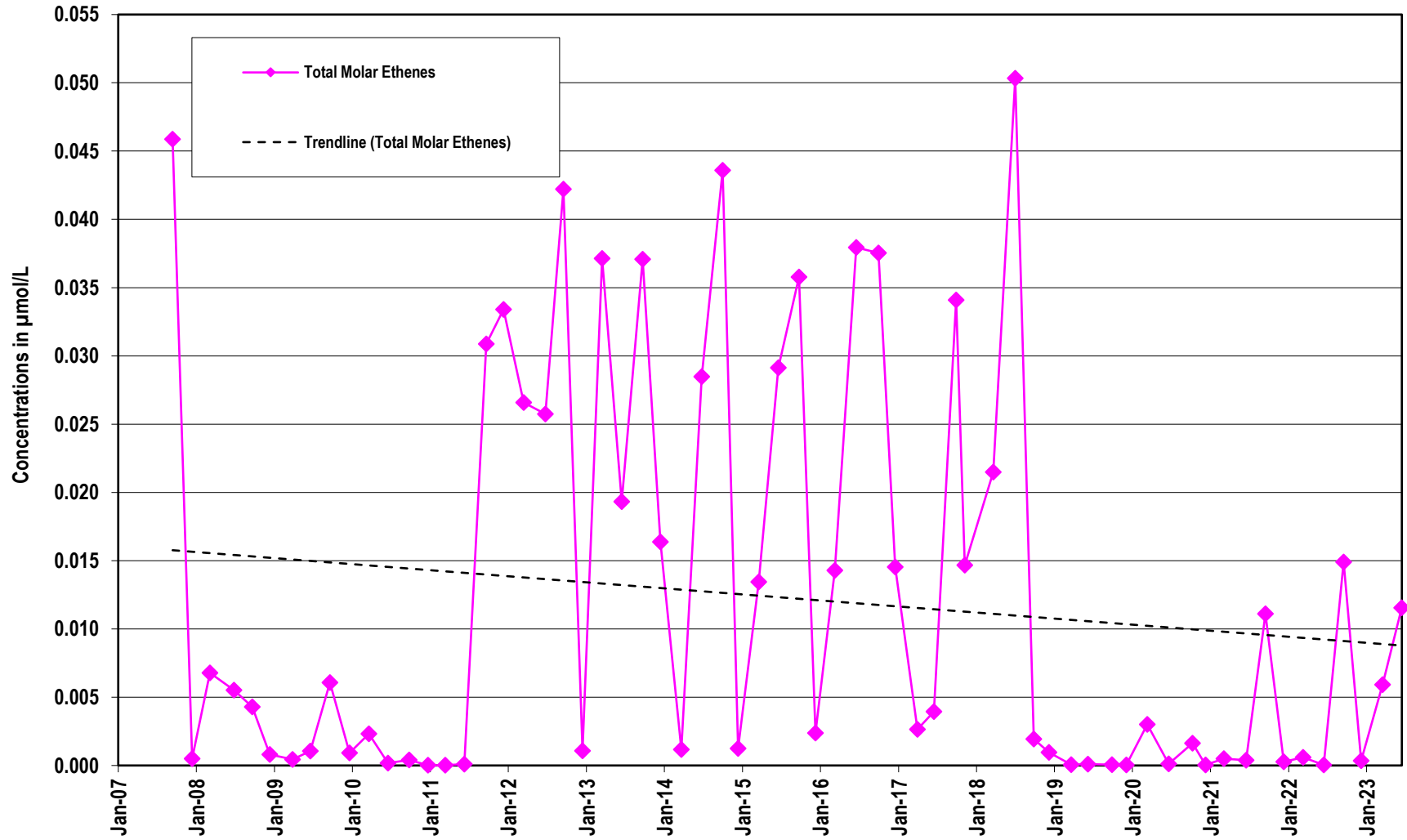


Interim Action Area - VOC Trends: MW-13

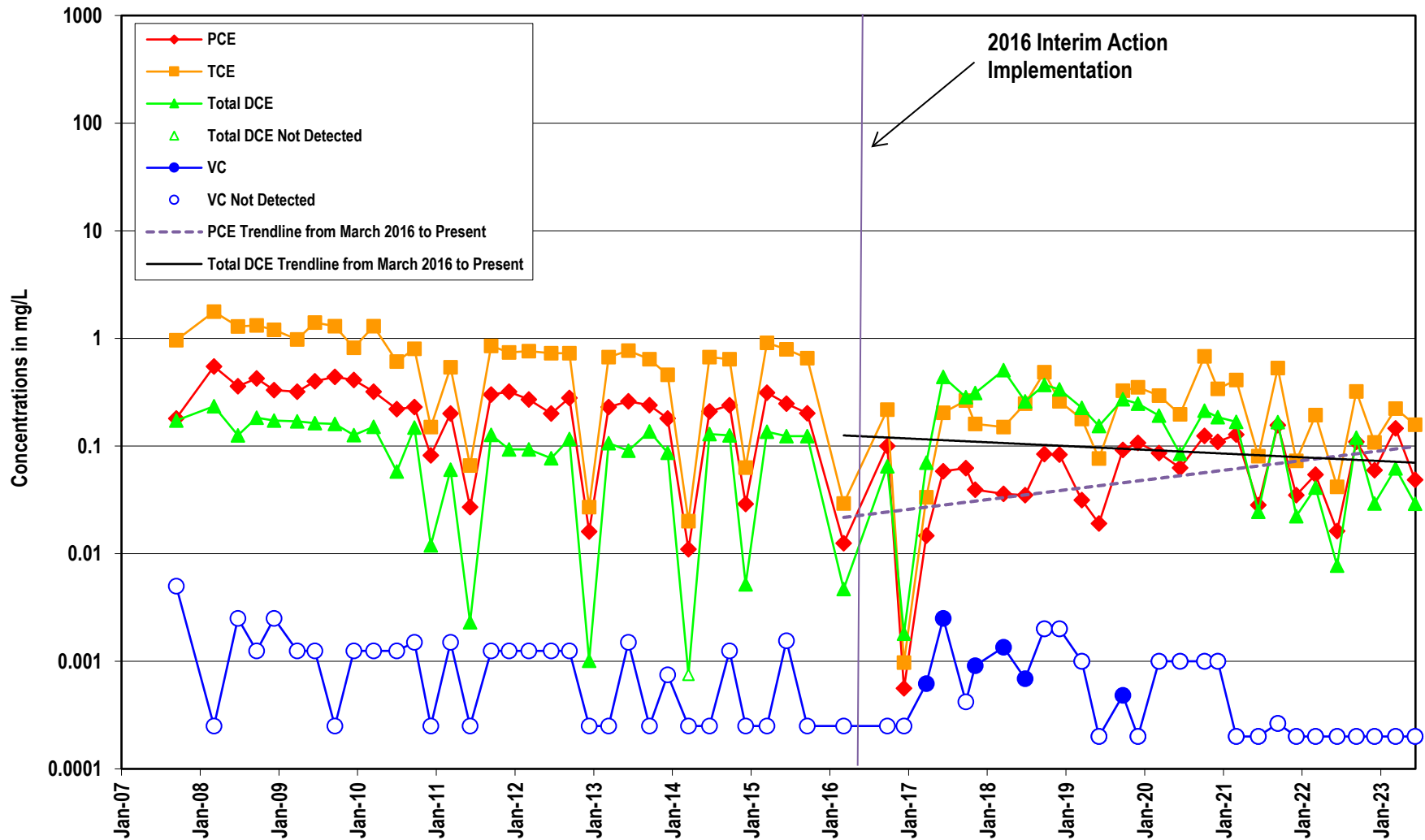


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MW-13

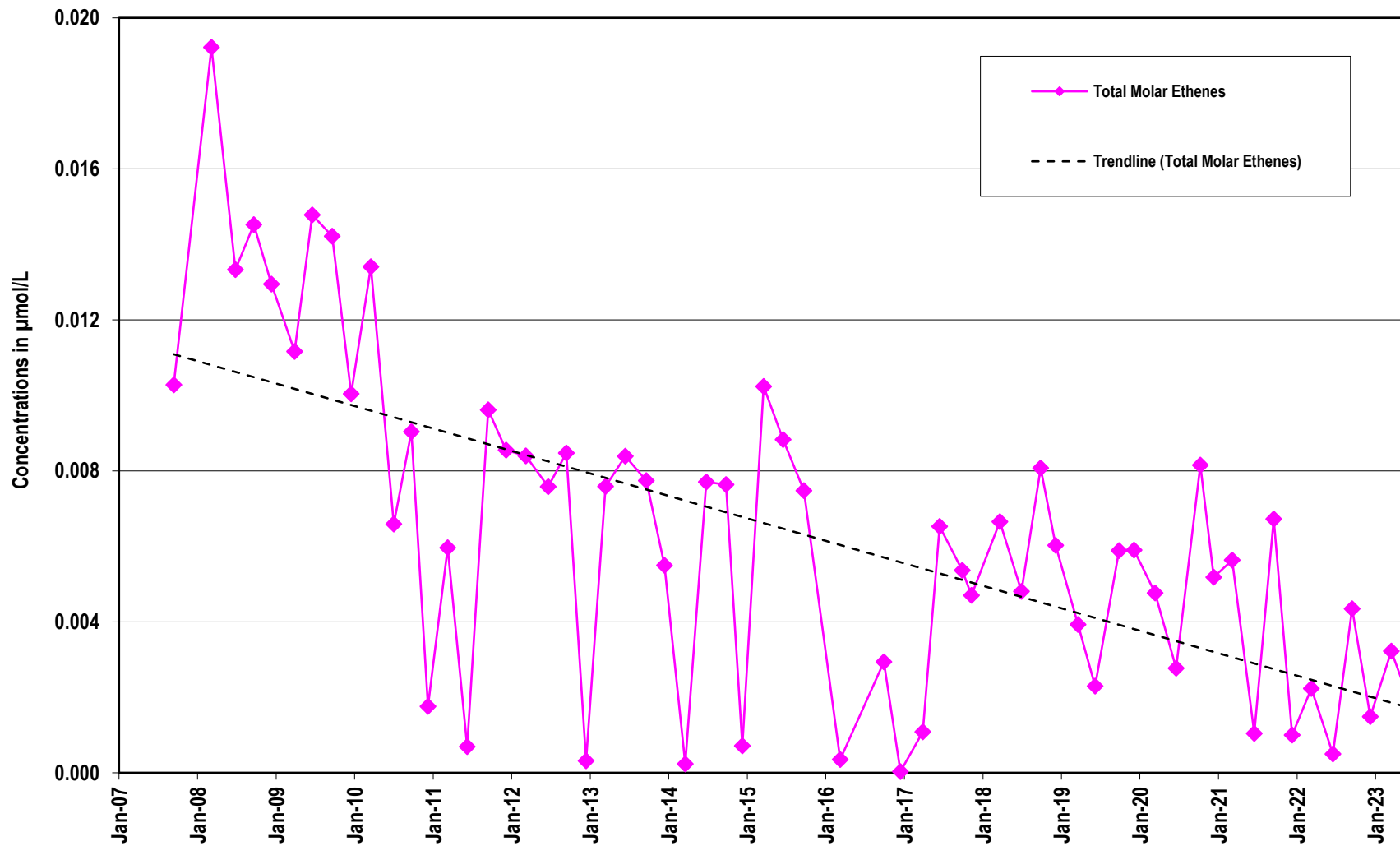


Interim Action Area - VOC Trends: MW-14

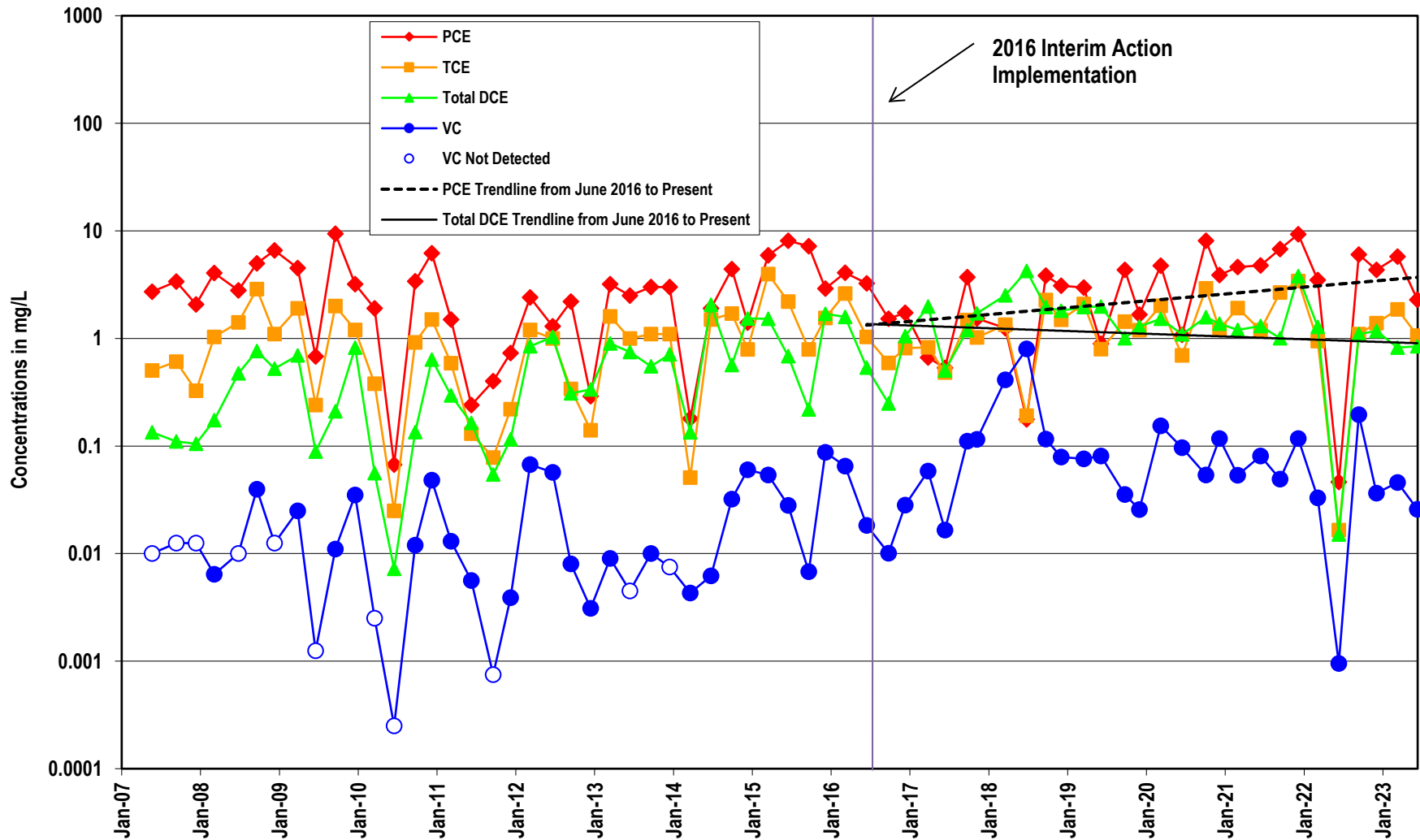


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MW-14

