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Portland, Oregon 97239
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February 15, 2022

Mr. Craig Rankine, Site Manager
Department of Ecology
12121 NE 99th Street, Suite 2100
Vancouver, Washington 98682

Subject: **Submittal of Second Semi-Annual 2022 Groundwater Monitoring Report**
July through December 2021
NuStar Vancouver Facility
Vancouver, Washington
File No. 19001-009-04

Dear Mr. Rankine:

Enclosed please find the *Semi-Annual Groundwater Monitoring Report: July through December 2021*. The report was prepared on behalf of NuStar Terminals Services, Inc. (NuStar) by GeoEngineers, Inc. (GeoEngineers) and presents data collected from July through December 2021.

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

Sincerely,
GeoEngineers, Inc.

Stephanie Bosze Salisbury, LG
Associate Geologist

SBS:leh

Attachments:
Semi-Annual Groundwater Monitoring Report July through December 2021 (2 hard copies)

cc: Ms. Renee Robinson, NuStar (electronic deliverable)
Ms. Patty Boyden, Port of Vancouver (electronic deliverable)
Mr. Richard Roché, Parametrix (electronic deliverable)
Mr. R.J. Sherman, P.G., Kinder Morgan (electronic deliverable)

Semi-Annual Groundwater Monitoring Report

July through December 2021
NuStar Vancouver Facility
2565 NW Harborside Drive, Port of Vancouver
Vancouver, Washington

for
NuStar Terminals Services, Inc.

February 15, 2022

GeoEngineers
Earth Science + Technology

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July through December 2021
NuStar Vancouver Facility
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File No. 19001-009-04

February 15, 2022

Prepared for:

NuStar Terminals Services, Inc.
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APPENDICES

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 the third and fourth quarters of 2021. 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 Nos.: 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 third and fourth quarters of 2021 is summarized in Table 1. Deviations from the Table 1 program include the following:

- Monitoring wells MW-32i and MW-32s were not able to be accessed and therefore were not gauged during the third quarter 2021 event. They were gauged during the fourth quarter 2021 event and will be gauged according to the monitoring program in future events.

Two monitoring events were conducted during this period: the third quarter 2021 groundwater monitoring event was conducted from September 13 through 16, 2021, and the fourth quarter 2021 event was conducted from December 6 through 10, 2021.

2.1. Water Level Measurements

Third quarter 2021 groundwater levels were measured on September 13, 2021, and fourth quarter 2021 groundwater levels were measured on December 6, 2021. The depth to groundwater was measured at Facility monitoring wells, multi-level groundwater monitoring (MGMS) wells and selected off-leasehold wells (MW-14, MW-17, MW-23i, MW-25i, MW-26, MW-E, MW-F, 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 third and fourth quarter 2021 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 third and fourth quarter 2021 sampling events and from well MW-26 during the fourth quarter 2021 sampling event.

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 8260B. Select samples were analyzed for total organic carbon (TOC) by SIM 5010C. 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 up until September 2020. The former contract with the fertilizer supplier has been terminated and it is uncertain whether 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 third and fourth quarter 2021 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 350.1.

Samples from select wells were also analyzed for ethene, ethane, and methane to assist in evaluating remedial parameters. 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 by Method RSK-175.

3.0 GROUNDWATER ELEVATIONS

Groundwater elevations and estimated elevation contours for the Shallow and Intermediate Zone wells for the third quarter 2021 are shown on Figures 3 and 4, respectively. Groundwater elevations and estimated elevation contours for the Shallow and Intermediate Zone wells for the fourth quarter 2021 are shown on Figures 5 and 6, respectively.

3.1. Third Quarter 2021

Shallow Zone. On September 13, 2021, 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 26.93 to 34.32 feet below the top of casing (BTOC), and the corresponding groundwater elevations in these wells ranged from 3.55 to 7.41 feet above mean sea level (MSL; Table 2).

During the third quarter 2021 monitoring event, gauging of the Shallow Zone wells was completed between 9:15 AM and 1:48 PM. During the gauging activities, the water level in the adjacent Columbia River increased by 0.57 feet with a maximum river stage difference of 1.35 feet. River stage

data were obtained from the nearest National Oceanographic and Atmospheric Administration (NOAA) tide station (Columbia River: Vancouver), which is located approximately 0.5 mile upstream of the Facility.

As shown in Table 2, groundwater elevations on average were 2.9 feet lower in September 2021 than during the previous monitoring event in March 2021. During the third quarter 2021 gauging event, and consistent with previous gauging data, there was a northwest to southeast groundwater divide between wells MW-10 located in the northwest and well MW-6 located in the southeast. To the south/southwest of the divide, groundwater flow was to the river; and to the north/northeast of the divide, groundwater flow was away from the river to the east/northeast (Figure 3).

Intermediate Zone. On September 13, 2021, depth-to-groundwater measurements were made at Intermediate Zone monitoring wells in accordance with the groundwater monitoring plan provided in Table 1. 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 11:58 AM and 1:36 PM on September 13, 2021. During the time interval in which Intermediate Zone wells were gauged, water levels in the adjacent Columbia River decreased by 0.75 feet.

During the September 13, 2021 water level measurements, the observed depths to groundwater in the Intermediate Zone wells ranged from 27.01 to 30.62 feet BTOC, with groundwater elevations ranging from 2.92 to 7.40 feet above MSL (Table 2). As shown in Table 2, groundwater elevations in the Intermediate Zone were approximately 3.5 feet lower in September 2021 than during the previous monitoring event in March 2021. During the September 2021 gauging event, the Intermediate Zone groundwater gradient beneath the Facility was to the south towards 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 30.23 feet BTOC, corresponding to an elevation of 3.68 feet above MSL. A groundwater potentiometric map was not prepared for Deep Zone groundwater.

3.2. Fourth Quarter 2021

Shallow Zone. On December 6, 2021, 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 23.88 to 32.71 feet BTOC, with groundwater elevations ranging from 4.52 to 7.46 feet above MSL (Table 2).

During the fourth quarter 2021 monitoring event, gauging of the Shallow Zone wells was completed between 8:36 AM and 1:40 PM. During the gauging activities, the water level in the adjacent Columbia River decreased by 1.5 foot. As shown in Table 2, groundwater elevations on average were around 2.2 feet higher in December 2021 than the previous gauging event in September 2021.

A northwest to southeast trending groundwater divide was observed in the western and central portion of the property between wells MW-10 and MW-3. To the south/southwest of the divide, groundwater flow was generally to the river; and to the north/northeast of the divide, groundwater flow was away from the river to the east/northeast (as shown on Figure 5).

Intermediate Zone. During the December 6, 2021 gauging event, depth to groundwater was measured in Intermediate Zone wells between 12:22 PM and 1:36 PM. During this time period, water levels in the adjacent Columbia River decreased by 0.3 foot. The observed depths to groundwater in Intermediate Zone wells ranged from 25.47 to 29.01 feet BTOC, and groundwater elevations in these wells ranged from 5.33 to 6.71 feet above MSL (Table 2). As shown in Table 2, groundwater elevations on average were around 2.5 feet higher in December 2021 than the previous monitoring event in September 2021. During the June 17, 2021 gauging event, groundwater flow beneath the Facility was to the south towards the river (Figure 6).

Deep Zone. Depth to water in Deep Zone well MW-24d was 26.69 feet BTOC, corresponding to an elevation of 7.22 feet above MSL (Table 2).

4.0 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Complete copies of the laboratory reports for the third and fourth quarter 2021 groundwater monitoring events, including the quality assurance evaluation report and chain-of-custody documentation, are included in Appendix C.

4.1. Third Quarter 2021

The September 2021 monitoring program included the collection of groundwater samples from the wells identified 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 first quarter 2021 are summarized in Tables 3 and 4, respectively; volatile organic compound (VOC) data are shown on Figure 7, and nitrate and ammonia results are shown on Figure 8.

4.2. Fourth Quarter 2021

The December 2021 monitoring program included the collection of groundwater samples from the wells as shown 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 fourth quarter 2021 are summarized in Tables 3 and 4; VOC data are shown on Figure 9, and nitrate and ammonia results are shown on Figure 10.

4.3. Evaluation of Results

VOC concentration trend plots for each monitoring well are provided in Appendix D. Monitoring results demonstrate decreasing VOC concentration trends in Shallow and Intermediate Zone groundwater in 30 of 33 monitoring wells. VOC concentration trends were slightly increasing for trichloroethene (TCE) and tetrachloroethene (PCE) in wells 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 [µg/L] to 16.3 µg/L for MGMS3-132 and TCE ranging from less than 0.5 µg/L to 28.2 µg/L for MW-17); therefore, it is difficult to identify a discernable concentration trend for the wells. The increasing VOC 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 found in the western area of the property in Shallow Zone groundwater. Concentrations of ammonia and nitrate in the Intermediate Zone groundwater were more similar throughout the Facility, with slightly higher concentrations being found in localized areas in the center of the Facility. 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 September and December 2021 are generally similar to or less than historical results. 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 are expected to be provided to Ecology in a memorandum by the end of first quarter 2022.

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 VOC mass.
- Bioremediation injections for remediation of Facility groundwater and the installation of an SVE system for the remediation of HVOCs in vadose-zone soils was 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. 13 (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. 13. 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 MP-1, MW-7, MW-12, MW-13, MW-19, MW-24i, MW-26, MGMS1-43, MGMS2-40, and MGMS3-43 during the third and fourth quarter 2021 events were analyzed for TOC by EPA Method 5310 D and ethene by Method RSK-175, to evaluate the performance of the bioremediation injections. During the fourth quarter 2021 event, samples MW-12 and MP-1 were inadvertently not analyzed for ethene.

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 third and fourth quarter 2021 monitoring events. Table 5 shows the results of interim action groundwater monitoring from the February 2007 baseline event through the fourth quarter 2021 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 fourth quarter 2021. 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 December 2021.

A discussion of reductive dechlorination of HVOCs in groundwater from prior to the 2008 interim action through the fourth quarter 2021 is provided below.

5.3.1.1. VOC Concentrations Evaluation

Bioremediation injections in the primary source area at the Facility were initiated in 2008 and expanded in 2011[1]; 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 EX, 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 MW-7, EX[2], MP-1, and MGMS2-40 are provided in Appendix F. VOC 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 December 2021. The concentrations of PCE and TCE have decreased in each well. The concentrations of PCE and TCE in wells MW-7 and MGMS2-40 have been reduced by more than 85 percent since the interim measures were initiated. The concentrations of PCE and TCE in well MP-1 have decreased by approximately 90 percent and 93 percent, respectively, between the February 2007 baseline event and the December 2021 monitoring event. The concentration 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. As described in Section 2.0, monitoring well EX was identified as damaged during the first quarter of 2019 and was decommissioned during the third quarter 2019. In April 2021, a replacement monitoring well was installed adjacent to the abandoned well location. During the first sampling events of the new well (June through December 2021) the PCE, TCE, and DCE concentrations were elevated above the concentrations measured 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.

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 wells MW-7, EX, MP-1, and MGMS2-40 are provided in Appendix F. Between the February 2007 baseline event and the December 2021 monitoring event, total molar concentrations in wells MP-1, MW-7 and MGMS2-40 decreased between 87 percent (well MGMS2-40) to over 99 percent (well MW-7). Between the February 2007 baseline event and the December 2018 monitoring event, total molar concentrations in well EX decreased over 99 percent. Since replacement of well EX, the total molar ethene concentration the well groundwater is higher than February 2007 concentrations. Given the large time gap between the sampling of well EX in December 2018 and the sampling of the replacement well EX in June 2021, trends will continue to be evaluated after a few more quarters of data are collected from the new well. In addition, as discussed further in Section 7.0, NuStar will be proposing additional soil and water VOC investigation at the Facility in 2022. The results will be used to evaluate current VOC concentrations in the historical source areas and to further understand the remedial progress from interim actions conducted to date.

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[1] The description of the primary source area or "source area" is detailed in the Remedial Investigation Report (Ash Creek, 2009a); the location is identified on Figure 2 of this report.

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

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 97 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 December 2021, PCE and TCE were detected at 4.97 and 3.28 µg/L, respectively. DCE concentrations have also decreased. The DCE concentrations in wells MW-12, MW-13, and MGMS3-40 have all been reduced by greater than 94 percent since the 2016 enhanced bioremediation injections; concentrations of DCE in well MGMS1-43 have decreased by approximately 84 percent since 2007 and 26 percent since 2016. Unlike wells MW-12 and MW-13, VOC concentrations in well MW-19 have not shown a 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 support that reductive dechlorination is occurring near the well.

The third and fourth quarter 2021 results showed a continued decrease of ethenes 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. These wells 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 VOC investigation is being proposed in the northwest area and will likely be conducted in second quarter 2022. The additional data will provide updated information on the nature and extend of chlorinated VOCs offsite 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 second semi-annual 2021 monitoring period, ethene was detected in five of the eleven 2016 interim action area monitoring wells sampled (MW-12, MW-13, MW-19, MGMS1-43, 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 all samples collected since then (September 2017 through September 2021). 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 has been detected in well EX, 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 not detected in well EX during the December 2018, June 2021, September 2021, or December 2021 monitoring events. As described in Section 2.0, 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. The presence of ethene in several interim action area wells, along with decreasing PCE and TCE concentrations, indicates that reductive dechlorination has been ongoing near this well.

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 56 µg/L, with a concentration during this reporting period (September 2021) of 18.0 µg/L.
- PCE and TCE concentrations in MW-13 have decreased significantly between September 2016 and June 2021 (from 5,090 µg/L and 951 µg/L, respectively, to 1.01 µg/L and 2.56 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 (240 µg/L). The ethene concentrations in MW-13 during September and December 2021 were 240 µg/L and 5.50 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 were below the detection limit (1.0 µg/L) in the December 2019 through December 2021 sampling periods, with the exception of detections during the March 2020, June 2020, June 2021, and September 2021 sampling events (7.5, 5.0, 1.3, and 1.4 µg/L, respectively). As previously stated, VC concentrations in groundwater samples collected from well MW-19 in the June 2018 monitoring event were the highest since the well was first sampled in 2002. Since then, concentrations of VC have continued to decrease. Collectively, these data confirm reductive dechlorination around well MW-19 and that chlorinated VOC 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 each subsequent monitoring event through September 2021, at concentrations ranging from 4.1 µg/L to 242 µg/L. The only exceptions being the December 2019 and December 2021 sampling events when concentrations of ethene were below the detection 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 December 2021 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 December 2021. 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 has 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 in September 2021 (6.01 mg/L) and December 2021 (4.57 mg/L). These results indicate utilization of the oil substrate in the dechlorination of HVOCs, supporting the significant decreases in VOC 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. TOC concentrations have remained stable to slightly decreasing from July 2018 to December 2021.
- 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. TOC concentrations have remained relatively stable in well MW-13 through the December 2021 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 June 2018 events. TOC concentrations decreased from June to September 2018, where they remained relatively stable (between 5.38 and 19.7 µg/L) through December 2021. The only exception being in June 2020, when the TOC concentration was 40.1 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 December 2021.
- At well MGMS1-43, the TOC concentration in groundwater has remained relatively low and steady from September 2016 through December 2021 and does not appear to be 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 VOC 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 December 2021 sampling event.

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 third and fourth quarter 2021 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 December 2021 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 December 2021, although concentrations are starting to taper off in many 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 VOC concentrations and achieve site goals.
- 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, VOC and 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 VOC 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 December 2021, 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 first SVE system monitoring event of the second semi-annual reporting period was conducted on August 25, 2021. Results from this sampling indicated that the carbon filter material was fully utilized, and the system was turned off on September 13, 2021 until the carbon could be replaced. On November 10, 2021 representatives from Pacific Coast Carbon removed the spent carbon and replaced the SVE System filter vessels with clean carbon. The SVE system was returned to operation after the carbon change out event. The second SVE system monitoring event of the second semi-annual reporting period was conducted on November 19, 2021. During this event, a pre-carbon sample was collected but the post carbon sample was not able to be sampled due to a leak in the sampling system. The post carbon sample was collected on December 6, 2021.

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 VOC 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 4,626 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 8,078 pounds.

6.0 INFRASTRUCTURE MAINTENANCE

The following section describes maintenance and upgrades at the site.

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. Troubleshooting 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 continuously assessed to identify the source of the blue water. Troubleshooting will continue to determine the source of the blue water.

No blue water was observed in the knockout drum during the August 25, 2021 SVE system monitoring event. During the November 19, 2021 SVE system monitoring event, approximately 6 gallons of blue water were observed in the knockout drum and subsequently removed. Typically, the blue water is only observed from late autumn through early summer and is correlated with local precipitation.

As discussed in Section 5.3.2, on November 10, 2021, the granulated carbon filter in the soil vapor extraction system was removed and replaced with clean carbon by representatives of Pacific Coast Carbon, LLC. The spent carbon was sampled and then stored in large sacks at the terminal, pending characterization for disposal. The laboratory results indicated the spent carbon was hazardous waste based on the concentrations of several HVOCs. The spent carbon was disposed of as hazardous waste at the Chemical Waste Management facility in Arlington, Oregon, on January 3, 2022.

7.0 FUTURE ACTIVITIES AND SUPPLEMENTAL REMEDIAL INVESTIGATION

Groundwater monitoring 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).

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 2020b), 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 VOCs in groundwater to

the west of well MW-26 and of VOCs 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 Supplemental Remedial Investigation Work Plan 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; a series of three results reports will be submitted to Ecology detailing the work performed, the results of the investigation, and potential recommendations for additional investigation.

It is anticipated that the stormwater, upland soil and groundwater investigation, and sediment investigation reports will be submitted to Ecology by the end of first quarter of 2022. The upland soil and groundwater investigation report will also include a work plan proposing additional (Phase II) SRI investigation at the Facility. The investigation will include additional delineation and source area evaluation for fertilizer constituents in site groundwater and additional VOC investigation in soil and groundwater in the northwest area, historical source areas, and along the riverbank. Based on our current understanding of available data, the Parties will not be proposing additional sediment investigation as part of the Phase II investigation, although upland investigation will likely be proposed along the seawall and in the land wedge between the upland seawall and the river shoreline.

8.0 LIMITATIONS

This report has been prepared for use by NuStar Terminals Services, Inc. and their authorized agents. This report will be provided to regulatory agencies for review. No third parties should place legal reliance on this report. GeoEngineers has performed this work in accordance with the scope and limitations of the Agreement between NuStar Logistics, L.P. and Cascadia Associates LLC dated July 20, 2017 as assigned by Cascadia Associates, LLC to GeoEngineers, Inc. dated July 7, 2021. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

9.0 REFERENCES

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TABLES

GeoEngineers

Table 1

Groundwater Monitoring Plan: First and Second Quarters 2021

NuStar Vancouver Facility

Vancouver, Washington

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

Notes:

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

Table 2

Groundwater Elevation Data: 2020 - 2021

NuStar Vancouver Facility

Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
Groundwater Monitoring Wells			
MW-1 (32.60)	3/1/2021	25.52	7.08
	6/14/2021	25.36	7.24
	9/13/2021	28.78	3.82
	12/6/2021	25.55	7.05
MW-2 (34.04)	3/1/2021	26.91	7.13
	6/14/2021	26.88	7.16
	9/13/2021	30.49	3.55
	12/6/2021	27.19	6.85
MW-3 (34.41)	3/1/2021	26.32	8.09
	6/14/2021	26.51	7.90
	9/13/2021	29.91	4.50
	12/6/2021	26.95	7.46
MW-5 (33.86)	12/7/2020	27.97	5.89
	3/1/2021	25.74	8.12
	6/14/2021	26.34	7.52
	9/13/2021	29.34	4.52
	12/6/2021	27.14	6.72
MW-6 (32.83)	3/1/2021	25.03	7.80
	6/14/2021	25.44	7.39
	9/13/2021	28.44	4.39
	12/6/2021	25.54	7.29
MW-7 (33.74)	3/1/2021	25.74	8.00
	6/14/2021	26.3	7.44
	9/13/2021	29.12	4.62
	12/6/2021	27.19	6.55
MW-8 (33.97)	3/1/2021	25.78	8.19
	6/14/2021	26.33	7.64
	9/13/2021	28.86	5.11
	12/6/2021	26.88	7.09
MW-9 (33.86)	3/1/2021	25.91	7.95
	6/14/2021	26.52	7.34
	9/13/2021	29.2	4.66
	12/6/2021	27.33	6.53
MW-10 (34.50)	3/1/2021	26.24	8.59
	6/14/2021	27.02	7.81
	9/13/2021	29.13	5.37
	12/6/2021	27.53	6.97
MW-12 (31.43)	3/1/2021	24.31	7.12
	6/14/2021	24.24	7.19
	9/13/2021	27.68	3.75
	12/6/2021	24.31	7.12

Table 2

Groundwater Elevation Data: 2020 - 2021

NuStar Vancouver Facility

Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-13 (33.15)	3/1/2021	25.68	7.47
	6/14/2021	25.89	7.26
	9/13/2021	28.79	4.36
	12/6/2021	26.23	6.92
MW-14 (33.79)	3/1/2021	26.03	7.76
	6/14/2021	26.56	7.23
	9/13/2021	29.23	4.56
	12/6/2021	27.40	6.39
MW-15 (39.22)	3/1/2021	31.47	7.75
	6/14/2021	31.76	7.46
	9/13/2021	34.32	4.90
	12/6/2021	32.71	6.51
MW-16 (33.05)	3/1/2021	26.15	6.90
	6/14/2021	25.75	7.30
	9/13/2021	29.45	3.60
	12/6/2021	26.40	6.65
MW-17 (32.65)	3/1/2021	25.34	7.31
	6/14/2021	25.00	7.65
	9/13/2021	28.12	4.53
	12/6/2021	25.52	7.13
MW-18i (33.40)	3/1/2021	26.1	7.30
	6/14/2021	26.09	7.31
	9/13/2021	29.64	3.76
	12/6/2021	26.69	6.71
MW-19 (33.59)	3/1/2021	26.63	6.96
	6/14/2021	26.29	7.30
	9/13/2021	29.13	4.46
	12/6/2021	26.86	6.73
MW-19i (33.62)	3/1/2021	26.74	6.88
	6/14/2021	26.35	7.27
	9/13/2021	30.16	3.46
	12/6/2021	27.02	6.60
MW-20i (33.14)	3/1/2021	25.87	7.27
	6/14/2021	25.9	7.24
	9/13/2021	29.44	3.70
	12/6/2021	26.47	6.67
MW21i-40 (34.10)	3/1/2021	26.82	7.28
	6/14/2021	26.86	7.24
	9/13/2021	30.35	3.75
	12/6/2021	27.54	6.56

Table 2

Groundwater Elevation Data: 2020 - 2021

NuStar Vancouver Facility

Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-21i-105 (33.99)	3/1/2021	26.69	7.30
	6/14/2021	26.74	7.25
	9/13/2021	30.24	3.75
	12/6/2021	27.52	6.47
MW-22i (34.39)	3/1/2021	27.13	7.26
	6/14/2021	27.09	7.30
	9/13/2021	30.62	3.77
	12/6/2021	28.07	6.32
MW-23i (33.80)	3/1/2021	26.42	7.38
	6/14/2021	26.45	7.35
	9/13/2021	29.98	3.82
	12/6/2021	27.31	6.49
MW-24i (33.47)	3/1/2021	26.16	7.31
	6/14/2021	26.05	7.42
	9/13/2021	29.51	3.96
	12/6/2021	26.91	6.56
MW-25i (33.58)	3/1/2021	26.29	7.29
	6/14/2021	26.3	7.28
	9/13/2021	29.81	3.77
	12/6/2021	27.13	6.45
MW-26 (33.73)	3/1/2021	25.87	7.86
	6/14/2021	26.48	7.25
	9/13/2021	29.06	4.67
	12/6/2021	27.40	6.33
MW-24d (33.91)	3/1/2021	26.61	7.30
	6/14/2021	26.69	7.22
	9/13/2021	30.23	3.68
	12/6/2021	27.35	6.56
EW-1 (31.07)	3/1/2021	23.97	7.10
	6/14/2021	23.92	7.15
	9/13/2021	27.25	3.82
	12/6/2021	23.88	7.19

Table 2

Groundwater Elevation Data: 2020 - 2021

NuStar Vancouver Facility

Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
Secor Interim Action Pilot Study Wells			
S-1 (32.72)	3/1/2021	25.45	7.27
	6/14/2021	25.44	7.28
	9/13/2021	28.96	3.76
	12/6/2021	26.31	6.41
S-2 (33.18)	3/1/2021	26.43	6.75
	6/14/2021	26.02	7.16
	9/13/2021	29.45	3.73
	12/6/2021	26.42	6.76
Multi-Level Monitoring Wells			
MGMS1-3 (43)* (32.86)	12/7/2020	28.02	4.84
	3/1/2021	25.45	7.41
	9/13/2021	29.02	3.84
	12/6/2021	26.65	6.21
MGMS1-2(60)* (32.86)	12/7/2020	27.75	4.84
	3/1/2021	25.78	6.81
	9/13/2021	29.67	2.92
	12/6/2021	26.69	5.90
MGMS1-1(110)* (32.86)	12/7/2020	27.81	4.78
	3/1/2021	25.79	6.80
	9/13/2021	29.53	3.06
	12/6/2021	26.67	5.92
MGMS2-4(40)* (32.59)	12/7/2020	27.62	4.97
	3/1/2021	24.89	7.70
	9/13/2021	28.8	3.79
	12/6/2021	26.23	6.36
MGMS2-3(60)* (32.59)	12/7/2020	27.94	4.65
	3/1/2021	25.35	7.24
	9/13/2021	29.52	3.07
	12/6/2021	26.67	5.92
MGMS2-2(110)* (32.59)	12/7/2020	27.86	4.73
	3/1/2021	25.43	7.16
	9/13/2021	29.57	3.02
	12/6/2021	26.72	5.87
MGMS2-1(132)* (32.59)	12/7/2020	28	4.59
	3/1/2021	25.09	7.50
	9/13/2021	29.46	3.13
	12/6/2021	26.71	5.88

Table 2

Groundwater Elevation Data: 2020 - 2021

NuStar Vancouver Facility

Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MGMS3-4(40)* (31.65)	12/7/2020	26.69	4.96
	3/1/2021	24.19	7.46
	9/13/2021	28.09	3.56
	12/6/2021	25.30	6.35
MGMS3-3(60)* (31.65)	12/7/2020	26.94	4.71
	3/1/2021	24.46	7.19
	9/13/2021	28.15	3.50
	12/6/2021	25.47	6.18
MGMS3-2(101)* (31.65)	12/7/2020	26.68	4.97
	3/1/2021	24.17	7.48
	9/13/2021	28.17	3.48
	12/6/2021	25.51	6.14
MGMS3-1(132)* (31.65)	12/7/2020	26.95	4.70
	3/1/2021	24.47	7.18
	9/13/2021	28.2	3.45
	12/6/2021	25.52	6.13
Port of Vancouver Wells			
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)	3/1/2021	NM	NM
	6/14/2021	NM	NM
	9/13/2021	NM	NM
	12/6/2021	NM	NM
MW-32s (34.34)	12/7/2020	29.01	5.33
	3/1/2021	NM	NM
	6/14/2021	26.93	7.41
	12/6/2021	27.43	6.91
MW-32i (34.41)	12/7/2020	29.34	5.07
	3/1/2021	27.24	7.17
	6/14/2021	27.01	7.40
	12/6/2021	27.77	6.64

Table 2

Groundwater Elevation Data: 2020 - 2021

NuStar Vancouver Facility

Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-E **	3/1/2021	NM	NM
(30.64)	6/14/2021	NM	NM
	9/13/2021	NM	NM
	12/6/2021	NM	NM
MW-F	3/1/2021	27.27	6.84
(34.11)	6/14/2021	27.00	7.11
	9/13/2021	30.55	3.56
	12/6/2021	27.02	7.09
MW-G	3/1/2021	NM	NM
(31.50)	6/14/2021	NM	NM
	9/13/2021	NM	NM
	12/6/2021	NM	NM

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 wells MW-E and MW-31i. The TOC elevation has not yet been re-surveyed, so groundwater elevation data for these wells is likely inaccurate.

Table 3

Groundwater Analytical Results: 2020-2021

NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	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
		Concentrations in µg/L (ppb)										
MW-1	3/4/2021	**3.38**	<0.400	<0.400	**37.2**	**0.608**	<0.500	**6.44**	<0.400	<0.500	**6.60**	**1.76**
	6/16/2021	**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	**5.06**	<0.400	**0.465**	**69.8**	**0.878**	<0.500	**7.30**	<0.400	<0.500	**8.69**	**3.20**
	12/9/2021	**1.51**	<0.400	<0.400	**24.9**	**0.446**	<0.500	**16.8**	<0.400	<0.500	**6.84**	**1.56**
MW-2	3/4/2021	<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	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-3	3/4/2021	**1.13**	<0.400	<0.400	**41.8**	**1.65**	**1.06**	**182**	**2.65**	<0.500	**46.7**	<0.400
	6/16/2021	<1.00	<1.00	<1.00	**31.5**	**1.44**	<1.25	**145**	**1.86**	<1.25	**36.3**	<1.00
	9/14/2021	**5.07**	<0.400	<0.400	**63.2**	**1.12**	**1.04**	**117**	**1.60**	<0.500	**33.1**	<0.400
	12/9/2021	**0.719**	<0.400	<0.400	**24.6**	**1.31**	<0.500	**183**	**2.50**	<0.500	**42.5**	<0.400
MW-5	3/3/2021	**0.664**	<0.400	<0.400	**10.4**	<0.400	<0.500	**7.50**	<0.400	<0.500	**5.55**	**20.5**
	6/16/2021	**6.51**	<0.400	**0.963**	**697**	**4.67**	**0.684**	**20.5**	<0.400	<0.500	**26.5**	**72.3**
	9/15/2021	**1.06**	<0.400	<0.400	**20.3**	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	**7.48**
	12/9/2021	**0.522**	<0.400	**0.534**	**89.0**	**0.857**	<0.500	**10.2**	<0.400	<0.500	**6.02**	**33.9**
MW-6	3/4/2021	<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	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-7	3/3/2021	**1.28**	<0.400	<0.400	**20.0**	<0.400	<0.500	**56.4**	<0.400	<0.500	**22.4**	<0.400
	3/3/2021 DUP	**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	**4.30**	<0.400	**0.927**	**35.5**	<0.400	<0.500	**78.0**	<0.400	<0.500	**39.6**	**0.450**
	6/16/2021 DUP	**4.12**	<0.400	**0.825**	**32.6**	<0.400	<0.500	**72.8**	<0.400	<0.500	**37.3**	**0.426**
	9/14/2021	**2.11**	<0.400	**0.457**	**25.8**	<0.400	<0.500	**47.6**	<0.400	<0.500	**20.6**	<0.400
	9/14/2021 DUP	**2.24**	<0.400	**0.498**	**26.7**	<0.400	<0.500	**46.0**	<0.400	<0.500	**21.1**	<0.400
	12/8/2021	**4.67**	<0.400	**0.870**	**39.1**	<0.400	<0.500	**118**	**0.593**	<0.500	**51.2**	**0.537**
	12/8/2021 DUP	**4.56**	<0.400	**0.859**	**39.1**	<0.400	<0.500	**116**	**0.573**	<0.500	**51.4**	**0.531**
MW-8	3/3/2021	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**4.640**	<0.400	<0.500	<0.400	<0.400
	12/9/2021	<0.400	<0.400	<0.400	**0.497**	<0.400	<0.500	**3.800**	<0.400	<0.500	<0.400	<0.400
MW-9	3/3/2021	<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	<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	**0.429**	<0.400	<0.400	**6.99**	**0.448**	<0.500	**144**	**3.26**	<0.500	**43.0**	**0.654**
	12/9/2021	<0.400	<0.400	<0.400	**0.799**	<0.400	<0.500	**134**	**1.62**	<0.500	**41.2**	<0.400
MW-10	3/4/2021	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**3.19**	<0.400	<0.500	**2.60**	<0.400
	9/15/2021	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**4.75**	<0.400	<0.500	**2.70**	<0.400
MW-12	3/5/2021	**1.55**	<0.400	<0.400	**8.60**	<0.400	<0.500	**6.73**	<0.400	<0.500	**4.92**	**0.436**
	3/5/2021 DUP	**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	**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	**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	**37.4**	<0.400	<0.400	**59.0**	**0.572**	<0.500	**4.29**	<0.400	<0.500	**5.59**	**308**
	9/14/2021 DUP	**34.8**	<0.400	<0.400	**54.7**	**0.570**	<0.500	**3.75**	<0.400	<0.500	**5.10**	**282**
	12/9/2021	**0.644**	<0.400	<0.400	**7.49**	<0.400	<0.500	**12.0**	<0.400	<0.500	**6.54**	**2.02**
	12/9/2021 DUP	**0.680**	<0.400	<0.400	**7.36**	<0.400	<0.500	**12.3**	<0.400	<0.500	**6.68**	**2.10**
MW-13	3/4/2021	**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	**1.12**	<0.400	<0.400	**13.4**	**0.673**	<0.500	**1.01**	<0.400	<0.500	**2.56**	**12.9**
	9/14/2021	**34.3**	<0.400	<0.400	**90.7**	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	**635**
	12/9/2021	**0.684**	<0.400	<0.400	**10.4**	<0.400	<0.500	**4.97**	<0.400	<0.500	**3.28**	**6.13**
MW-14	3/4/2021	**9.39**	<0.400	**3.76**	**161**	**2.51**	<0.500	**128**	**1.24**	<0.500	**410**	<0.400
	6/15/2021	**0.870**	<0.400	**0.485**	**23.8**	<0.400	<0.500	**28.3**	<0.400	<0.500	**80.6**	<0.400
	9/14/2021	**11.1**	<0.400	**4.52**	**159**	**3.21**	<0.500	**156**	**1.43**	<0.500	**531**	<0.530
	12/9/2021	**0.522**	<0.400	**0.465**	**21.6**	<0.400	<0.500	**34.9**	<0.400	<0.500	**72.8**	<0.400
MW-15	6/18/2020	<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	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**0.583**	<0.400	<0.500	<0.400	<0.400
MW-16	3/3/2021	<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	<0.400	<0.400	<0.400	**11.6**	<0.400	<0.500	**75.0**	**0.444**	<0.500	**12.2**	<0.400
	9/15/2021	<0.400	<0.400	<0.400	**38.6**	<0.400	<0.500	**168**	**0.547**	<0.500	**31.6**	<0.400
	12/7/2021	<0.400	<0.400	<0.400	**6.38**	<0.400	<0.500	**43.1**	<0.400	<0.500	**5.79**	<0.400
MW-17	3/3/2021	**0.684**	<0.400	<0.400	**22.8**	<0.400	<0.500	**4.19**	<0.400	<0.500	**11.0**	<0.400
	6/15/2021	<0.400	<0.400	<0.400	**5.99**	<0.400	<0.500	**1.90**	<0.400	<0.500	**3.62**	<0.400
	9/14/2021	<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	**0.517**	<0.400	<0.400	**35.3**	<0.400	<0.500	**7.75**	<0.400	<0.500	**16.2**	<0.400
MW-18i	3/3/2021	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**0.698**	<0.400	<0.500	**0.450**	<0.400
	9/15/2021	<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	<0.400	<0.400	<0.400	**1.23**	<0.400	<0.500	**0.949**	<0.400	<0.500	**0.533**	<0.400
MW-19	3/3/2021	**41.4**	<0.400	**51.0**	**1,120**	**11.4**	<0.500	**4,470**	**27.8**	<0.500	**1,880**	**53.6**
	3/3/2021 DUP	**35.8**	<20.0	**48.5**	**1,140**	<20.0	<25.0	**4,620**	**26.4**	<25.0	**1,920**	**50.0**
	6/16/2021	**58.0**	<10.0	**28.2**	**1,260**	**15.1**	<12.5	**4,770**	**22.5**	<12.5	**1,190**	**80.8**
	6/16/2021 DUP	**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	**19.6**	<10.0	**53.6**	**922**	<10.0	<12.5	**6,790**	**60.8**	<12.5	**2,540**	**45.1**
	9/15/2021 DUP	**19.3**	<10.0	**52.4**	**945**	<10.0	<12.5	**5,880**	**63.4**	<12.5	**2,670**	**49.1**
	12/8/2021	**223**	<40.0	**86.0**	**3,650**	<40.0	<50.0	**9,310**	**55.3**	<50.0	**3,420**	**110**
	12/8/2021 DUP	**226**	<40.0	**80.3**	**3,690**	<40.0	<50.0	**7,030**	**51.1**	<50.0	**3,040**	**117**

Table 3

Groundwater Analytical Results: 2020-2021

NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	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
		Concentrations in µg/L (ppb)										
MW-19i	3/3/2021	<0.400	<0.400	<0.400	**0.566**	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	6/17/2021	<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	<0.400	<0.400	<0.400	**0.796**	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
	12/7/2021	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-20i	3/2/2021	<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	<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	**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	<0.400	<0.400	<0.400	**4.15**	<0.400	<0.500	**0.832**	<0.400	<0.500	<0.400	<0.400
MW-21i-105	3/4/2021	<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	<0.400	<0.400	<0.400	**1.37**	<0.400	<0.500	**1.70**	<0.400	<0.500	**1.01**	<0.400
	9/15/2021	**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	<0.400	<0.400	<0.400	**1.38**	<0.400	<0.500	**2.32**	<0.400	<0.500	**1.50**	<0.400
MW-21i-40	3/2/2021	**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	**1.62**	<0.400	<0.400	**35.1**	<0.400	<0.500	**19.0**	<0.400	<0.500	**13.2**	<0.400
	9/15/2021	**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	**1.64**	<0.400	<0.400	**36.2**	<0.400	<0.500	**29.9**	<0.400	<0.500	**15.4**	<0.400
MW-22i	3/4/2021	**0.510**	<0.400	<0.400	**13.3**	<0.400	<0.500	**2.12**	<0.400	<0.500	**6.62**	<0.400
	6/15/2021	**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	**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	**0.514**	<0.400	<0.400	**13.9**	<0.400	<0.500	**5.00**	<0.400	<0.500	**8.62**	<0.400
MW-23i	3/2/2021	<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	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-24i	3/3/2021	<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	**0.989**	<0.400	<0.400	**9.31**	<0.400	<0.500	**15.7**	<0.400	<0.500	**8.00**	<0.400
	9/14/2021	**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	<0.400	<0.400	<0.400	**0.540**	<0.400	<0.500	**2.22**	<0.400	<0.500	**0.629**	<0.400
MW-24d	10/09/20	<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	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-25i	3/2/2021	<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	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
MW-26	3/4/2021	**5.92**	<0.400	**1.89**	**89.4**	**2.39**	<0.500	**151**	**2.04**	<0.500	**320**	<0.400
	6/17/2021	**4.35**	<1.00	**1.43**	**72.3**	**1.92**	<1.25	**132**	**2.06**	<1.25	**366**	<1.00
	9/15/2021	**3.33**	<2.00	<2.00	**71.7**	<2.00	<2.50	**162**	<2.00	<2.50	**257**	<2.00
	12/7/2021	**2.74**	<2.00	<2.00	**43.5**	<2.00	<2.50	**205**	<2.00	<2.50	**255**	<2.00
MW-32s	3/13/2020	<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	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<0.400
EW-1	3/2/2021	<0.400	<0.400	<0.400	**0.609**	<0.400	<0.500	**37.8**	**0.938**	<0.500	**15.0**	<0.400
	6/16/2021	<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	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**24.5**	**1.33**	<0.500	**8.36**	<0.400
S-1	3/3/2021	<0.400	<0.400	<0.400	**2.20**	<0.400	<0.500	**0.852**	<0.400	<0.500	**1.60**	<0.400
	6/15/2021	<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	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**0.453**	<0.400	<0.500	**0.973**	<0.400
	12/8/2021	<0.400	<0.400	<0.400	<0.400	<0.400	<0.500	**0.548**	<0.400	<0.500	**1.20**	<0.400
S-2	3/3/2021	**8.00**	<0.400	<0.400	**37.2**	**0.578**	<0.500	<0.400	<0.400	<0.500	**1.44**	<0.400
	6/15/2021	**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	**8.15**	<0.400	<0.400	**45.2**	**0.603**	<0.500	<0.400	**0.651**	<0.500	**2.16**	<0.400
	12/8/2021	**6.32**	<0.400	<0.400	**35.9**	<0.400	<0.500	<0.400	<0.400	<0.500	**1.38**	<0.400
MGMS1-3(43)	3/4/2021	**128**	<0.400	**29.0**	**2,840**	**38.5**	<0.500	**135**	<0.400	<0.500	**388**	**161**
	6/16/2021	**103**	<10.0	**20.8**	**2,690**	**34.9**	<12.5	**90.5**	<10.0	<12.5	**297**	**153**
	9/14/2021	**152**	<10.0	**31.2**	**3,550**	**49.6**	<12.5	**170**	<10.0	<12.5	**464**	**61.6**
	12/7/2021	**87.6**	<10.0	**17.2**	**2,280**	**61.2**	<12.5	**139**	<10.0	<12.5	**338**	**177**
MGMS1-2(60)	3/4/2021	**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	<0.400	<0.400	<0.400	**6.28**	<0.400	<0.500	**13.0**	<0.400	<0.500	**7.17**	<0.400
	9/14/2021	**17.2**	<0.400	**0.746**	**71.4**	**0.438**	<0.500	**29.8**	<0.400	<0.500	**18.0**	**60.5**
	12/7/2021	<0.400	<0.400	<0.400	**3.67**	<0.400	<0.500	**11.2**	<0.400	<0.500	**6.32**	<0.400
MGMS1-1(110)	6/16/2020	**4.22**	<0.400	**0.450**	**141**	<0.400	<0.500	**17.6**	<0.400	<0.500	**33.2**	<0.400
	12/8/2020	**5.56**	<0.400	**0.523**	**163**	**0.488**	<0.500	**16.1**	<0.400	<0.500	**32.7**	<0.400
	6/16/2021	**4.87**	<0.400	**0.408**	**166**	**0.464**	<0.500	**14.1**	<0.400	<0.500	**34.6**	<0.400
	12/7/2021	**4.06**	<0.400	<0.400	**132**	<0.400	<0.500	**18.0**	<0.400	<0.500	**33.2**	<0.400
MGMS2-4(40)	3/4/2021	**25.1**	<0.400	**3.83**	**159**	**1.120**	<0.500	**115**	<0.400	<0.500	**59.9**	**72.5**
	6/17/2021	**20.7**	<0.400	**3.25**	**181**	**0.975**	<0.500	**68.8**	<0.400	<0.500	**35.6**	**66.3**
	9/16/2021	**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	**22.7**	<0.400	**6.97**	**178**	**1.500**	<0.500	**190**	<0.400	<0.500	**106**	**0.989**
MGMS2-3(60)	3/4/2021	**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	**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	**1.29**	<0.400	<0.400	**26.9**	<0.400	<0.500	**18.9**	<0.400	<0.500	**11.5**	**0.956**
	12/7/2021	**1.57**	<0.400	**0.407**	**40.5**	<0.400	<0.500	**41.8**	<0.400	<0.500	**21.0**	**1.50**

Table 3

Groundwater Analytical Results: 2020-2021

NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	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
		Concentrations in µg/L (ppb)										
MGMS2-2(110)	6/16/2020	<0.400	<0.400	<0.400	**2.91**	<0.400	<0.500	**4.19**	<0.400	<0.500	**2.50**	**1.17**
	12/8/2020	<0.400	<0.400	<0.400	**4.63**	<0.400	<0.500	**3.21**	<0.400	<0.500	**2.52**	**1.56**
	6/17/2021	<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	<0.400	<0.400	<0.400	**5.50**	<0.400	<0.500	**4.06**	<0.400	<0.500	**3.23**	**1.41**
MGMS2-1(132)	6/16/2020	<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	<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	<0.400	<0.400	<0.400	**7.06**	<0.400	<0.500	**2.90**	<0.400	<0.500	**3.34**	**2.54**
	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**
MGMS3-4(40)	3/4/2021	**6.69**	<0.400	<0.400	**111**	<0.400	<0.500	**0.698**	<0.400	<0.500	<0.400	**137**
	3/4/2021 DUP	**6.81**	<0.400	<0.400	**116**	<0.400	<0.500	**0.617**	<0.400	<0.500	<0.400	**137**
	6/16/2021	**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	**4.80**	<0.400	<0.400	**17.0**	<0.400	<0.500	**0.466**	<0.400	<0.500	<0.400	**108**
	9/16/2021	**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	**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	**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	**2.13**	<0.400	<0.400	**5.65**	<0.400	<0.500	**0.535**	<0.400	<0.500	<0.400	**24.6**
MGMS3-3(60)	3/4/2021	<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	<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	**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	<0.400	<0.400	<0.400	**1.84**	<0.400	<0.500	**1.07**	<0.400	<0.500	<0.400	**0.542**
MGMS3-2(110)	6/16/2020	<0.400	<0.400	<0.400	**1.00**	<0.400	<0.500	**3.01**	<0.400	<0.500	**1.33**	<0.400
	12/10/2020	<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	<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	<0.400	<0.400	<0.400	**1.48**	<0.400	<0.500	**3.49**	<0.400	<0.500	**1.92**	<0.400
MGMS3-1(132)	12/4/2019	<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	**0.430**	<0.400	<0.400	**4.61**	<0.400	<0.500	**9.87**	<0.400	<0.500	**6.01**	<0.400
	12/10/2020	<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	<0.400	<0.400	<0.400	**4.86**	<0.400	<0.500	**7.30**	<0.400	<0.500	**5.35**	<0.400
EX*	12/4/2018	**0.876**	<0.400	<0.400	**8.18**	<0.400	<0.500	**6.35**	<0.400	<0.500	**3.60**	**1.88**
	6/17/2021	**4.55**	<0.400	**3.90**	**415**	**2.33**	<0.500	**4,570**	**12.4**	<0.500	**322**	**22.2**
	9/16/2021	**11.3**	<0.400	**7.65**	**739**	**6.50**	<0.500	**2,940**	**7.80**	<0.500	**380**	**20.6**
	12/10/2021	**3.09**	<0.400	**3.73**	**198**	**1.55**	<0.500	**4,900**	**10.6**	<0.500	**268**	**6.76**
MP-1	3/3/2021	<2.00	<2.00	**2.34**	**70.1**	<2.00	<2.5	**831**	<2.00	<2.5	**100**	<2.00
	6/16/2021	<0.400	<0.400	<0.400	**70.7**	<4.00	<5.00	**309**	<4.00	<5.00	**52.0**	<4.00
	9/15/2021	**1.67**	<0.800	**1.27**	**38.1**	<0.800	<1.00	**392**	<0.800	<1.00	**63.8**	<0.800
	12/8/2021	<0.400	<2.00	<2.00	**9.16**	<2.00	<2.50	**152**	<2.00	<2.50	**29.2**	<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.
4. D = Relative percent difference (RPD) between sample and duplicate is outside of the acceptable range of +/- 30%.
5. J = Estimated concentration above the method detection limit and below the reporting limit.
6. B= Analyte was detected in the associated method blank.