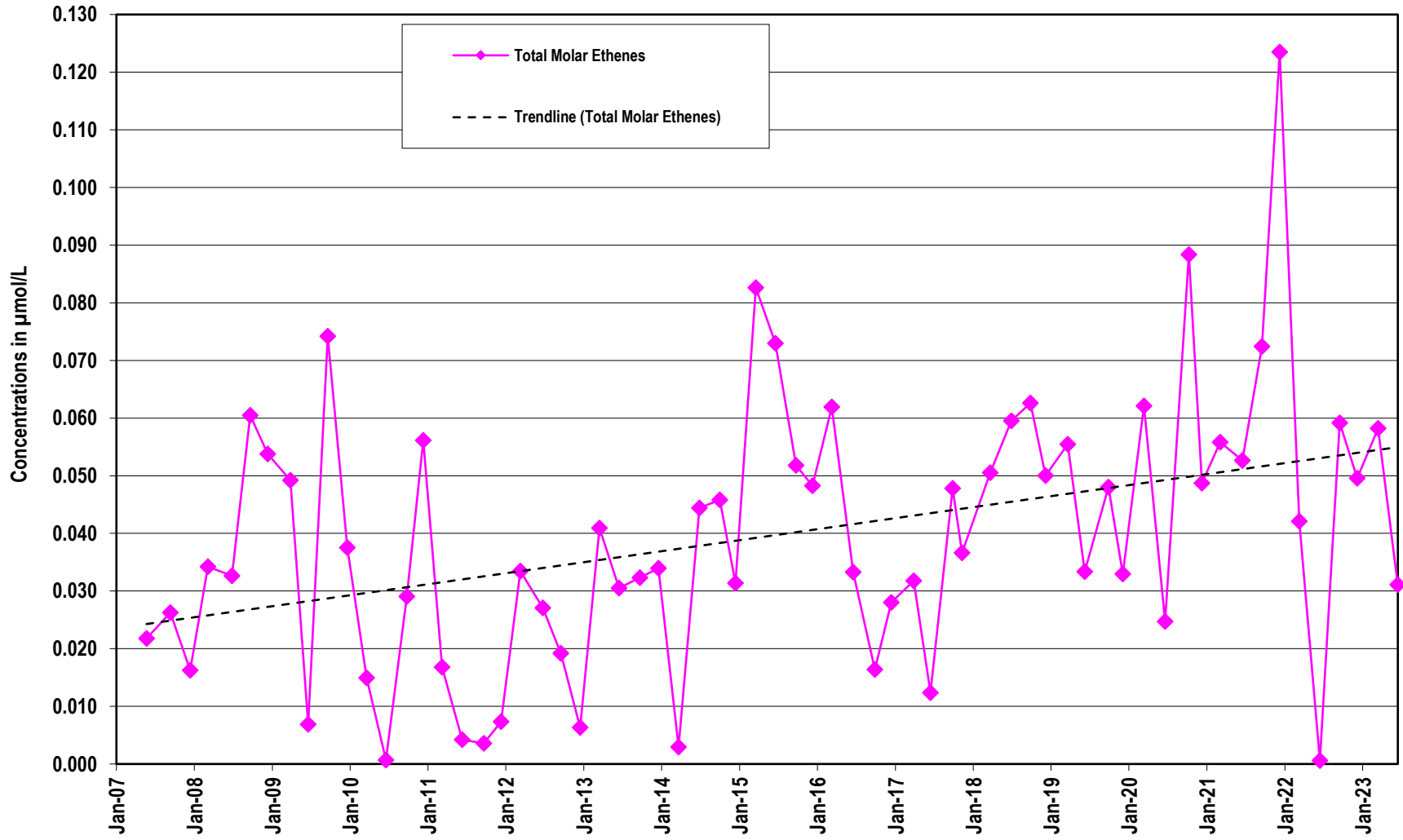


Interim Action Area - VOC Trends: MW-19

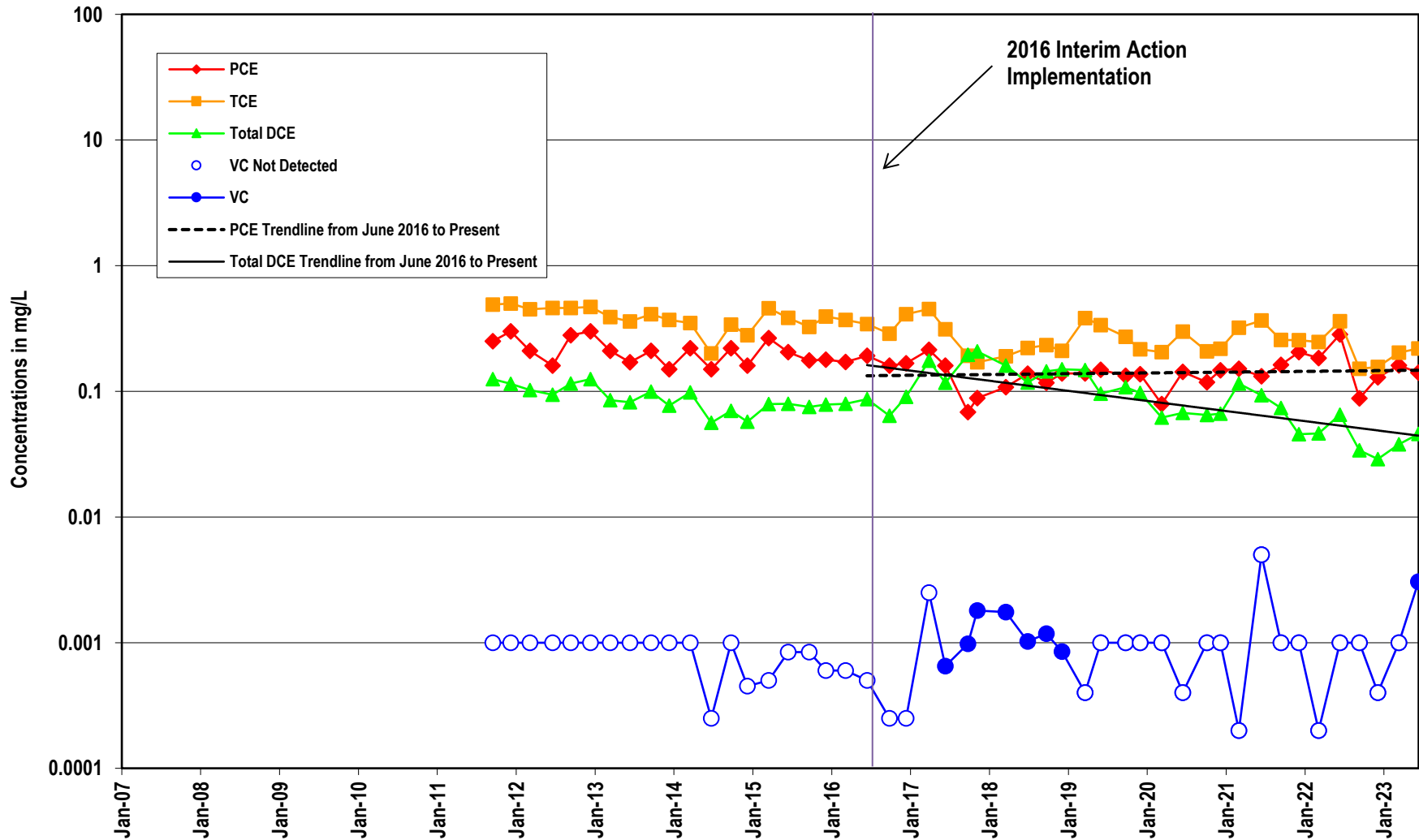


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MW-19

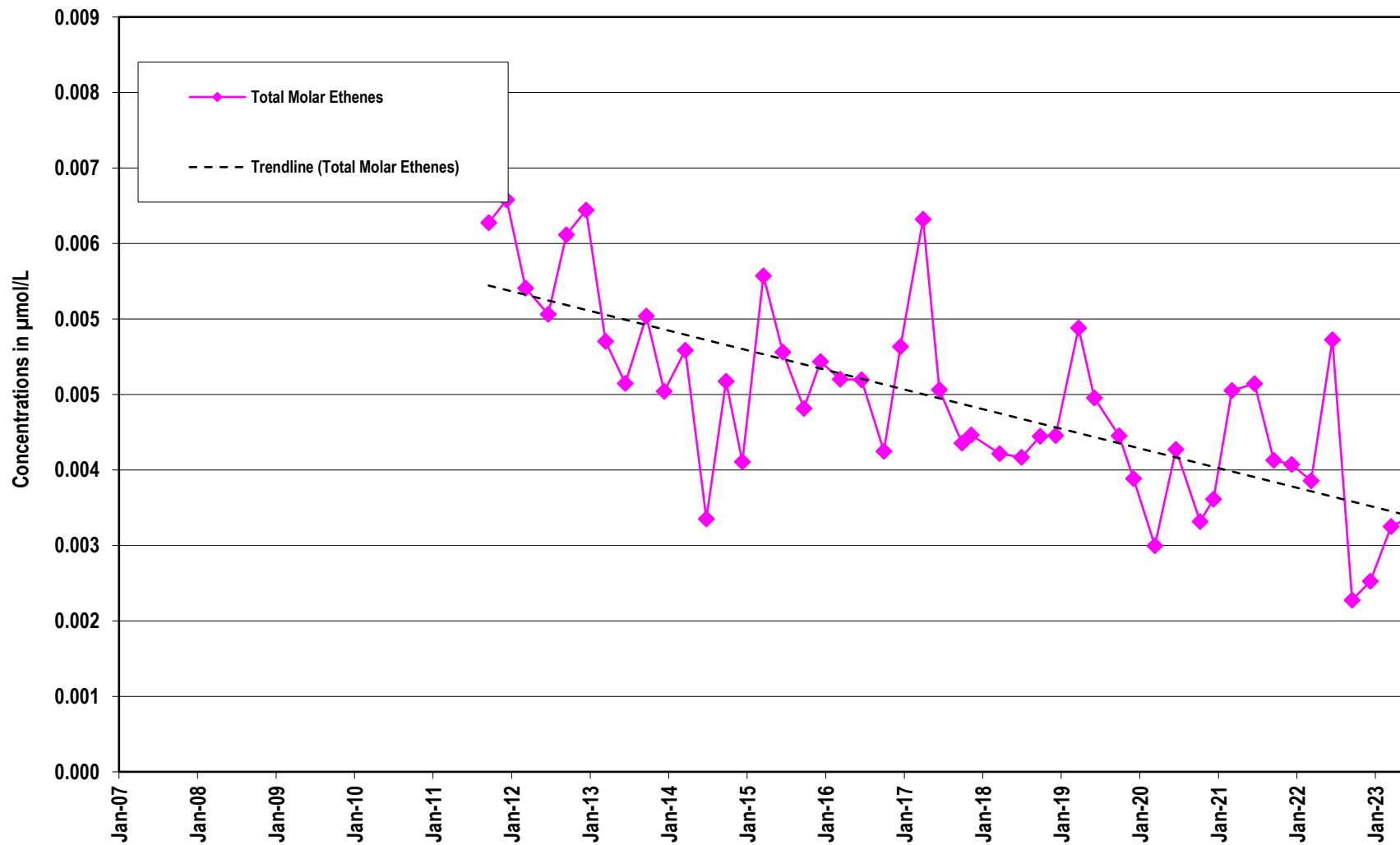


Interim Action Area - VOC Trends: MW-26

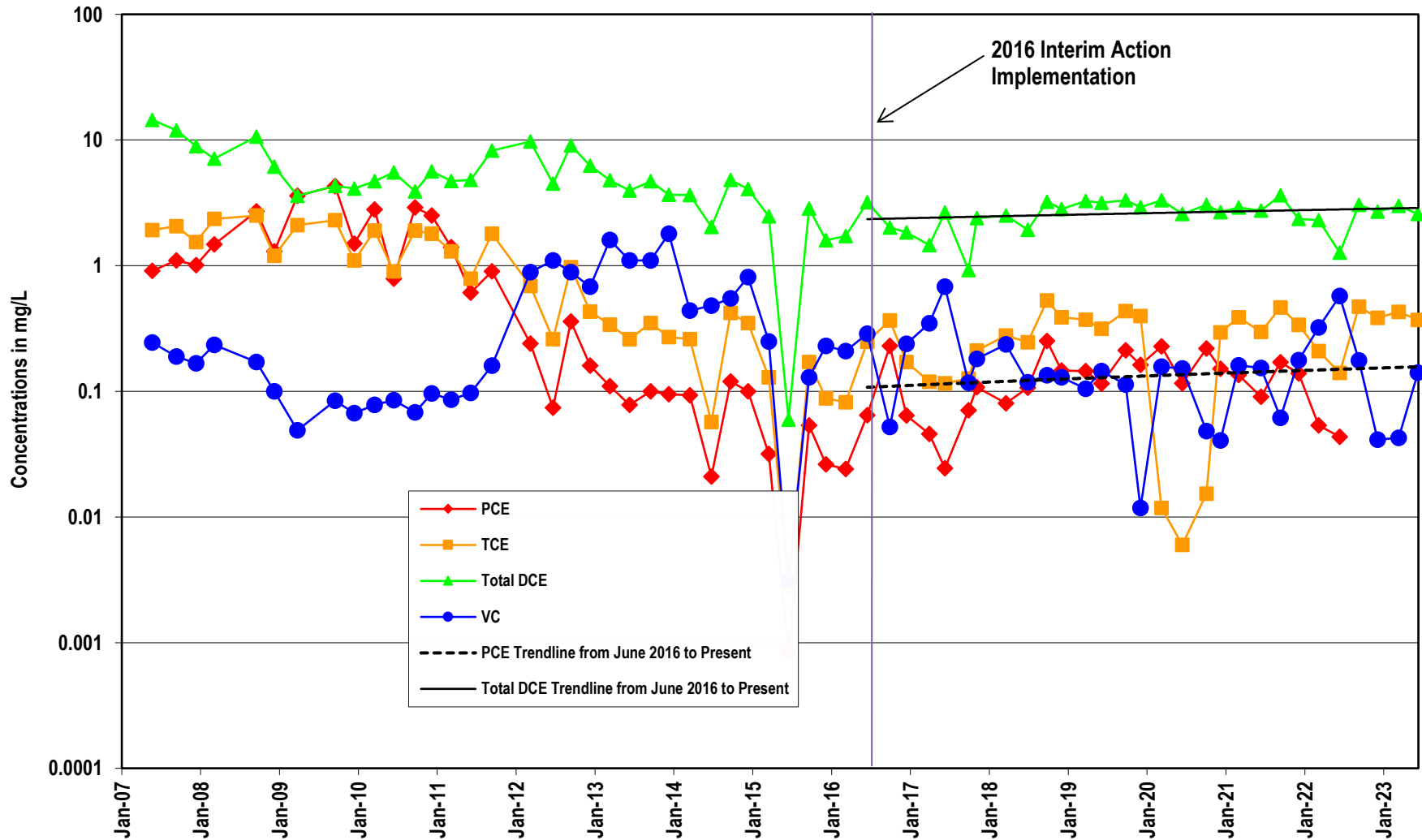