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
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**
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
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
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

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-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
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
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

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
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
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
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
	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

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-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	**9.30**	**155**	<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
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
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
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
	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
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

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-19 continued	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**	<0250
	12/8/2021	**104**	**89.5**	<0.250
	12/8/2021 DUP	**79.4**	**69.8**	<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
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
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

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-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
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
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
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
	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
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
	9/14/2021	**0.110**	<0.250	<0.250
	12/7/2021	**0.121**	<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-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
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
MW-32i	11/10/2017	<0.050	**1.33**	<0.10
	3/2/2021	<0.0200	**1.36**	<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
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
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

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)		
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
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
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
	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
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
MGMS2-4(40)	9/21/2010	**130**	**560**	<0.10
	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

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)		
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
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
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
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
	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
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

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)		
MGMS3-2(110)	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
MGMS3-1(132)	11/10/2017	<0.050	**0.52**	<0.10
	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
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**
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. D = Relative percent difference (RPD) between sample and duplicate is outside of the acceptable range of +/- 30%.

Table 5

Interim Action: Groundwater Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry	Field Parameters	
		Tetrachloro ethene	Trichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Vinyl chloride	Ethene	1,1-Dichloro ethene	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1,1-Trichloro ethane	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)
MW-7	2/6/2007	31,500	352	<100	<100	<100	N/A	<100	<100	<100	<100	<1.0	1.20	245.7
	12/16/2008	15,000	450	130	<50	<50	N/A	<50	<50	<50	<50	2.4	0.72	-103.2
	3/23/2009	3,300	270	420	<15.0	<15.0	N/A	<15.0	<15.0	<0.50	<15.0	6.7	0.69	-614.5
	6/18/2009	890	350	520	<3.0	<3.0	N/A	<3.0	3.7	<3.0	5.2	N/A	6.97	-16.4
	9/18/2009	2,600	250	930	<3.0	<3.0	<1.0	5.5	9.8	<3.0	10	4.1	0.59	121.7
	12/18/2009	1,600	160	330	<5.0	<5.0	<1.0	<5.0	6.7	<5.0	6.7	2.5	1.23	162.1
	3/16/2010	550	56	180	<2.0	<2.0	<1.0	<2.0	<2.0	<2.0	2.0	2.6	1.37	147.7
	6/17/2010	200	72	360	<1.5	<1.5	<1.0	<1.5	<1.5	<1.5	2.7	2.8	1.86	240.0
	9/23/2010	750	110	690	<3.0	4.8	<1.0	<3.0	3.3	<3.0	3.5	8.2	0.64	-483.4
	12/10/2010	220	36	94	<0.90	1.7	1.19	<0.90	1.8	<0.90	1.6	0.84	6.29	111.6
	3/11/2011	420	82	150	0.91	9.3	7.76	1.6	6.6	<0.90	5.1	1.10	6.65	132.3
	6/7/2011	430	110	1,400	3.3	7.9	<1.0	3.4	4.8	<2.5	4.0	4.7	0.45	108.6
	9/19/2011	410	84	1,300	<5.0	78	N/A	<5.0	<5.0	<5.0	<5.0	3,400	4.53	695.8
	12/9/2011	200	32	3,400	6.8	110	38.7	6.9	8.0	<5.0	<5.0	1,600	1.19	-117.5
	3/12/2012	41	8.6	1,600	<5.0	600	71	<5.0	9.2	<5.0	<5.0	1,000	2.97	96.8
	06/22/2012	25	5.2	500	<2.0	290	130	<2.0	9.0	<2.0	<2.0	790	6.28	-137.9
	9/14/2012	28	5.2	180	0.70	80	47	0.54	3.8	<0.50	<0.50	790	2.29	93.3
	12/14/2012	11	6.8	130	<0.50	18	19.5	<0.50	1.9	<0.50	<0.50	550	0.34	24.1
	3/15/2013	1.6	0.78	110	<0.50	11	13.3	<0.50	0.69	<0.50	<0.50	250	1.02	53.3
	6/14/2013	1.6	<0.50	58	<0.50	16	5.86	<0.50	0.51	<0.50	<0.50	220	0.29	47.9
	9/20/2013	<0.50	<0.50	56	<0.50	10	18.6	<0.50	1.5	<0.50	<0.50	270	0.45	-189.3
	12/16/2013	0.51	<0.50	6.9	<0.50	9.1	5.0	<0.50	2.9	<0.50	<0.50	250	0.44	-66.1
	3/24/2014	9.8	2.6	13	<0.50	7.6	220	<0.50	1.6	<0.50	<0.50	77	0.43	76.9
	6/25/2014	<0.50	<0.50	0.62	<0.50	1.4	21.9	<0.50	0.19	<0.50	<0.50	120	0.6	-90.5
	9/30/2014	<0.50	<0.50	4.5	<0.50	9.8	<1.0	<0.50	2.7	<0.50	<0.50	160	1.93	-112.0
	12/15/2014	0.61	1.5	16	<0.50	21	<1.0	<0.50	4.5	<0.50	<0.50	28.5	1.61	-34.0
	3/20/2015	<0.50	1.1	8.4	<0.50	1.0	<6.2	<0.50	1.0	<0.50	<0.50	23.5	1.19	-76.8
	6/17/2015	1.2	1.0	12	<0.50	12.6	<10.0	<0.50	2.6	<0.50	<0.50	46	0.81	-4.9
	9/23/2015	4.5	4.2	12.7	<0.50	4.8	<10.0	<0.50	1.8	<0.50	<0.50	40.6	0.87	-30.5
	12/8/2015	0.94	1.7	4.1	<0.50	1.9	<10.0	<0.50	<0.50	<0.50	<0.50	9.8	1.98	84.1
	6/17/2016	0.69	2.1	10.9	<0.50	5.4	<10.0	<0.50	0.60	<0.50	<0.50	18.9	1.67	-120.1
	9/29/2016	<0.50	6.0	10.9	<0.50	5.5	N/A	<0.50	1.1	<0.50	<0.50	N/A	0.96	164.1
	12/14/2016	0.78	<0.50	9.4	<0.50	1.0	N/A	<0.50	<0.50	<0.50	<0.50	N/A	1.13	5.6
	3/28/2017	1.2	0.73	<0.50	<0.50	<0.50	N/A	<0.50	<0.50	<0.50	<0.50	N/A	0.89	-25.4
	6/14/2017	<0.50	0.55	2.5	<0.50	2.5	<10.0	<0.50	<0.50	<1.0	<0.50	9.1	1.08	-60.5
	9/27/2017	2.6	1.60	1.7	<0.50	1.7	<10.0	<0.50	<0.50	<1.0	<0.50	7.8	1.75	110.2
	3/21/2018	0.228 J	2.86	17.6	<0.500	4.93	<13.0	<0.500	0.495 J	<0.500	<0.500	9.96	6.03	10.5
	6/29/2018	9.89	3.53	5.50	<0.500	1.47	<10.0	<0.500	0.461 J	<0.500	<0.500	5.0	0.56	187.5
	9/27/2018	6.50	10.8	8.48	<0.400	2.08	N/A	<0.400	1.23	<0.400	<0.400	N/A	1.21	-9.0
	12/7/2018	30.4	18.1	17.7	<0.400	1.62	N/A	0.472	3.97	<0.400	<0.400	N/A	1.89	18.5
	3/20/2019	22.8	10.8	22.2	<0.400	0.605	<1.0	<0.400	1.87	<0.400	<0.400	9.07	3.20	93.4
	6/5/2019	28.4	12.7	20.2	<0.400	1.15	<1.0	0.559	2.91	<0.400	<0.400	4.77	6.02	92.2
	9/26/2019	41.7	17.9	21.0	<0.400	0.420	N/A	0.672	2.98	<0.400	<0.400	N/A	0.67	182.9
	12/3/2019	66.1	31.8	29.7	<0.400	<0.400	<1.0	0.839	4.61	<0.400	<0.400	7.51	6.61	194.0
	3/11/2020	47.4	14.3	26.5	<0.400	0.476	<1.0	<0.400	0.936	<0.400	<0.400	5.98	3.39	109.1
	6/18/2020	43.0	10.1	11.1	<0.400	<0.400	<1.0	<0.400	0.850	<0.400	<0.400	5.10	1.03	230.9
	10/8/2020	50.2	19.7	23.6	<0.400	<0.400	<1.0	0.481	1.97	<0.400	<0.400	15.4	1.65	18.5
	12/9/2020	108	45.4	56.3	0.552	<0.400	<1.0	1.41	7.05	<0.400	<0.400	8.45	2.50	139.5
	3/3/2021	56.4	22.4	20.0	<0.400	<0.400	<1.0	1.28	<0.400	<0.400	<0.400	4.53	2.79	103.9
	6/16/2021	78.0	39.6	35.5	<0.400	0.450	<1.0	4.30	0.927	<0.400	<0.400	8.63	2.55	195.0
	9/14/2021	47.6	20.6	25.8	<0.400	<0.400	<1.0	0.46	2.11	<0.400	<0.400	19.40	2.37	19.2
	12/8/2021	118	51.4	39.1	<0.400	0.537	<1.0	0.870	4.67	<0.400	0.593	9.16	0.35	159.5
MP-1	2/6/2007	1,610	421	347	8.5	23.6	N/A	<5.0	18.4	<5.0	11.2	<1.00	0.39	208.9
	12/16/2008	1,600	230	70	<5.0	<5.0	N/A	<5.0	<5.0	<5.0	10	1.80	1.37	-78.5
	3/23/2009	1,200	180	89	<4.0	<4.0	N/A	<4.0	6.0	<4.0	10	2.0	1.05	127.3
	6/18/2009	1,500	180	43	<4.0	<4.0	N/A	<4.0	4.3	<4.0	12	N/A	3.65	-43.7
	9/18/2009	1,100	310	240	8.9	7.3	<1.0	<0.40	14	<4.0	8.2	1.50	0.48	99.7
	12/18/2009	1,000	180	58	<4.0	<4.0	<1.0	<4.0	<4.0	<4.0	7.1	1.60	0.78	155.3
	3/16/2010	1,500	400	410	13	10	2.47	4.7	22	<3.0	8.6	2.4	0.89	83.2
	6/17/2010	800	140	120	<3.0	<3.0	<1.0	<3.0	3.2	<3.0	5.4	2.4	3.22	228.3
	9/23/2010	730	120	41	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0	4.0	2.0	0.53	-464.0
	12/10/2010	1,000	150	27	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0	4.5	1.0	0.52	-4.6
	3/14/2011	1,200	180	150	<3.0	5.9	<0.0010	<3.0	7.1	<3.0	6.4	0.96	1.35	159.6
	6/7/2011	640	130	75	<2.5	<2.5	<1.0	<2.5	4.9	<2.5	3.3	1.6	0.52	48.9
	9/19/2011	30	72	4.1	<1.5	1.6	N/A	<1.5	2.4	<1.5	1.9	3.7	0.69	913.5
	12/9/2011	640	120	49	3.1	<2.5	3.28	<2.5	2.6	<2.5	3.1	8.3	0.83	-51.7
	3/9/2012	490	140	440	6.3	21	15.9	2.8	9.4	<1.5	3.5	16	0.23	77.7
	6/22/2012	690	120	530	2.9	48	66.6	2.8	5.6	<2.5	12	26	0.83	-51.7
	9/14/2012	340	83	170	2.2	4.5	16	<1.5	4.0	<1.5	2.0	23	0.43	98.2
	12/14/2012	230	48	170	1.7	1.8	21.1	<0.90	2.0	<0.90	1.0	18	0.28	-15.2
	3/15/2013	230	69	140	2.5	1.8	5.86	0.94	5.1	<0.90	1.0	35	0.44	60.4
	6/14/2013	330	70	190	1.6	1.8	2.96	1.4	4.5	<0.90	1.4	28	0.34	187.2
	9/20/2013	260	66	77	1.5	<0.90	3.17	<0.90	2.9	<0.90	0.95	35	0.44	1.2
	12/16/2013	290	70	67	0.92	<0.90	<1.0	1.1	1.7	<0.90	1.2	26	1.10	10.3
	3/24/2014	360	54	240	<1.5	<1.5	33	<1.5	2.2	<1.5	1.8	38	0.69	-18.7
	6/23/2014	1,200	130	290	1.7	5.0	19.6	2.3	4.9	<1.5	9.5	34	3.00	-14.0
	9/30/2014	360	63	110	<2.0	16	<1.0	<2.0	2.8	<2.0	<2.0	29	4.09	42.3
	12/15/2014	320	59	58	<1.5	<1.5	<1.0	<1.5	1.7	<1.5	<1.5	2.4	0.88	-28.6
	3/20/2015	570	96	190	1.5	25	<6.2	1.5	3.6	<1.0	1.0	7.8	1.04	29.8
	6/18/2015	376	80.8	91	0.87	<0.84	<10.0	1.5	2.9	<0.84	<0.84	6.0	1.75	-148.5
	9/22/2015	343	68.3	38.3	<1.2	<1.2	<1.0	1.4	1.8	<1.2	<1.2	2.2	1.66	105.5
	12/8/2015	308	62.6	50.9	<1.2	<1.2	<1.0	1.5	1.8	<1.2	<1.2	9.9	1.20	82.8
	3/8/2016	433	100	148	1.2	<0.84	<1.0	2.1	7.5	<0.84	<0.84	5.1	1.13	29.5
	6/17/2016	206	67.3	125	0.97	<0.50	<10.0	1.5	5.0	<0.50	<0.50	<1.0	3.71	-8.6
	9/28/2016	99.4	35.5	40.5	<0.50	3.3	<10.0	3.1	1.3	<0.50	<0.50	2620	1.32	135.2
	12/13/2016	2.9	1.0	209	0.55	4.3	<10.0	0.92	0.64	<0.50	<0.50	130	3.57	12.1
	3/30/2017	<0.50	0.79	177	6.0	186	328	<0.50	7.5	<0.50	<0.50	137	0.79	-137.7
	6/14/2017	16.2	8.5	143	1.9	29.4	83.2	<0.50	2.3	<1.0	<0.50	38.9	0.87	-53.2
	9/26/2017	307	65.9	83.0	0.83	2.3	<10.0	3.4	4.5	<1.0	<0.50	4.3	0.93	80.5
	11/9/2017	198	74.0	105	0.91	2.6	<10.0	4.3	3.3	<0.50	<0.50	3.7	0.66	-104.8
	3/21/2018	245	64.5	151	1.02	1.63	<13.0	4.04	3.17	<0.500	<0.500	8.3	0.36	175.8
	6/28/2018	747	140	353	1.74	5.26	<10.0	9.34	10.2	<0.500	0.555	8.2	0.45	159.1
	9/26/2018	322	57	60.2	<8.00	<8.00	<1.0	<8.00	<8.00	<8.00	<8.00	3.12	0.99	126.4
	12/4/2018	355	76.7	130	0.836	1.24	<1.0	6.59	<0.400	2.79	<0.400	6.09	2.28	-22.7
	3/20/2019	146	36.6	69.0	<0.400	1.55	<1.0	3.08	1.43	<0.400	<0.400	3.34	5.86	72.6
	6/7/2019	769	111	205	<8.00	<8.00	<1.0	<8.00	<8.00	<8.00	<8.00	8.2	0.73	29.2
	9/29/2019	176	26.8	37.1	<0.800	<0.800	<1.0	1.14	1.36	<0.800	<0.800	1.94	0.70	-16.2
	12/3/2019	306	57.8	40.6	<0.800	<0.800	<1.0	1.80	1.57	<0.800	<0.800	2.27	5.01	181.8
	3/11/2020	1,370	190	177	1.14	<0.800	<1.0	5.63	3.94	<0.800	1.77	2.28	0.94	99.5
	6/17/2020	427	61.2	72.0	<4.00	<4.00	<1.0	<4.00	<4.00	<4.00	<4.00	5.91	0.96	237.3
	10/8/2020	510	52.3	36.7	<2.00	<2.00	<1.0	<2.00	<2.00	<2.00	<2.00	1.74	1.80	1.6
	12/9/2020	362	41.3	29.5	<0.800	<0.800	<1.0	<0.800	1.15	<0.800	<0.800	1.76	1.50	-30.7

Table 5

Interim Action: Groundwater Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry	Field Parameters	
		Tetrachloro ethene	Trichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Vinyl chloride	Ethene	1,1-Dichloro ethene	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1,1-Trichloro ethane	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)
MP-1 continued	3/3/2021	831	100	70.1	<2.00	<2.00	<1.0	<2.00	2.34	<2.00	<2.00	1.83	6.85	19.3
	6/16/2021	309	52.0	70.7	<4.00	<4.00	<1.0	<4.00	<4.00	<4.00	<4.00	2.81	1.88	266.0
	9/15/2021	392	63.8	38.1	<0.800	<0.800	<1.0	1.27	1.67	<0.800	<0.800	1.51	1.30	-56.5
	12/8/2021	152	29.2	9.16	<2.00	<2.00	N/A	<2.00	<2.00	<2.00	<2.00	<1.00	2.44	100.7
EX	2/6/2007	2,810	564	68.2	<10.0	<10.0	N/A	<10.0	<10.0	<10.0	40	1.45	0.24	164.8
	12/16/2008	4,500	830	490	<15.0	<15.0	N/A	<15.0	54	<15.0	71	3.30	0.74	-174.5
	3/23/2009	1,400	420	50	<5.0	<5.0	N/A	<5.0	<5.0	<5.0	43	3.0	0.47	68.8
	6/18/2009	24	11	4.2	<0.50	<0.50	N/A	<0.50	<0.50	<0.50	1.1	N/A	0.37	-9.3
	9/18/2009	2,100	380	120	0.76	1.1	<1.0	3.3	4.1	<0.50	38	4.9	0.60	109.0
	12/18/2009	700	56	5.6	<2.5	<2.5	55.6	<2.5	<2.5	<2.5	3.7	1.8	2.13	170.1
	3/16/2010	150	33	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.2	2.4	0.88	102.6
	6/17/2010	150	39	92	<0.50	2.2	<1.0	<0.50	0.97	<0.50	2.3	3.3	0.84	239.5
	9/23/2010	2,400	220	90	0.53	1.8	<1.0	1.6	1.5	<0.50	20	3.6	0.93	-521.6
	12/21/2010	900	99	30	<0.50	0.71	<1.0	0.59	0.83	<0.50	6.7	<0.50	0.91	131.7
	3/31/2011	6,800	910	240	<4.0	5.1	1.91	8.1	8.2	<4.0	110	1.9	–	–
	6/7/2011	1,400	170	140	<4.0	<4.0	<1.0	<4.0	<4.0	<4.0	15	3.5	0.70	115.2
	9/19/2011	4,100	460	290	<5.0	14	N/A	11	7.9	<5.0	73	560	0.63	907.9
	12/9/2011	<50	<50	12,000	9.3	140	11.4	19	16	<5.0	17	320	1.23	-68.3
	3/9/2012	33	10	1,400	8.6	290	24.2	<4.0	5.0	<4.0	<4.0	89	0.14	-33.6
	6/22/2012	3.0	1.1	170	1.3	120	150	0.68	3.4	<0.50	0.59	110	1.23	-68.3
	9/14/2012	3.0	<1.5	320	<1.5	42	47.2	<1.5	1.5	<1.5	<1.5	77	0.15	-29.5
	12/14/2012	0.87	<0.50	26	<0.50	12	5.92	<0.50	<0.50	<0.50	<0.50	59	0.25	3.3
	3/15/2013	1.2	<0.50	<0.50	<0.50	4.4	<1.0	<0.50	<0.50	<0.50	<0.50	64	0.37	67.0
	6/14/2013	0.79	<0.50	1.6	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	12	0.54	158.8
	9/20/2013	4.1	2.6	71	0.68	30	35.4	0.54	1.9	<0.50	<0.50	42	0.43	-175.4
	12/16/2013	2.0	1.4	34	<0.50	28	45.3	<0.50	3.8	<0.50	<0.50	46	1.66	11.9
	3/24/2014	20	7.5	30	<0.50	11	91.1	<0.50	0.80	<0.50	<0.50	35	0.51	158.7
	6/23/2014	29	15	160	0.97	38	81.5	1.1	2.9	<0.50	<0.50	34	0.41	-50
	9/30/2014	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/15/2014	22	2.7	10	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	158	2.41	-52.2
	3/19/2015	170	56	690	1.9	2.8	<6.2	2.1	3.5	<0.50	2.5	<5.0	1.05	18.2
	6/18/2015	186	42	420	1.6	3.2	<10.0	2.6	2.6	<0.50	0.88	7.5	2.29	-35.2
	9/22/2015	302	61.9	543	2.6	24.4	<1.0	3.7	2.9	<0.50	0.65	22.6	0.90	23.7
	12/8/2015	94.4	21.3	427	<0.50	2.1	<1.0	<0.50	<0.50	<0.50	<0.50	7.5	–	–
	3/8/2016	274	71.1	1,160	3.6	13.3	<1.0	2.9	4.0	<1.2	5.0	22	0.36	113.3
	6/17/2016	592	90.8	1,040	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	1.2	2.72	4.8
	9/28/2016	39.4	549	2,230	3.8	128	N/A	3.5	4.6	<1.7	2.5	N/A	1.61	138.1
	12/12/2016	4.3	0.96	8.1	<0.50	51.9	N/A	<0.50	<0.50	<0.50	<0.50	N/A	2.00	-24
	3/28/2017	6.1	1.9	5.2	<0.50	<0.50	23.5	<0.50	<0.50	<0.50	<0.50	347	1.50	89.9
	6/14/2017	9.5	3.0	11.7	0.56	1.3	11.2	<0.50	10.7	<1.0	<0.50	14.0	3.48	-12.4
	9/26/2017	0.82	0.63	6.9	<0.50	10.1	17.5	<0.50	8.8	<1.0	<0.50	25.5	1.18	-140.5
	3/21/2018	1.48	2.72	22.6	<0.500	10.8	28.3	<0.500	1.34	<0.500	<0.500	15.4	0.19	74.4
	6/28/2018	1.91	0.758	722	8.72	424	99.2	1.11	4.55	<0.500	<0.500	43.6	0.39	-62.6
	9/24/2018	3.07	2.42	3.38	0.751	7.56	2.9	<0.400	1.42	<0.400	<0.400	13.2	1.55	150.7
	12/4/2018	6.35	3.60	8.18	<0.400	1.88	<1.0	<0.400	0.876	<0.400	<0.400	11.0	5.80	-10.0
	6/17/2021	4,570	322	415	2.33	22.2	<1.0	4.55	3.90	<0.400	12.4	5.32	3.02	67.5
	9/16/2021	2,940	380	739	6.50	20.6	<1.0	7.65	11.30	<0.400	7.80	6.01	3.25	186.4
	12/10/2021	4,900	268	198	1.55	6.76	<1.0	3.73	3.09	<0.400	10.6	4.57	0.58	241.4
MW-12	6/7/2011	53	25	59	1.0	<0.50	<1.0	<0.50	1.8	<0.50	0.70	0.94	3.16	110.4
	9/19/2011	860	690	4,700	55	63	N/A	45	240	2.5	65	8.3	0.84	906.3
	12/7/2011	520	380	2,900	33	40	6.15	28	130	1.3	34	59	1.00	109.0
	3/12/2012	770	540	3,800	45	46	<1.0	44	210	<15.0	48	65	1	45.3
	6/22/2012	270	200	1,700	39	22	<1.0	16	100	<5.0	13	56	0.66	117.1
	9/14/2012	1,100	730	5,400	73	84	<1.0	58	270	<15.0	76	100	0.43	140.7
	12/13/2012	38	23	62	0.97	<0.50	<1.0	<0.50	1.0	<0.50	0.53	4.9	1.07	128.6
	3/15/2013	760	540	4,300	56	54	<1.0	40	200	1.8	53	95	0.62	117.3
	6/13/2013	610	500	4,800	53	59	<1.0	39	240	<15.0	46	62	0.39	205.2
	9/20/2013	510	400	3,400	49	50	<1.0	37	170	1.6	37	110	0.59	-10.7
	12/16/2014	150	110	800	10	9.8	<1.0	7.6	36	<2.5	5.8	23	1.22	40.4
	3/24/2014	180	170	1,900	25	47	<1.0	18	110	0.77	8.6	41	1.94	29.1
	6/24/2014	42	34	310	2.3	<1.5	<1.0	1.9	14	<1.5	1.6	13	3.68	1.5
	9/30/2014	680	480	3,500	45	42	<1.0	39	190	<15.0	36	93	6.09	47.1
	12/11/2014	25	15	34	0.64	<0.50	<1.0	<0.50	0.73	<0.50	<0.50	1.9	0.65	-110.0
	3/20/2015	580	340	2,110	29	37	<6.2	25	102	<5.0	18	4	0.89	75.7
	6/19/2015	514	356	2,570	25	31.1	<10.0	28.2	151	<10.0	23.6	4.8	0.71	10.2
	9/22/2015	343	239	2,250	23.4	22.5	<1.0	16.9	120	<8.3	15.7	4.4	1.06	65.3
	12/8/2015	44.9	22	40.1	0.72	<0.50	<10.0	<0.50	0.84	<0.50	0.52	16.5	0.99	28.1
	3/8/2016	325	209	1,380	16.2	21.3	<10.0	15.4	79.9	<3.6	7.7	5.5	0.71	62.2
	6/16/2016	314	288	3,310	31.6	52.3	<10.0	29.9	174	<8.4	12.8	3.7	2.68	59.7
	9/27/2016	387	163	867	11.4	14.8	<10.0	11.5	44	<10.0	3.9	5,240	0.98	252.5
	12/14/2016	62.3	42.2	744	2.3	20.5	<10.0	4.7	16.5	<10.0	<10.0	1,930	0.46	-91.3
	3/30/2017	55.9	29.6	1,120	6.1	28.3	75.2	3.8	11.4	<2.5	<2.5	490	2.92	-17.9
	6/12/2017	42.4	18.1	893 J	7.6	48.4	120	4.7	14.0	<3.1	<3.1	530	0.91	-34.2
	9/28/2017	<1.7	<1.7	457	5.4	47.7	16.0	<1.7	19.5	<1.7	<1.7	243	1.19	-87.4
	11/9/2017	<0.50	<0.50	22.2	1.6	49.1	<10.0	<0.50	4.5	<0.50	<0.50	326 J	1.61	-119.0
	3/20/2018	<0.500	0.271 J	5.64	1.33	2.77	<13.0	<0.500	0.522	<0.500	<0.500	89.1	8.95	-136.3
	7/1/2018	0.304 J	0.996	4.02	1.57	1.45	<10.0	<0.500	0.913	<0.500	<0.500	66.0	1.77	114.3
	9/25/2018	<0.400	<0.400	1.46	0.520	1.23	<1.0	<0.400	0.730	<0.400	<0.400	79.5	1.27	-174.0
	12/4/2018	1.29	1.29	4.30	0.415	1.69	<1.0	<0.400	0.470	<0.400	<0.400	36.4	5.51	-30.5
	3/20/2019	2.11	1.33	6.70	0.675	1.64	<1.0	<0.400	0.655	<0.400	<0.400	34.4	2.34	-38.6
	6/5/2019	3.64	3.45	9.36	0.756	2.74	<1.0	<0.400	0.719	<0.400	<0.400	16.6	1.72	69.9
	9/26/2019	<0.400	0.459	5.31	0.565	6.82	1.1	<0.400	6.26	<0.400	<0.400	46.1	0.29	-227.1
	12/5/2019	2.37	1.41	2.61	<0.400	0.413	<1.0	<0.400	<0.400	<0.400	<0.400	23.8	9.18	185.3
	3/11/2020	7.01	4.25	8.47	0.561	0.423	<1.0	<0.400	0.806	<0.400	<0.400	12.0	5.10	91.3
	6/18/2020	2.59	2.68	14.1	<0.400	1.04	<1.0	<0.400	1.30	<0.400	<0.400	10.5	0.90	173.1
	10/7/2020	<0.400	0.750	81.7	0.632	196	56	<0.400	37.8	<0.400	<0.400	39.5	2.49	-156.9
	12/8/2020	13.5	6.47	9.92	<0.400	7.36	3.6	<0.400	1.55	<0.400	<0.400	4.60	2.34	120.9
	3/5/2021	6.73	4.92	8.6	<0.400	0.436	<1.0	1.55	<0.400	<0.400	<0.400	8.33	0.68	-4.2
	6/16/2021	8.85	9.62	34.0	0.426	35.7	14.0	6.90	<0.400	<0.400	<0.400	10.7	2.90	273.2
	9/14/2021	4.29	5.59	59.0	0.572	308	18.0	<0.400	37.40	<0.400	<0.400	49.2	3.69	-1.1
	12/9/2021	12.3	6.68	7.49	<0.400	2.10	N/A	<0.400	0.680	<0.400	<0.400	4.23	0.26	133

Table 5

Interim Action: Groundwater Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry	Field Parameters	
		Tetrachloro ethene	Trichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Vinyl chloride	Ethene	1,1-Dichloro ethene	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1,1-Trichloro ethane	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)
MW-24i	6/7/2011	6.6	1.4	2.0	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	1.2	6.40	59.0
	9/16/2011	27	24	270	1.7	19	N/A	2.5	13	<0.50	5.6	7.0	0.61	646.9
	12/7/2011	19	14	100	<0.50	7.5	2.29	0.84	5.0	<0.50	2.9	290	3.50	-147.5
	3/12/2012	30	11	79	<0.50	4.5	2.03	<0.50	5.9	<0.50	2.3	33	2.11	-1.2
	6/22/2012	0.85	<0.50	14	<0.50	2.6	1.52	<0.50	1.8	<0.50	<0.50	44	3.50	-147.5
	9/14/2012	31	20	58	<0.50	<0.50	<1.0	0.87	4.4	<0.50	0.79	15	0.40	-54.0
	12/14/2012	2.1	0.65	51	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	16	2.11	6.3
	3/15/2013	23	15	48	<0.50	<0.50	<1.0	<0.50	2.8	<0.50	0.57	9.5	0.79	13.1
	6/14/2013	6.2	3.6	28	<0.50	<0.80	<1.0	<0.50	2.7	<0.50	<0.50	11	0.39	130.2
	9/20/2013	15	5.9	15	<0.50	<0.80	<1.0	<0.50	1.0	<0.50	<0.50	11	1.92	-31.2
	12/16/2013	6.7	3.4	8.4	<0.50	<0.50	<1.0	<0.50	1.3	<0.50	<0.50	7.9	3.08	16.9
	3/24/2014	10	5.5	16	<0.50	<0.80	<1.0	<0.50	1.3	<0.50	<0.50	9.4	3.16	-55.4
	6/23/2014	1.3	5.2	13	<0.50	2.1	29.1	<0.50	1.2	<0.50	<0.50	8.4	4.70	-49.7
	9/30/2014	20	10	21	<0.50	<0.50	<1.0	<0.50	1.8	<0.50	<0.50	12.0	2.01	129.7
	12/15/2014	2.4	1.1	12	<0.50	<0.50	<1.0	<0.50	0.60	<0.50	<0.50	<1.0	6.27	-13.9
	3/20/2015	6.1	3.1	5.9	<0.50	<0.50	<6.2	<0.50	0.58	<0.50	<0.50	<1.0	10.28	38.6
	6/18/2015	<0.50	<0.50	3.4	<0.50	<0.50	<10.0	<0.50	<0.50	<0.50	<0.50	1.6	1.08	-158.7
	9/22/2015	2.2	0.8	4.7	<0.50	<0.50	<1.0	<0.50	1.9	<0.50	<0.50	2.3	1.85	99.4
	12/8/2015	189	36.4	18	<0.50	<0.50	<1.0	<0.50	0.74	<0.50	<0.50	3.5	1.36	99.2
	3/8/2016	4.1	1.6	3.5	<0.50	<0.50	<10.0	<0.50	<0.50	<0.50	<0.50	1.0	1.75	47.8
	6/17/2016	11.5	6.3	7.8	<0.50	<0.50	<10.0	<0.50	0.99	<0.50	<0.50	<1.0	3.12	14.0
	9/28/2016	5.8	3.1	5.4	<0.50	<0.50	<10.0	<0.50	0.53	<0.50	<0.50	5.3	2.58	123.9
	12/12/2016	1.1	<0.50	<0.50	<0.50	<0.50	<10.0	<0.50	<0.50	<0.50	<0.50	1.5	5.64	2.6
	3/30/2017	1.0	<0.50	0.70	<0.50	<0.50	<10.0	<0.50	<0.50	<0.50	<0.50	3.4	5.24	14.3
	6/15/2017	6.6	2.8	3.2	<0.50	<0.50	<10.0	<0.50	<0.50	<1.0	<0.50	1.2	3.72	-13.4
	9/26/2017	30.1	16.6	24.5	<0.50	<0.50	<10.0	<0.50	2.1	<1.0	<0.50	1.2	1.21	-10.7
	11/9/2017	12.7	5.9	9.6	<0.50	<0.50	<10.0	<0.50	1.1	<0.50	<0.50	1.3	3.11	-100.1
	3/21/2018	19.1	10.2	13.5	<0.500	<0.500	<13.0	<0.500	1.42	<0.500	<0.500	0.734 B J	0.95	129.6
	6/28/2018	10.3	5.93	13.6	1.09	<0.500	<10.0	<0.500	1.44	<0.500	<0.500	<1.0	2.69	129.9
	9/27/2018	24.8	14.3	25.0	<0.400	<0.400	N/A	<0.400	2.18	<0.400	<0.400	N/A	1.67	106.3
	12/4/2018	10.2	3.76	5.13	<0.400	<0.400	N/A	<0.400	0.800	<0.400	<0.400	N/A	5.24	-6.9
	3/25/2019	11.7	5.91	8.46	<0.400	<0.400	<1.0	<0.400	0.888	<0.400	<0.400	<1.00	4.52	18.1
	6/7/2019	7.39	3.55	4.99	<0.400	<0.400	<1.0	<0.400	0.601	<0.400	<0.400	<1.00	4.39	5.8
	9/27/2019	<0.400	<0.400	<0.400	<0.400	<0.400	1.6	<0.400	<0.400	<0.400	<0.400	<1.00	5.30	-252.2
	12/3/2019	8.78	3.72	3.82	<0.400	<0.400	<1.0	<0.400	0.775	<0.400	<0.400	<1.00	3.09	1.3
	3/12/2020	17.0	8.42	15.4	<0.400	<0.400	<1.0	<0.400	1.30	<0.400	<0.400	<1.00	7.57	66.9
	6/18/2020	6.24	2.84	2.91	<0.400	<0.400	<1.0	<0.400	0.610	<0.400	<0.400	<1.00	7.63	-43.8
	10/9/2020	1.35	<0.400	1.08	<0.400	<0.400	<1.0	<0.400	<0.400	<0.400	<0.400	1.09	3.60	-63.2
	12/10/2020	29.7	13.0	20.0	<0.400	<0.400	N/A	<0.400	1.73	<0.400	<0.400	N/A	9.37	77.2
	3/3/2021	0.955	<0.400	0.505	<0.400	<0.400	<1.0	<0.400	<0.400	<0.400	<0.400	<1.00	6.41	22.2
	6/17/2021	15.7	8.00	9.31	<0.400	<0.400	<1.0	0.989	<0.400	<0.400	<0.400	<1.50	2.99	132.0
	9/14/2021	36.7	17.20	27.5	<0.400	<0.400	N/A	<0.400	<0.400	<0.400	<0.400	<1.00	0.17	94.0
	12/7/2021	2.22	0.629	0.540	<0.400	<0.400	<1.0	<0.400	<0.400	<0.400	<0.400	<1.00	5.32	38.7
MGMS2-40	6/7/2011	4,400	1,400	1,600	17	48	<1.0	30	65	<15.0	57	2.2	0.86	49.5
	9/12/2011	790	380	7,400	20	58	N/A	28	44	<15.0	48	110	2.63	338.9
	12/7/2011	61	39	5,300	<15.0	460	14.5	<15.0	35	<15.0	<15.0	300	6.28	-137.9
	3/8/2012	9.9	5.4	470	2.8	260	368	2.3	38	<2.0	5.2	290	1.22	-73.6
	6/19/2012	7.2	2.5	20	1.3	63	566	<0.50	53	<0.50	<0.50	500	6.28	-137.9
	9/12/2012	89	80	310	3.2	440	264	2.8	39	<1.5	5.0	140	1.16	-40.1
	12/11/2012	10	3.4	33	1.3	4.0	110	<0.50	4.8	<0.50	<0.50	280	0.55	-82.3
	3/15/2013	5.6	2.2	300	2.0	270	121	1.9	28	<0.50	2.5	81	0.33	-24.3
	6/11/2013	0.94	<0.50	7.9	<0.50	4.8	55.6	<0.50	8.3	<0.50	<0.50	110	0.42	-116.7
	9/17/2013	16	17	290	1.4	330	143	4.8	28	<0.50	1.6	98	0.27	-209.9
	12/16/2013	2.4	1.4	8.4	<0.50	3.4	33.3	<0.50	9.7	<0.50	<0.50	110	1.19	-41.9
	3/24/2014	2.6	1.8	84	<0.50	270	930	2.9	45	<0.50	<0.50	120	1.06	-126.1
	6/26/2014	21	22	88	0.84	90	207	10	31	<0.50	<0.50	120	2.22	-23.7
	9/23/2014	170	110	590	2.4	800	12.1	30	30	<0.50	3.2	94	1.31	-119.0
	12/12/2014	3.4	2.3	10	<0.50	18	34	<0.50	35	<0.50	<0.50	7.9	1.41	-162.1
	3/20/2015	31	22	47	<0.50	17	8.1	3.9	4.3	<0.50	<0.50	8	20.02	-83.7
	6/19/2015	18.4	12.8	53.8	<0.50	48.3	33.7	1.3	13.8	<0.50	<0.50	11	13.5	-117.5
	9/25/2015	67.4	45.9	105	0.61	57.8	<10.0	4.2	12.3	<0.50	0.92	10.9	9.67	-145.1
	12/8/2015	4.0	2.8	7.2	<0.50	3.3	22.8	<0.50	13.5	<0.50	<0.50	7.9	6.14	-96.9
	3/8/2016	6.5	6.2	36.0	<0.50	36	63.7	1.6	20.6	<0.50	<0.50	7.4	5.52	-161.7
	6/17/2016	223	146	744	2.8	227	31	26.4	24.9	<0.50	3.1	3.8	1.60	-72.2
	9/29/2016	33.3	24.8	115	<0.50	142	N/A	<0.50	12.1	<0.50	<0.50	N/A	5.16	194.5
	12/16/2016	2.6	1.9	5.2	<0.50	2.0	N/A	<0.50	10.3	<0.50	<0.50	N/A	0.80	-28.1
	3/31/2017	4.3	14.4	236	0.60	235	N/A	14.3	57.6	<0.50	<0.50	N/A	0.68	-92.2
	6/15/2017	5.1	4.9	46.2	<0.50	98.9	128	3.5	38.6	<0.50	<0.50	7.0	1.29	-109.6
	9/29/2017	41.5	31.3	195	0.74	428	47.4	6.8	21.7	<1.0	0.67	6.4	1.03	-43.7
	11/9/2017	13.2	9.2	61.6	0.52	170	95.7	0.86	21.3	<0.50	<0.50	6.2	1.24	-113.3
	3/22/2018	46.0	27.3	109	0.571	122	32.7	4.22	25.9	<0.500	0.259 J	9.58	6.89	-112.9
	7/1/2018	62.1	48.9	151	0.971	38.2	<10.0	5.93	12.7	<0.500	1.04	5.2	3.15	-50.8
	9/28/2018	66.9	43.3	140	<0.800	106	3.6	1.44	8.74	<0.800	<0.800	5.91	1.50	97.3
	12/10/2018	18.7	12.0	24.9	<0.400	123	78	0.563	20.9	<0.400	<0.400	5.08	2.05	-111.4
	3/25/2019	62.0	35.9	136	0.752	155	26	2.58	26.6	<0.400	<0.400	4.61	0.97	151.7
	6/4/2019	14.6	10.4	37.8	<0.400	145	19	0.960	28.2	<0.400	<0.400	4.83	0.64	104.5
	9/27/2019	17.0	13.1	73.8	<0.400	101	1.4	0.729	11.2	<0.400	<0.400	4.76	7.37	-133.9
	12/4/2019	32.3	17.9	40.5	<0.400	65.4	4.2	0.778	20.6	<0.400	<0.400	5.01	4.39	-82.2
	3/12/2020	86.3	43.3	105	0.641	134	2.1	2.73	24.1	<0.400	0.453	5.13	8.14	-78.9
	6/16/2020	14.8	9.09	85.0	<0.400	138	6.1	1.25	27.3	<0.400	<0.400	4.13	0.93	177.2
	10/6/2020	101	56.2	98.4	0.635	148	3.8	2.45	19.1	<0.400	<0.400	5.15	1.17	28.8
	12/8/2020	41.0	19.4	82.6	<0.800	80.2	2.0	1.85	17.8	<0.800	<0.800	5.37	1.07	-19.5
	3/4/2021	115	59.9	159	1.12	72.5	<1.0	25.1	3.83	<0.400	<0.400	5.17	1.97	-19.5
	6/17/2021	68.8	35.6	181	0.975	66.3	<1.0	20.7	3.25	<0.400	<0.400	4.93	2.75	82.2
	9/16/2021	42.2	28.3	98.7	0.734	34.2	<1.0	1.40	9.92	<4.00	<4.00	4.82	4.14	18.9
	12/7/2021	190	106	178	1.50	0.989	<1.0	6.97	22.7	<0.400	0.812	5.84	0.59	60.5
MW-13	9/28/2016	5,090	951	148	<2.5	<2.5	<10.0	<2.5	<2.5	<2.5	<2.5	33,600	2.71	158.7
	12/16/2016	1,020	394	509	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	2,220	0.66	-111.4
	3/30/2017	176	57.6	101	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	341	4.36	-61.8
	6/15/2017	97.7	56.3	272	1.6	4.1	N/A	1.2	<1.0	<1.0	<1.0	N/A	1.41	-105.7
	9/27/2017	3.3	1.3	3220	7.3	25.0	<10.0	5.0	<1.0	<1.0	<1.0	55.8	2.16	-103.9
	11/7/2017	<4.2	<4.2	1,360	5.4	25.0	11.6	<4.2	<4.2	<4.2	<4.2	85.5	2.19	-89.2
	3/20/2018	0.396 J	2.19	1,730	5.20	211	191	2.55	0.879	<0.500	<0.500	73.7	5.79	-114.8
	7/1/2018	<0.500	0.781	1680	26.9	2030	500	5.98	18.3	0.148 J	<0.500	52.9	1.13	-31.0
	9/25/2018	0.410	0.800	9.78	1.26	113	61	<0.400	1.91	<0.400	<0.400	20.8	1.22	-146.8
	12/5/2018	0.567	0.413	6.17	0.682	55.2	7.1	<0.400	<0.400	<0.400	<0.400	51.7	7.71	-130.6
	3/19/2019	<0.400	0.433	2.69	<0.400	2.02	<1.0	<0.400	<0.400	<0.400	<0.400	48.5	2.58	-79.2
	6/6/2019	<0.400	0.673	4.62	<0.400	2.89	<1.0	<0.400	<0.400	<0.400	<0.400	21.2	0.02	48.4
	9/26/2019	<0.400	<0.400	1.94	0.439	2.01	<1.0	<0.400	1.07	<0.400	<0.400	34.3	0.50	-261.4
	12/3/2019	<0.400	<0.400	1.06	0.488	1.42	<1.0	<0.400	1.50	<0.400	<0.400	29.1	2.41	-149.4
	3/10/2020	<0.400	7.59	72.5	2.04	134	18.0	1.97	9.19	<0.400	<0.400	20.1	5.76	-122.2

Table 5

Interim Action: Groundwater Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry	Field Parameters	
		Tetrachloro ethene	Trichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Vinyl chloride	Ethene	1,1-Dichloro ethene	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1,1-Trichloro ethane	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)
MW-13 continued	6/18/2020	<0.400	1.12	1.15	<0.400	5.28	<1.0	<0.400	0.610	<0.400	<0.400	21.9	0.90	182.1
	10/7/2020	0.470	0.87	3.47	0.920	98.8	120	<0.400	18.1	<0.400	<0.400	9.99	0.26	-126.4
	12/8/2020	<0.400	<0.400	0.606	<0.400	2.30	<1.0	<0.400	2.67	<0.400	<0.400	23.2	2.11	-100.5
	3/4/2021	<0.400	0.996	3.48	0.494	27.4	16.0	11.9	<0.400	<0.400	<0.400	12.9	3.06	-120.8
	6/15/2021	1.01	2.56	13.4	0.673	12.9	1.00	1.12	<0.400	<0.400	<0.400	20.9	4.20	10.0
	9/14/2021	<4.00	<4.00	90.7	<4.00	635	240	34.3	<4.00	<4.00	<4.00	8.44	1.68	-84.1
	12/9/2021	4.97	3.28	10.4	<0.400	6.13	5.50	<0.400	0.684	<0.400	<0.400	44.2	0.74	37.5
MW-14	9/27/2016	100	218	61.8	0.94	<0.50	<10.0	2.1	7.2	<0.50	1.7	8.8	8.1	221.2
	12/13/2016	0.56	0.97	1.3	<0.50	<0.50	<10.0	<0.50	<0.50	<0.50	<0.50	5.1	3.1	55.0
	3/27/2017	14.7	33.4	69.2	<0.50	0.62	<10.0	0.57	<0.50	<0.50	<0.50	5.1	3.1	55.0
	6/13/2017	58.3	204	432	2.7	2.5	N/A	5.3	10	<1.0	2.1	N/A	0.94	61.3
	9/26/2017	62.4	265	279	2.8	<0.84	<10.0	2.6	6.2	<0.84	1.1	3.8	1.89	80.6
	11/8/2017	39.3	160	306	2.2	0.91	<10.0	2.1	4.5	<0.84	<0.84	8.5	1.85	106.9
	3/20/2018	36.0	150	500	2.56	1.35	<13.0	3.64	5.42	<0.500	0.579	8.76	0.58	21.7
	6/28/2018	34.9	247	255	2.52	0.687	<10.0	2.54	10.5	<0.500	1.57	6.6	6.59	203.6
	9/26/2018	84.3	484	361	4.50	<4.00	<1.0	4.40	12.1	<4.00	<4.00	4.56	1.55	100.1
	12/5/2018	83.4	260	333	<4.00	<4.00	<1.0	<4.00	5.43	<4.00	<4.00	13.4	4.40	55.3
	3/19/2019	31.4	178	223	2.06	<2.00	<1.0	<2.00	5.4	<2.00	<2.00	4.89	8.17	88.6
	6/6/2019	19.1	76.4	151	0.937	<0.400	<1.0	1.09	1.74	<0.400	<0.400	6.64	2.96	80.3
	9/25/2019	91.8	327	264	3.60	0.482	<1.0	4.58	12.5	<0.400	1.47	5.06	0.77	67.5
	12/4/2019	107	351	242	2.88	<0.400	<1.0	3.17	7.81	<0.400	0.704	50.0	4.41	110.9
	3/11/2020	85.9	294	186	2.45	<2.00	NA	2.72	6.80	<2.00	<2.00	N/A	3.30	108.2
	6/17/2020	62.6	197	82.6	<2.00	<2.00	<1.0	<2.00	3.50	<2.00	<2.00	4.22	1.16	205.3
	10/8/2020	124	680	207	<2.00	<2.00	<1.0	4.79	14.6	<2.00	<2.00	2.79	0.82	18.1
	12/9/2020	109	339	180	2.52	<2.00	<1.0	3.04	7.77	<2.00	<2.00	3.05	1.05	94.4
	3/4/2021	128	410	161	2.51	<0.400	<1.0	9.39	3.76	<0.400	1.24	2.16	8.52	84.7
	6/15/2021	28.3	80.6	23.8	<0.400	<0.400	<1.0	0.87	0.485	<0.400	<0.400	2.44	7.35	-23.0
	9/14/2021	156	531	159	3.21	<0.530	<1.0	4.52	11.1	<0.400	1.43	2.48	2.56	-8.4
	12/9/2021	34.9	72.8	21.6	<0.400	<0.400	<1.0	0.465	0.522	<0.400	<0.400	3.09	0.29	132.7
MW-19	9/26/2016	1,520	592	235	<5.0	10.1	<10.0	11.0	10.4	<5.0	14.5	1.9	3.27	174.4
	12/12/2016	1,730	975	1,030	11.6	31.9	<10.0	14.2	78.7	<5.0	15.5	8.1	9.22	175.2
	3/28/2017	755	896	1,990	21.5	63.2	<10.0	26.7	214	<5.0	19.9	4.8	2.5	35.8
	6/14/2017	566	506	486	6.2	17.2	N/A	15.8	41.8	<2.5	8.2	N/A	1.54	-22.7
	9/26/2017	3,710	1,480	1,160	5.4	111	44.3	28.9	11.1	<2.5	40.4	8.1	1.92	185.2
	11/9/2017	1,530	1,020	1,660	24.0	115	11.8	24.9	104	0.75 J	20.2	6.9	2.26	-75.2
	3/21/2018	1,250	1,340	2,430	11.2	413	32.3	31.4	59.0	0.225 J	17.0	29.9	1.43	135.6
	6/28/2018	177	191	4190	18.4	799	271	36.3	81.6	<0.500	11.7	58.2	2.18	-30.8
	9/25/2018	3,830	2,270	1,960	<0.400	116	9.8	<0.400	<0.400	<0.400	<0.400	16.8	1.30	57.4
	12/5/2018	3,090	1,490	1,750	18.4	79.0	2.1	39.3	91.8	0.453	21.8	10.5	5.11	-29.9
	3/20/2019	2,970	2,090	1,910	13.9	75.8	2.1	39.5	49.7	<8.00	23.7	19.1	4.26	108.6
	6/7/2019	894	793	1,910	20.4	80.8	2.9	52.6	108	<10.0	<10.0	9.34	0.72	61
	9/26/2019	4,340	1,620	1,160	12.1	39.1	3.1	40.2	41.9	<4.00	30.6	5.38	1.73	-172.4
	12/3/2019	1,670	1,200	1,250	<20.0	25.6	<1.0	28.6	57.4	<20.0	<20.0	6.88	6.52	205.1
	3/11/2020	4,730	2,010	1,450	14.8	154	7.5	60.4	35.4	<10.0	29.1	13.6	3.01	87.0
	6/18/2020	1,080	697	956	5.60	96.3	5.0	27.5	32.5	<20.0	9.40	40.1	3.12	162.1
	10/7/2020	8,110	2,920	1,510	<20.0	53.8	<1.0	58.8	46.9	<20.0	39.0	19.7	1.1	-83.5
	12/8/2020	3,880	1,210	1,330	<40.0	117	<1.0	<40.0	70.8	<40.0	<40.0	17.3	2.36	106.3
	3/3/2021	4,470	1,880	1,120	11.4	53.6	<1.0	41.4	51.0	<0.4	27.8	5.84	6.47	24.6
	6/16/2021	4,770	1,190	1,260	15.1	80.8	1.3	58	28.2	<10	22.5	7.63	2.95	391.7
	9/15/2021	6,790	2,540	922	<10.0	45.1	1.4	53.6	19.6	<10.0	60.8	4.94	1.49	32.9
	12/8/2021	9,310	3,420	3,690	<40.0	117	<1.0	86.0	226	<40.0	55.3	5.48	0.33	155.3
MW-26	9/26/2016	160	288	61.1	1.6	<0.50	N/A	1.1	3.9	<0.50	2.4	N/A	1.64	236.7
	12/13/2016	167	410	85.9	2.0	<0.50	<10.0	2.4	8.9	<0.50	3.3	2.4	0.88	102.4
	3/29/2017	214	452	170	<0.50	<0.50	<10.0	<0.50	<0.50	<0.50	<0.50	1.3	1.34	165.2
	6/13/2017	160	311 E, J	113	2.0	0.65	NA	1.9	6.7	<1.0	2.1	N/A	3.80	74.6
	9/26/2017	68.4	192	192	2.1	0.98	<10.0	1.0	5.1	<1.0	0.83	7.1	5.56	77.3
	11/8/2017	88.1	170	204	2.3	1.8	<10.0	1.5	4.8	<0.50	1.0	5.9	1.75	99.8
	3/20/2018	108	190	157	1.85	1.75	<13.0	1.35	4.85	<0.500	1.20	5.84	7.28	156.4
	6/29/2018	138	221	114	1.88	1.02	<10.0	1.46	5.05	<0.500	1.94	3.9	0.88	224.6
	9/24/2018	117	233	141	2.14	1.18	<1.0	1.24	4.24	<0.400	1.19	5.13	4.17	152.8
	12/5/2018	139	210	147	1.89	0.85	<1.0	1.09	3.02	<0.400	0.846	<1.00	4.16	36.5
	3/22/2019	139	383	142	3.18	<0.800	<1.0	2.18	7.74	<0.800	2.09	3.48	1.12	100.2
	6/3/2019	148	336	92.2	2.35	<2.00	<1.0	<2.00	5.75	<2.00	2.10	2.76	5.68	69.1
	9/26/2019	133	272	104	2.6	<2.00	<1.0	<2.00	5.14	<2.00	<2.00	4.38	0.40	-6.1
	12/3/2019	137	216	95.0	<2.00	<2.00	<1.0	<2.00	2.63	<2.00	<2.00	5.56	3.12	49.2
	3/11/2020	79.1	205	59.7	<2.00	<2.00	<1.0	<2.00	3.65	<2.00	<2.00	3.72	10.81	72.3
	6/17/2020	143	299	64.2	1.90	<0.800	N/A	1.38	5.16	<0.800	2.20	N/A	2.19	-17.1
	10/7/2020	118	208	62.8	<2.00	<2.00	<1.0	<2.00	2.64	<2.00	<2.00	4.06	9.73	109.3
	12/9/2020	147	218	64.3	<2.00	<2.00	<1.0	<2.00	3.34	<2.00	<2.00	4.04	3.99	119.1
	3/4/2021	151	320	89.4	2.39	<0.4	<1.0	5.92	1.89	<0.4	2.04	2.87	1.97	141.5
	6/17/2021	132	366	72.3	1.92	<1.0	<1.0	4.35	1.43	<1.0	2.06	3.42	6.13	226.5
	9/15/2021	162	257	71.7	<2.00	<2.00	<1.0	<2.00	3.33	<2.00	<2.00	4.28	0.33	225
	12/7/2021	205	255	43.5	<2.00	<2.00	<1.0	<2.00	2.74	<2.00	<2.00	2.63	0.76	219.2
MGMS1-43	9/26/2016	230	366	1,980	24.2	52	<10.0	13.5	81.9	<8.3	<8.3	9.0	5.09	184.2
	12/16/2016	64.1	171	1,810	20.1	239	<10.0	9.5	92.6	<8.4	<8.4	6.2	6.06	-17.5
	3/31/2017	45.8	119	1,430	15.2	348	14.8	12.5	90.8	<8.4	<8.4	7.0	3.02	-40.7
	6/12/2017	24.4	116	2,620	18.7	681	N/A	16.7	173	<8.3	<8.3	N/A	1.17	-109.8
	9/29/2017	70.7	126	901	12.9	117	<10.0	6.9	60.1	<2.5	<2.5	6.1	8.73	90.7
	11/7/2017	108	211	2,350 J	26.6	181	<10.0	13.7	153	<2.5	<2.5	5.6	2.04	74.5
	3/22/2018	80.1	278	2,450	34.9	236	<13.0	18.0	192	<0.500	0.780	13.8	10.71	-11.7
	7/1/2018	107	246	1,880	32.8	118	<10.0	13.8	116	<0.500	0.588	7.5	3.48	-1.6
	9/28/2018	252	528	3,150	47.4	134	<1.0	27.8	141	<8.00	<8.00	5.52	1.98	97.4
	12/4/2018	146	388	2,750	48.1	129	<1.0	22.5	148	<0.400	1.08	6.06	8.31	-2.0
	3/26/2019	145	372	3,210	42.2	105	<1.0	22.3	160	<8.00	<8.00	5.58	0.96	-10.1
	6/7/2019	115	315	3,090	40.8	145	<1.0	26.5	169	<8.00	<8.00	6.73	1.24	-12.5
	9/27/2019	212	434	3,240	53.9	113	<1.0	30.5	156	<8.00	<8.00	6.32	0.42	-295.7
	12/4/2019	162	398	2,860	40.9	11.8	<1.0	17.5	124	<8.00	<8.00	5.60	6.76	-32.5
	3/11/2020	228	495	3,230	60.4	157	1.4	29.7	157	<10.0	<10.0	4.82	8.24	-40.1
	6/16/2020	116	264	2,520	31.5	152	3.4	21.8	114	<10.0	<10.0	6.56	1.3	166.4
	10/6/2020	219	507	2,980	45.5	48.2	<1.0	26.0	124	<10.0	<10.0	5.30	1.07	127.5
	12/10/2020	151	294	2,620	34.3	40.6	<1.0	<20.0	131	<20.0	<20.0	5.51	1.26	95.2
	3/4/2021	135	388	2,840	38.5	161	<1.0	128	29.0	<4	<4	5.64	1.46	-22.8
	6/16/2021	90.5	297	2,690	34.9	153	1.6	103	20.8	<10	<10	6.53	0.58	-71.8
	9/14/2021	170	464	3,550	49.6	61.6	<1.0	31.2	152	<10.0	<10.0	5.05	0.42	113
	12/7/2021	139	338	2,280	61.2	177	2.9	17.2	87.6	<10.0	<10.0	6.57	0.3	124

Table 5

Interim Action: Groundwater Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Well Number	Sample Date	Volatile Organic Compounds										Attenuation Chemistry	Field Parameters	
		Tetrachloro ethene	Trichloro ethene	cis-1,2-Dichloro ethene	trans-1,2-Dichloro ethene	Vinyl chloride	Ethene	1,1-Dichloro ethene	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1,1-Trichloro ethane	Total Organic Carbon	Dissolved Oxygen	Oxidation Reduction Potential
		Concentrations in µg/L										(mg/L)	(mg/L)	(mV)
MGMS3-40	9/26/2016	**1.7**	**1.4**	**226**	**2.0**	**52.1**	<10.0	**0.60**	**4.5**	<0.50	<0.50	**36.2**	2.7	165.3
	12/16/2016	**0.63**	<0.50	**1.3**	**0.97**	**0.88**	**55.2**	<0.50	**1.0**	<0.50	<0.50	**86.9**	5.95	-9.20
	3/28/2017	**1.4**	**0.60**	**1,050**	**6.0**	**323**	**68.1**	**3.3**	**22.5**	**0.68**	<0.50	**5.0**	1.57	-125.8
	6/12/2017	**0.97**	<0.50	**1.7**	<0.50	<0.50	N/A	<0.50	**3.3**	<0.50	<0.50	N/A	5.22	-94.1
	9/26/2017	**0.79**	<0.50	**0.69**	<0.50	<0.50	**22.8**	<0.50	**1.1**	<1.0	<0.50	**3.8**	10.02	-82.8
	11/10/2017	**0.85**	<0.50	**8.0**	<0.50	**15.8**	**54.8**	<0.50	**4.3**	<0.50	<0.50	**6.5**	0.93	-111.6
	3/22/2018	**1.45**	**0.528**	**9.81**	**0.179 J**	**39.8**	**242**	<0.500	**8.57**	<0.500	<0.500	**8.74**	6.95	-130.8
	7/1/2018	**0.498 J**	**0.169 J**	**7.58**	<0.500	**8.98**	**27.4**	<0.500	**1.39**	<0.500	<0.500	**4.6**	3.18	-28.6
	9/28/2018	**0.970**	<0.400	**143**	<0.400	**129**	**33**	**0.560**	**9.08**	<0.400	<0.400	**4.38**	6.62	-61.7
	12/10/2018	**0.603**	<0.400	**1.77**	<0.400	**5.44**	**4.9**	<0.400	**1.54**	<0.400	<0.400	**3.42**	1.05	-122.9
	3/26/2019	**0.680**	<0.400	**117**	<0.400	**151**	**38**	**0.709**	**8.36**	<0.400	<0.400	**4.00**	0.74	92.6
	6/3/2019	**0.530**	<0.400	**74.7**	<0.400	**157**	**45**	**0.440**	**7.22**	<0.400	<0.400	**3.66**	0.89	-24.3
	9/27/2019	**0.578**	<0.400	**80.5**	<0.400	**106**	**8.4**	**0.413**	**5.09**	<0.400	<0.400	**2.86**	0.35	-182.8
	12/4/2019	**1.35**	<0.400	**2.66**	<0.400	**5.79**	<1.0	<0.400	**1.67**	<0.400	<0.400	**2.69**	2.92	-91.1
	3/12/2020	**0.529**	**0.439**	**418**	**0.638**	**330**	**40**	**2.43**	**12.8**	<0.400	<0.400	**4.00**	3.98	-136.4
	6/16/2020	**0.660**	<0.400	**138**	<0.400	**134**	**12.0**	<0.400	**3.71**	<0.400	<0.400	**3.08**	0.48	186.5
	10/6/2020	**0.850**	<0.400	**67.2**	<0.400	**84.0**	**4.1**	<0.400	**4.38**	<0.400	<0.400	**3.15**	0.56	-84.6
	12/10/2020	<8.00	<8.00	**125**	<8.00	**155**	**16**	<8.00	<8.00	<8.00	<8.00	**3.49**	0.70	-93.0
	3/4/2021	**0.698**	<0.400	**111**	<0.400	**137**	**13**	**6.69**	<0.400	<0.400	<0.400	**3.35**	2.96	-137.2
	6/16/2021	**0.486**	<0.400	**16.3**	<0.400	**109**	**6.2**	**4.74**	<0.400	<0.400	<0.400	**2.87**	0.74	-152.3
	9/16/2021	**0.547**	<0.400	**9.61**	<4.00	**30.7**	**1.2**	<0.400	**2.86**	<0.400	<0.400	**2.69**	2.01	31.7
	12/10/2021	**0.509**	<0.400	**6.02**	<0.400	**25.7**	<1.0	<0.400	**2.32**	<0.400	<0.400	**2.54**	0.37	-80.3

Notes:

1. µg/L (ppb) = Micrograms per liter (parts per billion)
2. mg/L = milligrams per liter
3. mV = millivolts
4. N/A = Not analyzed
5. – = Not sampled
6. B = The analyte was found in the associated method blank
7. J = Value is estimated
8. Ethene is analyzed by EPA Method RSK-175M. All other VOCs were analyzed by EPA Method 8260.
9. **Bold** value represents detected concentration of listed analyte.
10. < = Not detected at or above the specified laboratory method reporting limit (MRL).
11. E = Analyte concentration exceeded the calibration range. Reported result is estimated.

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-Trichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	Trichloro-ethene	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/m^3 = 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 Cascadia PID
11/19/2021	0.0	-19	36.9	28.0	25.1	11.0	24.5	6.0	Used Cascadia 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.

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.

Table 9

South SVE System – Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	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-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	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

Table 9

South SVE System – Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	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

Table 9

South SVE System – Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m^3										
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
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

Table 9

South SVE System – Analytical Results

NuStar Vancouver Facility

Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m^3										
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
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

Notes:

1. µg/m^3 = 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 – VOC Mass Removal

NuStar Vancouver Facility
Vancouver, Washington

Sample Date	Post-Blower Pressure (in water)	Air Flow Rate [1] (cfm)	Total VOCs (mg/m^3)	VOC 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 – VOC Mass Removal

NuStar Vancouver Facility
Vancouver, Washington

Date	Activity	VOC Removal Rate (lb/day)	Days of Operation	Approximate VOCs Removed (lbs)	Approximate Cumulative VOCs Removed (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.
2. cfm = cubic feet per minute
3. mg/m^3 = milligrams per cubic meter
4. lb/day = pounds per day
5. VOCs = volatile organic compounds
6. lbs = pounds
7. * = Not measured/sampled; system intentionally shut down to evaluate system efficiency.
8. -- = Not measured/sampled.

Table 11

South SVE System – VOC Mass Removal

NuStar Vancouver Facility

Vancouver, Washington

Sample Date	Activity	Post-Blower Pressure (in water)	Air Flow Rate [1] (cfm)	Total VOCs (mg/m^3)	VOC Removal (lb/day)	Days of Operation	Approximate VOCs Removed (lbs)	Approximate Cumulative VOCs 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 – VOC Mass Removal

NuStar Vancouver Facility

Vancouver, Washington

Sample Date	Activity	Post-Blower Pressure (in water)	Air Flow Rate [(1)] (cfm)	Total VOCs (mg/m^3)	VOC Removal (lb/day)	Days of Operation	Approximate VOCs Removed (lbs)	Approximate Cumulative VOCs 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	9	6	4,626

Notes:

1. Air flow rate read from system gauge.
2. cfm = cubic feet per minute
3. mg/m^3 = 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 duration of shutdown is unknown.
8. * = system was off for part replacement.
9. -- = Not measured/sampled.
10. VOCs = volatile organic compounds

FIGURES

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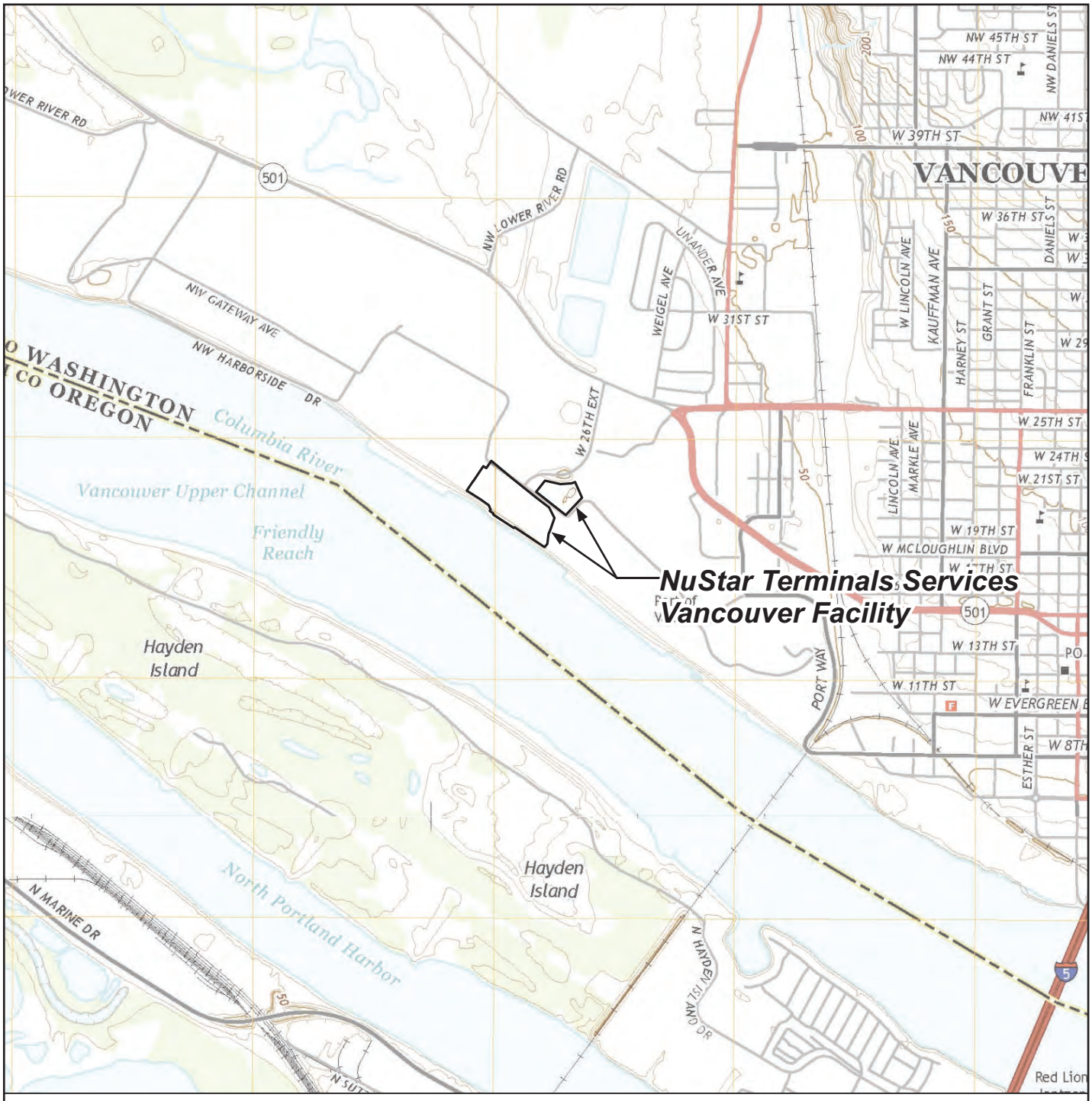


Note: Base map prepared from USGS 7.5-minute quadrangles of Vancouver, WA and Portland, OR-WA, dated 2014 as provided by USGS.gov.

0 2,000 4,000

Approximate Scale in Feet

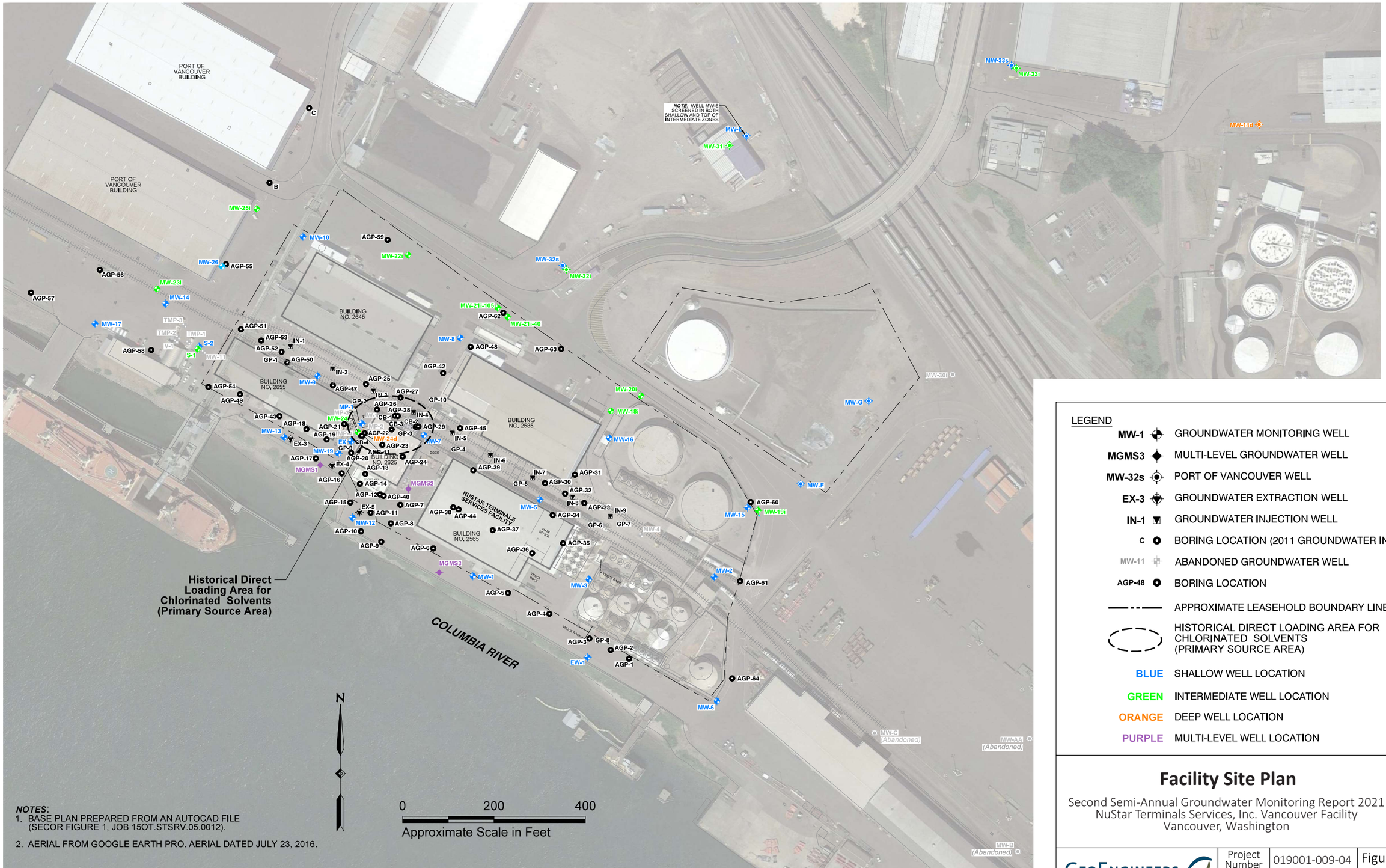
N

Facility Location Map

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

GeoEngineers

Project Number	019001-009-04	Figure 1
	February 2022	



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.

LEGEND

MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
EX-3	GROUNDWATER EXTRACTION WELL
IN-1	GROUNDWATER INJECTION WELL
C	BORING LOCATION (2011 GROUNDWATER INV.)
MW-11	ABANDONED GROUNDWATER WELL
AGP-48	BORING LOCATION
	APPROXIMATE LEASEHOLD BOUNDARY LINE
	HISTORICAL DIRECT LOADING AREA FOR CHLORINATED SOLVENTS (PRIMARY SOURCE AREA)
BLUE	SHALLOW WELL LOCATION
GREEN	INTERMEDIATE WELL LOCATION
ORANGE	DEEP WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Facility Site Plan

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

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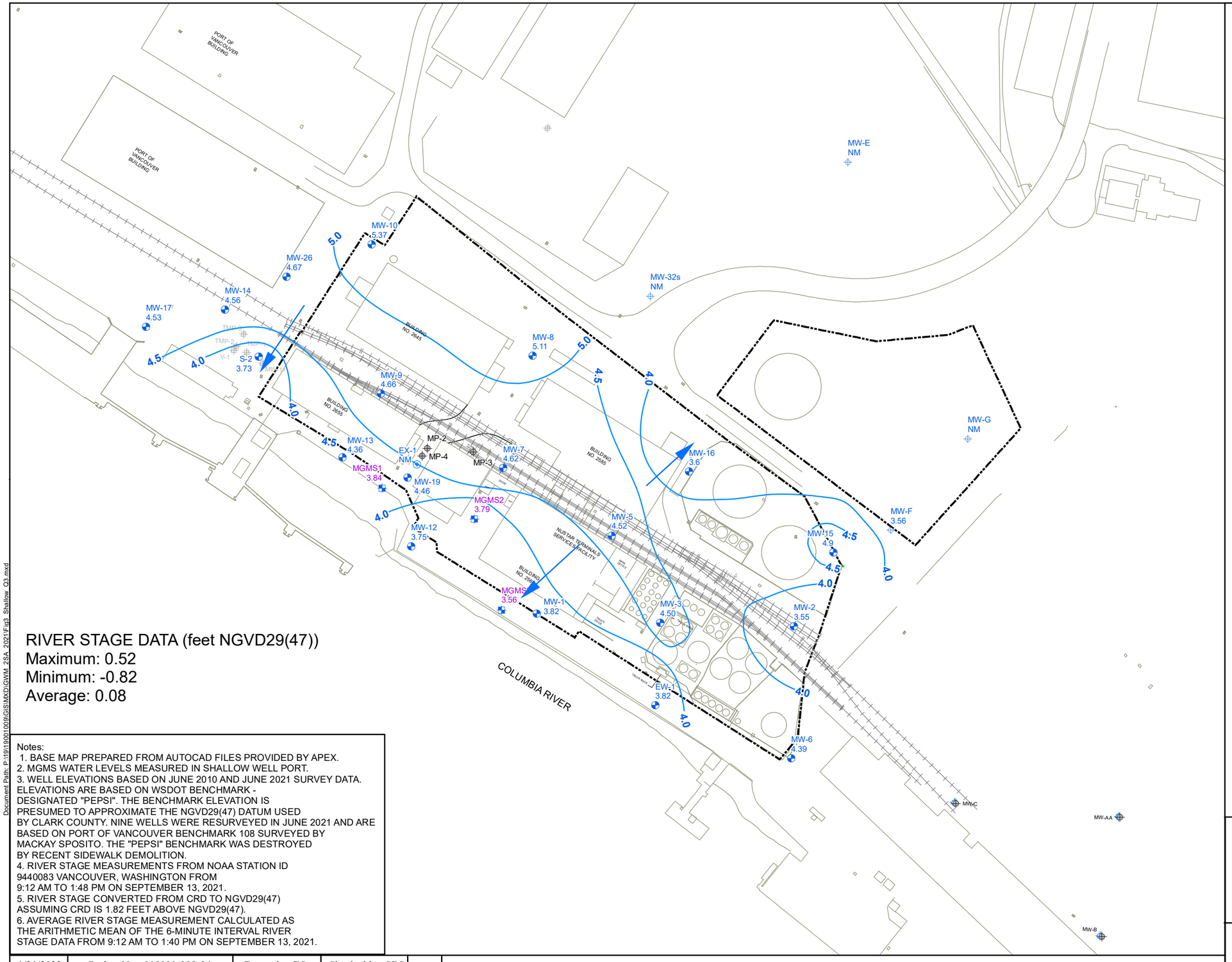
Project Number	019001-009-04	Figure
February 2022		**2**



RIVER STAGE DATA (feet NGVD29(47))
Maximum: 0.52
Minimum: -0.82
Average: 0.08

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 9:12 AM TO 1:48 PM ON SEPTEMBER 13, 2021.
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 9:12 AM TO 1:40 PM ON SEPTEMBER 13, 2021.

1/31/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS	

Document Path: P:\19\19001009\GIS\MXD\GWM_2SA_2021F\fig3_Shallow_Q3.mxd

Legend

- Port of Vancouver Well
- Multi-Level Groundwater Well
- Monitoring Well
- Historical Groundwater Extraction Well
- Abandonded Groundwater Well
- Groundwater Elevation Contour (Feet)
- Approximate Property Line
- 3.56 - Groundwater Elevation in Feet
- **NM - Not Measured**
- **BLUE - Shallow Well Location**
- **PURPLE - Multi Level Well Location**
- **Groundwater Flow Direction**

0 50 100 200 Feet

Third Quarter- Shallow Groundwater (September 2021)

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

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Figure 3

PORT OF VANCOUVER BUILDING

PORT OF VANCOUVER BUILDING

MW-25i
3.77

MW-23i
3.82

TMP-3
TMP-2
TMP-1
V-1
S-1
3.76

MW-22i
3.77

MW-31i
NM

MW-32i
NM

MW-21i-105
3.75

MW-21i-40
3.75

BUILDING NO. 2645

BUILDING NO. 2652

BUILDING NO. 2585

MW-24i
3.96

MW-18i
3.76

MW-20i
3.70

MW-30i

MGMS1
2.92

MGMS2
3.07

MGMS3
3.50

3.5

NUSTAR TERMINALS SERVICES FACILITY

BUILDING NO. 2565

MW-19i
3.46

COLUMBIA RIVER

MW-C

MW-AA

MW-B

RIVER STAGE DATA (feet NGVD29(47))
Maximum: 0.49
Minimum: -0.17
Average: 0.21

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 12:00 PM TO 1:36 PM ON SEPTEMBER 13, 2021.
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 12:00 PM TO 1:36 PM ON SEPTEMBER 13, 2021.

Legend

- Port of Vancouver Well
- Multi-Level Groundwater Well
- Monitoring Well
- Historical Groundwater Extraction Well
- Abandonded Groundwater Well
- Groundwater Elevation Contour (Feet)
- Approximate Property Line
- 4.14 - Groundwater Elevation in Feet
- **NM - Not Measured**
- **GREEN - Intermediate Well Location**
- **PURPLE - Multi Level Well Location**
- **Groundwater Flow Direction**

0 50 100 200 Feet

Third Quarter- Intermediate (September 2021)

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

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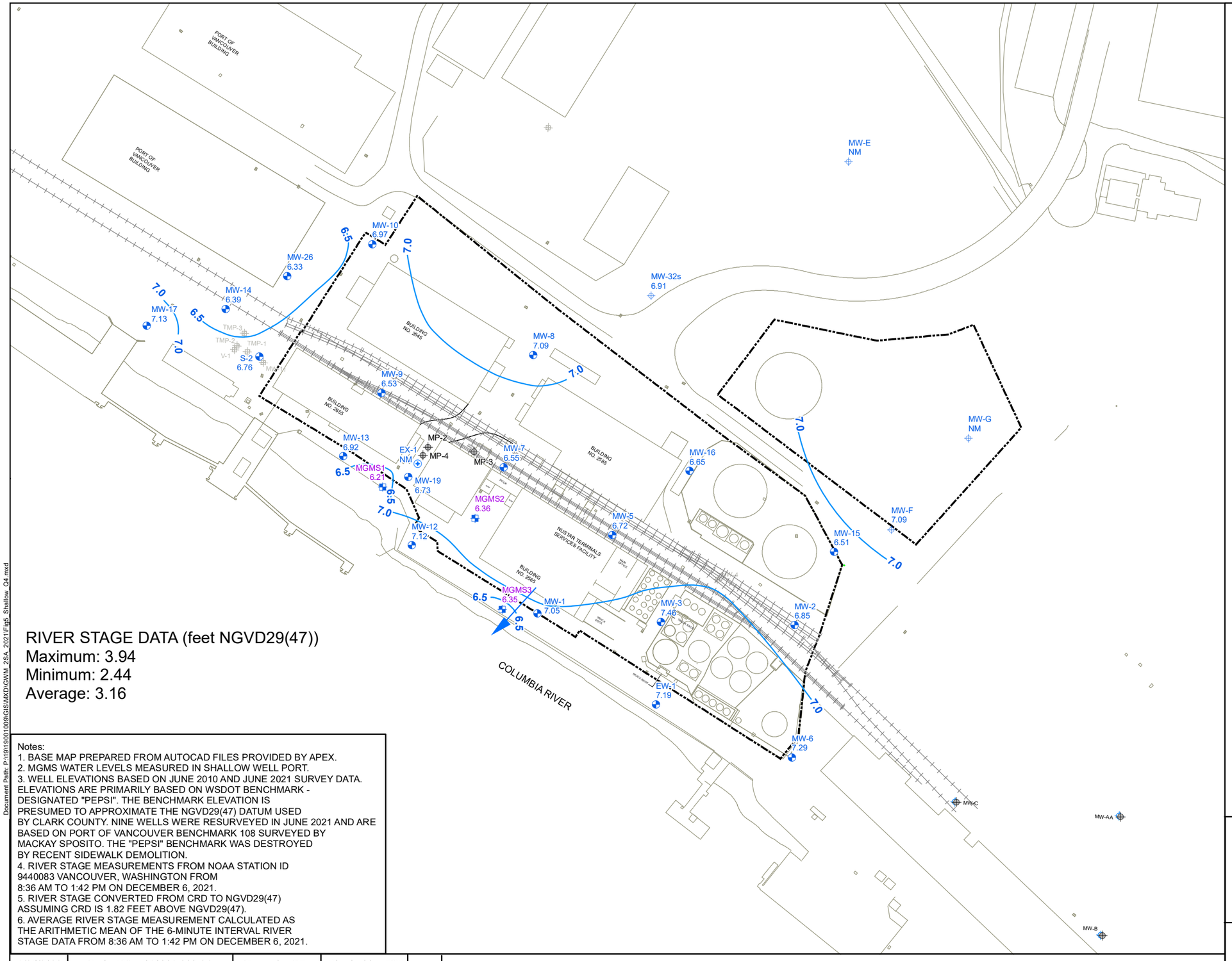
Figure 4

1/31/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS	

Document Path: P:\19\19001009\GIS\MXD\GWM_2SA_2021Fig4_Int_Q3.mxd



RIVER STAGE DATA (feet NGVD29(47))
Maximum: 3.94
Minimum: 2.44
Average: 3.16

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.
4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 8:36 AM TO 1:42 PM ON DECEMBER 6, 2021.
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 8:36 AM TO 1:42 PM ON DECEMBER 6, 2021.