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MW-26

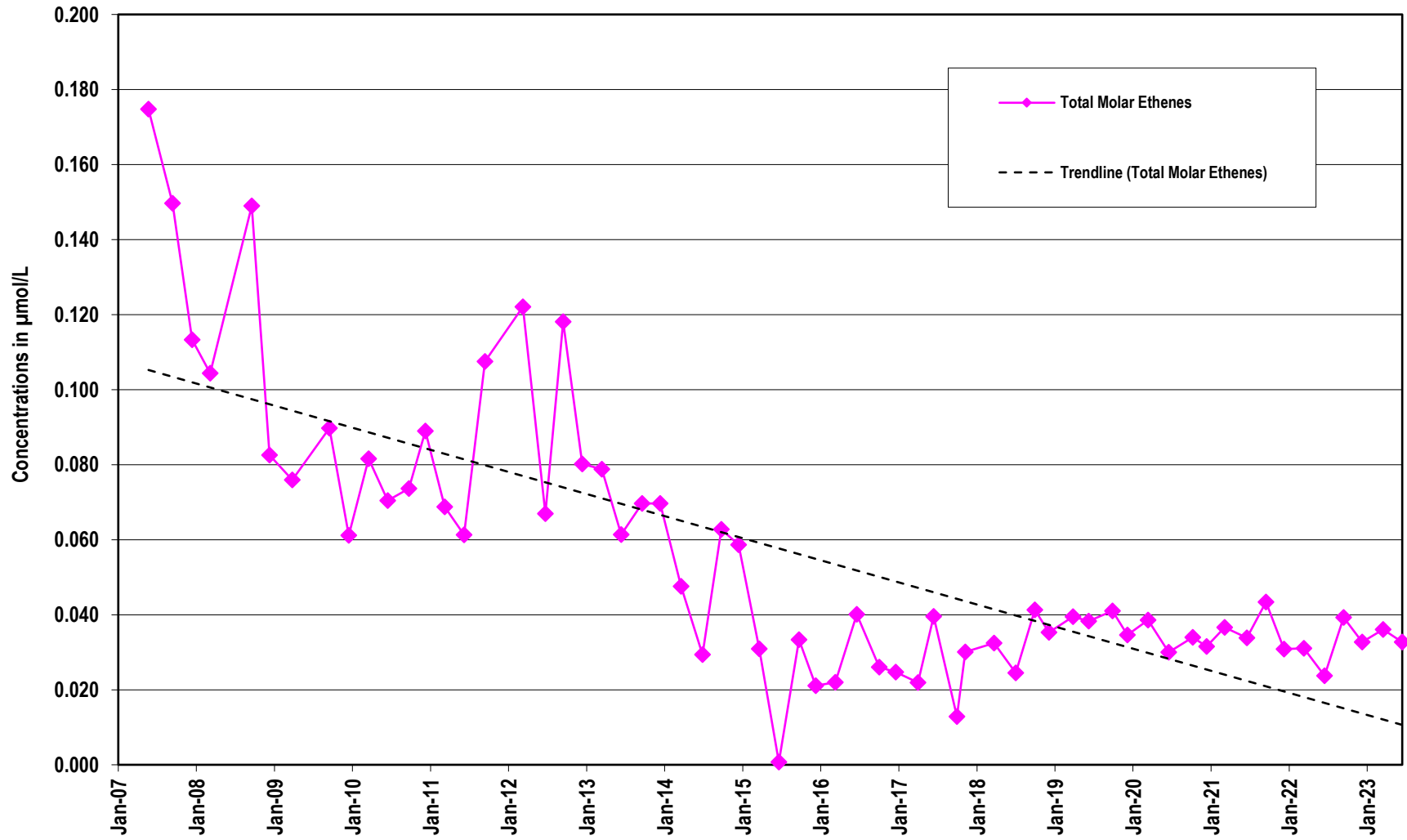


Interim Action Area - VOC Trends: MGMS1-43

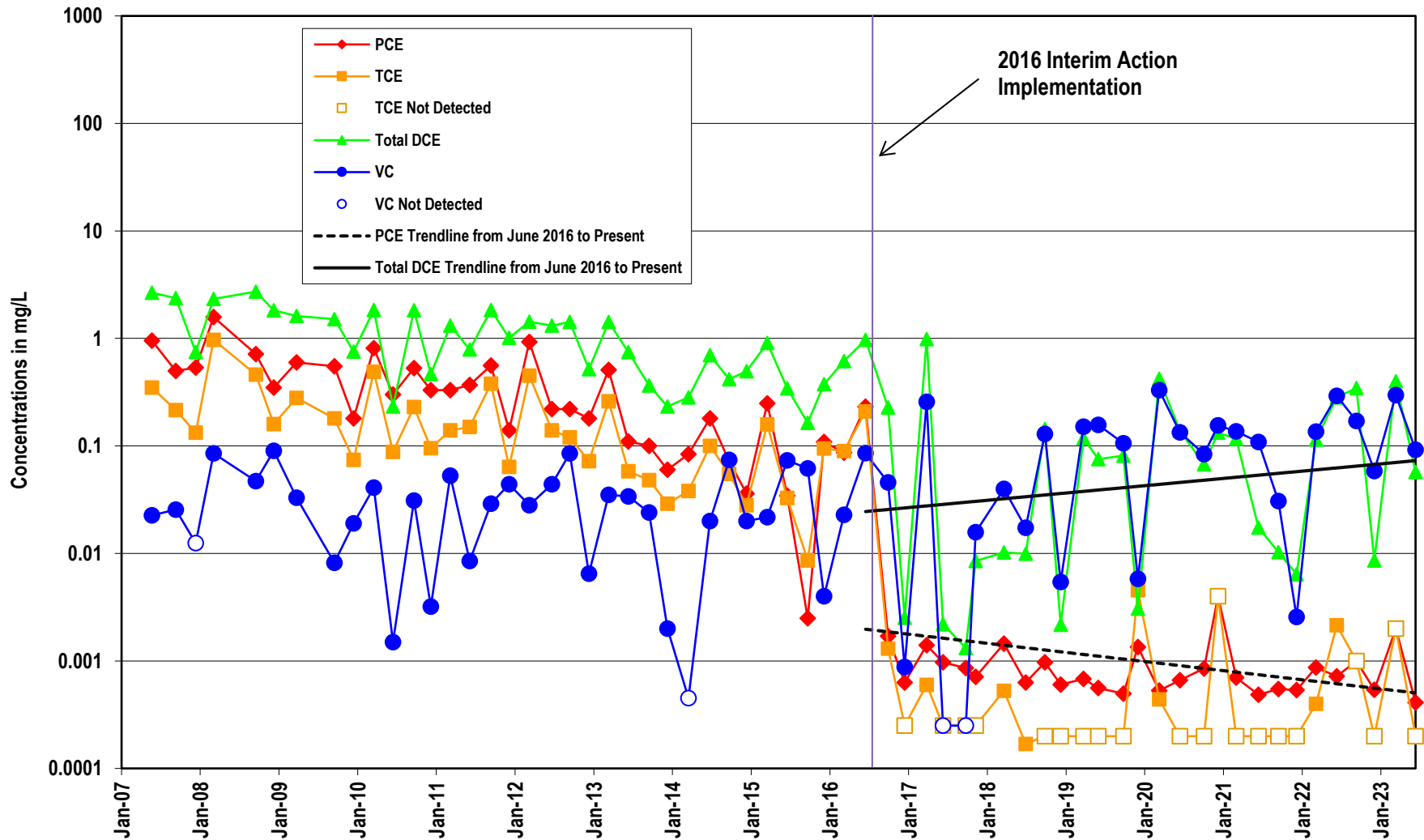


Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MGMS1-43

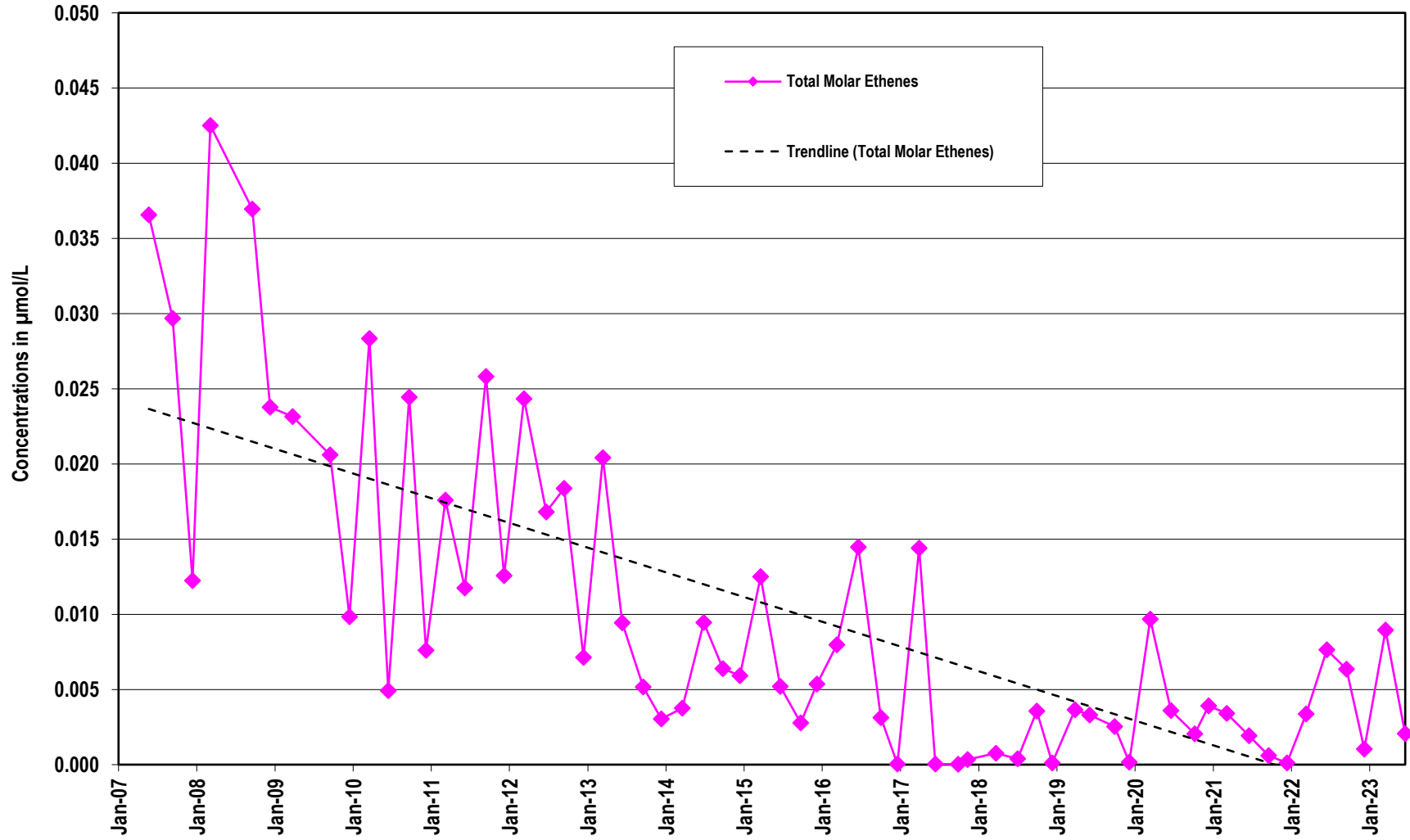


Interim Action Area - VOC Trends: MGMS3-40



Note: Not detected values plotted at 1/2 the reporting limit.

Total Molar Ethenes in MGMS3-40



APPENDIX G
May 2023 Well Survey

May 25, 2023
MONITORING WELL SURVEY DATA
NUSTAR FACILITY, PORT OF VANCOUVER, CLARK COUNTY, WASHINGTON

WELL	NORTHING	EASTING	RIM	TOP OF PVC
MW-21i-40	118777.72	1076748.53	34.29	33.66
MW-8	118752.76	1076632.26	34.31	33.69
MW-10	118981.68	1076300.74	34.92	34.37
MW-23i	118855.41	1075984.63	34.03	33.64
S-2	118750.73	1076069.36	33.47	32.90
S-1	118745.65	1076066.16	33.44	32.69
MW-24i	118550.44	1076409.67	34.25	33.82
MP-1	118567.72	1076418.34	34.06	33.71
MW-9	118675.17	1076319.82	34.20	33.98
MGMS1	118480.56	1076322.21	33.73	32.82
MGMS2	118417.79	1076511.88	33.64	32.46
MGMS3	118229.02	1076568.24	31.92	31.60
MW-20i	118032.64	1076884.75	31.72	31.20
EW-1	118587.90	1077034.45	33.47	32.81

SURVEYOR'S NOTES:

MW-20i and EW-1 are swapped on this report. Other well IDs have been checked with the reported coordinates and appear correct.

1. SURVEY DATA WAS COLLECTED ON 5/23/2023.
2. ELEVATIONS ARE BASED ON PORT OF VANCOUVER BENCHMARK 108 SURVEYED BY MACKAY SPOSITO AND DOCUMENTED IN THE AMENDED RECORD OF SURVEY FILED IN BOOK 59 OF SURVEYS AT PAGE 179. ELEVATION = 31.52 NGVD29. THE RECORDED NGVD29 ELEVATIONS WERE THEN ADJUSTED UP 0.44 FEET TO THE NGVD29(47) DATUM USED BY CLARK COUNTY. THE WSDOT BENCHMARK #6219 - DESIGNATED "PEPSI" - USED IN PREVIOUS MONITORING WELL SURVEYS WAS DESTROYED BY RECENT SIDEWALK DEMOLITION.
3. HORIZONTAL COORDINATES ARE WASHINGTON STATE PLANE OF 1983 (2011), SOUTH ZONE, EXPRESSED IN UNITS OF U.S. SURVEY FEET (3837 U.S. SURVEY FEET = 1200 METERS). COORDINATES WERE DERIVED FROM A GPS STATIC SESSION ON MSI CONTROL POINT 1, ESTABLISHED DURING A PREVIOUS SURVEY.



5/25/2023