Legend

- Port of Vancouver Well
- Multi-Level Groundwater Well
- Monitoring Well
- Historical Groundwater Extraction Well
- Abandonded Groundwater Well
- Groundwater Elevation Contour (Feet)
- Approximate Property Line
- 6.51 - Groundwater Elevation in Feet
- **NM - Not Measured**
- **BLUE - Shallow Well Location**
- **PURPLE - Multi Level Well Location**
- **Groundwater Flow Direction**

0 50 100 200 Feet

Fourth Quarter- Shallow Groundwater (December 2021)

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

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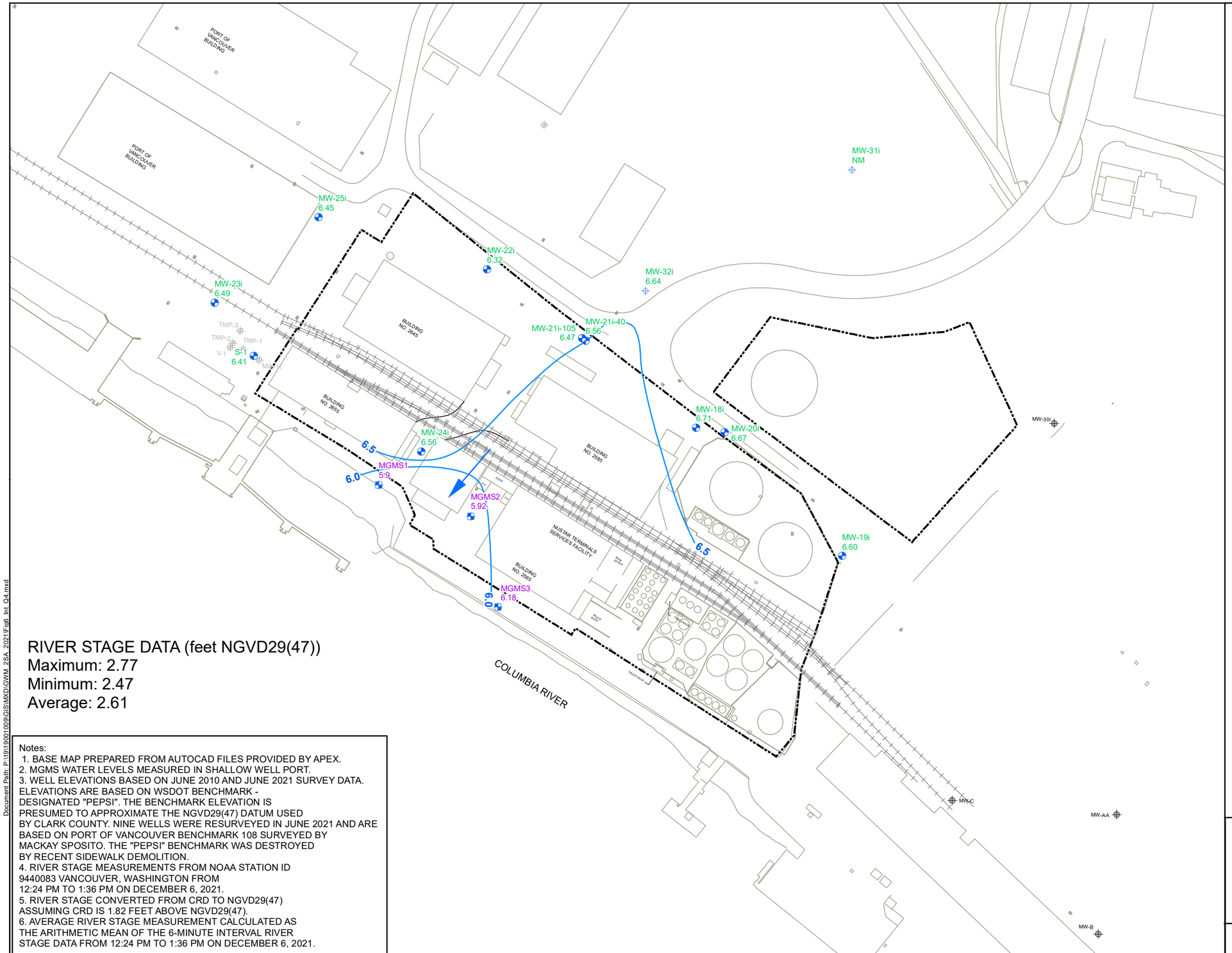
Figure 5

1/26/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS	

Document Path: P:\19\19001009\GIS\MXD\GWM_2SA_2021FIg5_Shallow_Q4.mxd



RIVER STAGE DATA (feet NGVD29(47))
Maximum: 2.77
Minimum: 2.47
Average: 2.61

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 12:24 PM TO 1:36 PM ON DECEMBER 6, 2021.
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 12:24 PM TO 1:36 PM ON DECEMBER 6, 2021.

Legend

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

0 50 100 200 Feet

Fourth Quarter- Intermediate (December 2021)

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

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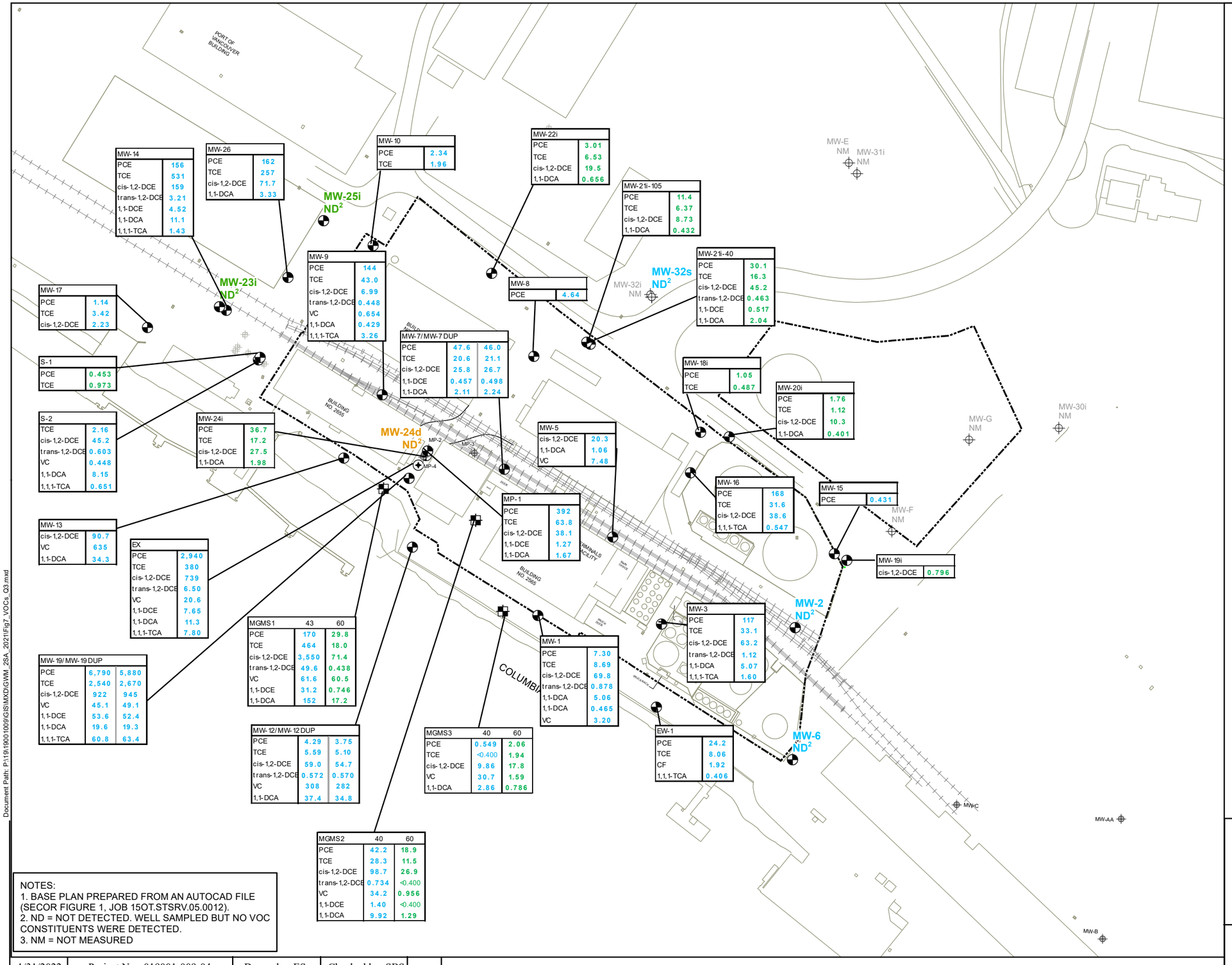
Figure 6

1/31/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS	

Document Path: P:\19\19001009\GIS\MXD\GWM_2SA_2021Fig6_Int_Q4.mxd



NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. ND = NOT DETECTED. WELL SAMPLED BUT NO VOC CONSTITUENTS WERE DETECTED.
3. NM = NOT MEASURED

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

MGMS1	43	60
PCE	219	24
TCE	507	15.3
cis-1,2-DCE	2,980	16.5
trans-1,2-DCE	45.5	<0.400
VC	48.2	<0.400
1,1-DCE	26.0	<0.400
1,1-DCA	124	1.16

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
- Abandonded 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

0 50 100 200 Feet

VOC Concentrations in Groundwater (September 2021)

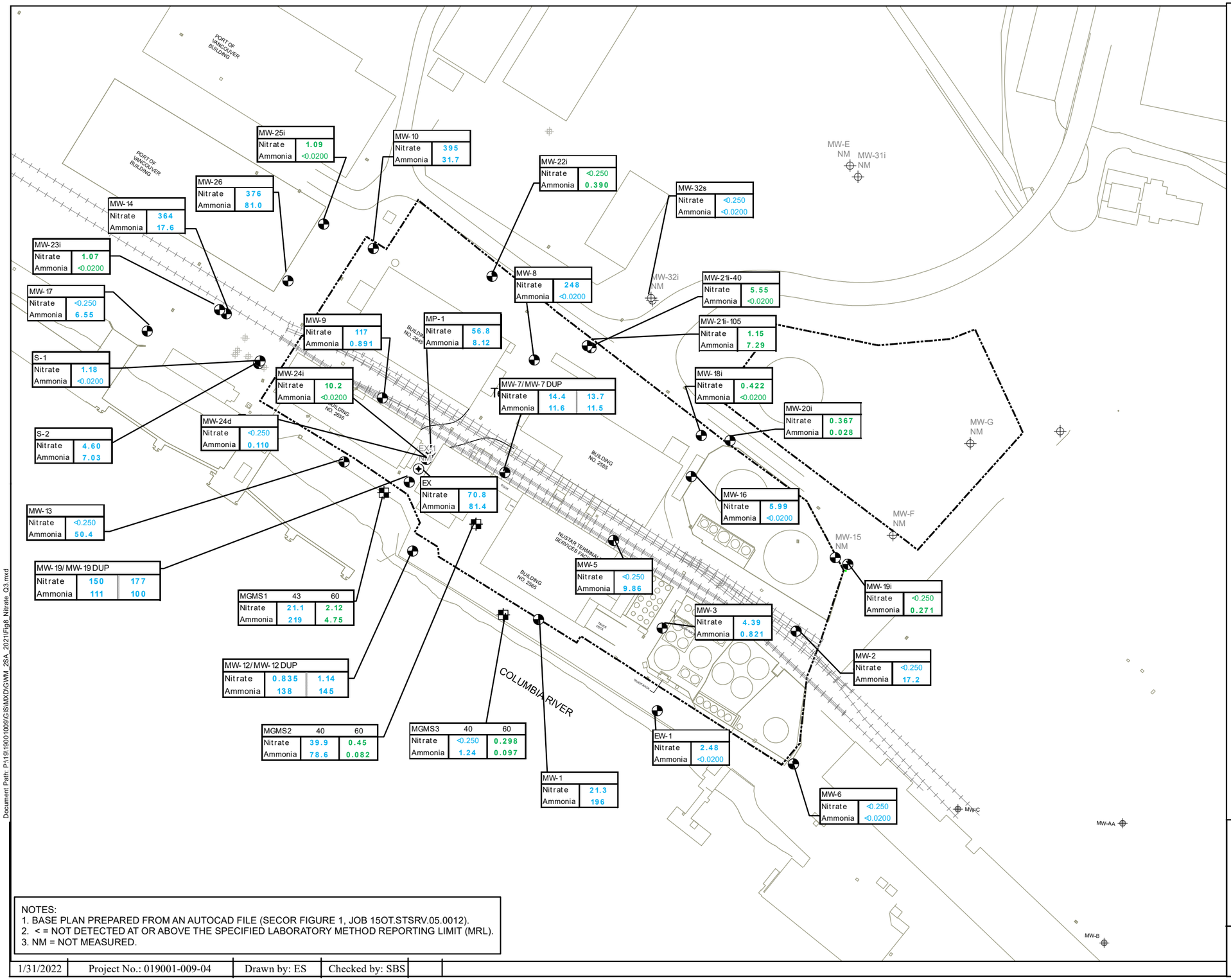
Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

GeoEngineers

Figure 7

1/31/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS	

Document Path: P:\19\19001009\GIS\MXD\GWM_2SA_2021\Fig7_VOCs_Q3.mxd



WELL IDENTIFICATION

MW-22i	
Nitrate	<0.250
Ammonia	0.325

NITRATE IN mg/L (AS NITROGEN METHOD 300.0)

AMMONIA IN mg/L (AS NITROGEN METHOD 350.1)

Legend

- Port of Vancouver Well
- Multi-Level Groundwater Well
- Monitoring Well
- Historical Groundwater Extraction Well
- Abandonded Groundwater Well
- Approximate Property Line

BLUE - Shallow zone concentration data

GREEN - Intermediate zone concentration

ORANGE - Deep zone concentration data

0 50 100 200 Feet

NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. < = NOT DETECTED AT OR ABOVE THE SPECIFIED LABORATORY METHOD REPORTING LIMIT (MRL).
3. NM = NOT MEASURED.

Nitrate and Ammonia Concentrations in Groundwater (September 2021)

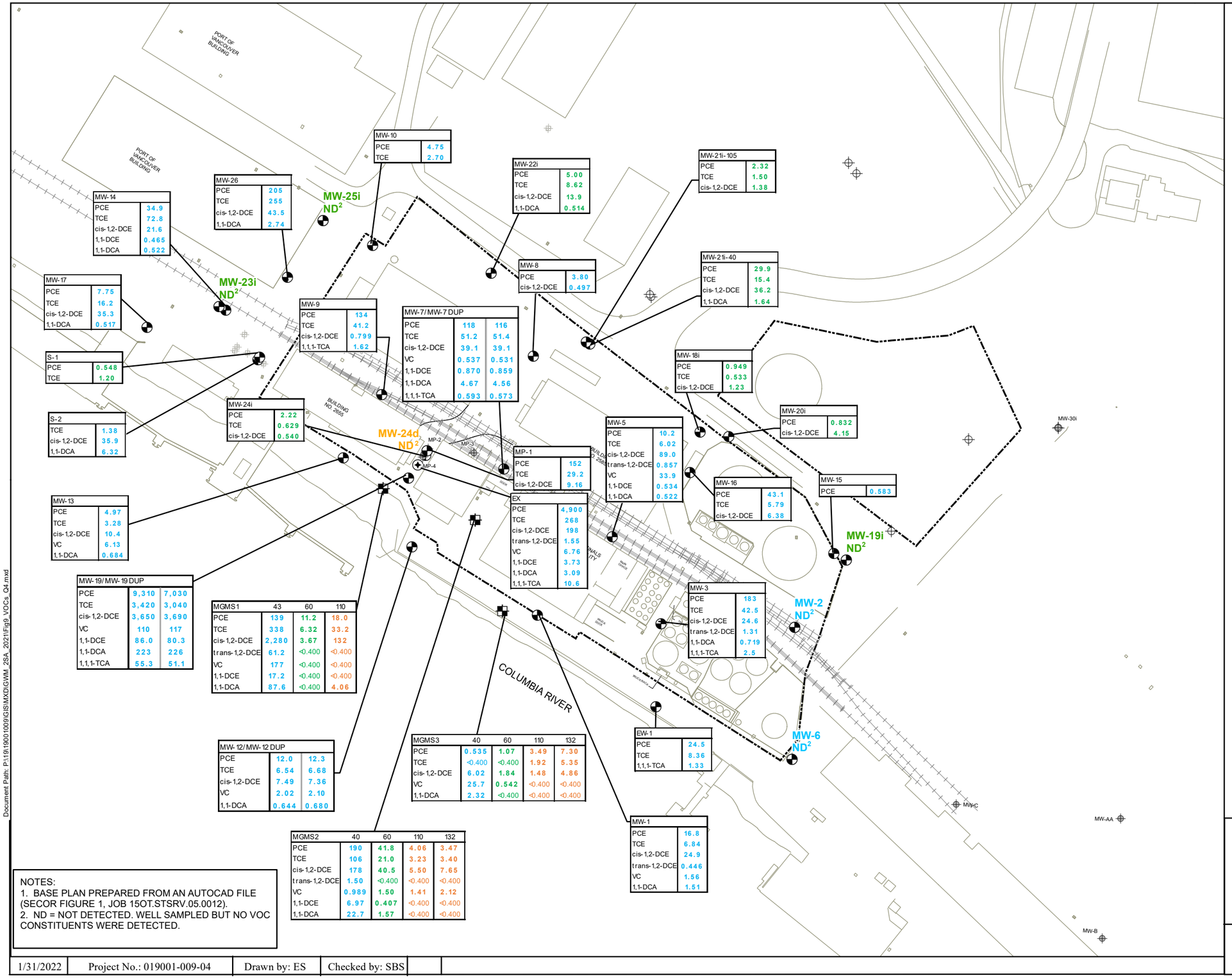
Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

GeoEngineers

Figure 8

1/31/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS

Document Path: P:\19\19001009\GIS\MXD\GWM_2SA_2021Fig8_Nitrate_Q3.mxd



NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. ND = NOT DETECTED. WELL SAMPLED BUT NO VOC CONSTITUENTS WERE DETECTED.

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

MGMS1	43	60	110
PCE	151	20.3	16.1
TCE	294	10.0	32.7
cis-1,2-DCE	2,620	13.1	163
trans-1,2-DCE	34.3	<0.400	0.49
VC	40.6	0.640	<0.400
1,1-DCE	<20.0	<0.400	0.52
1,1-DCA	131	1.54	5.56

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
- Abandonded 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

0 50 100 200 Feet

VOC Concentrations in Groundwater (December 2021)

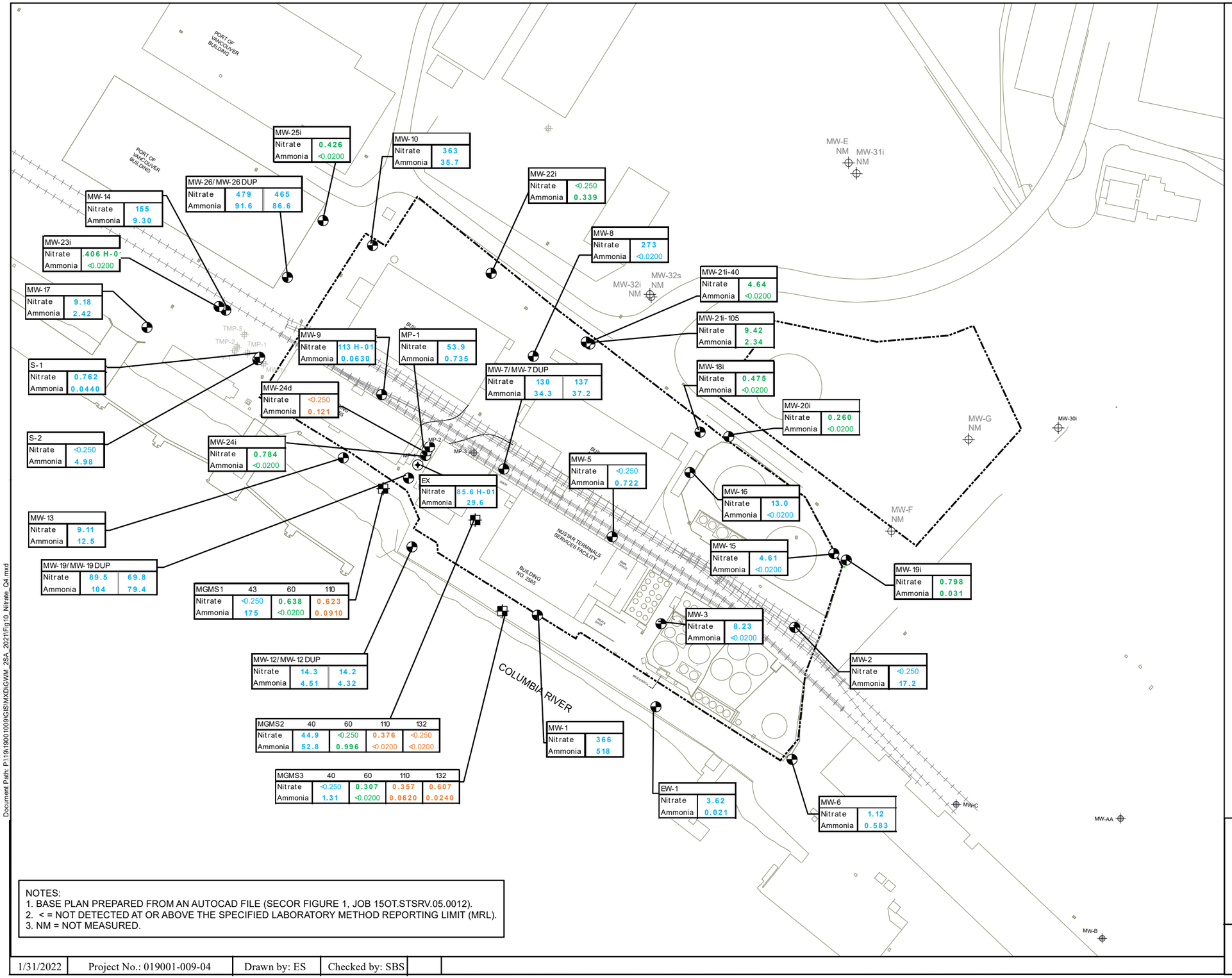
Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

GeoEngineers

Figure 9

1/31/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS	

Document Path: P:\19\19001009\GIS\MXD\GWM_2SA_2021\Fig9_VOCs_Q4.mxd



WELL IDENTIFICATION

MW-22i	
Nitrate	<0.250
Ammonia	0.34

NITRATE IN mg/L (AS NITROGEN METHOD 300.0)

AMMONIA IN mg/L (AS NITROGEN METHOD 350.1)

Legend

- Port of Vancouver Well
- Multi-Level Groundwater Well
- Monitoring Well
- Historical Groundwater Extraction Well
- Abandonded Groundwater Well
- Approximate Property Line

BLUE - Shallow zone concentration data

GREEN - Intermediate zone concentration data

ORANGE - Deep zone concentration data

NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. < = NOT DETECTED AT OR ABOVE THE SPECIFIED LABORATORY METHOD REPORTING LIMIT (MRL).
3. NM = NOT MEASURED.

Nitrate and Ammonia Concentrations in Groundwater (December 2021)

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

GeoEngineers

Figure 10

1/31/2022	Project No.: 019001-009-04	Drawn by: ES	Checked by: SBS	

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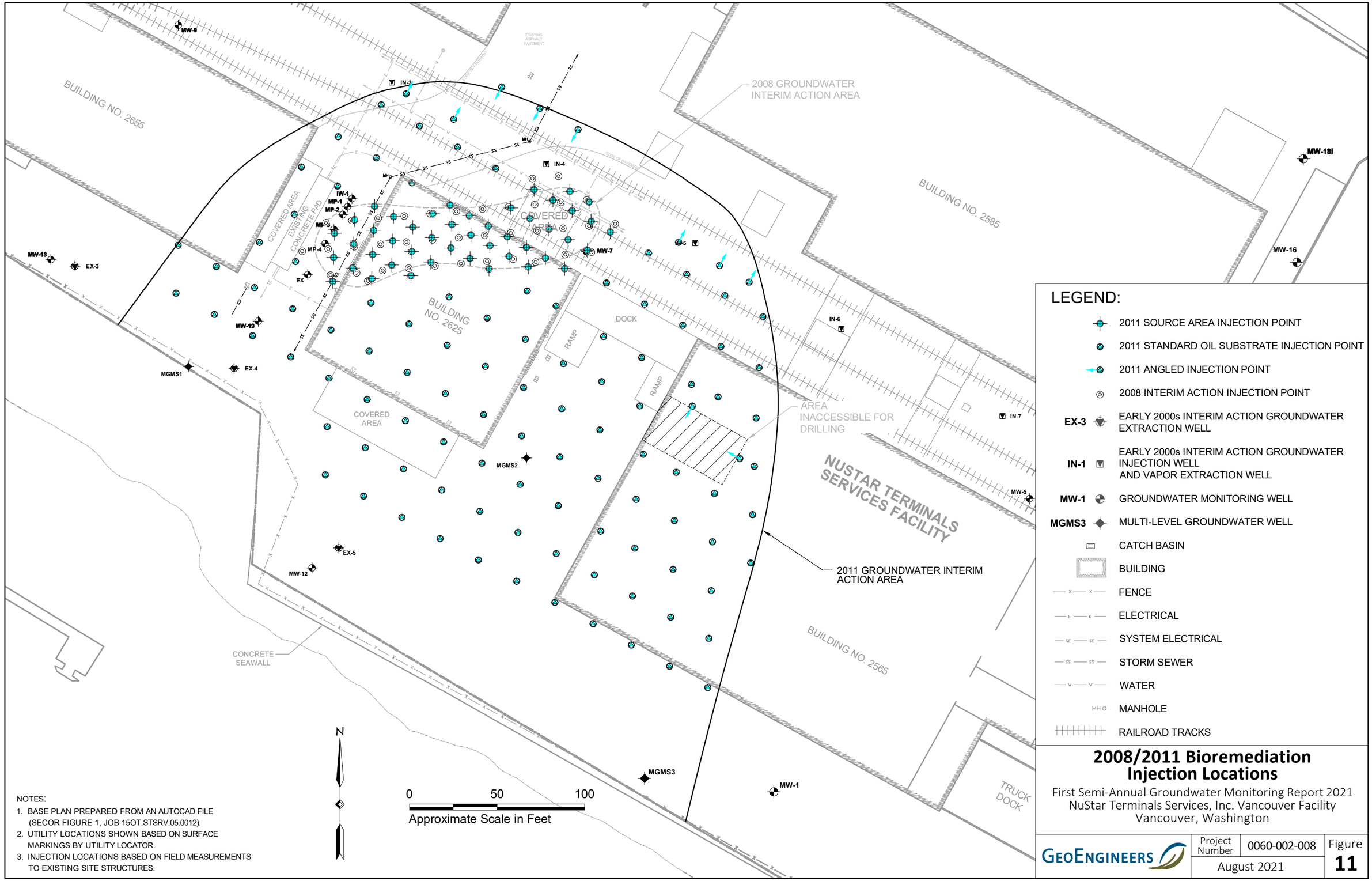


NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.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:

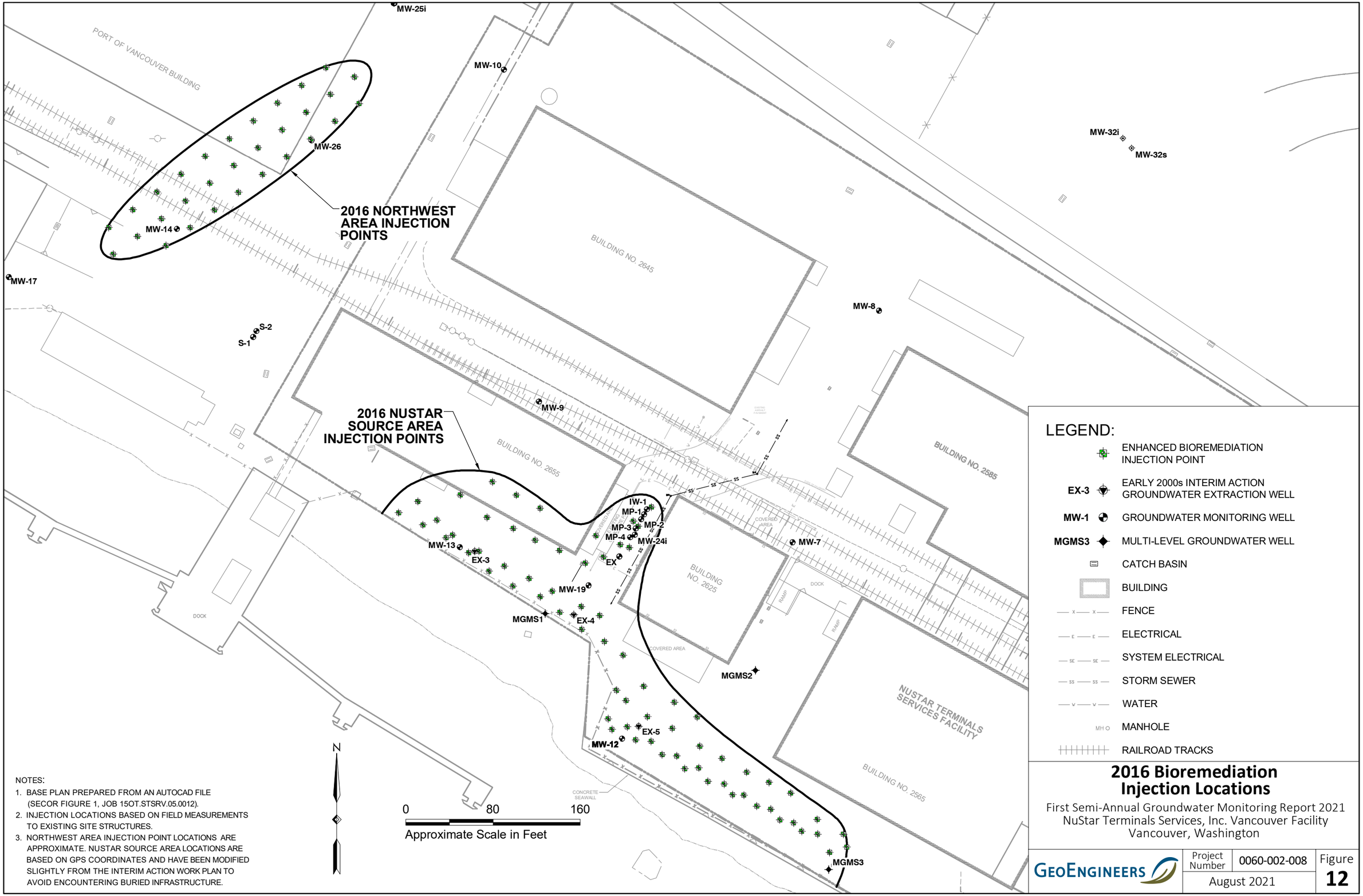
- 2011 SOURCE AREA INJECTION POINT
- 2011 STANDARD OIL SUBSTRATE INJECTION POINT
- 2011 ANGLED INJECTION POINT
- 2008 INTERIM ACTION INJECTION POINT
- **EX-3** EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- **IN-1** EARLY 2000s INTERIM ACTION GROUNDWATER INJECTION WELL AND VAPOR EXTRACTION WELL
- **MW-1** GROUNDWATER MONITORING WELL
- **MGMS3** MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MANHOLE
- RAILROAD TRACKS

2008/2011 Bioremediation Injection Locations

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

GeoEngineers

Project Number	0060-002-008	Figure 11
August 2021		



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.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:

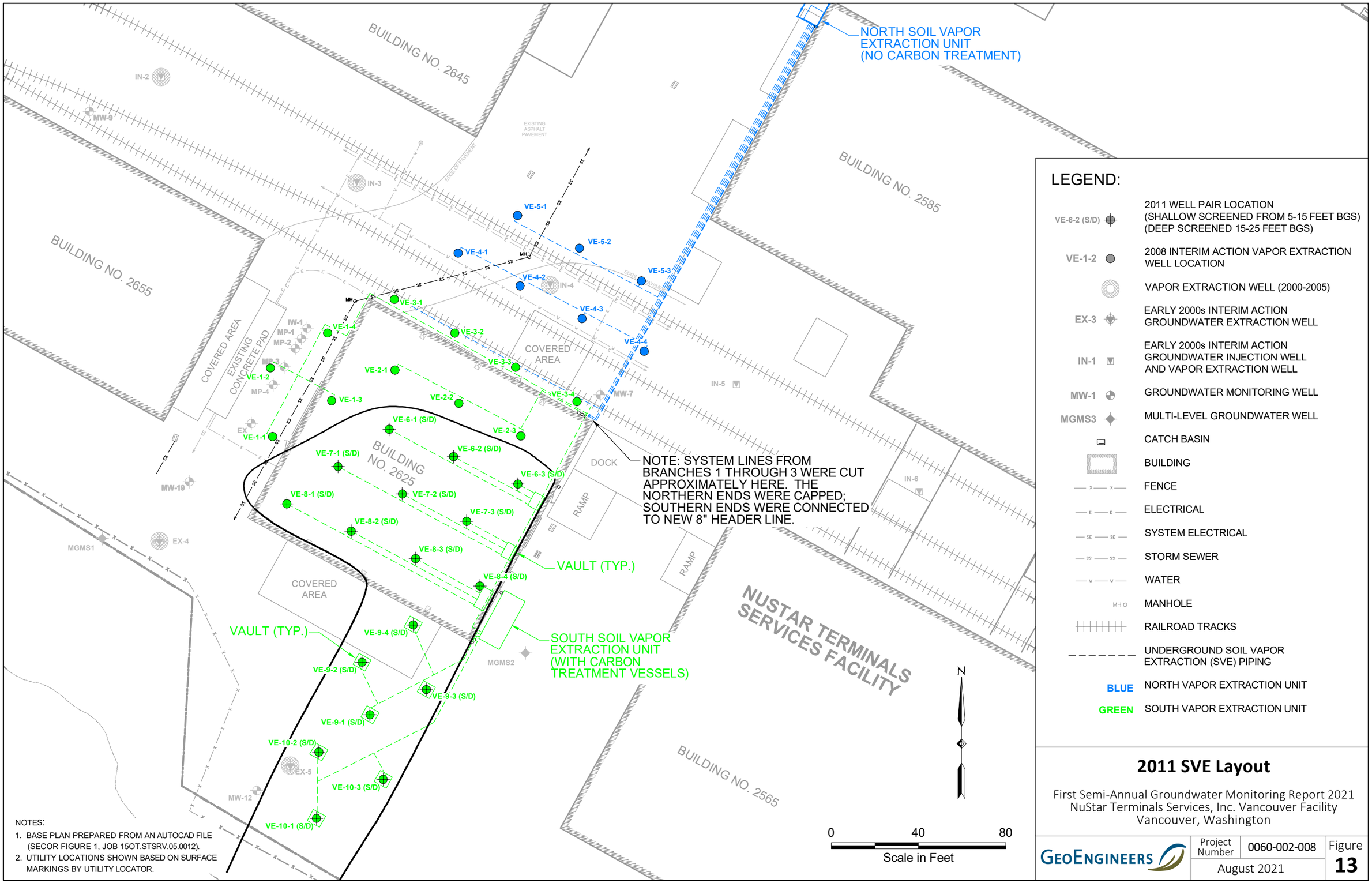
- ENHANCED BIOREMEDIATION INJECTION POINT
- EX-3 — EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- MW-1 — GROUNDWATER MONITORING WELL
- MGMS3 — MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MH — MANHOLE
- RAILROAD TRACKS

2016 Bioremediation Injection Locations

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

GeoEngineers

Project Number	0060-002-008	Figure
August 2021		12



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.

LEGEND:

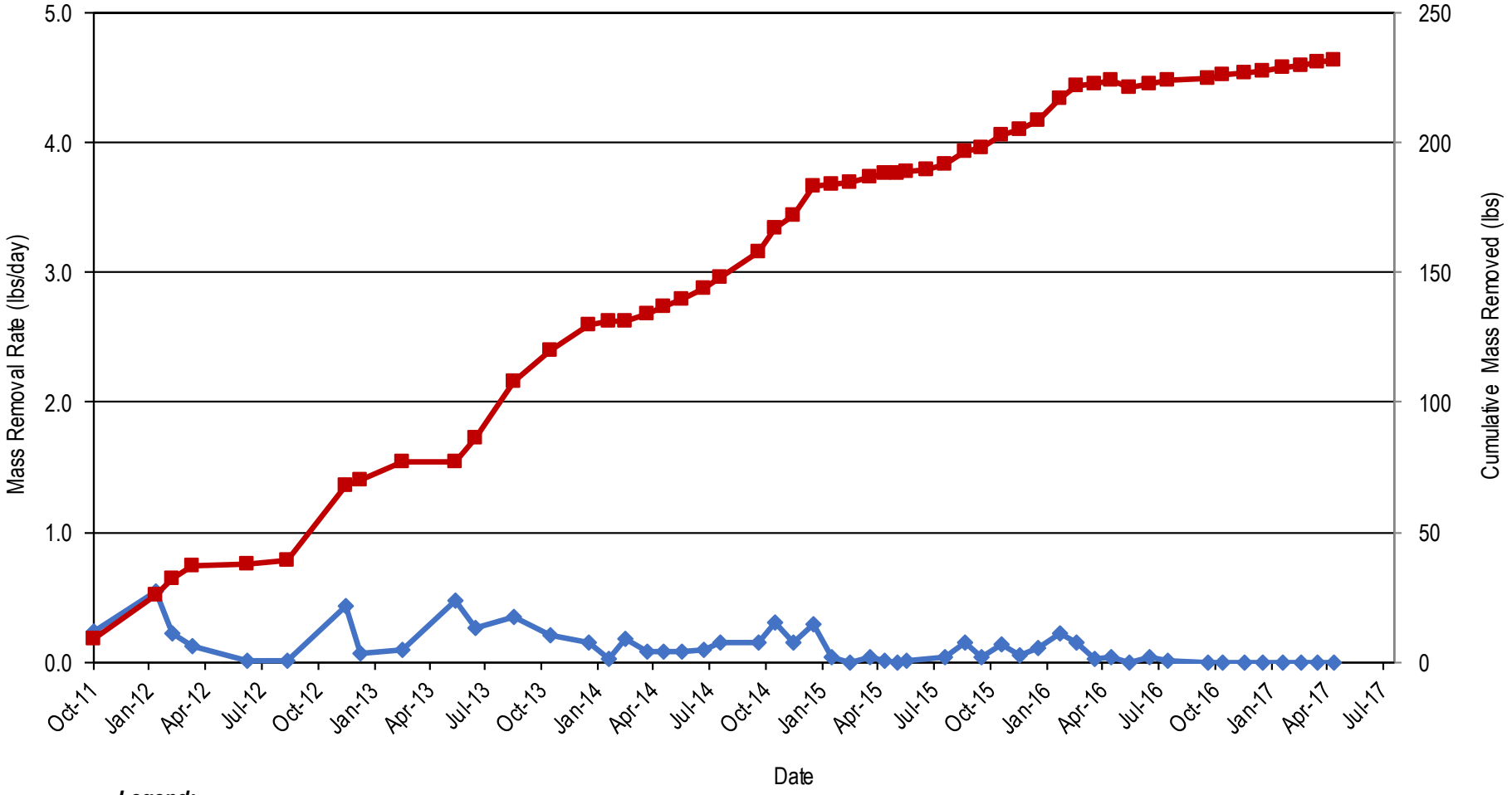
- VE-6-2 (S/D) — 2011 WELL PAIR LOCATION (SHALLOW SCREENED FROM 5-15 FEET BGS) (DEEP SCREENED 15-25 FEET BGS)
- VE-1-2 — 2008 INTERIM ACTION VAPOR EXTRACTION WELL LOCATION
- VAPOR EXTRACTION WELL (2000-2005)
- EX-3 — EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- IN-1 — EARLY 2000s INTERIM 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
- MH — MANHOLE
- RAILROAD TRACKS
- UNDERGROUND SOIL VAPOR EXTRACTION (SVE) PIPING
- BLUE — NORTH VAPOR EXTRACTION UNIT
- GREEN — SOUTH VAPOR EXTRACTION UNIT

2011 SVE Layout

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

GeoEngineers

Project Number	0060-002-008	Figure
August 2021		13



Legend:

Volatile Organic Compound (VOC) Removal Rate (lbs/day)

Approximate Cumulative VOCs Removed (lbs)

North SVE System – VOC Mass Removal

Second Semi-Annual Groundwater Monitoring Report 2021
NuStar Terminals, Inc. Vancouver Facility
Vancouver, Washington

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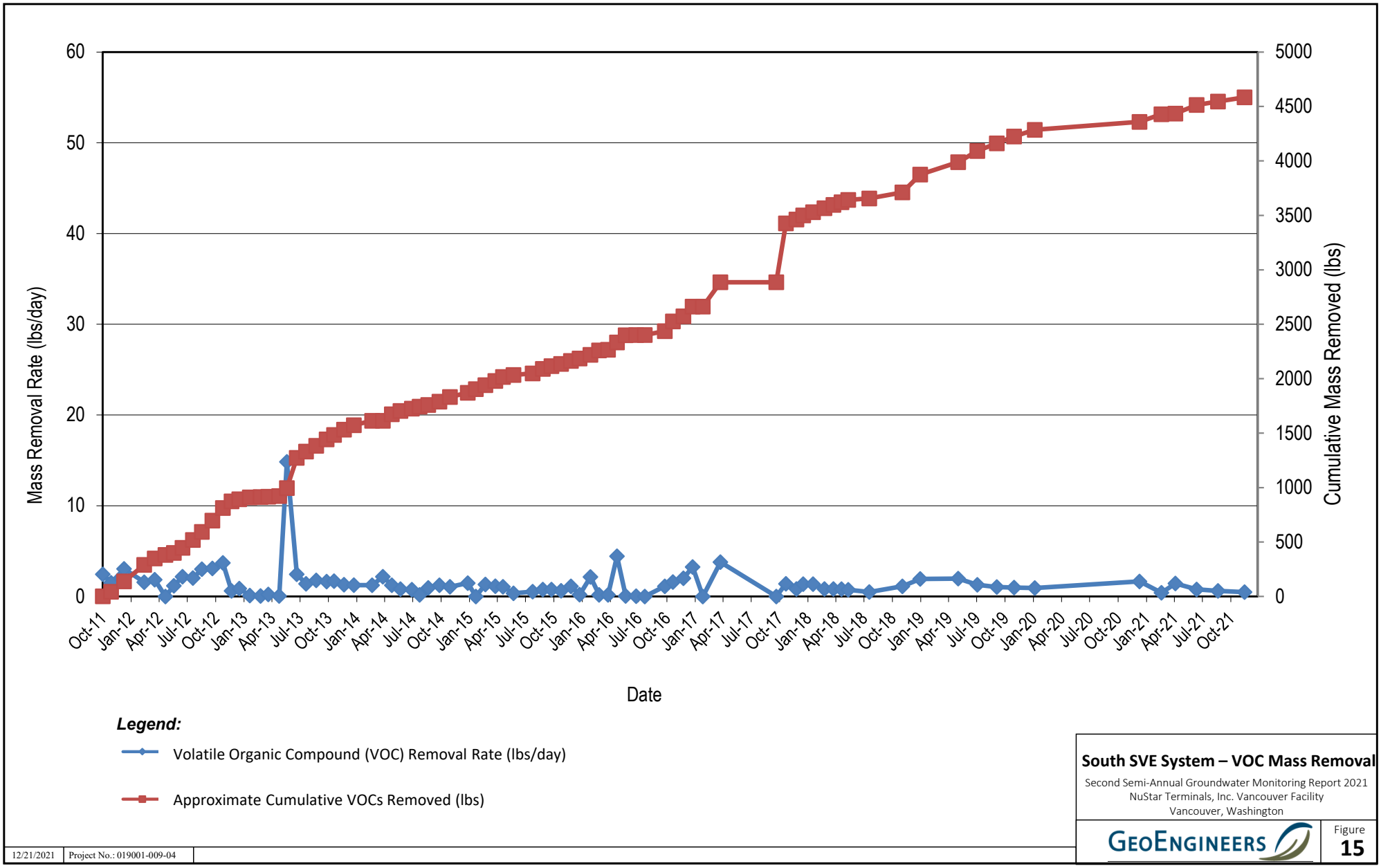
Figure **14**

12/21/2021 | Project No.: 019001-009-04



South SVE System – VOC Mass Removal

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NuStar Terminals, Inc. Vancouver Facility
Vancouver, Washington

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Figure **15**

12/21/2021 | Project No.: 019001-009-04

APPENDICES

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APPENDIX A
Field Sampling Data Sheets

Project:
Client: NuStar Vanc Main
Sampler: GW

Date: 9/13
Permit:

Well ID:	Time:	DTP:	DTW:	Product Thickness:	Notes:
MW-1	1132	—	28.78		
MW-5	1009	—	29.46		
MW-12	1125	—	27.68		
MW-19	1145	—	29.13		
MP-1	1150	—	29.34		
E MW-7	1004	—	29.12		
MW-9	0956	—	29.20		
MW-13	1139	—	28.79		
S S-2	1205	—	29.45		
NE MW-17	0915	—	28.12		
MW-14	0922	—	29.23		
MW-26	0930	—	29.06		
E MW-10	0937	—	29.13		
N MW-8	0948	—	28.86		
MW-32s					
MW-16	1018	—	29.45		1 bolt only
MW-15	1032	—	34.32		
1357 MW-F	~~1043~~		~~30.55~~		~~obstruction (pump) @ 29'~~
MW-2	1050	—	30.49		
MW-6	1058	—	28.44		
EW-1	1116	—	27.25		1 bolt only
E MW-3	1105	—	29.91		
MGMS3-40	1318	—	28.09		
MGMS3-60	1315	—	28.15		
MGMS3-101	1313	—	28.17		
MGMS3-132	1310	—	28.20		

Project:
Client:
Sampler:

Date:
Permit:

Well ID:	Time:	DTP:	DTW:	Product Thickness:	Notes:
MGMS2-40	1336	—	28.80		
MGMS2-60	1334	—	29.52		
MGMS2-110	1330	—	29.57		
MGMS2-132	1328	—	29.46		
MGMS1-43	1348		29.02		
MGMS1-60	1346	—	29.67		
MGMS1-110	1342	—	29.53		
MW-24d	1153	—	30.23		
MW-24i	1158	—	29.51		
S-1	1211	—	28.96		
MW-23i	1222	—	29.98		
MW-25i	1228	—	29.81		
MW-22i	1233	—	30.62		
MW-21i-105	1238	—	30.24		
MW-21i-40	1243	—	30.35		
MW-32i	~~1248~~	—			
MW-18i	1251	—	29.64		
MW-20i	1248	—	29.44		2 bolts only
MW-19i	1254	—	30.16		
EX	1202	—	28.79		

S

W

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-23i	Job Number:	
Client:	Water VAN	Date:	9/15/21
Project:	3621	Sampler:	LW
Weather:	Sunny, 65°F	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	Good	Depth to Water:	31.36	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 LF	Pump Intake Depth:	MS
Sampling Method:		Tubing Material & Type:	SIS 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	
1029			31.36	0.25	6.49	16.17	1460	7.23	203	clear
1032			↓	↓	7.33	14.72	273	7.32	147	↓
1035					7.28	14.54	254	2.51	163	
1038					7.19	14.45	259	2.57	164	
1041					7.13	14.45	259	2.46	165	
1044					7.11	14.43	259	2.37	166	

PURGING DATA

Sample ID:	MW-23i	Sampling Flow Rate:	0.25	Analytical Laboratory:		Apex
Sample Time:	1045	Final Depth to Water:	31.36	Did Well Dewater:		No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs	—			
1x250	H2SO4	NH3	—			
1x250	—	NO2/NO3	—			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-8	Job Number:	
Client:	Nvstar DAN	Date:	9/15/21
Project:	3Q21	Sampler:	LW
Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	4"	Depth to Free Product:	—
	Other: (Vault) good	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	28.91	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 Bladder Pump LF low flow	Pump Intake Depth:	mid screen
Sampling Method:		Tubing Material & Type:	Skip bonded 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	
1108			28.91	0.25	6.02	16.07	Ø	41.74	234	clear
1111			29.21	0.125	6.73	16.29	1160	4.30	188	↓
1114			29.29	0.2	6.84	16.32	2210	1.92	190	
1117			↓	↓	6.52	16.17	2360	1.53	194	
1120					6.52	16.18	2340	1.43	193	
1123					6.51	16.22	2350	1.36	193	

PURGING DATA

Sample ID:	MW-8	Sampling Flow Rate:	0.2		Analytical Laboratory:	Apex
Sample Time:	1120	Final Depth to Water:	29.29		Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs	—	—		
1x250	H2SO4	NH3	—	—		
1x250	—	NO2/NO3	—	—		

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-18i	Job Number:	
Client:	Nu Star Dam	Date:	9/15/21
Project:	3021	Sampler:	LW
Weather:	Sunny	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:	30.32	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:	Mod Screen
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	
1229			30.32	0.3	7.14	14.70	483	3467	211	clear
1232			↓	↓	7.23	15.63	238	6.68	194	↓
1235					7.22	14.65	185	4.20	201	
1238					7.18	14.35	184	3.74	206	
1241					7.15	14.28	185	3.53	210	
1244					7.12	14.26	185	3.37	213	

PURGING DATA

Sample ID:	MW-18i	Sampling Flow Rate:	0.3	Analytical Laboratory:		Anex
Sample Time:	1245	Final Depth to Water:	30.32	Did Well Dewater:		N
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs				
1x250	H2SO4	NH3				
1x250	—	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Cascadia Associates, LLC — Geo Engineers

Well ID:	MW-5	Job Number:	
Client:	Nustar VAN	Date:	9/15/21 LW
Project:	3021	Sampler:	
Weather:	Sunny	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:	25.59	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	
1415			29.59	0.25	6.00	15.62	816	24.52	111	clear
1418			29.71	0.2	6.43	19.93	900	3.78	-90	↓
1421			29.94	↓	6.63	24.78	1110	4.46	-114	
1424			29.99		6.58	25.86	1090	4.12	-117	
1427			30.05		6.58	26.04	1080	0.09	-120	↓
1430			30.08		6.58	26.13	1070	0.26	-122	
1433			30.12	↓	6.58	26.17	1070	0.05	-123	↓

PURGING DATA

Sample ID:	MW-5	Sampling Flow Rate:	0.2	Analytical Laboratory:	Apex	
Sample Time:	1430	Final Depth to Water:	30.15	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs	—			
1x250	H2SO4	NH3				
1x250	—	NO2/NO3	—			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Cascadia Associates, LLC (Geo. Engineers)

Well ID:	MW-19i	Job Number:	
Client:	NWStar NAN	Date:	9/15/21
Project:	3602	Sampler:	LW
Weather:	Sunny	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:	30.25	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	
1343			30.25	0.35	6.94	13.10	225	17.36	1	clear
1346			↓	↓	7.17	15.33	264	3.71	19	↓
1349					7.13	14.78	323	0.25	4	
1352					7.01	14.64	328	0.01	-2	
1355			↓	↓	6.98	14.59	328	0.01	-2	↓
1358			↓	↓	6.97	14.61	328	0.00	-2	↓

PURGING DATA

Sample ID:	MW-19i	Sampling Flow Rate:	0.35		Analytical Laboratory:	Apex
Sample Time:	1406	Final Depth to Water:	30.25		Did Well Dewater:	N
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOC1	—			
1x250	H2SO4	NH3				
1x250	—	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Cascadia Associates, LLC — Geo Engineers

Well ID:	MW-20i	Job Number:	
Client:	Nustar Van	Date:	9/15/21
Project:	3Q21	Sampler:	MS
Weather:	Sunny	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	29.99	Water Column Length:	—
Well Cap Lock Present:	(Yes) No	Screened Interval:	45-55	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 Low flow	Pump Intake Depth:	mid screen (50')
Sampling Method:		Tubing Material & Type:	SKP bond — 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	
1312			29.99	0.25	6.65	15.27	290	3.01	29	cloudy clear
1315			↓	↓	7.08	14.71	269	0.51	10	slt cloudy clear
1318					7.08	14.69	296	0.06	-1	↓
1321					6.94	14.40	298	0.01	-10	
1324			↓	↓	6.90	14.44	299	0.01	-10	↓

PURGING DATA

Sample ID:	MW-20i	Sampling Flow Rate:	0.25		Analytical Laboratory:	Apex
Sample Time:	1325	Final Depth to Water:	29.99		Did Well Dewater:	no

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs	—			
1x250	H2SO4	NH3	—			
1x250	—	NO2/NO3	←			

NOTES/ADDITIONAL COMMENTS

New tubing (60')
Sample slt. cloudy.

WELL MONITORING DATA SHEET

Well ID:	MW-32s	Job Number:		
Client:	NuStar Van	Date:	9/16	
Project:	GWM 3Q21	Sampler:	GW	
Weather:	Pt. Sun 55°	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:	30.85	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 / dedicated 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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
756			30.85	.25	6.82	15.9	602	7.16	103.4	clear
759			31.04	↓	6.51	15.4	610	6.20	115.3	↓
802			31.11	↓	6.47	15.5	619	5.57	120.0	↓
805			31.20	↓	6.44	15.5	621	5.11	123.1	↓
808			31.25	↓	6.43	15.5	619	4.59	126.7	↓
811			31.28	↓	6.42	15.5	616	4.18	128.7	↓
814			↓	↓	6.42	15.4	612	3.76	129.6	↓
817			↓	↓	6.41	15.4	612	3.64	131.0	↓
820			↓	↓	6.41	15.4	610	3.61	132.1	↓

PURGING DATA

Sample ID:	MW-32s	Sampling Flow Rate:	.25	Analytical Laboratory:		Apex
Sample Time:	820	Final Depth to Water:	31.28	Did Well Dewater:		No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 830

WELL MONITORING DATA SHEET

Well ID:	MGMS2-6D	Job Number:		
Client:	NuStar Van	Date:	9/16	
Project:	GWM 3Q21	Sampler:	AD	
Weather:	Sunny 85°	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:	vault	Depth to Water:	30.54	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 flow	Pump Intake Depth:	MS
Sampling Method:	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
912			30.54	.15	6.57	15.6	418.1	3.44	154.5	clear
915			↓	↓	6.61	16.4	332.0	3.17	149.1	↓
918					6.69	17.1	273.2	3.02	143.9	
921					6.79	17.4	233.3	2.78	137.3	
924					6.84	17.3	222.0	2.41	133.8	
927					6.86	17.3	210.9	2.24	128.6	
930					6.87	17.4	207.3	2.11	126.1	

PURGING DATA

Sample ID:	MGMS2-6	Sampling Flow Rate:	.15			Analytical Laboratory:	Apex ND
Sample Time:	930	Final Depth to Water:	30.54			Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 935

WELL MONITORING DATA SHEET

Well ID:	MGMS2-40	Job Number:		
Client:	NuStar Vun	Date:	9/10	
Project:	GWM 3Q19	Sampler:		
Weather:	Sun 65	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 - MGMS	Depth to Water:	29.74	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 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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
940			29.74	.2	6.81	17.4	873	2.75	123.3	clear
943			↓	↓	7.23	17.7	1546	3.13	61.0	↓
946					7.67	18.2	1417	3.50	18.4	
949					7.59	18.1	1466	4.02	19.5	
952					7.56	18.0	1479	4.10	19.2	
955					7.55	17.9	1470	4.14	18.9	

PURGING DATA

Sample ID:	MGMS2-40	Sampling Flow Rate:	.2	Analytical Laboratory:		Apex
Sample Time:	955	Final Depth to Water:	29.74	Did Well Dewater:		N

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC				
2x40	HCl	RSK				
1x250	H2SO4	NO2/3				
1x25	—	NH3				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 1010

WELL MONITORING DATA SHEET

Well ID:	EW-1	Job Number:		
Client:	NuStar Van	Date:	9/16	
Project:	GWM 3Q1	Sampler:	AW	
Weather:	Sun 65	Time In/Out:		

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:		Free Product Thickness:	—
Monument Condition:	good	Depth to Water:	28.57	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 Intake Depth:	~~28.8~~ ~~29.5~~
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1050			~~28.57~~	.2	8.12	16.8	510	7.99	130.3	cloudy
1053			27.52		7.73	15.8	298.1	6.65	134.2	
1056			↓		7.07	15.7	301.7	5.11	149.2	
1059					7.02	15.6	283.2	4.97	151.3	
1102					7.02	15.7	277.1	4.90	150.8	
1105					7.03	15.7	270.6	4.85	151.6	

PURGING DATA

Sample ID:	EW-1	Sampling Flow Rate:	.2		Analytical Laboratory:	Apex
Sample Time:	1105	Final Depth to Water:	27.52		Did Well Dewater:	NO

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC				
1x250	H2SO4	NO2/3				
1x250	—	NH3				

NOTES/ADDITIONAL COMMENTS

* DTB = 28.05'

WELL MONITORING DATA SHEET

Well ID:	EX	Job Number:		
Client:	Nustar Name	Date:	9/16	
Project:	GWM 3Q21	Sampler:	AL	
Weather:	Sun 70°	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:	Vault - good	Depth to Water:	28.81	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 Low flow	Pump Intake Depth:	MS 35'
Sampling Method:		Tubing Material & Type:	BB (NEW / DEDICATED)

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1132			28.81	.25	6.55	20.7	1464	6.50	210.9	clear
1135			↓	↓	6.55	16.7	1757	6.57	214.6	↓
1138			↓	↓	7.00	15.7	1915	5.31	207.2	↓
1141			↓	↓	7.07	15.6	1885	4.77	201.9	↓
1144			↓	↓	7.10	15.7	1823	3.53	190.4	↓
1147			↓	↓	7.10	15.7	1830	3.33	188.5	↓
1150			↓	↓	7.11	15.6	1835	3.25	186.4	↓

PURGING DATA

Sample ID:	EX	Sampling Flow Rate:	.25			Analytical Laboratory:	Apex
Sample Time:	1150	Final Depth to Water:	28.81			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x 40	HCl	VOC	—				—
2x 40	HCl	RSK	—				—
1x 250	H2SO4	NO2/3	—				—
1x 250	—	NH3	—				—

NOTES/ADDITIONAL COMMENTS

New tubing ~ $50
VOA no headspace @ 1205

WELL MONITORING DATA SHEET

Well ID:	MGMS3-60	Job Number:		
Client:	Nu Star Var	Date:	9/16	
Project:	GWM 3Q21	Sampler:	AD	
Weather:	Sun 75°	Time In/Out:		

WELL DATA

Monument Type:	Flush-mount/Stick up Vault	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS good	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	29.68	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 low flow	Pump Intake Depth:	MS
Sampling Method:		Tubing Material & Type:	2DPE

NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1230			29.68	.2	7.34	21.1	1084	2.41	86.4	clear
1233			↓	↓	7.36	20.5	683	2.85	78.1	↓
1236					7.35	19.7	287	2.36	58.7	
1239					7.34	19.6	275	2.30	49.4	
1242					7.34	19.5	272	2.19	46.5	

PURGING DATA

Sample ID:	MGMS3-60	Sampling Flow Rate:	.2		Analytical Laboratory:	Apex
Sample Time:	1242	Final Depth to Water:	29.69		Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—			
1x250	H2SO4	NO2/3	—			
1x250	—	NH3	—			

NOTES/ADDITIONAL COMMENTS

VOA no headsp

WELL MONITORING DATA SHEET

Well ID:	MGMS3-40	Job Number:		
Client:	NW Stan Van	Date:	9/16	
Project:	GWM3Q21	Sampler:	AMS	
Weather:	Sun 70°	Time In/Out:		

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS Vault	Well Depth:		Free Product Thickness:	—
Monument Condition:	good	Depth to Water:	29.06	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 Intake Depth:	MS
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1256			29.06	.25	6.88	22.2	265.4	2.60	64.3	clear
1259			↓	↓	6.65	18.5	397.3	2.57	67.4	↓
1302			↓	↓	6.69	17.7	412.5	2.62	44.0	↓
1305			↑	↓	6.69	17.6	414.7	2.[illegible]	40.9	↓
1308			↑	↓	6.71	17.5	412.4	2.07	35.9	↓
1311			↑	↓	6.72	17.5	410.6	2.01	31.7	↓

PURGING DATA

Sample ID:	MGMS3-40	Sampling Flow Rate:	.25		Analytical Laboratory:	Apex
Sample Time:	1311	Final Depth to Water:	29.06		Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—	—	—	—
1x250	H_2SO_4	NO2/3	—	—	—	—
1x250	—	NH3	—	—	—	—
2x40	HCl	RSK	—	—	—	—
3x40	HCl	VOC	—	—	—	MGMS3-40 Dup
1x250	H_2SO_4	NO2/3	—	—	—	↓

NOTES/ADDITIONAL COMMENTS

1x250	—	NH3	—	—	—	↓

VOA no headsp @ 1330

WELL MONITORING DATA SHEET

	Well ID:	MW-12	Job Number:	
	Client:	Nu Star Ven	Date:	9/14
	Project:	GWM 3Q21	Sampler:	
	Weather:	Sun 60°	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:	27.70	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 low flow	Pump Intake Depth:	MS 35'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
752			27.70	.25	6.67	15.9	2937	9.07	40.1	cloudy
755			27.80	.2	6.63	15.5	3070	6.86	32.1	clear
758			27.92	↓	6.64	15.5	3061	5.40	22.0	↓
801			28.04		6.65	15.9	3050	4.16	10.7	
804			28.08		6.65	15.9	3045	3.79	4.8	
807			28.10	↓	6.66	16.1	3032	3.69	-1.1	

PURGING DATA

Sample ID:	MW-12	Sampling Flow Rate:			Analytical Laboratory:		Apex NS
Sample Time:	807	Final Depth to Water:	28.16		Did Well Dewater:		
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NH3	—				
1x250	—	NO2/NO3	—				
2x40	HCl	RSK	—				
3x40	HCl	VOC	—			MW12	Dup
1x250	H2SO4	NH3	—			↓	

NOTES/ADDITIONAL COMMENTS

1x250 — NO2/3

VOA no headsp @ 825

WELL MONITORING DATA SHEET

Well ID:	MW-13	Job Number:		
Client:	NuStarVan	Date:	9/14	
Project:	GWM 3Q21	Sampler:	AW	
Weather:	Sun 75°	Time In/Out:		

WELL DATA

Monument Type:	Flush-mount / Stick-up / Other:	Well Diameter:	4"	Depth to Free Product:	—
		Well Depth:	—	Free Product Thickness:	—
Monument Condition:	Good	Depth to Water:	28.78	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 Low Flow	Pump Intake Depth:	MS 35'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/- 0 5 ppm	+/-20 mV	
850			28.78	.25	6.78	17.5	2579	1.70	-74.6	clear
853			↓	↓	6.89	16.8	1772	2.39	-78.5	↓
856			↓	↓	6.83	16.3	1690	2.22	-80.7	↓
859			↓	↓	6.77	16.1	1670	1.88	-82.3	↓
902			↓	↓	6.76	16.1	16666	1.70	-83.2	↓
905			↓	↓	6.76	16.1	1662	1.68	-84.1	↓

PURGING DATA

Sample ID:	MW-13	Sampling Flow Rate:	.25		Analytical Laboratory:	Apex
Sample Time:	905	Final Depth to Water:	28.78		Did Well Dewater:	NO

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—			
2x40	HCl	RSK	—			
1x250	H2SO4	NH3	—			
1x250	—	NO2/3	—			

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 0920

WELL MONITORING DATA SHEET

Well ID:	MW-14	Job Number:		
Client:	NuStar Nam	Date:	9/14	
Project:	GWM3613	Sampler:		
Weather:	Sun 75	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:	29.24	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 Low flow	Pump Intake Depth:	MS 35'	
Sampling Method:		Tubing Material & Type:	& B	NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
934			29.24	.2	7.07	19.4	3189	6.31	15.6	cloudy
937			29.26		6.62	17.6	3616	5.12	9.9	clear
940			29.29		6.50	17.5	3606	3.38	0.5	
943			↓		6.48	17.1	3601	2.76	-1.3	
946					6.49	17.4	3590	2.62	-8.0	
949			↓	↓	6.50	17.3	358	2.56	-8.4	↓

PURGING DATA

Sample ID:	MW-14	Sampling Flow Rate:	.2		Analytical Laboratory:		Apex
Sample Time:	940	Final Depth to Water:	29.29		Did Well Dewater:		No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NH3	—				
1x250	—	NO2/3	—				
2x40	HCl	RSK	—				

NOTES/ADDITIONAL COMMENTS

VOA no headspace @ 955

WELL MONITORING DATA SHEET

Well ID:	MW-17	Job Number:		
Client:	NuStar Van	Date:	9/14	
Project:	GWM3Q21	Sampler:	AD	
Weather:	Sun 75°	Time In/Out:		

WELL DATA

Monument Type:	Flush-mount / Stick-up / Other:	Well Diameter:	4"	Depth to Free Product:	—
Monument Condition:	good	Well Depth:	—	Free Product Thickness:	—
Well Cap Lock Present:	Yes / No	Depth to Water:	28.14	Water Column Length:	—
Comments:	vault	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:	BP	Pump Intake Depth:	MS 35'
Sampling Method:	Low flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1014			28.14	.25	6.90	22.2	1607	3.12	-31.2	clear
1017			28.17	↓	6.75	20.3	1660	3.77	-15.7	↓
1020			28.19	↓	6.61	16.3	1658	3.15	-24.0	↓
1023			↓	↓	6.60	16.2	1647	2.61	-27.5	↓
1026			↓	↓	6.58	16.1	1635	2.37	-34.2	↓
1029			↓	↓	6.59	16.1	1625	2.30	-36.7	↓

PURGING DATA

Sample ID:	MW-17	Sampling Flow Rate:	.25		Analytical Laboratory:		Apex
Sample Time:	1029	Final Depth to Water:	28.19		Did Well Dewater:		No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				—
1x250	H2SO4	NH3	—				—
1x250	—	NO2/3	—				—

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 1040

WELL MONITORING DATA SHEET

Well ID:	S1	Job Number:		
Client:	NuStar Van	Date:	9/14	
Project:	GWM 3Q21	Sampler:	AD	
Weather:	Sun 75°	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 vault	Depth to Water:	29.64	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 69'
Sampling Method:	Low flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1054			29.64	.2	6.86	22.7	1130	2.91	-37.0	clear
1057			↓	↓	6.99	22.0	657	4.02	-32.4	↓
1100			↓	↓	6.59	21.0	506	4.68	-36.19	↓
1103			↓	↓	6.76	20.3	266	5.13	-32.9	↓
1106			↓	↓	7.02	19.7	209	5.20	-28.2	↓
1109			↓	↓	7.04	18.4	199	5.20	-24.3	↓
1112			↓	↓	7.05	18.6	195	5.23	-20.3	↓
1115			↓	↓	7.06	18.8	194	5.24	-19.4	↓

PURGING DATA

Sample ID:	S1	Sampling Flow Rate:	.2		Analytical Laboratory:		Apex
Sample Time:	1115	Final Depth to Water:	29.64		Did Well Dewater:		No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NH3	—				
1x250	—	NO2/3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 1125

WELL MONITORING DATA SHEET

	Well ID:	S-2	Job Number:		
	Client:	Nu Star Var	Date:	9/14	
	Project:	GWM 3Q21	Sampler:	AW	
	Weather:	Sun 75°	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 - vault	Depth to Water:	29.58	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 45'		
Sampling Method:	low flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1142			29.58	.3	6.8	23.9	1070	5.83	24.1	clear
1145			29.90	.2	6.76	22.2	1122	6.53	41.7	↓
1148			29.95	↓	6.52	19.5	2106	6.36	58.1	↓
1151			29.97	↓	6.47	18.4	2172	5.32	53.7	↓
1154			↓	↓	6.47	18.1	2164	4.29	46.6	↓
1157			↓	↓	6.47	18.1	2160	3.69	38.7	↓
1200			↓	↓	6.48	18.0	2158	3.44	34.4	↓
1203			↓	↓	6.48	18.0	2157	3.39	33.0	↓

PURGING DATA

Sample ID:	S2	Sampling Flow Rate:	.2		Analytical Laboratory:		Apex
Sample Time:	1200	Final Depth to Water:	29.97		Did Well Dewater:		No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NH3	—				
1x25	—	NO2/3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headsp. @ 1210

WELL MONITORING DATA SHEET

Well ID:	MW-3	Job Number:		
Client:	Nu Star Vam	Date:	9/14	
Project:	GWM 3Q21	Sampler:	AW	
Weather:	Sun 75°	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:	29.96	Water Column Length:	—
Well Cap Lock Present:	Yes / No vault	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 Lowflow	Pump Intake Depth:	MS 32' SB
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1226			29.94	.25	6.60	22.4	1660	2.06	14.2	clear
1229			30.25	.2	6.53	17.1	553	3.07	19.1	↓
1232			30.40	↓	6.48	17.9	540	2.88	-2.7	↓
1235			30.46	↓	6.41	18.5	544	2.78	1.5	↓
1238			30.55	↓	6.38	18.8	544	2.73	2.6	↓
1241			30.58	↓	6.36	19.1	545	2.72	2.8	↓

PURGING DATA

Sample ID:	MW-3	Sampling Flow Rate:	.2			Analytical Laboratory:	ApDex
Sample Time:	1241	Final Depth to Water:	30.64			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NH3	—				
1x250	—	NO2/3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headspace 1256

WELL MONITORING DATA SHEET

Well ID:	MW-7	Job Number:		
Client:	Northstar Vane	Date:	9/14	
Project:	GWM 3Q21	Sampler:	AW	
Weather:	Sun 80°	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 - vault	Depth to Water:	29.13	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:	SS

NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1317			29.13	.25	6.40	23.5	700	3.89	38.0	clear
1320			↓	↓	6.44	20.4	827	4.25	43.5	↓
1323			↓	↓	6.61	17.1	885	3.28	38.9	↓
1326			↓	↓	6.66	16.4	868	2.80	26.9	↓
1329			↓	↓	6.66	16.5	865	2.48	25.6	↓
1332			↓	↓	6.67	16.4	866	2.37	19.2	↓

PURGING DATA

Sample ID:	MW-7	Sampling Flow Rate:	.25		Analytical Laboratory:	Apex
Sample Time:	1332	Final Depth to Water:	29.13		Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—			
1x250	~~H2SO4~~	NO2/3	—			
1x250	—	NH3	—			
2x40	HCl	RSL	—			
3x40	HCl	VOC	—			MW-7 Dup
1x250	H2SO4	NO2/3	—			

NOTES/ADDITIONAL COMMENTS

1x250	—	NH3	—

WELL MONITORING DATA SHEET

Well ID:	MW-9	Job Number:		
Client:	NuStarVan	Date:	9/14	
Project:	GWM 3Q21	Sampler:		
Weather:	Sun 80°	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:	29.21	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

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MP 35'		
Sampling Method:	low flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1400			29.21	.25	6.61	20.7	1024	2.45	1.0	clear
1403			29.24		6.24	17.8	1055	2.28	11.6	
1406			↓		6.07	17.0	1050	2.07	14.9	
1409					5.90	16.9	1047	1.70	19.1	
1412					5.87	16.9	1044	1.60	19.8	
1415					5.85	16.8	1039	1.50	20.4	

PURGING DATA

Sample ID:	MW-9	Sampling Flow Rate:	.25	Analytical Laboratory:		Apex
Sample Time:	1415	Final Depth to Water:	29.24	Did Well Dewater:		No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC				
1x250	H2SO4	NH3				
1x25	—	NO2/3				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 1430

WELL MONITORING DATA SHEET

Well ID:	MW-10	Job Number:		
Client:	NuStar Van	Date:	9/15	
Project:	GWM 3Q19	Sampler:	[illegible]	
Weather:	Sun 65°	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:	29.14	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 low flow	Pump Intake Depth:	MS 35'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
807			29.14	.3	6.90	17.9	3487	9.00	138.1	clear
810			29.30	.2	5.94	16.1	3557	7.07	145.9	↓
813			29.37	↓	5.73	15.6	3555	5.96	159.1	↓
816			↓	↓	5.64	15.5	3560	5.89	167.2	↓
819			↓	↓	5.63	15.4	3561	5.48	168.7	↓
822			↓	↓	5.60	15.4	3564	5.32	170.1	↓

PURGING DATA

Sample ID:	MW-10	Sampling Flow Rate:	.2		Analytical Laboratory:	Apex
Sample Time:	822	Final Depth to Water:	29.37		Did Well Dewater:	No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—			
1x250	H2SO4	NO2/3	—			
1x250	—	NH3	—			

NOTES/ADDITIONAL COMMENTS

VOA no headspace @ 830

WELL MONITORING DATA SHEET

	Well ID:	MW-22i	Job Number:	
	Client:	Nu Star Vane	Date:	9/15
	Project:	GWM 3Q21	Sampler:	JW
	Weather:	Sun 65°	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:	31.49	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 low flow	Pump Intake Depth:	MS 50'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
854			31.49	.25	6.57	17.0	661	5.13	124.9	clear
857			↓	↓	6.65	16.4	544	4.60	115.4	↓
900			↓	↓	6.67	16.1	470	3.93	103.5	↓
903			↓	↓	6.65	15.9	471.1	2.96	85.4	↓
906			↓	↓	6.64	15.3	484.0	2.48	71.4	↓
909			↓	↓	6.64	15.9	484.4	2.35	69.0	↓
912			↓	↓	6.65	16.0	483.7	2.29	67.6	↓

PURGING DATA

Sample ID:	MW-22i	Sampling Flow Rate:	.25		Analytical Laboratory:		Apex
Sample Time:	912	Final Depth to Water:	31.49		Did Well Dewater:		No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H_2SO_4	NO2/3	—				
1x25	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 925

WELL MONITORING DATA SHEET

Well ID:	MW-21i-105	Job Number:	
Client:	NyStar York	Date:	6/17
Project:	GWM 3Q21	Sampler:	JW
Weather:	Sun 65°	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:	31.18	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:	BP low flow	Pump Intake Depth:	MS 110'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
948			31.18	.2	6.70	17.7	334.5	3.25	35.7	clear
951			31.22		6.65	16.9	305.7	3.96	48.6	
954			↓		6.63	16.7	284.6	4.72	61.9	↓
957			↓	↓	7.02	15.6	330.7	4.21	64.7	
1002			↓	↓	7.20	15.4	340.6	3.06	52.6	↓
1003			↓	↓	7.26	15.3	342.5	2.48	50.2	
1006			↓	↓	7.24	15.2	344.1	2.36	46.1	
1009			↓	↓	7.23	15.2	349.6	2.30	39.8	↓

PURGING DATA

Sample ID:	MW-21i-105	Sampling Flow Rate:	.2			Analytical Laboratory:	Apex
Sample Time:	1009	Final Depth to Water:	31.22			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 1015

WELL MONITORING DATA SHEET

Well ID:	MW-2	Job Number:		
Client:	NuStar Vam	Date:	9/15	
Project:	GWM 3Q21	Sampler:	SW	
Weather:	Sun 70°	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:	30.57	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 low flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1039			30.57	.25	7.42	19.0	425.1	2.48	29.9	clear
1042			↓	↓	6.70	15.8	793	2.21	31.0	cloudy
1045			↓	↓	6.66	16.2	804	1.99	26.2	clear
1048			↓	↓	6.65	16.4	813	1.87	22.0	↓
1051			↓	↓	6.64	16.5	824	1.76	18.7	↓

PURGING DATA

Sample ID:	MW-2	Sampling Flow Rate:	.25		Analytical Laboratory:		Apex NJ
Sample Time:	1051	Final Depth to Water:	30.57		Did Well Dewater:		
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x25		NH3	—				

NOTES/ADDITIONAL COMMENTS

VOA no headsp @ 1104

WELL MONITORING DATA SHEET

	Well ID:	MW-1	Job Number:	
	Client:	NuStar Van	Date:	9/15
	Project:	GWM 3Q21	Sampler:	
	Weather:	Sun 75°	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:	29.12	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:	PP low flow	Pump Intake Depth:	MS 31'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1230 ~~1242~~			29.12	.2	8.03	22.7	1927	6.18	84.7	cloudy
1233			↓	↓	7.90	18.9	1733	5.23	81.6	
1236					7.75	17.4	1685	4.17	76.0	
1239					7.76	17.2	1625	3.86	74.5	
1242					7.78	17.6	1610	3.66	70.0	
1245					7.80	17.6	1612	3.50	69.1	↓

PURGING DATA

Sample ID:	MW-1	Sampling Flow Rate:	.2		Analytical Laboratory:		APPL
Sample Time:	12.45	Final Depth to Water:	29.12		Did Well Dewater:		NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/NO3	—				
1x250	—	~~NH3~~	—				

NOTES/ADDITIONAL COMMENTS

Peri - BP not functioning

VOA no headsp @ 1300

WELL MONITORING DATA SHEET

	Well ID:	MW-6	Job Number:	
	Client:	Nu Star/Valero	Date:	9/15
	Project:	GWM 3Q21	Sampler:	AW
	Weather:	Sun 75°	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	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 Intake Depth:	MS 32'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1305			28.52	.25	7.04	18.5	1037	2.43	36.9	clear
1308			28.58		6.71	16.4	826	2.28	34.7	
134			28.64		6.48	16.1	712	2.17	36.1	
1314			28.70		6.34	16.2	689	2.03	40.9	
1317			28.72		6.32	16.1	680	1.96	41.5	
1320			↓		6.29	15.9	673	1.90	43.6	

PURGING DATA

Sample ID:	MW-6	Sampling Flow Rate:	.24	Analytical Laboratory:		Apex
Sample Time:	1320	Final Depth to Water:	28.72	Did Well Dewater:		NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—			
1x250	H2SO4	NO2/3	—			
1x250	—	NH3	—			

NOTES/ADDITIONAL COMMENTS

VOA no headspace @ 1320

WELL MONITORING DATA SHEET

	Well ID:	MW-19	Job Number:	
	Client:	Nu Star Van	Date:	5/15
	Project:	GWM 3Q21	Sampler:	AW
	Weather:	Sun 75°	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:	29.20	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:	Peri flow	Pump Intake Depth:	MS 40'
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1342			29.20	.25	6.32	19.8	2395	2.20	70.0	cloudy
1345			29.41	.2	6.43	17.7	2790	2.06	65.5	clear
1348			29.54	"	6.64	17.1	2878	1.86	52.8	
1351			29.60	"	6.72	17.0	2894	1.69	41.8	"
1354			29.62	"	6.78	16.8	2862	1.55	35.8	"
1357			29.65	"	6.80	16.8	2839	1.49	32.9	"

PURGING DATA

Sample ID:	MW-19	Sampling Flow Rate:	.2		Analytical Laboratory:	Eurofins
Sample Time:	1354	Final Depth to Water:	29.65		Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC				
1x250	H2SO4	NO2/3				
1x250	—	NH3				
2x40	HCl	RSK				
3x40	HCl	VOC				Dup
1x250	H2SO4	NO2/3				

NOTES/ADDITIONAL COMMENTS

1x250 — NH3

VOA no headspace @ 1410

WELL MONITORING DATA SHEET

	Well ID:	MP-1	Job Number:	
	Client:	NuStar Van	Date:	9/15
	Project:	GWM 3Q21	Sampler:	AC
	Weather:	Sun 75°	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:	29.35	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 Intake Depth:	MS
Sampling Method:	Flow Flow	Tubing Material & Type:	CPE

NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1423			29.35	.25	7.33	18.2	1375	1.66	-39.7	clear
1426			29.45	.2	7.38	15.8	1184	1.56	-43.5	↓
1429			29.51	↓	7.35	15.7	1135	1.48	-46.0	↓
1432			29.52	↓	7.34	15.7	1091	1.35	-50.0	↓
1435			↓	↓	7.34	15.6	1048	1.32	-55.0	↓
1438			↓	↓	7.33	15.7	1030	1.30	-56.5	↓

PURGING DATA

Sample ID:	MP-1	Sampling Flow Rate:	.2		Analytical Laboratory:	APAL
Sample Time:	1435	Final Depth to Water:	29.52		Did Well Dewater:	NO

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—			
2x40	HCl	RSK	—			
1x250	H2SO4	NO2/3	—			
1x250	—	NH3	—			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-24d	Job Number:	
Client:	Nustar JAN MAIN	Date:	9/14/21
Project:	3Q21 GWM	Sampler:	LW
Weather:	Sunny	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other:	Well Depth:	230'	Free Product Thickness:	
Monument Condition:	Good	Depth to Water:	30.67	Water Column Length:	—
Well Cap Lock Present:	Yes No	Screened Interval:	220'-230'	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 / LF	Pump Intake Depth:	225'
Sampling Method:		Tubing Material & Type:	SB/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	
818			30.67	0.2	7.29	15.55	382	4.84	9	clear
821			30.84	↓	7.53	14.76	371	1.40	-119	↓
824			31.01		7.51	14.60	353	0.85	-122	
827			31.29		7.81	13.70	385	0.79	-139	
830			31.44	↓	7.77	13.63	385	0.28	-139	↓
833			31.52		7.75	13.58	385	0.22	-141	

PURGING DATA

Sample ID:	MW-24d	Sampling Flow Rate:	0.2			Analytical Laboratory:	Apex
Sample Time:	830	Final Depth to Water:	31.62			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
1x250	H2SO4	NH3	—	—	—	—	—
1x250	—	NO2/NO3	—	—	—	—	—
3x40	HCl	HVOCs	—	—	—	—	—

NOTES/ADDITIONAL COMMENTS

New downhole tubing (3/8") (190')

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-24i	Job Number:	
Client:	NuStar JAM	Date:	9/14/21
Project:	3Q21	Sampler:	LW
Weather:	Sunny	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	good	Depth to Water:	30.61	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:	Mid screen
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	
852			30.61	0.35	7.64	13.54	367	11.98	26	cloudy
855			↓	0.2	7.31	13.50	382	5.61	13	clear
858				↓	7.01	13.47	395	0.43	81	↓
901					6.85	13.43	394	0.26	89	
904					6.78	13.38	394	0.19	93	
907					6.76	13.38	394	0.17	94	

PURGING DATA

Sample ID:	MW-24i	Sampling Flow Rate:	0.2		Analytical Laboratory:	APEX
Sample Time:	910	Final Depth to Water:	30.61		Did Well Dewater:	NO

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOCs				
1x250	—	NO2/NO3	—			
1x250	H2SO4	NH3	—			

NOTES/ADDITIONAL COMMENTS

New SB tubing

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MGMS1-C00	Job Number:	
Client:	Master Van	Date:	9/14/21
Project:	3421	Sampler:	LW
Weather:	Sunny	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:	-	Water Column Length:	-
Well Cap Lock Present:	Yes (No) N/A	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:	PP/BP/det.	Pump Intake Depth:	MS
Sampling Method:	LF	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	
942			30.21	0.2	6.01	13.63	805	16.36	129	clear
945			↓	↓	6.03	15.00	878	2.91	133	↓
948					6.07	15.56	819	0.90	131	
951					6.09	15.64	804	0.70	131	
954					6.21	15.89	788	0.40	130	
957			↓		6.28	16.06	747	0.03	127	↓
1000					6.33	16.11	745	0.02	126	
1003			↓	↓	6.35	16.17	743	0.02	126	↓

PURGING DATA

Sample ID:	MGMS1-C00	Sampling Flow Rate:	0.2		Analytical Laboratory:	Apex
Sample Time:	1000	Final Depth to Water:	30.21		Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs	—	—	—	—
1x250	—	NO2/NO3	—	—	—	—
1x250	H2SO4	NH3	—	—	—	—

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MGMS1-43	Job Number:	
Client:	Nwstar VAN	Date:	9/14/21
Project:	342-1	Sampler:	LW
Weather:	Sunny	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:	29.09	Water Column Length:	—
Well Cap Lock Present:	Yes No N/A	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:	Bailed.	Pump Intake Depth:	MS
Sampling Method:		Tubing Material & Type:	HDPE

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	
1014			29.09	0.2	6.67	16.87	201	2.21	114	Clear
1017			↓	↓	6.30	17.19	1450	1.54	121	↓
1020					6.66	17.51	2690	1.14	124	
1023					7.21	18.21	2935	0.61	113	
1026					7.25	18.47	2780	0.42	101	
1029					7.22	18.67	2810	0.42	113	

PURGING DATA

Sample ID:	MGMS1-43	Sampling Flow Rate:	0.2		Analytical Laboratory:	APEX
Sample Time:	1030	Final Depth to Water:	29.09		Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2x40	HCl	TOC/DSK				
3x40	HCl	HVOCs				
1x250	—	NO2/NO3				
1x250	H2SO4	NH3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-21-40	Job Number:	
Client:	Wyatt VAN	Date:	9/15/21
Project:	3021	Sampler:	LW
Weather:	Overcast	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	good	Depth to Water:	31.13	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	
759			31.13	0.2	4.90	20.70	1	16.21	220	clear
802			↓	↓	6.65	20.47	1	10.94	158	↓
805					6.28	20.45	1	10.23	199	
808					6.27	20.38	137	1.64	215	
811					6.44	20.29	~~215~~ 188	1.09	~~215~~ 188	
814					7.46	16.13	~~329~~ 167	0.73	~~329~~ 167	
817					7.01	15.54	~~335~~ 174	0.56	~~335~~ 175	
820			↓	↓	6.95	15.49	337	0.48	176	
823					6.91	15.52	338	0.46	177	↓

PURGING DATA

Sample ID:	MW-21-40	Sampling Flow Rate:	0.2		Analytical Laboratory:	Apex
Sample Time:	820	Final Depth to Water:	31.13		Did Well Dewater:	N
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs				
1x250	H2SO4	NH3				
1x250	—	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-16	Job Number:	
Client:	Nustar Van	Date:	9/15/21
Project:	3Q21	Sampler:	LW
Weather:		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	good	Depth to Water:	30.14	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	
842			30.14	0.25	5.78	17.27	1	15.57	240	clear
845			30.14	↓	6.25	15.05	504	2.34	201	↓
848			↓	↓	6.20	14.85	502	1.89	201	
851			↓	↓	6.11	14.65	518	1.37	202	
854			↓	↓	6.10	14.67	521	1.31	202	
857			↓	↓	6.08	14.62	533	1.15	201	

PURGING DATA

Sample ID:	MW-16	Sampling Flow Rate:	0.25		Analytical Laboratory:		type X
Sample Time:	900	Final Depth to Water:	30.14		Did Well Dewater:		N
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	HVOCs					
1x250	H2SO4	NH3					
1x250	—	NO2/NO3					

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-25i	Job Number:	
Client:	Nustar VAN	Date:	9/15/21
Project:	3621	Sampler:	LW
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:	31.0	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	
914			31.0	0.3	6.20	15.61	417	7.09	219	clear
917			↓	↓	6.27	16.18	354	7.26	219	↓
920					6.27	15.86	327	1.85	220	
923					6.26	15.82	327	1.14	219	
926					6.26	15.85	326	0.87	218	
929					6.26	15.88	326	0.77	217	

PURGING DATA

Sample ID:	MW-25i	Sampling Flow Rate:	0.3	Analytical Laboratory:		Alex
Sample Time:	930	Final Depth to Water:	31.0	Did Well Dewater:		NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs				
1x250	H2SO4	NH3				
1x250	—	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-26	Job Number:	
Client:	NAVSTAR VAN	Date:	9/15/21
Project:	3Q21	Sampler:	LW
Weather:	Sunny	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:	29.24	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 LF	Pump Intake Depth:	MS SR
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	
951			29.24	0.3	5.36	16.30	5130	11.61	260	clear
954			↓	↓	5.61	15.66	5590	1.54	244	↓
957					5.84	15.61	4570	0.00	230	
1000					5.85	15.59	4360	0.00	230	
1003					5.97	15.73	3700	0.08	225	
1006					5.99	15.81	3740	0.31	225	
1009					5.97	15.77	3620	0.33	225	

PURGING DATA

Sample ID:	MW-26	Sampling Flow Rate:	0.3		Analytical Laboratory:	Apex
Sample Time:	1005	Final Depth to Water:	29.24		Did Well Dewater:	No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2x40	HCl	TOC/RSK	—			
3x40	HCl	HVOCs				
1x250	H2SO4	NH3				
1x250	—	NO2/NO3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Well ID:	MW-12	Job Number:		
Client:	Nuster Van	Date:	12/4/21	
Project:	GWM 4021	Sampler:	JP	
Weather:	Rain, cold, wind	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:	24.42	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

Sampling Method: Low flow

Pump Intake Depth: Mid screen

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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1008			24.42	0.25	6.26	7.5	427.1	9.22	129.6	Clear
1011			24.54	0.25	6.33	12.3	433.6	1.01	121.6	↓
1014			24.83	0.25	6.03	13.6	418.1	0.37	133.0	
1017			25.00	0.25	6.00	13.3	406.1	0.28	134.3	
1020			25.09	0.25	6.00	13.5	349.7	0.26	133.0	

PURGING DATA

Sample ID:	MW-12	Sampling Flow Rate:	0.25			Analytical Laboratory:	APS/No
Sample Time:	1020	Final Depth to Water:	25.13			Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40mL	HCl	VOC					
(3) 40mL	HCl	VOC				MW-12 DUP	
(1) 250mL	—	NH_3					
(1) 250mL	—	NH_3				MW-12 DUP	
(1) 250mL	H_2SO_4	$NO_{2/3}$					
(1) 250mL	H_2SO_4	$NO_{2/3}$				MW-12 DUP	

NOTES/ADDITIONAL COMMENTS

Sampled with Nolan from Antea for RM

WELL MONITORING DATA SHEET

	Well ID:	MW-3	Job Number:	
	Client:	NuStar Van	Date:	12/9/21
	Project:	GWM 4Q21	Sampler:	JP
	Weather:	light rain, wind, cold	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	~~26.70~~	Free Product Thickness:	—
Monument Condition:	Good	Depth to Water:	26.70	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 Low flow	Pump Intake Depth:	Mid screen
Sampling Method:	Low flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1110			26.70	0.25	6.40	8.8	366.6	7.28	132.7	Clear
1113			26.73	0.25	6.14	11.8	365.0	4.43	118.5	↓
1116			26.76	0.25	6.04	12.2	344.8	5.02	114.4	
1119			26.81	0.25	6.08	12.3	336.8	5.38	115.4	
1122			26.81	0.25	6.07	12.5	338.3	5.51	112.9	

PURGING DATA

Sample ID:	MW-3	Sampling Flow Rate:	0.25		Analytical Laboratory:		Apex
Sample Time:	1122	Final Depth to Water:	26.81		Did Well Dewater:		No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40mL	HCl	VOCs	—				
(1) 250mL	—	NH_3	—				
(1) 250mL	H_2SO_4	$NO_{2/3}$	—				

NOTES/ADDITIONAL COMMENTS

Sampled w/ Nolan from Antea for KM

WELL MONITORING DATA SHEET

	Well ID:	MW-2	Job Number:		
	Client:	NuStar Van	Date:	12/9/21	
	Project:	GWM 1403	Sampler:	JR	
	Weather:	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:	27.18-27.06	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 Lowflow	Pump Intake Depth:	Mid screen
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/- 0.5 ppm	+/- 20 mV	
1212		27.18	~~27.06~~	0.25	5.53	10.4	524	1.93	152.4	Clear
1215			27.68	0.25	6.05	12.4	662	0.54	153.7	↓
1218			27.81	0.25	6.17	12.5	664	0.42	112.3	↓
1221			27.77	0.25	6.24	12.5	670	0.33	102.4	↓
1224			27.64	0.25	6.26	12.5	672	0.29	98.4	↓

PURGING DATA

Sample ID:	MW-2	Sampling Flow Rate:	0.25			Analytical Laboratory:	Apex
Sample Time:	1224	Final Depth to Water:	27.62			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40 mL	HCl	VOC					
(1) 250 mL	—	NH_3					
(1) 250 mL	H_2SO_4	$NO_{2/3}$					

NOTES/ADDITIONAL COMMENTS

Depth to bottom: 39.60 ft
Sampled w/ Nolan from Antea for KM

WELL MONITORING DATA SHEET

Well ID:	MW-9	Job Number:	
Client:	NuStar Van	Date:	12/9/21
Project:	GWM 4Q21	Sampler:	JP
Weather:	Rain, cold	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:	27.14	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:	Midscreen
Sampling Method:	Low Flow	Tubing Material & Type:	S/S NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1344			27.14	0.25	6.19	7.5	598	4.62	9.6	Clear
1347			27.14	0.25	5.94	11.2	807	3.14	37.6	
1350			27.14	0.25	5.06	12.9	843	3.27	77.2	
1353			27.14	0.25	4.94	13.1	843	3.26	84.6	
1356			27.14	0.25	4.91	13.1	841	3.22	88.2	
1359			27.14	0.25	4.87	13.1	841	3.20	92.4	

PURGING DATA

Sample ID:	MW-9	Sampling Flow Rate:	0.25			Analytical Laboratory:	Apex
Sample Time:	1359	Final Depth to Water:	27.14			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40mL	HCl	VOCs	—	—	—	—	
(1) 250mL	—	NH_3	—	—	—	—	
(1) 250mL	H_2SO_4	$NO_2/3$	—	—	—	—	

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Well ID:	MW-7	Job Number:	
Client:	NuStar Van	Date:	12/8/21
Project:	GWM Mon	Sampler:	JP
Weather:	light rain	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:	26.43	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:	BD Low flow	Pump Intake Depth:	Mid screen
Sampling Method:		Tubing Material & Type:	S/S NEW / ~~DEDICATED~~

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1406			26.42	0.20	6.41	12.7	1711	1.29	161.42	Clear
1406			27.14	0.20	6.41	13.3	1943	0.59	163.2	
1409			27.22	0.15	6.41	13.4	1948	0.53	163.6	
1412			27.24	0.15	6.44	13.6	2100	0.46	164.9	
1415			27.47	0.15	6.50	13.6	1742	0.42	154.5	
1418			27.52	0.15	6.49	13.6	1838	0.38	160.4	
1421			27.54	0.15	6.49	13.6	1812	0.35	159.5	↓

PURGING DATA

Sample ID:	MW-7	Sampling Flow Rate:	0.15	Analytical Laboratory:		Apex
Sample Time:	1421	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
(3) 40mL	HCl	VOC				
(2) 40mL	HCl	RSK				
(3) 40mL	HCl	VOC				MW-7 DUP
(1) 250 mL	—	NH_3				
(1) 250 mL	—	NH_3				MW-7 DUP
(1) 250 mL	H_2SO_4	$NO_{2/3}$				

NOTES/ADDITIONAL COMMENTS

(1) 250 mL | H_2SO_4 | $NO_{2/3}$ | | | | MW-7 DUP

Sampled w/ Nolan from Antea for Kinder Morgan

WELL MONITORING DATA SHEET

	Well ID:	MP-1	Job Number:	
	Client:	NuStar Van	Date:	12/9/21
	Project:	GWM 4Q21	Sampler:	JP
	Weather:	light rain, cold	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:	27.18	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:	BP	Pump Intake Depth:	Mid Screen
Sampling Method:	Low Flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1301			27.18	0.20	6.99	11.9	834	6.27	135.3	Clear
1304			27.31	0.20	6.98	12.4	710	5.18	123.9	
1307			27.31	0.20	6.83	12.6	597	4.76	113.5	
1310			27.36	0.20	6.71	13.5	567	5.10	99.7	
1313			27.40	0.20	6.64	13.0	562	2.26	98.7	
→ 1316			27.23	0.20	6.66	13.7	574	2.12	99.6	
1319			27.31	0.20	6.66	13.6	580	2.34	99.6	
1322			27.37	0.20	6.65	14.0	586	2.44	100.7	

PURGING DATA

Sample ID:	MP-1	Sampling Flow Rate:	0.20			Analytical Laboratory:	Apex
Sample Time:	1322	Final Depth to Water:	27.39			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40mL	HCl	VOAs	—				
(1) 250mL	—	NH3	—				
(1) 250mL	H_2SO_4	NO2/3	—				

NOTES/ADDITIONAL COMMENTS

Sampled w/ Nolan from Antea for Kinder Morgan

WELL MONITORING DATA SHEET

Well ID:	MW-19	Job Number:	
Client:	Nustar Van	Date:	12/8/21
Project:	GWM 4Q21	Sampler:	JP
Weather:	Clear, cold, windy	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:	26.64	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:	Mid screen
Sampling Method:	Low Flow	Tubing Material & Type:	SI3 NEW / ~~DEDICATED~~

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1208			26.64	0.25	6.62	13.8	2036	1.05	159.5	Clear
1211			27.17	0.20	6.70	14.4	2080	0.62	156.3	↓
1214			27.15	0.20	6.71	14.4	2095	0.48	155.1	
1217			27.13	0.20	6.72	14.6	2118	0.33	155.3	

PURGING DATA

Sample ID:	MW-19	Sampling Flow Rate:	0.20		Analytical Laboratory:	Apex
Sample Time:	1217	Final Depth to Water:			Did Well Dewater:	No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(3) 40mL	HCl	VOC	—	—	—	
(2) 40mL	HCl	RSK	—	—	—	
(3) 40mL	HCl	VOC	—	—	—	MW-19 DUP
(1) 250 mL	—	NH_3	—	—	—	
(1) 250 mL	H_2SO_4	NH_3	—	—	—	MW-19 DUP
(1) 250 mL	H_2SO_4	$NO_2/3$	—	—	—	
(1) 250 mL	H_2SO_4	$NO_2/3$	—	—	—	MW-19 DUP

NOTES/ADDITIONAL COMMENTS

Sampled with Nolan from Antea for Kinder Morgan

WELL MONITORING DATA SHEET

Well ID:	MW-22i	Job Number:	
Client:	Nustar Van	Date:	12/8/21
Project:	Gwm Mgt	Sampler:	JP
Weather:	Clear, cold, windy	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:	26.97	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:	Mid screen
Sampling Method:	Low flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1114			26.97	0.20	6.29	9.9	304.3	10.38	159.2	Clear
1117			26.99	0.20	6.35	11.4	276.2	6.04	151.8	↓
1120			26.99	0.20	6.14	13.3	287.4	4.44	151.5	
1123			26.99	0.20	6.09	13.3	314.0	4.12	150.3	
1126			26.99	0.20	6.09	13.4	338.4	3.88	146.0	
1129			27.01	0.20	6.09	13.5	337.7	3.67	141.5	

PURGING DATA

Sample ID:	MW-22i	Sampling Flow Rate:	0.20			Analytical Laboratory:	Apex
Sample Time:	1129	Final Depth to Water:	27.03			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) VOA 40mL	HCl	VOCs	—				
(1) 250mL	—	NH_3	—				
(1) 250mL	H_2SO_4	$NO_{2/3}$	—				

NOTES/ADDITIONAL COMMENTS

Sampled with Nolan from Antea for Kinder Morgan

WELL MONITORING DATA SHEET

Well ID: MW-21i-105		Job Number:	
Client: NuStar Van		Date:	12/3/21
Project: GWM 4Q21		Sampler:	JP
Weather: Clear, windy		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:	26.54	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:	Mid Screen
Sampling Method:	Low flow	Tubing Material & Type:	SiB NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
~~0954~~	1009		26.54	0.20	6.60	10.5	274.4	8.84	146.0	Clear
1013			26.54	0.20	6.62	11.1	283.1	9.14	145.1	↓
1017			26.54	0.20	6.72	12.1	271.2	12.35	136.3	
1021			26.54	0.20	6.72	12.4	136.2	4.34	129.3	
1025			26.54	0.20	6.43	12.4	125.3	2.83	140.2	
1029			26.54	0.20	6.25	12.6	129.6	2.37	148.3	
1033			26.54	0.20	6.20	12.6	132.6	2.17	151.2	
1037			26.54	0.20	6.17	12.6	136.4	2.00	154.2	

PURGING DATA

Sample ID:	MW-21i-105	Sampling Flow Rate:	0.20			Analytical Laboratory:	Apex
Sample Time:	1037	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	
(3) 40mL VOA	HCl	VOCs					
(1) 250mL	H_2SO_4	$NO_2/3$					
(1) 250mL	—	NH_3					

NOTES/ADDITIONAL COMMENTS

Replace 2 bolts on well

Sampled with Nolan from Antea for Kinder Morgan

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMS1-60	Job Number:	
Client:	NW Star Van	Date:	12/7
Project:	GMM, 4021	Sampler:	AW
Weather:	Cloudy 48°	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:		Depth to Water:	25.74	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

Sampling Method: low flow

Pump Intake Depth: Mid Screen

Tubing Material & Type: 2" PE

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	
1052			25.74	.25	6.60	13.9	302.4	2.08	80.1	clear
1055			↓	↓	6.81	14.0	223.0	5.11	69.6	
1058			↓	↓	6.77	14.2	159.6	6.07	70.4	↓
1101			↓	↓	6.76	14.2	156.4	5.90	71.7	↓
1104			↓	↓	6.74	14.2	155.2	5.75	74.0	↓
1107			↓	↓	6.73	14.1	156.3	5.72	75.2	

PURGING DATA

Sample ID:	MGMS1-60	Sampling Flow Rate:	.25			Analytical Laboratory:	APEX
Sample Time:	1107	Final Depth to Water:	25.74			Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMSI-43	Job Number:	
Client:	Nu Star Van	Date:	12/7
Project:	GWM 4Q21	Sampler:	qw
Weather:	lt rain	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	25.69	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 low flow — Pump Intake Depth: Midscreen

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	
1120			25.69	.25	6.52	13.5	214.3	5.95	140.4	clear
1123			↓	↓	6.59	13.7	234.3	1.04	137.5	↓
1126			↓	↓	6.62	13.8	244.5	.57	133.8	↓
1129			↓	↓	6.64	13.9	247.4	.36	125.9	↓
1132			↓	↓	6.64	13.8	248.1	.30	124.0	↓

PURGING DATA

Sample ID:	MGMSI-43	Sampling Flow Rate:	.25			Analytical Laboratory:	Apex
Sample Time:	1132	Final Depth to Water:	25.69			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—	—	—	—	—
2x40	HCl	RSK	—	—	—	—	—
1x250	H2SO4	NO2/3	—	—	—	—	—
1x250	—	NH3	—	—	—	—	—

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MGMS2-40	Job Number:	
Client:	Mr Steve Van	Date:	12/7
Project:	GMM 4021	Sampler:	
Weather:	Rain	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	25.98	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

PURGING DATA

Purge Method:	Bail	Pump Intake Depth:	Mid screen
Sampling Method:	Bail	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	
1310			25.98	.2	6.42	14.2	974	3.09	55.3	clear
1313			↑	↓	6.65	14.5	1260	1.90	60.8	↓
1316			↑	↓	6.74	14.5	1745	1.02	57.2	↓
1319			↑	↓	6.77	14.7	1763	.68	59.4	↓
1322			↑	↓	6.76	14.6	1770	.59	60.5	↓

PURGING DATA

Sample ID:	MGMS2-40	Sampling Flow Rate:	.2			Analytical Laboratory:	Apex
Sample Time:	1322	Final Depth to Water:	25.98			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—	—	—	—	—
2x40	HCl	RSK	—	—	—	—	—
1x250	H2SO4	NO2/3	—	—	—	—	—
1x250		NH3	—	—	—	—	—

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGM52-132	Job Number:	
Client:	Nustar Van	Date:	12/7
Project:	GWM 4Q21	Sampler:	JC
Weather:	It rain	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGM52 Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	26.12	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 Intake Depth:	Midscreen
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	
1157			26.12	.2	6.62	12.1	979	4.97	82.6	clear
1200			↓	↓	6.69	13.4	712	1.29	64.8	↓
1203					6.80	14.2	254.0	.64	43.4	
1206					6.78	14.1	239.6	.44	39.7	
1209					6.78	14.1	234.1	.32	38.1	

PURGING DATA

Sample ID:	MGM52-132	Sampling Flow Rate:	.2			Analytical Laboratory:	Apex
Sample Time:	1209	Final Depth to Water:	26.12			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	~				
1x250	H2SO4	NO2/3	~				
1x25	—	NH3	~				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMS2-60	Job Number:	
Client:	NuStar Van	Date:	12/7
Project:	GWM 4Q21	Sampler:	AS
Weather:	Cloudy 55°	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	26.11	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 Intake Depth:	Midscreen
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
					6.84					
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1241			26.11	.2	~~13.7~~	13.7	200.2	2.92	11.5	clear
1244			↓	↓	6.73	13.5	209.7	3.79	8.9	↓
1247					6.57	14.3	207.7	.67	9.0	
1250					6.60	14.5	204.0	.40	7.5	
1253					6.62	14.4	201.2	.31	6.9	

PURGING DATA

Sample ID:	MGMS2-60	Sampling Flow Rate:	.2			Analytical Laboratory:	Apex
Sample Time:	1253	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	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x25	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMS2-110	Job Number:	
Client:	NuStar Vam	Date:	12/7
Project:	GWM 4Q21	Sampler:	AW
Weather:	Cloudy 50	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	26.15	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 Intake Depth:	Midscreen
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	
1220			26.15	.2	6.39	14.0	210.1	2.30	19.9	clear
1223			↓	↓	6.48	14.2	203.6	1.04	15.2	↓
1226					6.51	14.2	197.1	.96	9.6	
1229					6.51	14.2	195.9	.91	8.9	

PURGING DATA

Sample ID:	MGMS2-110	Sampling Flow Rate:	.2			Analytical Laboratory:	Apex NW
Sample Time:	1229	Final Depth to Water:	26.15			Did Well Dewater:	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

	Well ID:	MW-19i	Job Number:	
	Client:	Nustar Van	Date:	12/7/21
	Project:	GWM 4Q21	Sampler:	JP
	Weather:	Overcast, light 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:	26.75	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 Lowflow	Pump Intake Depth:	Mid screen
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
~~1339~~	1339		26.75	0.20	6.56	10.1	257.7	9.40	135.4	Clear
1342			26.75	0.20	6.86	10.3	207.2	10.92	134.5	
1345			26.75	0.20	6.94	10.3	190.4	9.33	137.2	
1348			26.75	0.20	7.06	10.7	156.8	7.28	134.8	
1351			26.77	0.20	7.01	11.0	145.8	5.84	142.6	
1354			26.77	0.20	6.94	11.1	144.1	5.41	143.3	
1357			26.78	0.20	6.93	11.4	145.0	5.37	142.0	

PURGING DATA

Sample ID:	MW-19i	Sampling Flow Rate:	0.20			Analytical Laboratory:	Apex
Sample Time:	1357	Final Depth to Water:	26.80			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40mL VOA	HCl	VOCs	—				
(1) 250 mL	—	NH_3	—				
(1) 250mL	H_2SO_4	$NO_{2/3}$	—				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

	Well ID:	MW-16	Job Number:		
	Client:	Nustar Van	Date:	12/7/24	
	Project:	GWM 4Q21	Sampler:	SP	
	Weather:	Overcast cold	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:	26.12	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:	SB NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1248			26.12	0.20	6.08	12.6	553	0.85	137.9	Clear
1251			26.16	0.20	6.11	13.0	568	0.59	134.7	↓
1254			26.19	0.20	6.13	13.3	577	0.48	132.4	↓
1257			26.21	0.20	6.14	13.4	573	0.37	130.4	↓

PURGING DATA

Sample ID:	MW-16	Sampling Flow Rate:	0.20		Analytical Laboratory:	Apex
Sample Time:	1257	Final Depth to Water:	26.23		Did Well Dewater:	No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(3) 40mL VOA	HCl	VOCs				
(1) 250 mL	—	NH_3				
(1) 250 mL	H_2SO_4	$NO_{2/3}$				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Well ID:	MW-21i-40	Job Number:		
Client:	NuStar Van	Date:	12/7/21	
Project:	GWM 4Q21	Sampler:	JP	
Weather:	Overcast, cold	Time In/Out:		

WELL DATA

Monument Type:	~~Flush-mount~~/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	Good	Depth to Water:	26.94	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 Low Flow	Pump Intake Depth:	Midscreen
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1130			26.94	0.20	6.03	12.1	2248	7.14	191.4	Clear
1133			26.94	0.20	6.30	13.1	898.2	10.05	176.8	
1136		26.95→	~~26.95~~	0.20	6.63	14.4	303.1	2.09	130.1	
1139			26.97	0.20	6.54	14.7	271.7	0.91	128.1	
1142			26.97	0.20	6.41	14.6	264.2	0.36	128.0	
1145			26.97	0.20	6.39	14.6	264.9	0.31	128.3	
1148			26.97	0.20	6.39	14.6	265.1	0.30	128.2	

PURGING DATA

Sample ID:	MW-21i-40	Sampling Flow Rate:	0.20		Analytical Laboratory:	Apex
Sample Time:	1148	Final Depth to Water:	26.97		Did Well Dewater:	No

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
(3) 40mL	HCl	VOCs				
(1) 250mL	—	NH_3				
(1) 250mL	H_2SO_4	$NO_{2/3}$				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

	Well ID:	MW-26	Job Number:		
	Client:	NuStar Van	Date:	12/7/21	
	Project:	Calvin 4421	Sampler:	JP	
	Weather:	Overcast, cold	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:	27.35	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 Low Flow	Pump Intake Depth:	Midscreen
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1022			27.35	0.20	5.73	13.8	3957	1.17	201.3	Clear
1025			27.37	0.20	5.74	14.2	3979	1.00	210.7	↓
1028			27.34	0.20	5.73	14.2	3966	0.84	211.9	
1031			27.39	0.20	5.72	14.3	3980	0.76	214.2	

PURGING DATA

Sample ID:	MW-26	Sampling Flow Rate:	0.20		Analytical Laboratory:	
Sample Time:	1031	Final Depth to Water:	27.40		Did Well Dewater:	

No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(5) 40mL	HCl	VOC/RSK	—	—	—	—	
(1) 250mL	—	NH_3	—	—	—	—	
(1) 250mL	—	NH_3	—	—	—		MW-26 DUP
(1) 250mL	H_2SO_4	$NO_{2/3}$	—	—	—	—	
(1) 250mL	H_2SO_4	$NO_{2/3}$	—	—	—		MW-26 DUP

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Well ID:	EW-1	Job Number:	
Client:	NuStar Vane	Date:	12/7/21
Project:		Sampler:	JP
Weather:	Overcast, windy	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:		Depth to Water:	23.69	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 Low flow	Pump Intake Depth:	Mid screen
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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0900			23.69	0.20	6.38	11.4	107.5	7.01	109.1	Clear
0904			23.69	0.20	5.70	14.5	107.5	6.92	107.8	↓
0908			23.69	0.20	5.73	14.6	107.6	5.54	109.0	
0912			23.69	0.20	5.71	14.5	106.3	5.62	112.0	
0916			23.69	0.20	5.69	14.6	107.4	5.67	112.6	

PURGING DATA

Sample ID:	EW-1	Sampling Flow Rate:	0.20			Analytical Laboratory:	Apex
Sample Time:	0916	Final Depth to Water:	23.69			Did Well Dewater:	N.S
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40mL VOA	HCl	VOCs	—	—	—		
(1) 250mL	—	NH_3	—	—	—		
(1) 250mL	H_2SO_4	$NO_{2/3}$	—		—		

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	S-1	Job Number:	
Client:	NuStar Van	Date:	12/8
Project:	GwSM 4Q21	Sampler:	qw
Weather:	P+Sun 50°	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 - Vault	Depth to Water:	25.42	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 Low flow	Pump Intake Depth:	Midscreen 69'
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	
940			25.42	.25	6.70	10.1	238.9	10.96	215.3	clear
943			↓	↓	6.76	11.8	180.1	7.30	206.4	↓
946					6.74	12.0	165.2	5.65	201.3	
949					6.66	12.2	164.5	5.40	200.2	
952					6.64	12.3	162.7	5.36	198.5	
955			↓	↓	6.63	12.3	163.5	5.32	196.8	↓

PURGING DATA

Sample ID:	S-1	Sampling Flow Rate:	.25		Analytical Laboratory:		Apex NJ
Sample Time:	955	Final Depth to Water:	25.42		Did Well Dewater:		
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				—
1x250	H2SO4	NO2/3	—				—
1x250	—	NH3	—				—

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	S-2	Job Number:	
Client:	NuStar Van	Date:	12/8
Project:	GWM 4Q21	Sampler:	AW
Weather:	Pt Sun 55°	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 - vault	Depth to Water:	25.51	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 low flow	Pump Intake Depth:	Midscreen ~15'
Sampling Method:		Tubing Material & Type:	SS — 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	
1010			25.51	.25	6.66	10.1	1511	12.45	231.2	cloudy
1013			↓	↓	6.26	13.1	1891	1.32	226.1	↓
1016					6.29	13.3	1924	.68	224.1	
1019					6.31	13.4	1927	.44	220.5	
1022					6.30	13.4	1926	.32	219.0	

PURGING DATA

Sample ID:	S-2	Sampling Flow Rate:	.25			Analytical Laboratory:	Apex
Sample Time:	1022	Final Depth to Water:	25.51			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-17	Job Number:	
Client:	NuStar Van	Date:	12/8
Project:	GWM 4Q21	Sampler:	AJ
Weather:	Cloudy 50°	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up / Other:	Well Diameter:	4"	Depth to Free Product:	—
		Well Depth:	—	Free Product Thickness:	—
Monument Condition:	good - vault	Depth to Water:	25.04	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 lowflow | Pump Intake Depth: Midscreen 33'

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	
1045			25.04	.25	6.30	13.4	1185	4.85	179.1	clear
1048			↓	↓	6.31	14.2	1178	1.06	175.7	↓
1051			↓	↓	6.29	14.2	1179	.57	173.6	↓
1054			↓	↓	6.29	14.3	1184	.41	171.3	↓
1057			↓	↓	6.29	14.3	1186	.37	170.1	↓

PURGING DATA

Sample ID:	MW-17	Sampling Flow Rate:	.25			Analytical Laboratory:	Apex
Sample Time:	1057	Final Depth to Water:	25.04			Did Well Dewater:	NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3 x 40	HCl	VOC	—				
1 x 250	H2SO4	NO2/3	—				
1 x 250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-25i	Job Number:	
Client:	Nu Stem Van	Date:	12/8
Project:	GWM 4Q21	Sampler:	AW
Weather:	Cloudy 50°	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:	26.38	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 low flow	Pump Intake Depth:	Midscreen 35'
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	
1129			26.39	.2	5.87	11.2	839	9.62	165.9	clear
1132			↓	↓	6.96	13.0	314.1	8.50	149.4	↓
1135					7.00	12.8	309.6	7.41	153.0	
1138					6.87	13.2	293.3	2.43	155.2	
1142					6.65	13.3	290.4	2.20	159.9	
1145					6.64	13.3	285.1	2.11	161.0	

PURGING DATA

Sample ID:	MW-25i	Sampling Flow Rate:	.2		Analytical Laboratory:		Apex
Sample Time: →	1142	Final Depth to Water:	25		Did Well Dewater:		No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—				
1x250	H2SO4	NO2/3	—				
1x250	—	NH3	—				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMS3-132
Client:	NuStar Van
Project:	GWM 4Q21
Weather:	Rain 45°

WELL DATA

Monument Type:	Flush mount / Stick up	Well Diameter:			
	Other: Vault good MGM			Free Product Thickness:	
Monument Condition:			25.50		
Well Cap Lock Present:	Yes / No	Screened Interval:	—		
Comments:					
Purge Volume = (Water Height) X (Multiplier) X (# Casing Volum					
Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162			

PURGING DATA

Purge Method:	BP low flow
Sampling Method:	
Pump Intake Depth:	Midscreen
Tubing Material & Type:	LDE

Time	Volume Purged (liters)	Cumulativ Volume Purged (liters)	DTW (btc)	Purge R (L/min						
					+/-0.1					
820			26	.2	6	19	34	8	234	clear
823			↓	↓	3	12	24	24		
826					683	4	234	1.87	101	
829					710	13	4	7	18	
832					7.13	136	30	1.4	17	
835					712	1	31	136	177.2	↓

PURGING DATA

Sample ID:	MGMS3-132	Sampling Flow Rate:	2	Analytical Laboratory:		Apex
Sample Time:	835	Final Depth to Water:	25.50			No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered		Duplicate ID	
3x40	HCl	VOC	—			
1x250	H2SO4	NO2/3	—			
1x250	—	NH3	—			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMS3-110	Job Number:	
Client:	Nustar Van	Date:	12/10
Project:	GWM 4Q2	Sampler:	AW
Weather:	Cloudy 40°	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up Other: Vault	Well Diameter:	—	Depth to Free Product:	—
		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:	Peri	Pump Intake Depth:	
Sampling Method:	Low flow	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	
849			25.57	.2	7.02	13.3	205.3	6.03	183.2	clear
852			↓	↓	7.05	13.5	209.7	1.92	173.0	↓
855					7.15	13.4	211.6	.69	170.2	
858					7.17	13.5	211.5	.63	168.5	
901					7.18	13.6	212.2	.59	166.9	

PURGING DATA

Sample ID:	MGMS3-110	Sampling Flow Rate:	.2	Analytical Laboratory:	Apex	
Sample Time:	901	Final Depth to Water:	25.52	Did Well Dewater:	No	
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC				
1x250	H2SO4	NO2/3				
1x25	—	NH3				

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMS 3-60	Job Number:	
Client:	NuStar Van	Date:	12/10
Project:	GWM 4Q21	Sampler:	JW
Weather:	Cloudy 45°	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	good	Depth to Water:	25.49	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

PURGING DATA

Purge Method:	peri	Pump Intake Depth:	Midscreen
Sampling Method:	low flow	Tubing Material & Type:	LDPE W FD

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	(		
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
916			25.49	.2	7.07	12 9	171.0	1.94	3	clear
919			↓	↓	7.01	13 2	163.4	6	1 7	↓
922					6.95	13.1	159.0	4 7	1 8	
925					6.94	13 2	157	1	53	
928					6.92	13 3	158.6	4.7	150.9	

PURGING DATA

Sample ID:	MGMS3-60	Sampling Flow Rate:	.2		Analytical Laboratory.	Apex
Sample Time:	928	Final Depth to Water:	25.59		Did Well Dewater:	N
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	VOC	—			
1x250	H2SO4	NO2/3	—			
1x250	—	NH3	—			

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MGMS3-40	Job Number:	
Client:	Northstar Van	Date:	12/10
Project:	Gum 402	Sampler:	AW
Weather:	Cloudy 45°	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	—	Depth to Free Product:	—
	Other: MGMS vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	good	Depth to Water:	25.04	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 Intake Depth:	Midscreen
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	
940			25.04	.2	6.52	13.4	300.9	2.35	160.5	clear
943			↓	↓	6.51	13.9	327.1	.78	73.2	↓
946			↓	↓	6.54	14.1	329.5	.63	30.0	↓
949			↓	↓	6.59	14.0	332.1	.51	-21.4	↓
952			↓	↓	6.61	14.0	332.9	.46	-45.4	↓
955			↓	↓	6.62	14.1	333.9	.44	-72.0	↓
958			↓	↓	6.62	14.1	335.0	.39	-76.1	↓
1001			↓	↓	6.62	14.0	334.5	.37	-80.3	↓

PURGING DATA

Sample ID:	MGMS3-40	Sampling Flow Rate:	.2		Analytical Laboratory:		Apex
Sample Time:	1001	Final Depth to Water:	25.04		Did Well Dewater:		NO
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3x40	HCl	VOC	—	—	—	—	—
2x250	↓	RSK	—	—	—	—	—
1x250	H2SO4	NO2/3	—	—	—	—	—
1x250	—	NH3	—	—	—	—	—
3x40	HCl	VOC	—	—	—	—	MGMS3-40
1x250	H2SO4	NO2/3	—	—	—	—	↓

NOTES/ADDITIONAL COMMENTS

1x250	—	NH3	—	—	—	—	↓

WELL MONITORING DATA SHEET

	Well ID:	MW-15	Job Number:	
	Client:	Mustang Van	Date:	11/10/21
	Project:	GWM 4Q21	Sampler:	SP
	Weather:	Overcast, light rain	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:	32.02	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:	Mid screen
Sampling Method:	Low Flow	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 (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/- 0.5 ppm	+/- 20 mV	
0829			32.02	0.20	6.47	6.8	497.4	4.29	200.1	Clear
0832			32.27	0.20	6.24	9.3	491.5	1.48	194.0	↓
0835			32.29	0.20	6.10	10.9	501.	1.48	193.7	
0838			32.46	0.20	6.05	11.6	509	1.02	193.6	
0841			32.48	0.20	6.04	11.6	509	0.97	193.5	
~~0844~~ 0844			32.62	0.20	6.04	11.7	510	0.96	193.4	

PURGING DATA

Sample ID:	MW-15	Sampling Flow Rate:	0.20			Analytical Laboratory:	Apex
Sample Time:	0844	Final Depth to Water:	32.69			Did Well Dewater:	No
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
(3) 40mL	HCl	VOCs					
(1) 250mL	—	NH3					
(1) 250mL	H_2SO_4	NO2,3					

NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

	Well ID:	EX-1		Job Number:	
	Client:	NuStar Van		Date:	12/10/21
	Project:	GWM 4Q21		Sampler:	JP
	Weather:	Overcast, windy, cold		Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	—
	Other: Vault	Well Depth:	—	Free Product Thickness:	—
Monument Condition:	Good	Depth to Water:	26.59	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:	Midscreen
Sampling Method:	Lowflow	Tubing Material & Type:	SS NEW / DEDICATED

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0938			26.59	0.20	6.40	12.4	1126	2.48	247.4	Clear
0941			26.54	0.25	6.50	13.4	1184	1.14	244.7	↓
0944			26.54	0.25	6.58	13.8	1187	0.97	243.0	
0947			26.54	0.25	6.60	13.8	1160	0.79	242.4	
0950			26.54	0.25	6.62	14.1	1178	0.58	241.4	

PURGING DATA

Sample ID:	EX-1	Sampling Flow Rate:	0.25			Analytical Laboratory:	Apex
Sample Time:	0950	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	
(3) 40mL	HCl	VOCs	—	—	—	—	
(2) 40mL	HCl	RSKs	—	—	—	—	
(1) 250mL	—	NH_3	—	—	—	—	
(1) 250mL	H_2SO_4	$NO_{2/3}$	—	—	—	—	

NOTES/ADDITIONAL COMMENTS

8/25/21 Nustar Van SVE O+M

South SVE System parameters:

	PID	pressure
pre blower	0.0	-17
post blower	29.1	30
post carbon 1	33.6	18
Post Carbon 2	35.5	7

SVE sampling

SVE-South-Post Carbon-082521
Pi: -25 Pf: -4 Ti: 0735 Tf: 0741

Canister: 610895 Controller: 1913

SVE-South-Pre Carbon-082521
Pi: -30 Pf: -6 Ti: 0725 Tf: 0731

Canister: 610363 Controller: 1849

Checked to drum: No Blue Water.

GeoEngineers

1200 NW Naito Parkway, Suite 180
Portland, Oregon 97209
503.624.9274

Field Report

File Number:

Project: Nustar VAN Main SVE O+M

Date: 11/19/21

Owner: Nustar

Time of Arrival: 0650

Report Number:

Prepared by: Lindsey Wallis

Location: Port of Vancouver, WA

Time of Departure: 1015

Page: 1/2

Purpose of visit: O&M - SVE

Weather: light rain, 45°F

Travel Time: 25 min, 30 min

Permit Number:

Upon arrival to the site I assessed personal safety hazards: ☒ Yes or ☒ Referred to Site Safety Plan and Safety Tailgate if applicable

Safety Hazards Were Addressed by: ☒ Staying Alert to Construction and Equipment Hazards ☐ Other (describe)

0650 - LW JP onsite
0700 - H&S meeting. Issued work permit
0720 - Mob to SVE system. System on upon arrival. Collect system parameters

	PID	Pressure
pre blower	0.0	-19
post blower	36.9	28
post carbon 1	25.1	11
post carbon 2	24.5	6

Collect air samples.

SVE-South-PostCarbon-111921
Pi: -29 Ti: 0754 Pf: -5 Tf: 0758
34424 Flow: 2115 *Noticed system outlet valve closed during sampling.

SVE-South-PreCarbon-111921
Pi: -30 Ti: 0828 Pf: -5 Tf: 835
27420 Flow: 2135

Emptied 6 gal Blue water from ko drum 3x cont. 840

☐ THIS FIELD REPORT IS PRELIMINARY
A preliminary report is provided solely as evidence that field observation was performed. Observations and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those indicated in a preliminary report.

FIELD REPRESENTATIVE: [signature] DATE: 11/19/21

☐ THIS FIELD REPORT IS FINAL
A final report is an instrument of professional service. Any conclusions drawn from this report should be discussed with and evaluated by the professional involved.

REVIEWED BY DATE

Attachments:

Distribution:

Blue Water emptied into new 20 gal drum (closed top). Alerted operator.

Checked suspected catch Basin/dry well, near truck scales. ID'd as CB with two inlet/outlet pipes, ~2 ft below ground surface. Total depth: 10 ft bgs.

Was not able to open corroded shut lid near Butler building. Appears to have bottom few inches below grade (?) with water present.

Put bolts in well MW-8 and MW-11 (only 1 bolt present).

1010 - Turned in work permit, signed out.
1015 - Geo personnel off site.

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
	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

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)	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
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
	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

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	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
(continued)	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
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

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	6/27/2000	<20	<100	<10	<10	<10	<10	<10	410	<10	10.2	1,460	<20	--	241	<10
(continued)	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
	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
	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

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 (continued)	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
	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

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 (continued)	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
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
	9/25/2001	<25	200	<25	<25	34	<25	<25	1,800	<25	<25	2,200	<25	--	180	180
	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	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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	5/4/2004	<20	<20	<20	<20	<20	<20	<20	432	<20	<20	2,440	<20	--	178	188
(continued)	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
	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

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)	3/15/2013	<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
	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

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)	3/3/2021	<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
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
	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

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)	3/21/2014	<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	<0.500	<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
	6/5/2019	<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	<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
	3/4/2021	<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
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

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)	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
	12/6/2006	<200	<100	<100	<200	<100	<100	<100	<100	<100	<100	24,600	<100	--	408	<100
	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

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	12/18/2009 DUP	<5	<5	<5	<5	6.6	<5	<5	320	<5	<5	1,500	6.6	<5	160	<5
(continued)	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
	06/22/2012	<2	9.2	<2	<2	9.8	<2	<2	540	<2	<2	24	<2	<2	5.1	300
	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

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)	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
	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
	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

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)	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
	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
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

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)	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
	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

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)	6/24/2014	<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
	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
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

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)	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
	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

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)	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
	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

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	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
(continued)	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
	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
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

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	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
(continued)	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
	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
	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

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-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 (continued)	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
	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

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 (continued)	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
	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

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	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

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-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
	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
	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
	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

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-13 (continued)	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
	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

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	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
	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

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)	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
	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

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	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
	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

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)	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
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
	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

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	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
(continued)	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	9.5	<0.50	<0.50	144	0.66	<0.50	35.6	<0.50
	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

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)	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
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
	5/23/2007	<1	<1	<1	<1	<1	<1	<1	8.82	<1	<1	37.8	<1	–	28.2	<1
	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

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	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
(continued	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
	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
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

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)	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
	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
	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

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)	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
	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

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)	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
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
	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

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	3/8/2011	<5	<5	<5	<5	23	<5	12	280	<5	<5	1,500	18	<5	590	13
(continued)	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
	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
	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

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 (continued)	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
	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
	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

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 (continued)	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
	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
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

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)	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
	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	<0.500	<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
	3/25/2019	<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
	6/3/2019	<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	0.43	<0.400	<0.500	<0.400	<0.400	<0.500	<0.400	<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	<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	<0.400	<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
	12/10/2020	<2.00	<5.00	<1.00	<1.00	<0.400	<0.400	<0.400	0.489	<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	0.566	<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	0.796	<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

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	0.69	<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	6.8	<0.50	<0.50	3.4	<0.50	<5	1.8	<0.50
	6/16/2016	<0.50	<2	<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	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	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
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
	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
	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

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	12/8/2011	<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
(continued)	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
	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

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)	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
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
	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

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)	9/23/2015	<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
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

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)	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	0.5	<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	8	<0.50	<0.50	2.1	<0.50	<0.50	11	<0.50
	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

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)	3/21/2019	<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
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
	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

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)	9/18/2013	<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	0.207 J	<0.500	<0.500	0.402 J	<0.500	<0.500	0.215 J	<0.500
	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

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	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
	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

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)	6/7/2019	<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
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

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)	6/15/2017	<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
	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
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

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)	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
	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
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

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 (continued)	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
	9/24/2014	<2	<2	<2	<2	3.9	<2	<2	68	<2	<2	220	3.1	<2	340	<2
	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

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	1.4	<0.5	<0.5	0.94	<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	<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	<0.500	<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-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
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	--	0.69	<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
	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	0.57	<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

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	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
	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

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	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
(continued)	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
	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

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)	6/17/2020	<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
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
	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

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)	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
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
	5/3/2004	<100	<100	<100	<100	370	<100	<100	12,300	<100	<100	830	<100	--	1,520	111
	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

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
MGMS1-3(43)	5/22/2007	<100	<100	<100	<100	439	<100	119	14,200	152	<100	910	<100	--	1,920	245
(continued)	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
	9/23/2014	<15	<15	<15	<15	190	<15	35	4,700	69	<15	120	<15	<15	420	550
	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

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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
MGMS1-3(43) (continued)	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
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

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
MGMS1-2(60) (continued)	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
	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
	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

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
MGMS1-2(60)	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
(continued)	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
	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

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
MGMS1-2(60) (continued)	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
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
	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

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)	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
(continued)	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
	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
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

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
MGMS2-4(40) (continued)	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
	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
	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

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
MGMS2-4(40)	3/8/2012	<2	<2	<2	<2	38	<2	2.3	470	2.8	<2	9.9	5.2	<2	5.4	260
(continued)	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
	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

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
MGMS2-4(40) (continued)	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
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
	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
	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

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)	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
(continued)	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
	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

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)	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
(continued)	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
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

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)	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
(continued)	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
	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

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
MGMS2-1(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
	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
	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

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
MGMS2-1(132) (continued)	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
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

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
MGMS3-4(40)	6/6/2006	<20	<20	<20	<20	20.4	<20	<20	2,290	32.2	<20	1,410	<20	--	401	23.6
(continued)	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
	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
	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

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
MGMS3-4(40) (continued)	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
	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
	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

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
MGMS3-4(40) (continued)	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
	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
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

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)	2/1/2005	<2	<1	<1	<2	<1	<1	<1	179	1.72	<1	15.6	<1	--	7.9	<1
(continued)	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
	6/6/2006	<1	<1	<1	<1	<1	<1	<1	7.97	<1	<1	2.84	<1	--	1.04	<1
	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

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)	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
	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

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

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)	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
(continued)	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
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
	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

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)	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

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

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)	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	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	4,570.0	12.4	<0.500	322	22.2
	9/16/2021	<1.00	<5.00	<1.00	<1.00	11.3	<0.400	7.65	739.0	6.50	<0.500	2,940.0	7.80	<0.500	380.0	20.6
	12/10/2021	<1.00	<5.00	<1.00	<1.00	3.1	<0.400	3.73	198.0	1.55	<0.500	4,900.0	10.60	<0.500	268.0	6.8

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	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
	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
	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

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	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
(continued)	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
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 September and December 2021 groundwater sampling events, and air samples collected during the August, November, and December 2021 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
A1I0458	9/29/2021	9/14/2021	First Quarter Groundwater Monitoring Event
A100533	10/5/2021	9/15/2021	First Quarter Groundwater Monitoring Event
A1I0571	10/5/2021	9/16/2021	First Quarter Groundwater Monitoring Event
A1L0236	12/28/2021	12/7/2021	Second Quarter Groundwater Monitoring Event
A1L0317	12/28/2021	12/8/2021	Second Quarter Groundwater Monitoring Event
A1L0366	12/29/2021	12/9/2021	Second Quarter Groundwater Monitoring Event
A1L0413	12/29/2021	12/10/2021	Second Quarter Groundwater Monitoring Event
2108625	9/10/2021	8/25/2021	Soil Vapor Extraction System Monitoring
2111593	12/7/2021	11/19/2021	Soil Vapor Extraction System Monitoring
2112270	12/29/2021	12/8/2021	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 volatile organic compounds (VOCs) 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 VOCs 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 VOC analysis arrived without headspace with the exceptions of 1 of 5 bottles from sample MGMS1-43 (report A10458), 2 of 5 bottles from samples MW-12 and MW-13 (report A10458), and 1 of 5 bottles on MW-19 (report A1L0317). Field staff check for headspace when collecting samples and sealing bottles and additional sample volume is added if headspace is present.

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 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 fourth quarter 2021: MW-9, MW-23i, MGMS3-1(132), MGMS3-2(110), MGMS3-3(60), MGMS-4(40), MGMS-4(40) DUP, MW-15, and EX. The hold time for nitrate is 48 hours and the initial analysis of samples were made within the recommended hold time. Samples were rerun out of hold time due to standard failure during initial analysis. Project data have flagged with the H-01 qualifier to indicate the hold time exceedances.

Calibration and Analysis. Calibration verification was outside of acceptable limits for select VOCs 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 and 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 A1I0458. The LCS recovery of bromomethane, carbon tetrachloride, 2,2-dichloropropane, and 1,1,1,2-tetrachloroethane was outside acceptable limits for sample batch 1090702. The LCS recovery of bromomethane, carbon tetrachloride, 2,2-dichloropropane, and 1,1,1,2-tetrachloroethane was outside acceptable limits for sample batch 1090762. The LCS recovery of bromomethane, dichlorodifluoromethane, 2,2-dichloropropane, 1,2,4-trichlorobenzene, and trichlorofluoromethane was outside acceptable limits for sample batch 1090827. No associated sample data were detected; therefore, no sample data were flagged.
- Report A1I0533. The LCS recovery of bromomethane, carbon tetrachloride, 2,2-dichloropropane, and 1,1,1,2-tetrachloroethane was outside acceptable limits for sample batch 1090762.. The LCS recovery of bromomethane, carbon tetrachloride, dibromochloromethane, dichlorodifluoromethane, 2,2-dichloropropane, trans-1,3-dichloropropene, and 1,1,1,2-tetrachloroethane was outside acceptable limits for sample batch 1090803. The LCS recovery percentage chloromethane, 2,2-dichloropropane, hexachlorobutadiene, 1,2,3-trichlorobenzene, and 1,2,4-trichlorobenzene was outside acceptable limits for sample batch 1090877. No associated sample data were detected; therefore, no sample data were flagged.
- Report A1L0236. The LCS recovery of bromoform, chloromethane, 2,2-dichloropropane, hexachlorobutadiene, and trichlorofluoromethane in sample batch 21L0287was outside acceptable limits. The LCS recovery of bromoform, chloromethane, and 2,2-dichloropropane in sample batch 21L0376 was outside acceptable limits. The LCS recovery of trichlorofluoromethane in sample batch 21L0452 was outside acceptable limits. No associated sample data were detected; therefore, no sample data were flagged.

- Report A1L0317. The LCS recovery of trichlorofluoromethane was outside acceptable limits in sample batch 21L0452. No associated sample data were detected; therefore, no sample data were flagged.
- Report A1L0366. The LCS recovery of chloroethane and trichlorofluoromethane was outside acceptable limits for sample batch 21L0537. The LCS recovery of chloroethane, chloromethane, 2,2-dichloroproene, and trichlorofluoromethane was outside acceptable limits for sample batch 21L0589. The LCS recovery of bromomethane, chloromethane, and trichlorofluoromethane was outside acceptable limits for sample batch 21L0620. The LCS recovery of bromomethane, chloromethane, hexachlorobutadiene, and trichlorofluoromethane was outside acceptable limits for sample batch 21L0658. No associated sample data were detected; therefore, no sample data were flagged.
- Report A1L0413. . The LCS recovery of bromomethane, chloromethane, and trichlorofluoromethane was outside acceptable limits for sample batch 21L0620. The LCS recovery of bromomethane, chloromethane, hexachlorobutadiene, and trichlorofluoromethane was outside acceptable limits for sample batch 21L0658. No associated sample data were detected; 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 A1I0458. The MS recovery percentage (using sample MW-9) was outside acceptable limits for bromomethane, carbon tetrachloride, cis-1,2-dichloroethene, and 1,1,1,2-tetrachloroethane for sample batch 1090702. The MS recovery percentage (using the non-source sample) was outside acceptable limits for bromodichloromethane, bromomethane, carbon tetrachloride, 2,2-dichloropropane, and 1,1,1,2-tetrachloroethane for sample batch 1090762. The MS recovery percentage (using the non-source sample) was outside acceptable limits for bromomethane, carbon tetrachloride, 2,2-dichloropropane, and 1,1,1,2-tetrachloroethane for sample batch 1090827. No associated sample data were detected, with the exception of cis-1,2-dichloroethene in sample MW-9 which had associated LCS recoveries within acceptable limits; therefore, no sample data were flagged as a result.
- Report A1I0533. The MS recovery percentage (using sample MW-21i-40) was outside acceptable limits for bromodichloromethane, bromomethane, carbon tetrachloride, cis-1,2-dichloroethene, 2,2-dichloropropane, and 1,1,1,2-tetrachloroethane for sample batch 1090762. The MS recovery

percentage (using sample MW-20i) was outside acceptable limits for bromomethane, carbon tetrachloride, cis-1,2-dichloroethene, hexachlorobutadiene, and 1,1,1,2-tetrachloroethane for sample batch 1090803. The MS recovery percentage (using the non-source sample) was outside acceptable limits for bromobenzene, chloromethane, 2-chlorotoluene, 4-chlorotoluene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, hexachlorobutadiene, 1,2,3-trichlorobenzene, and 1,2,4-trichlorobenzene for sample batch 1090877. No associated sample data were detected, with the exception of cis-1,2-dichloroethene in samples MW-21i-40 and MW-20i which had associated LCS recoveries within acceptable limits; therefore, no sample data were flagged as a result.

- Report A1L0236. The MS recovery percentage (using the non-source sample) was outside acceptable limits for hexachlorobutadiene for sample batch 21L0376. No associated sample data were detected; therefore, no sample data were flagged as a result.
- Report A1L0366. The MS recovery percentage (using sample MW-6) was outside acceptable limits for bromochloromethane for sample batch 21L0537. The MS recovery percentage (using the non-source sample) was outside acceptable limits for bromochloromethane, 1,3-dichlorobenzene, tetrachloroethene (PCE), and trichlorofluoromethane for sample batch 21L0589. The MS recovery percentage (using the non-source sample) was outside acceptable limits for PCE and trichlorofluoromethane for sample batch 21L0620. The MSD recovery percentage for sample batch 21L0620 (using the non-source sample) was also outside acceptable limits for PCE. The MS recovery percentage (using the non-source sample) was outside acceptable limits for PCE and trichlorofluoromethane for sample batch 21L0658. The MSD recovery percentages for sample batch 21L0658 (using the non-source sample were within acceptable limits for analytes analyzed. No associated sample data were detected, with the exception of PCE in samples that had associated LCS recoveries within acceptable limits; therefore, no sample data were flagged as a result. The MS and MSD recovery percentages were below acceptable limits for ammonia as nitrogen for sample batch 21L0419. Associated LCS recoveries were within limits; therefore, no sample data were flagged.
- Report A1L0413. The MS recovery percentage (using the non-source sample) was outside acceptable limits for PCE and trichlorofluoromethane for sample batch 21L0620. The MSD recovery percentage for sample batch 21L0620 (using the non-source sample) was also outside acceptable limits for PCE. The MS recovery percentage (using the non-source sample) was outside acceptable limits for PCE and trichlorofluoromethane for sample batch 21L0658. The MSD recovery percentages for sample batch 21L0658 (using the non-source sample were within acceptable limits for analytes analyzed. No associated sample data were detected, with the exception of PCE in samples that had associated LCS recoveries within acceptable limits; 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.

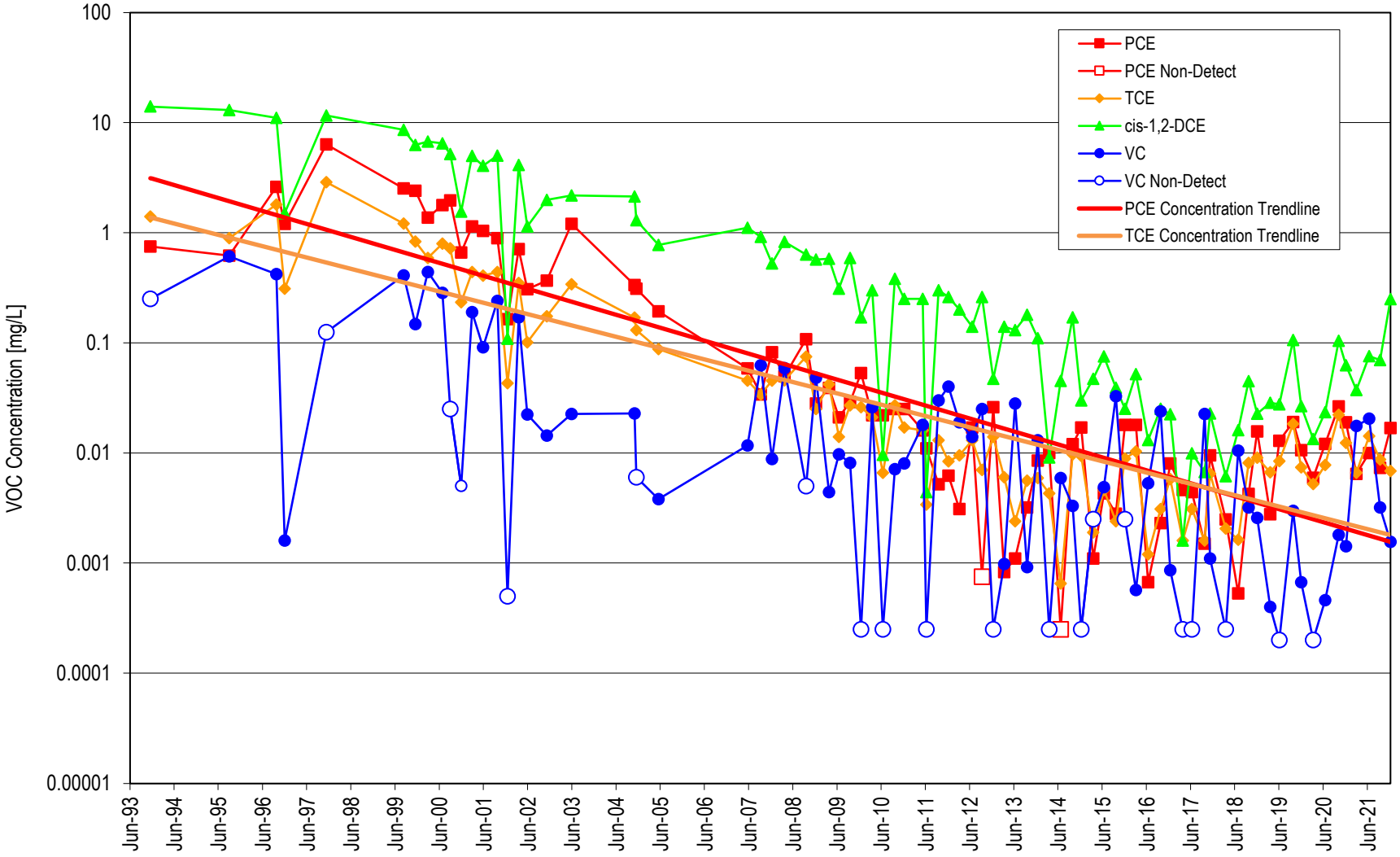
Laboratory Duplicate. A laboratory duplicate is a second analysis of an environmental sample received by the laboratory, which serves as an internal check on laboratory quality as well as potential variability of the sample matrix. The laboratory duplicate concentration is compared to the primary sample 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.

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%.

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.

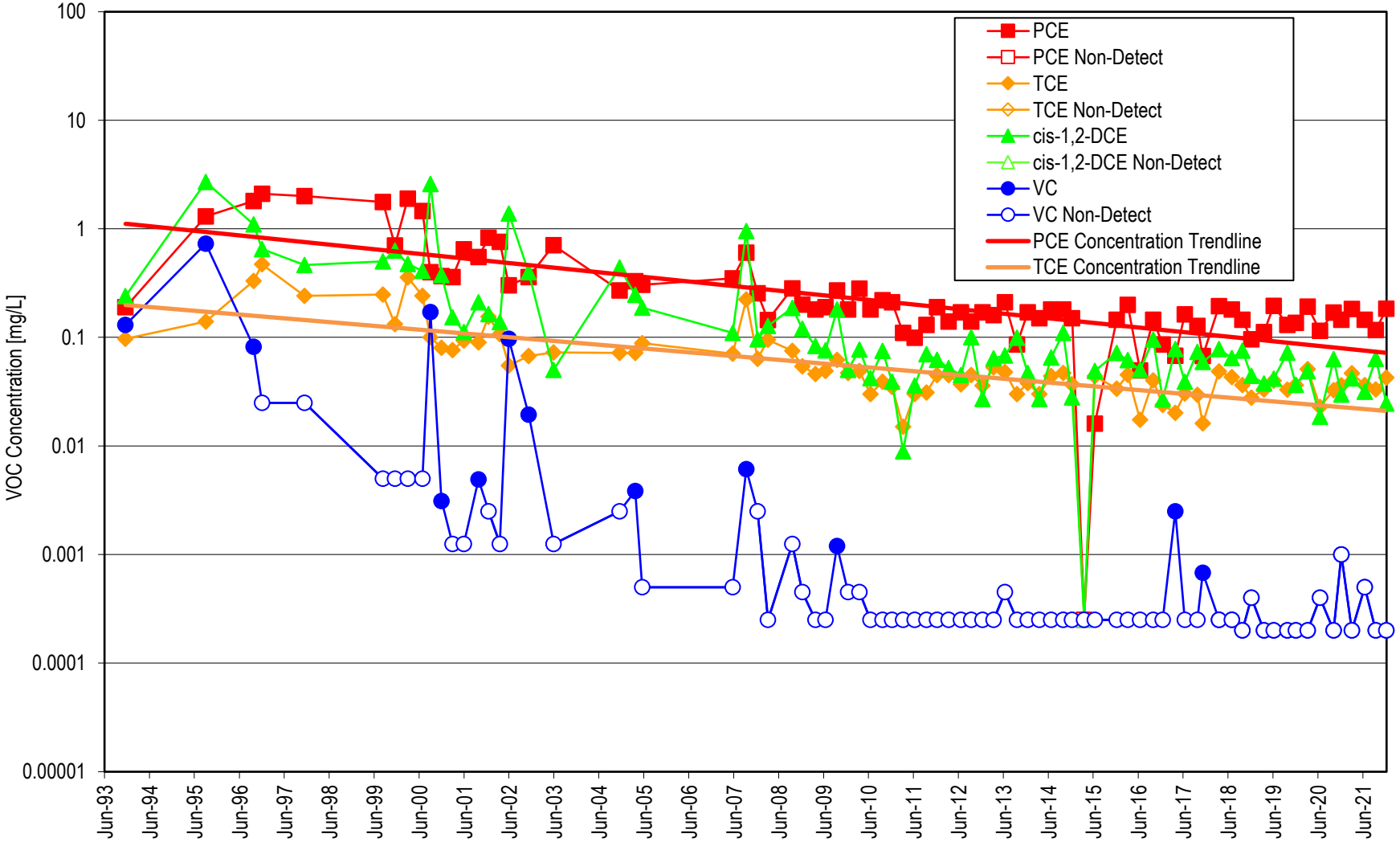
APPENDIX D
VOC Concentration Trend Plots

VOC Concentrations in MW-1



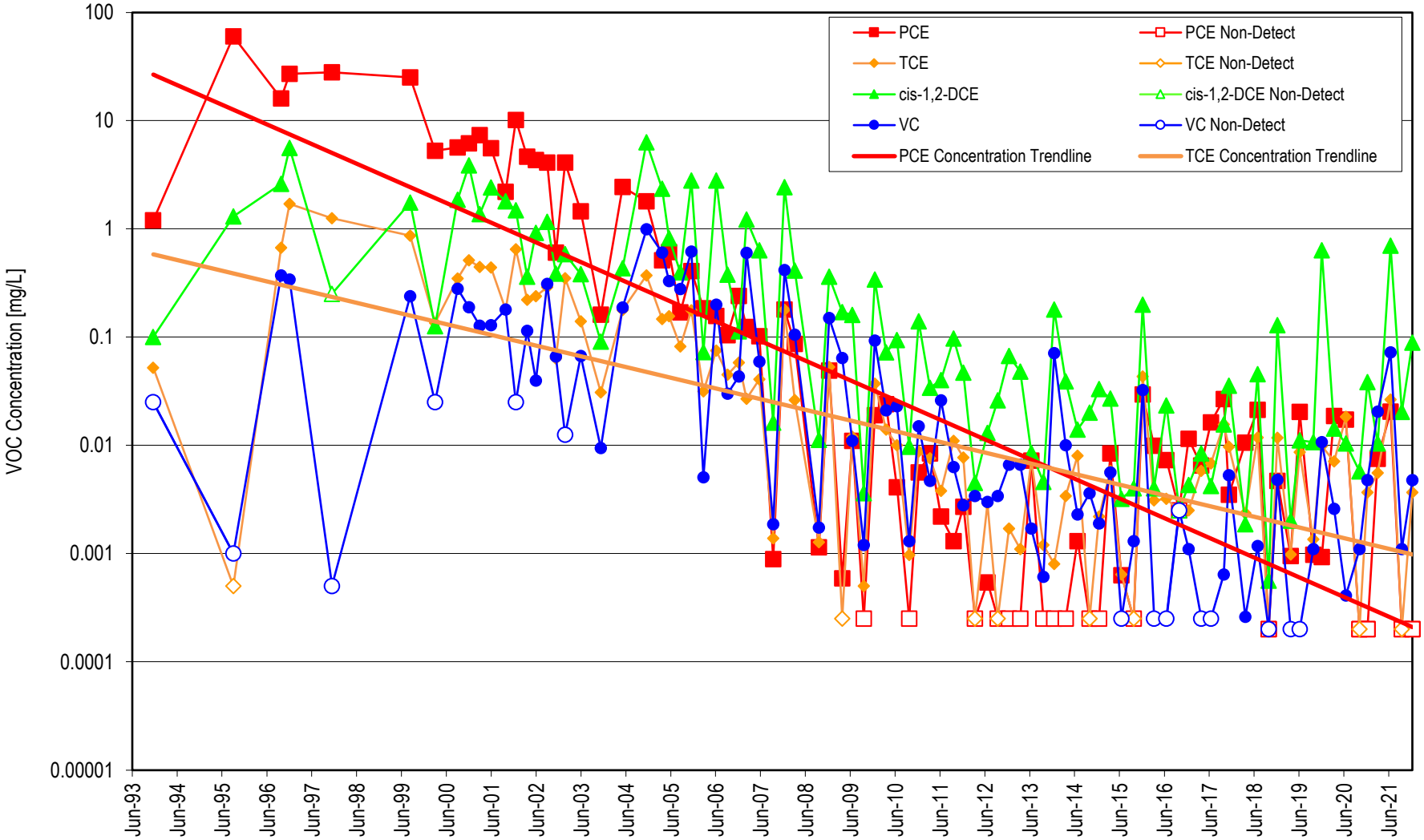
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-3



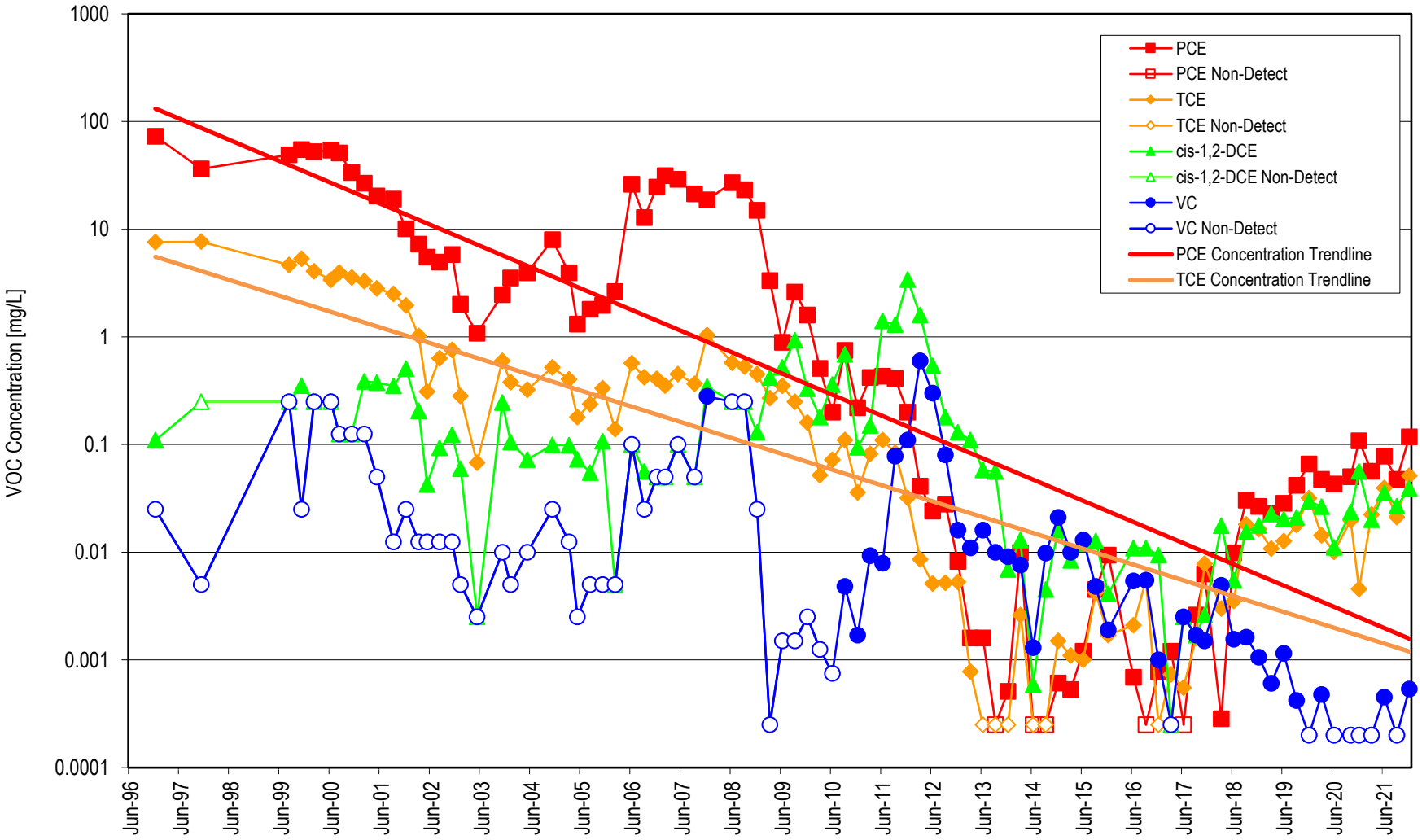
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-5



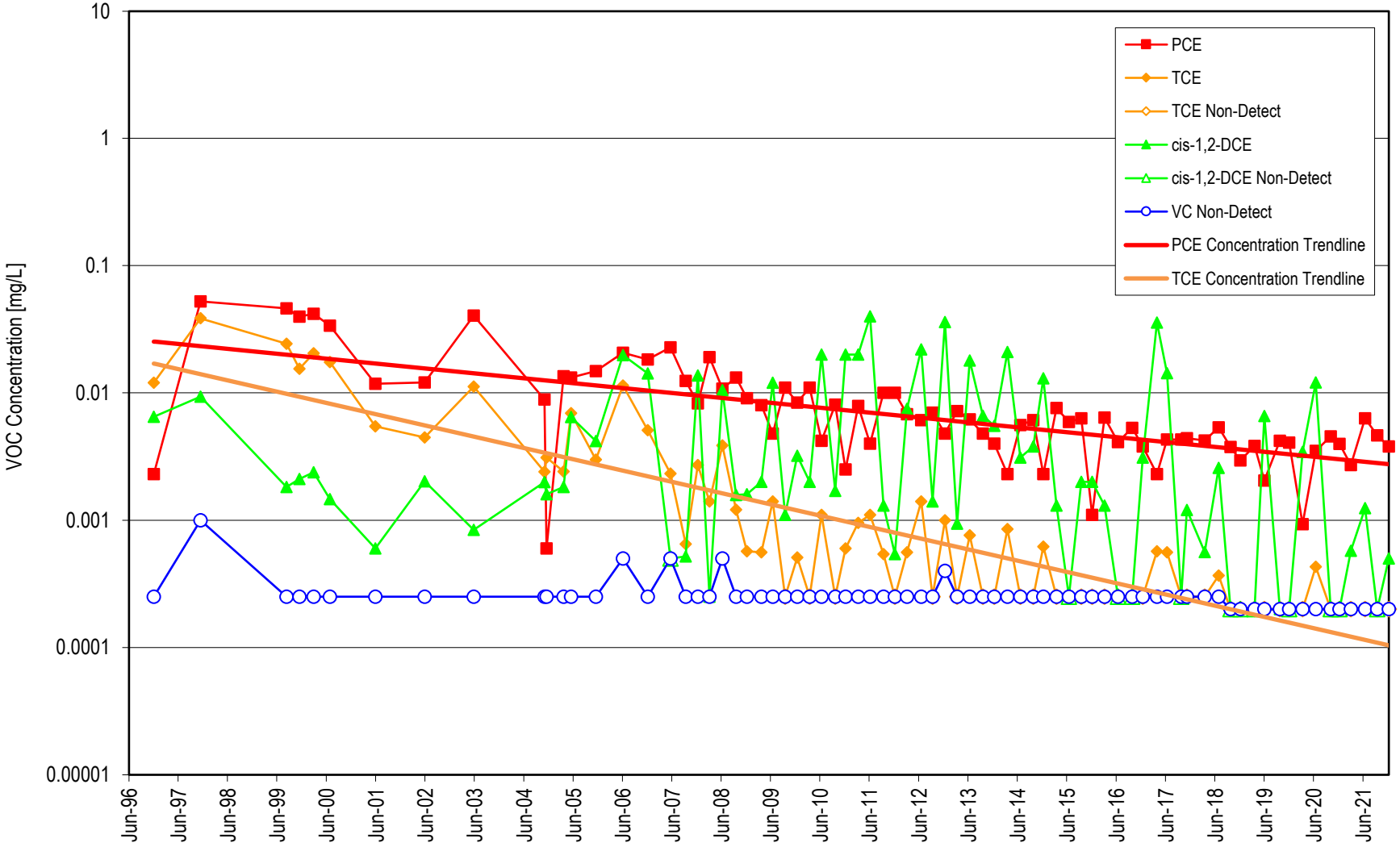
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-7



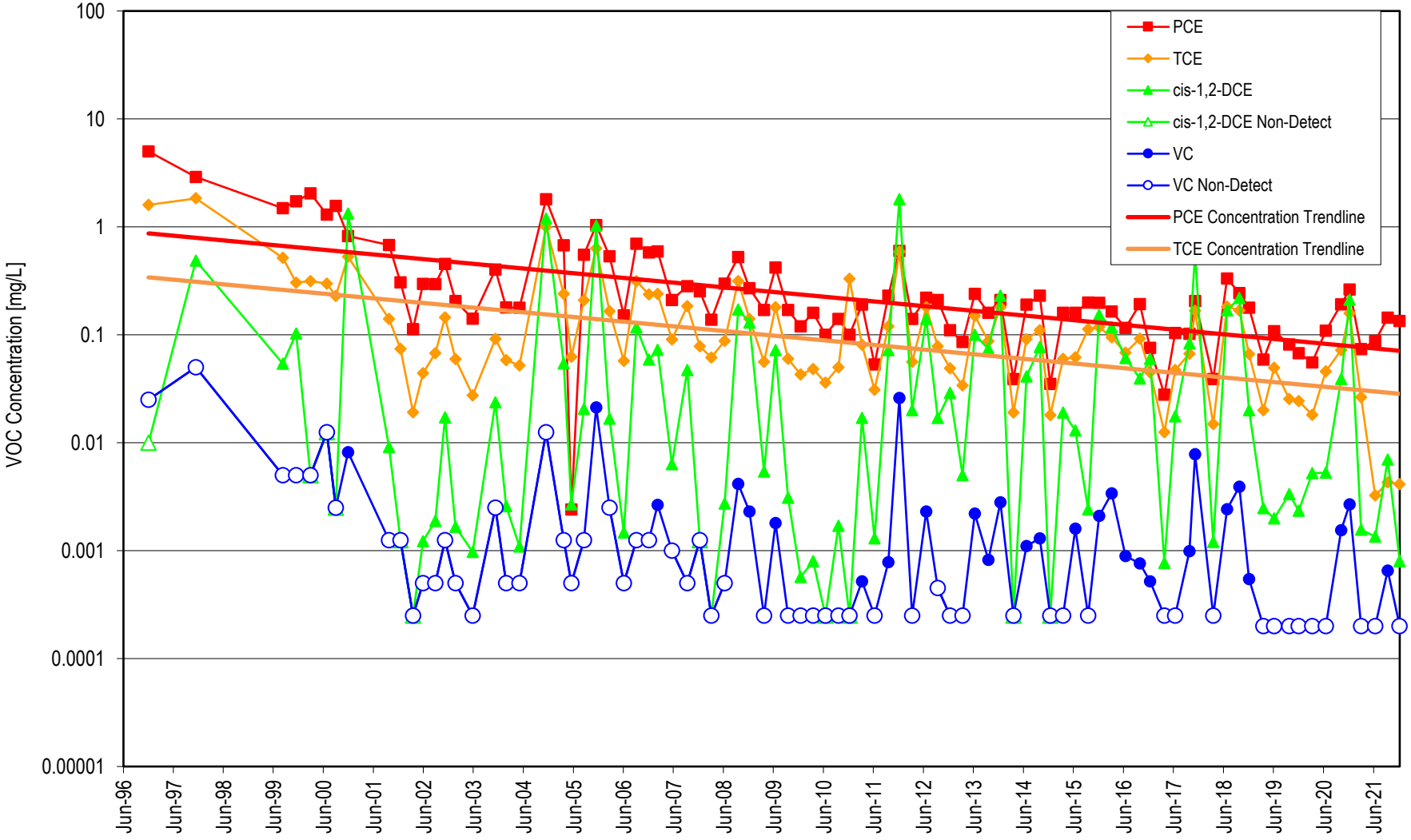
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-8



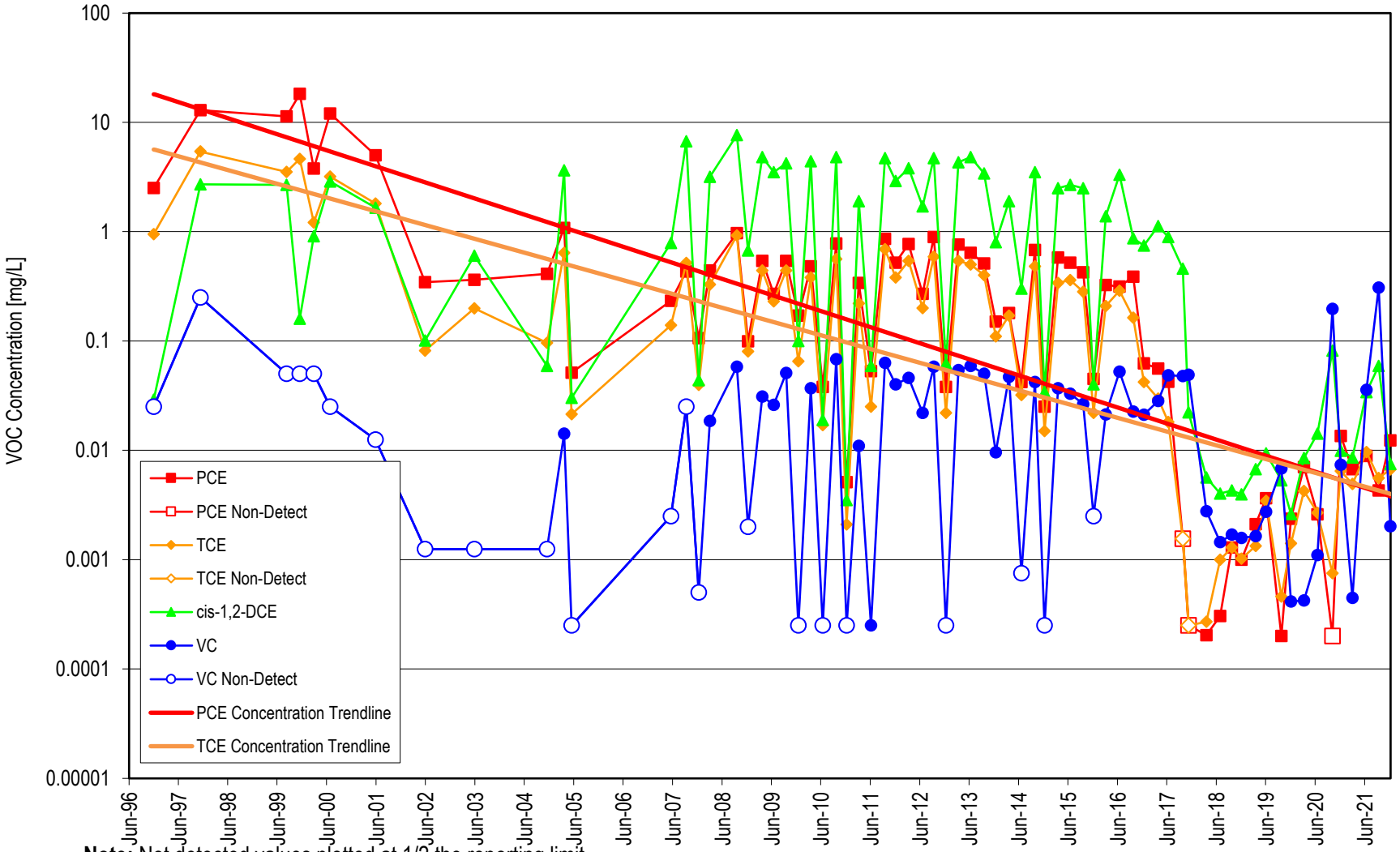
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-9



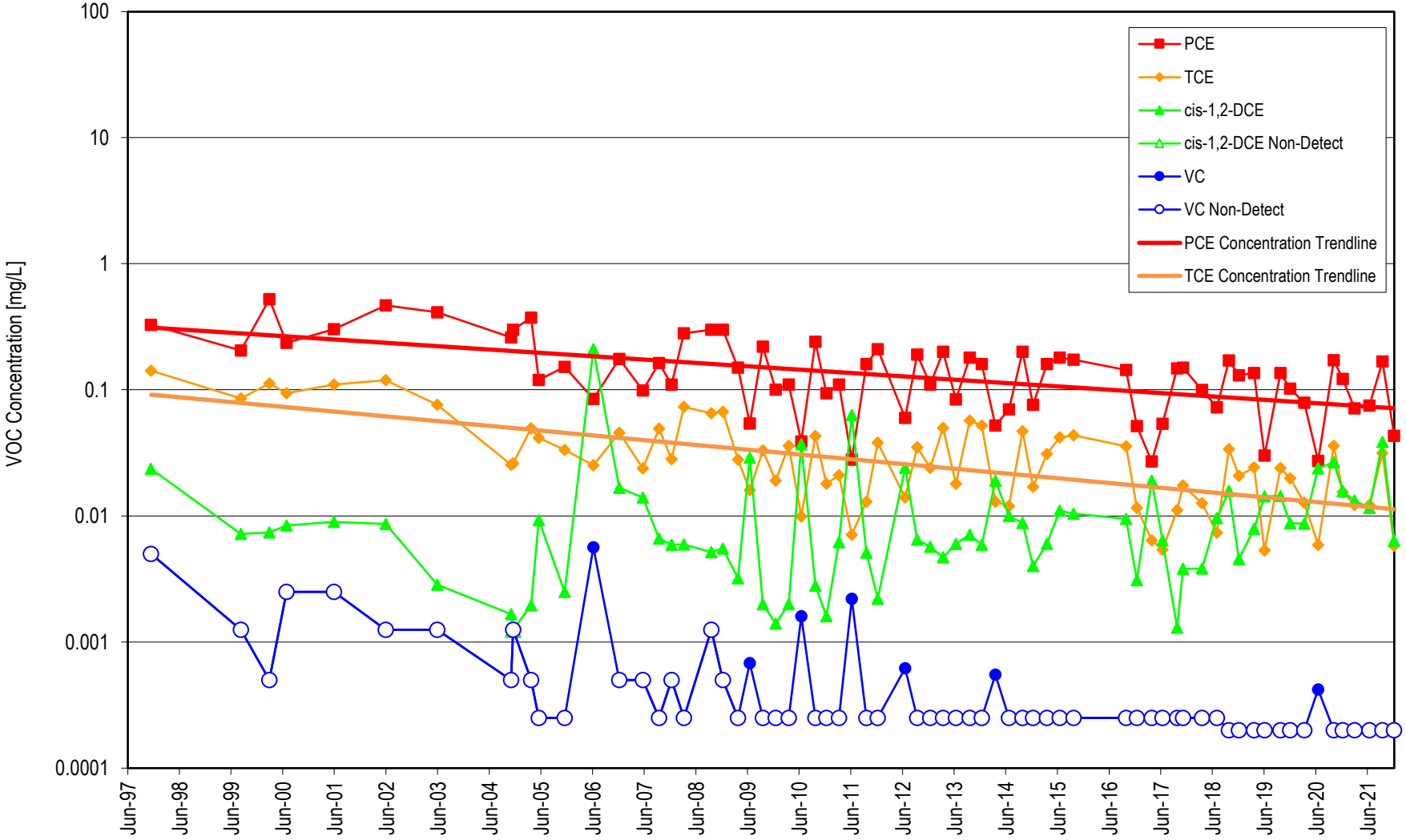
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-12



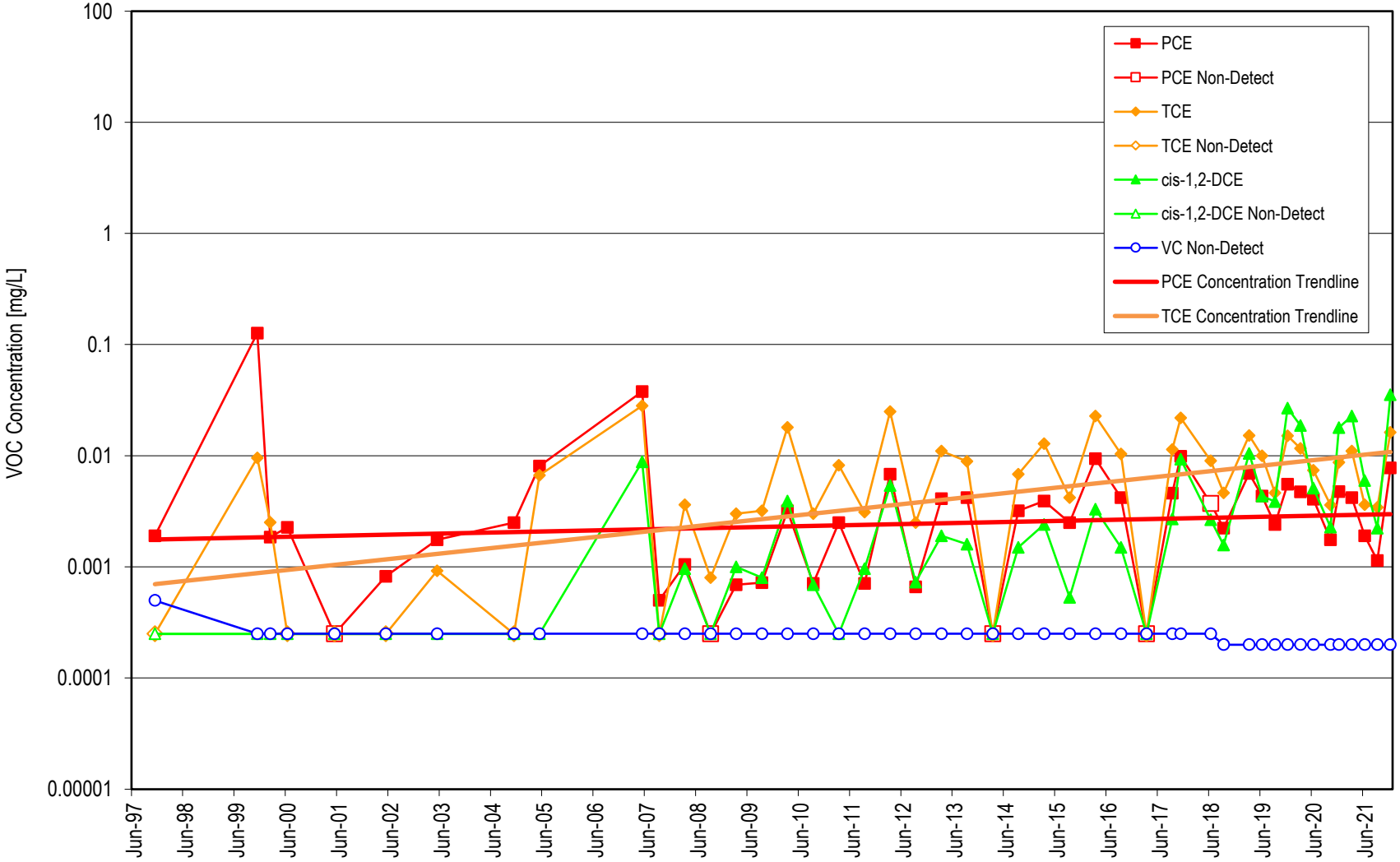
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-16



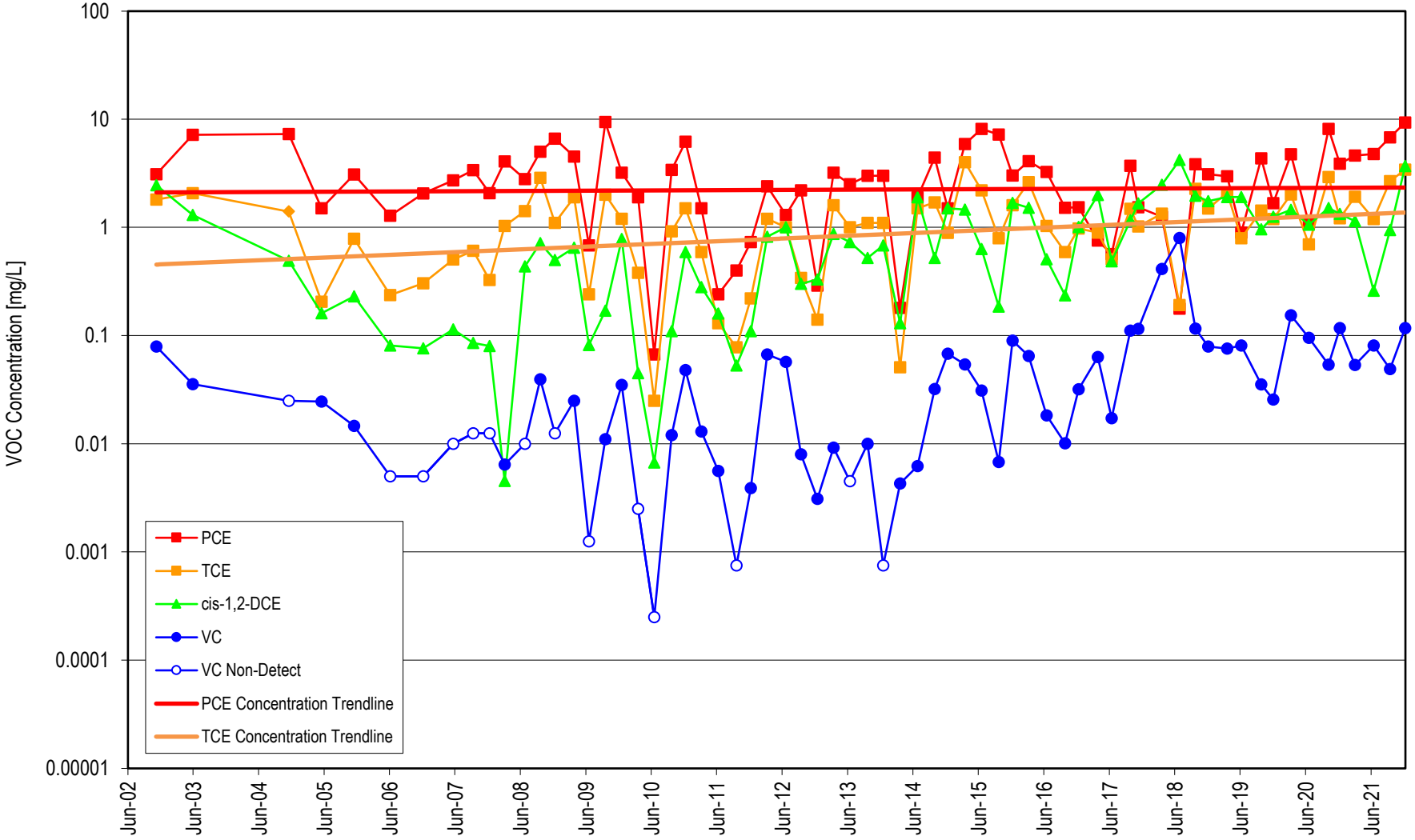
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-17



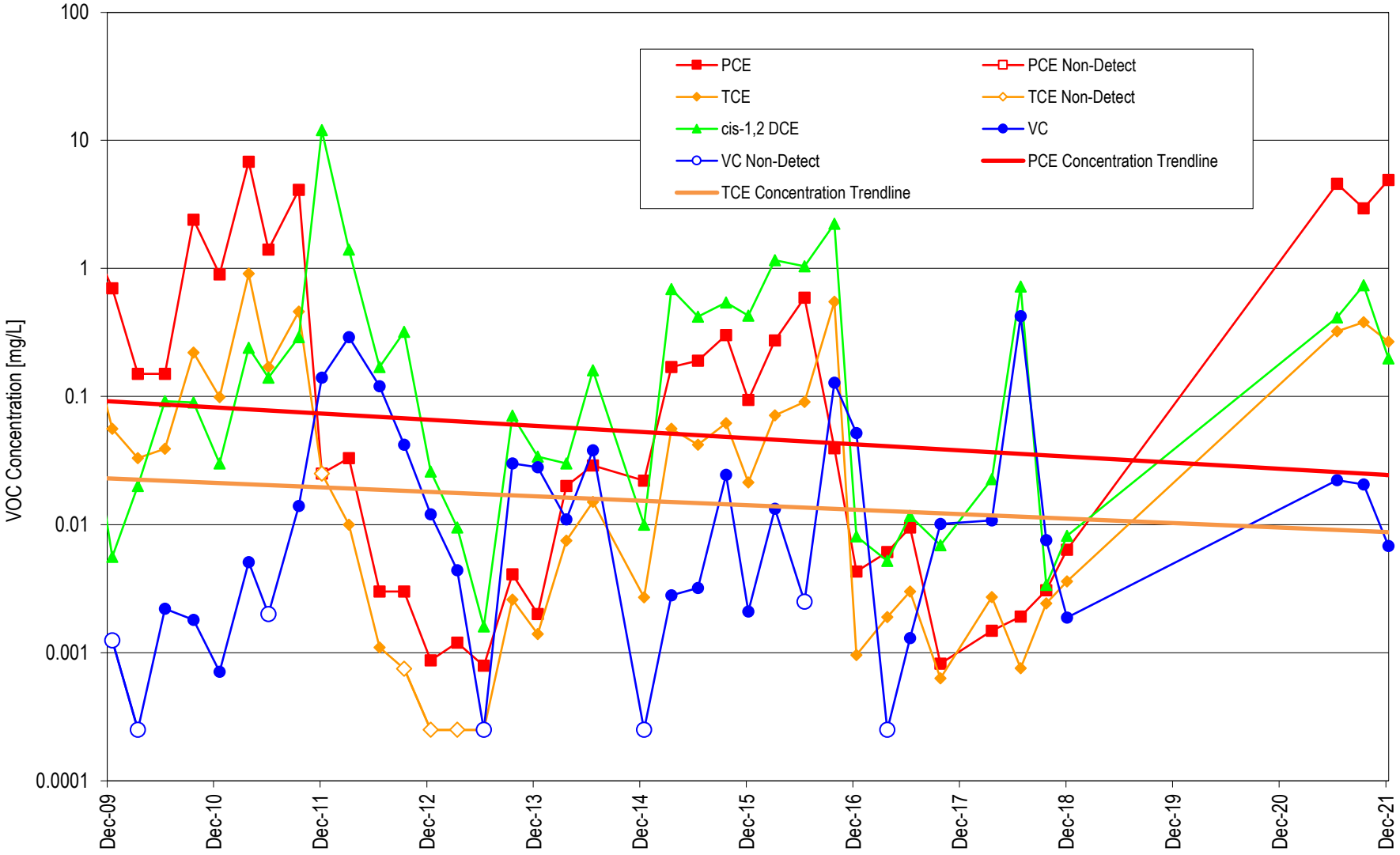
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-19



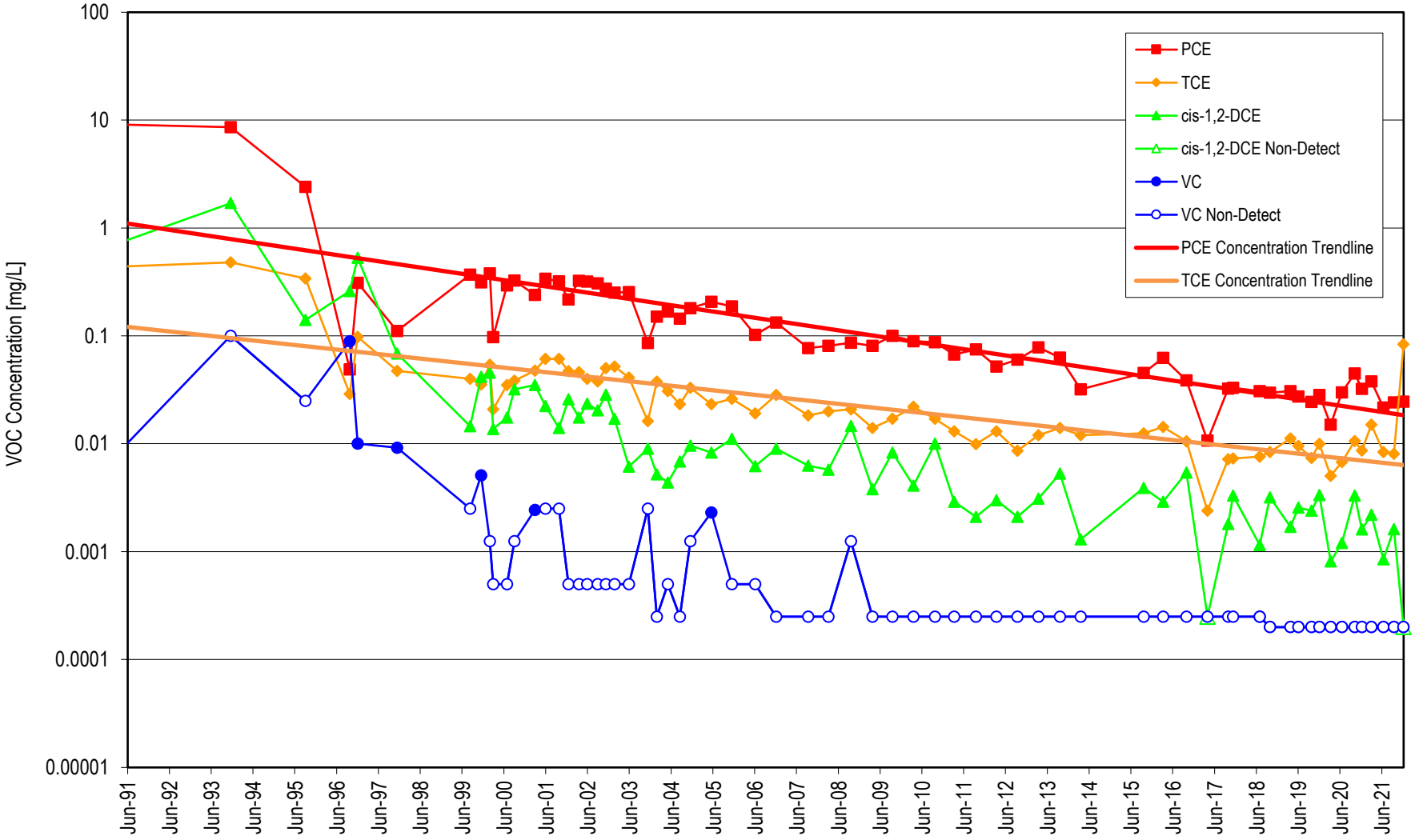
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in EX



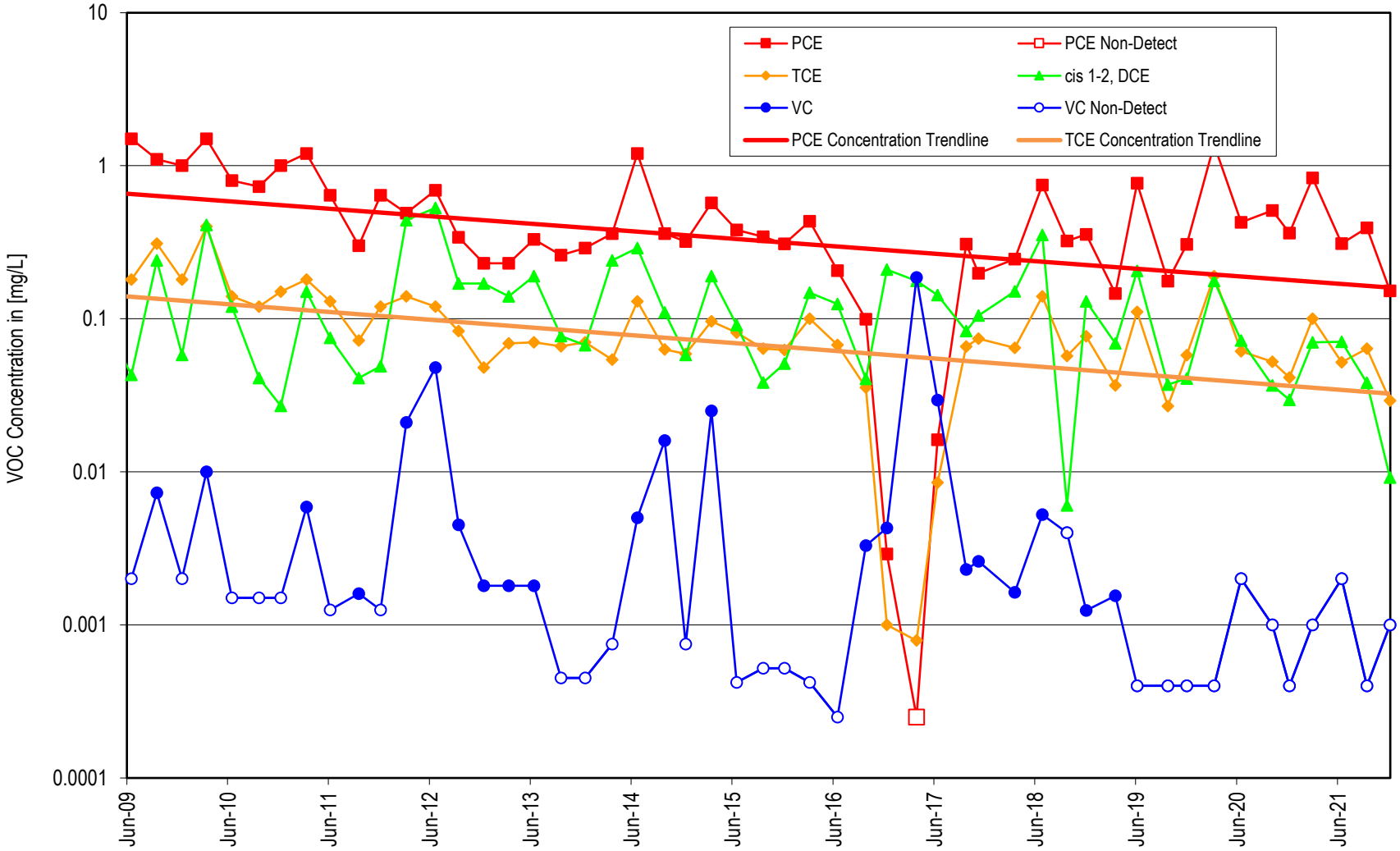
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in EW-1



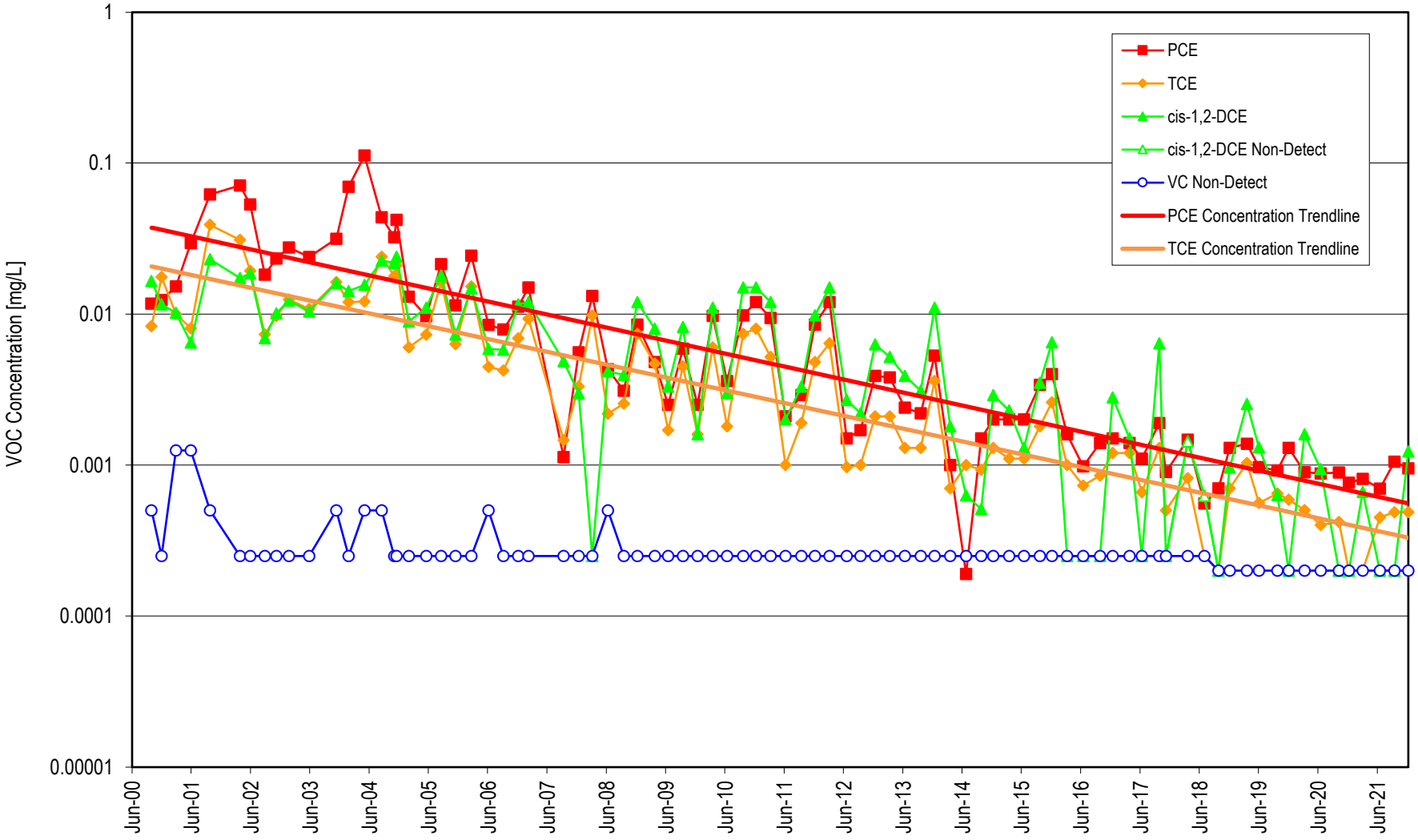
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MP-1



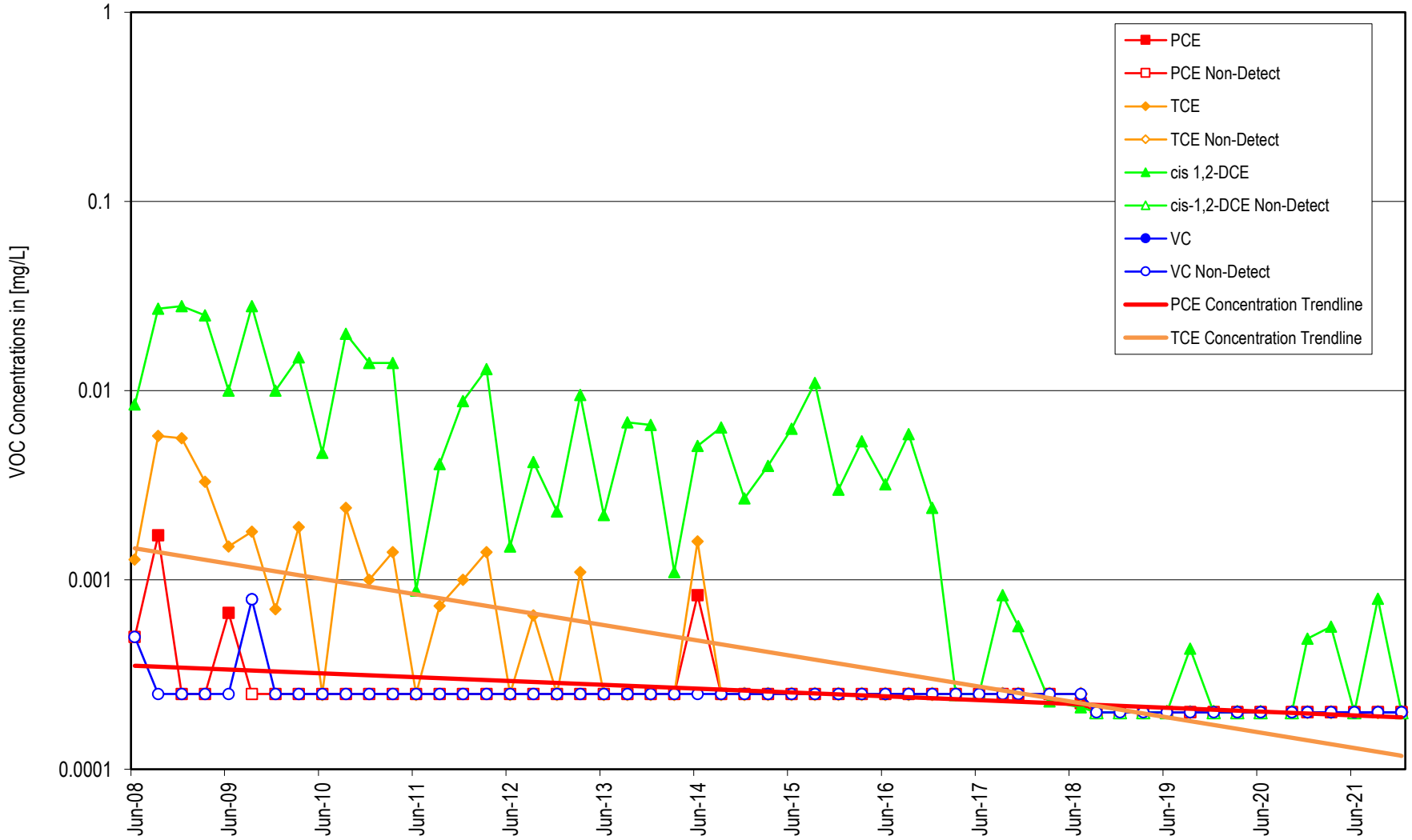
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-18i



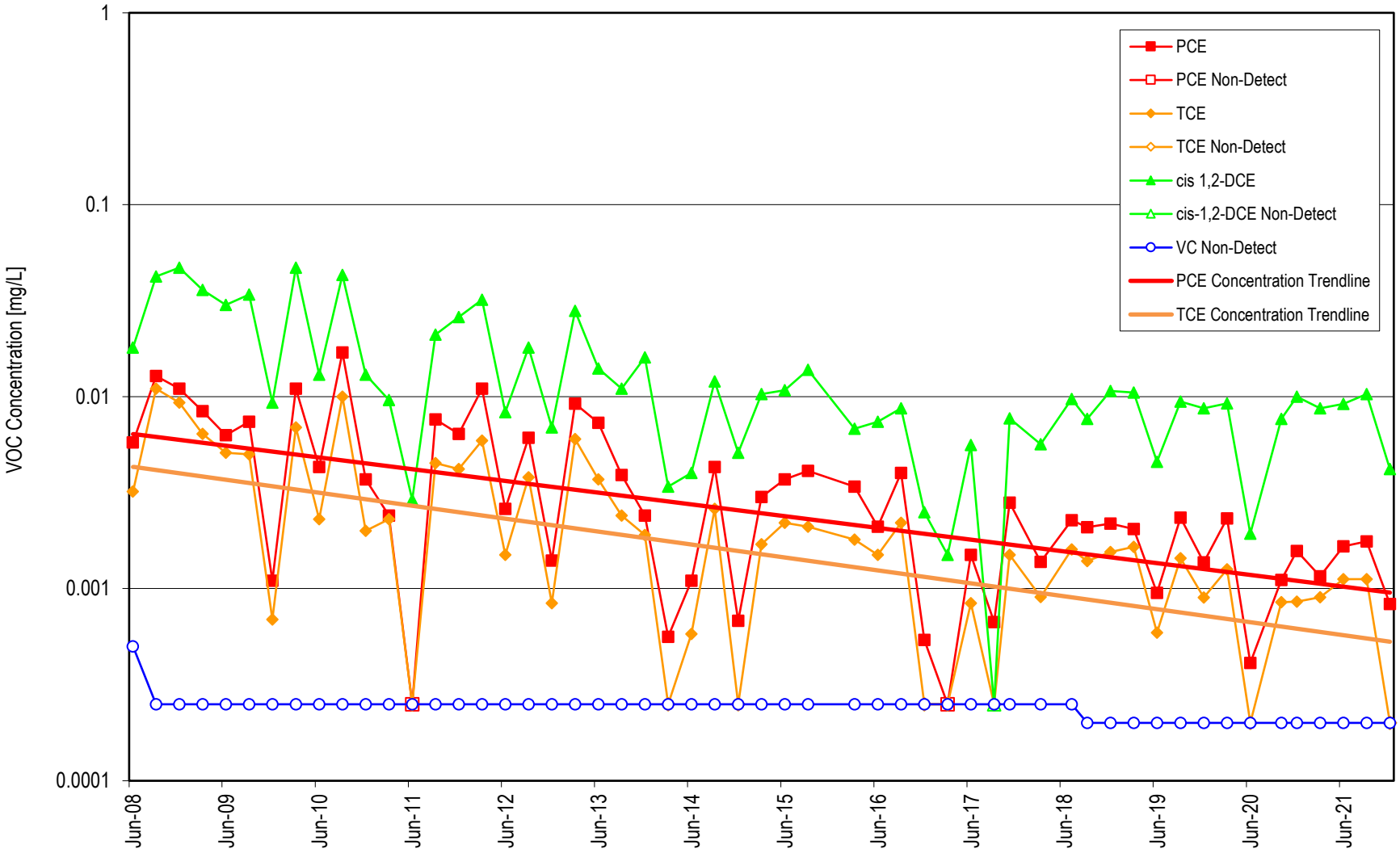
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-19i



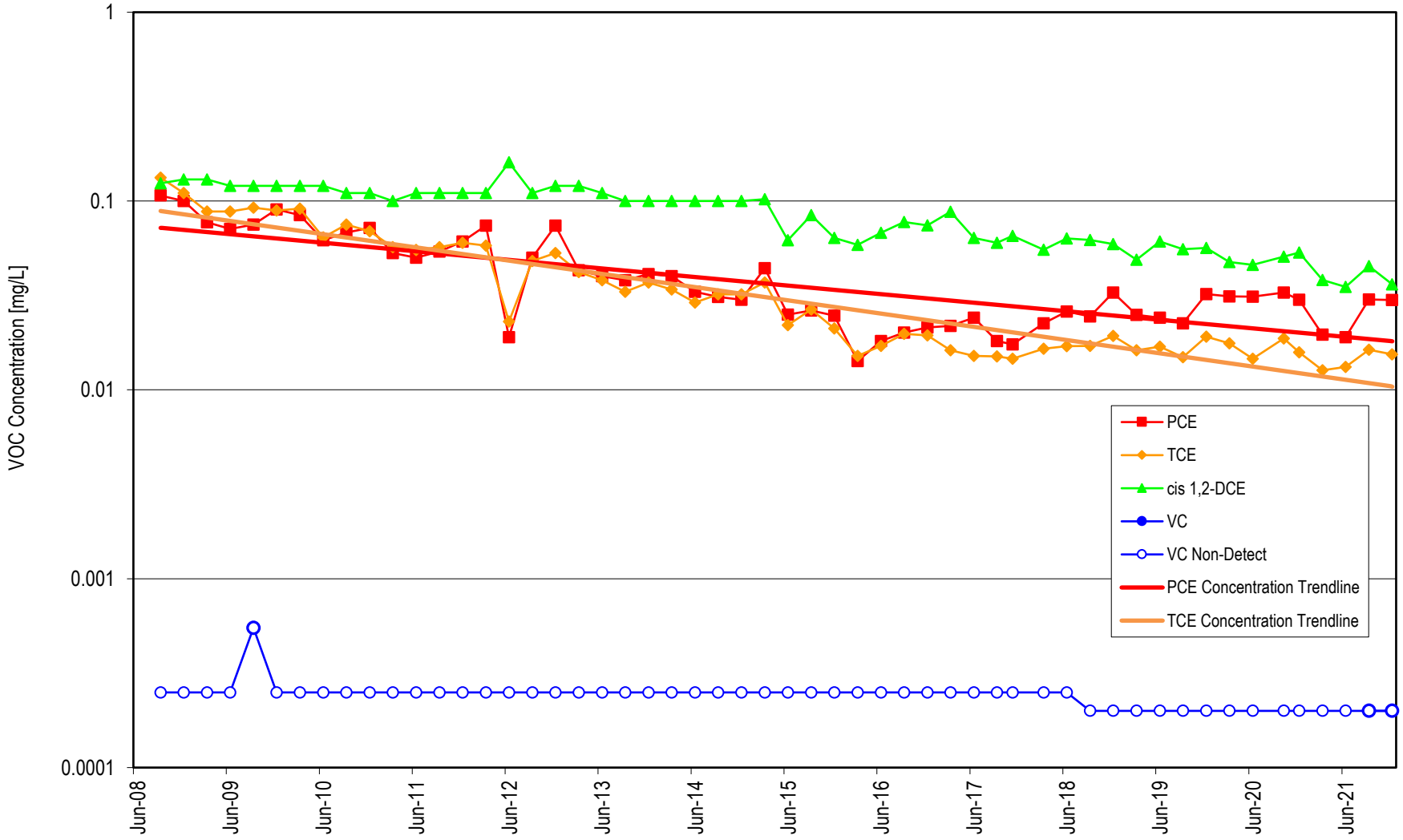
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-20i



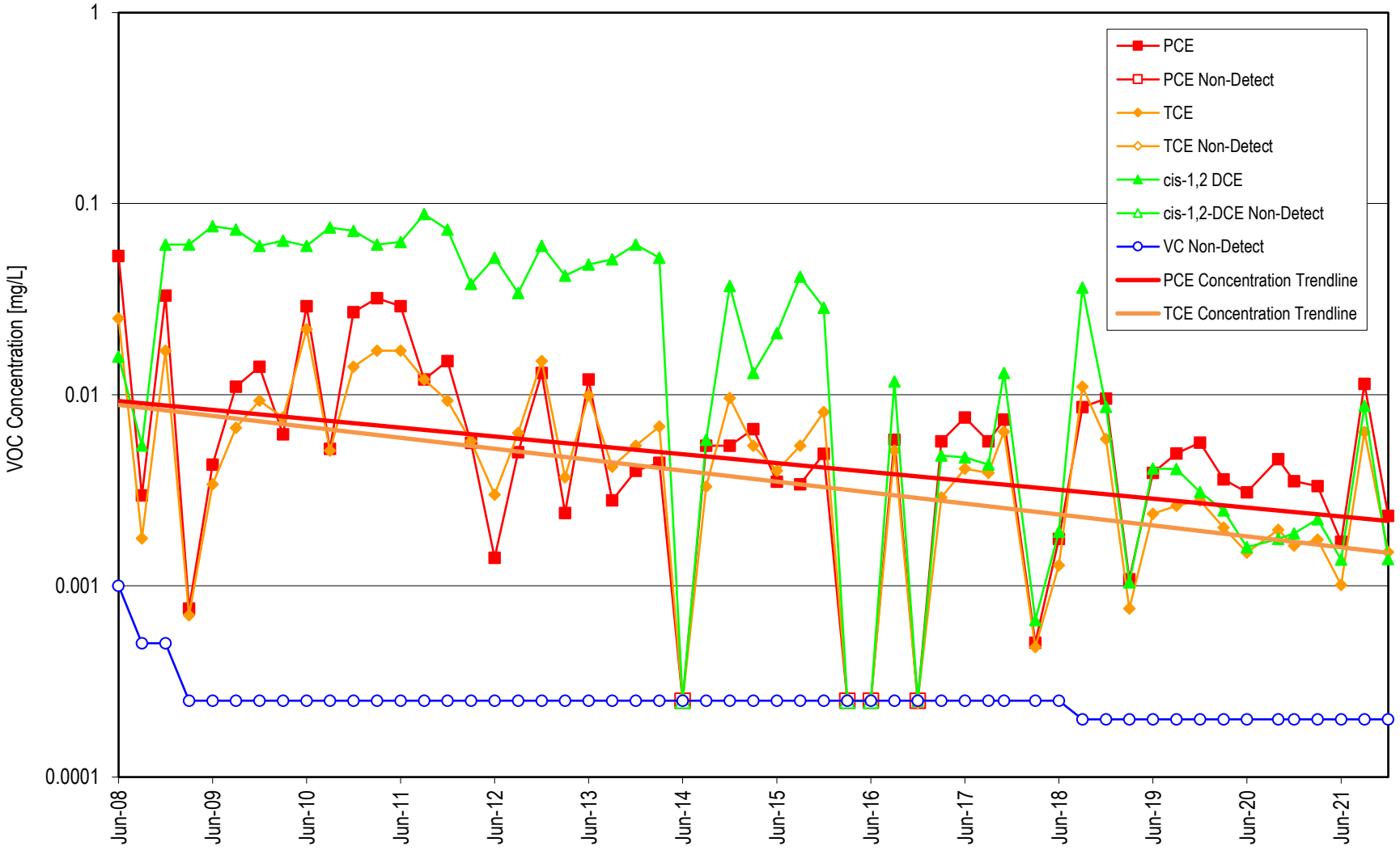
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-21i-40



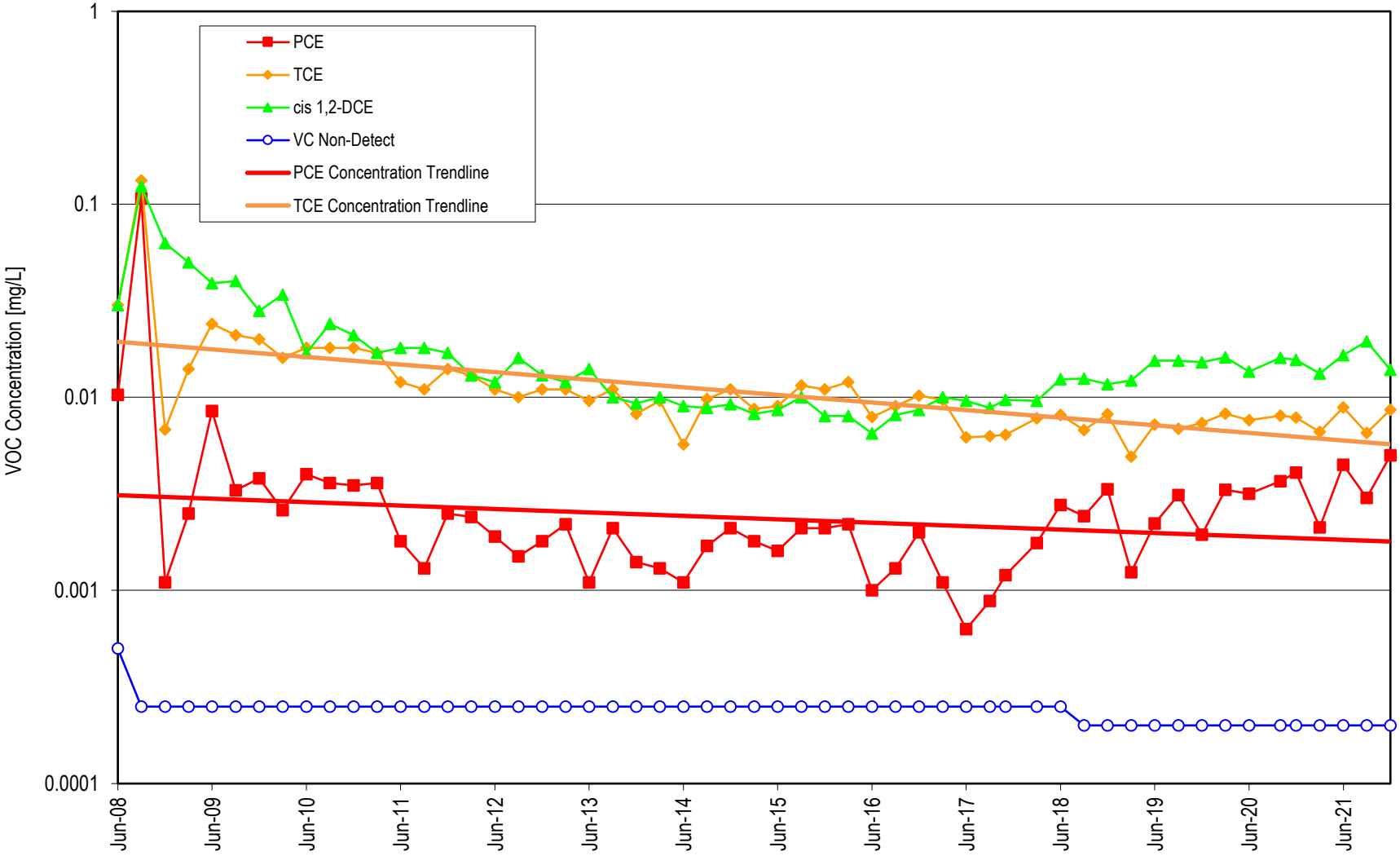
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-21i-105



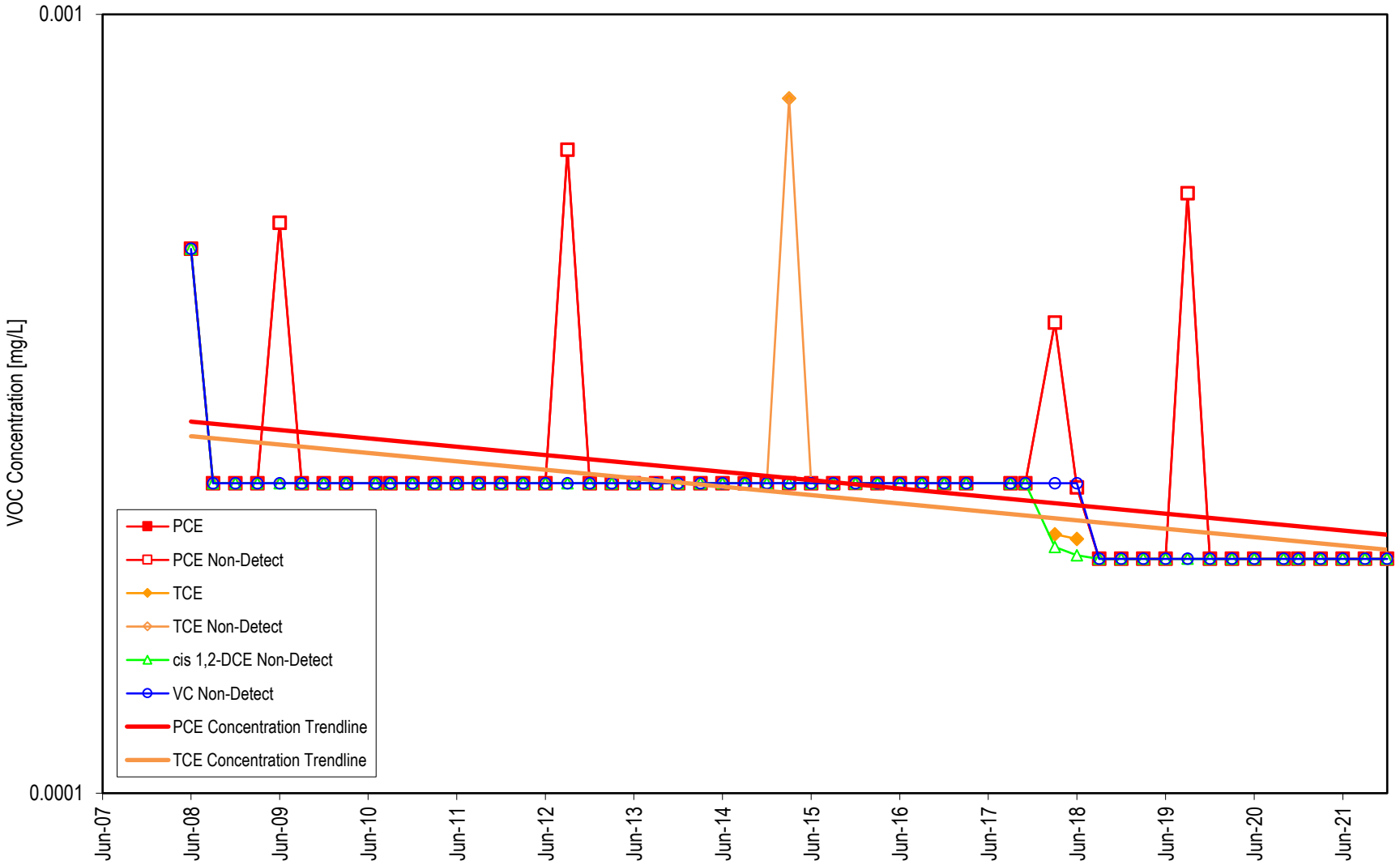
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-22i



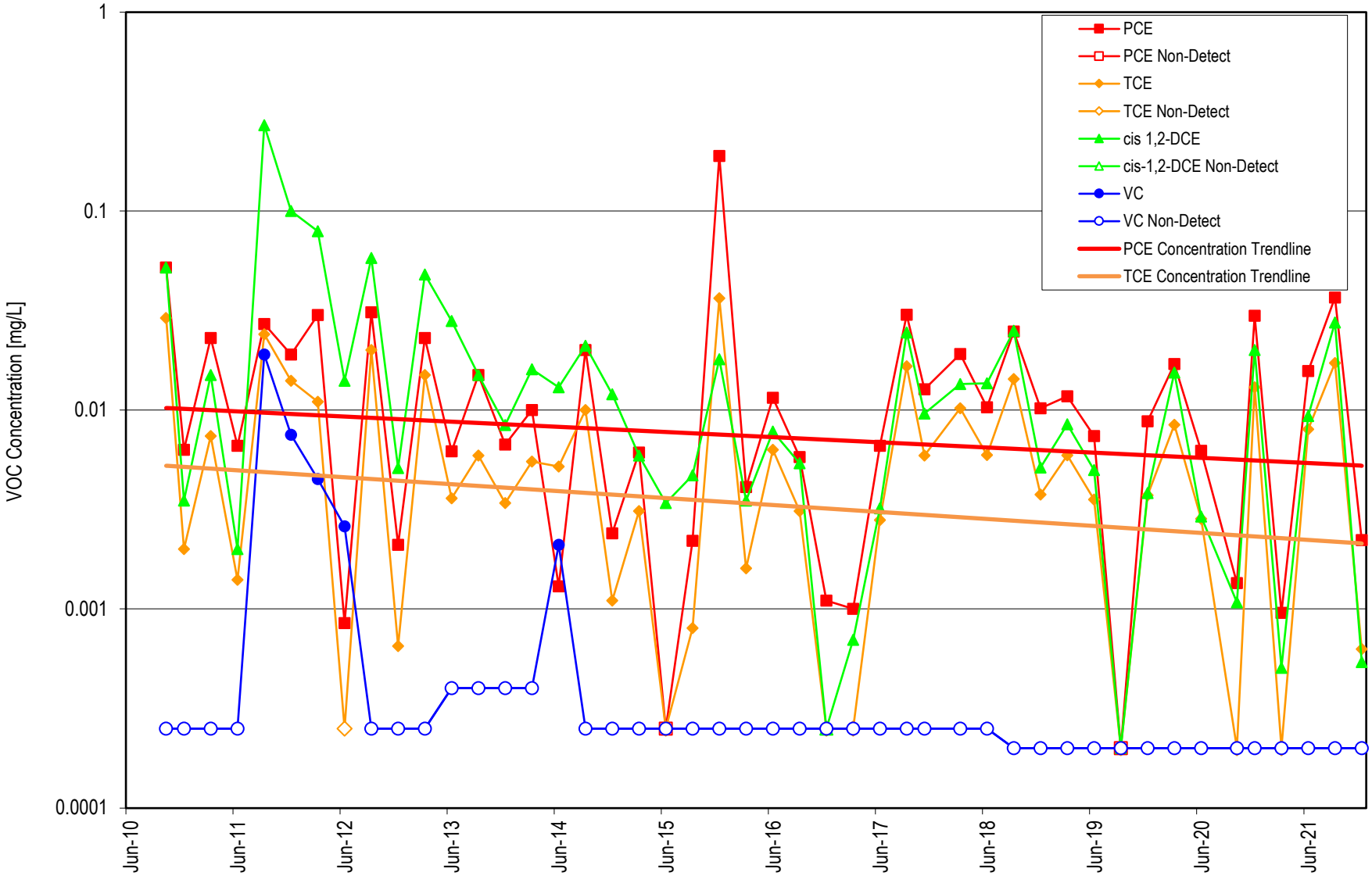
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-23i



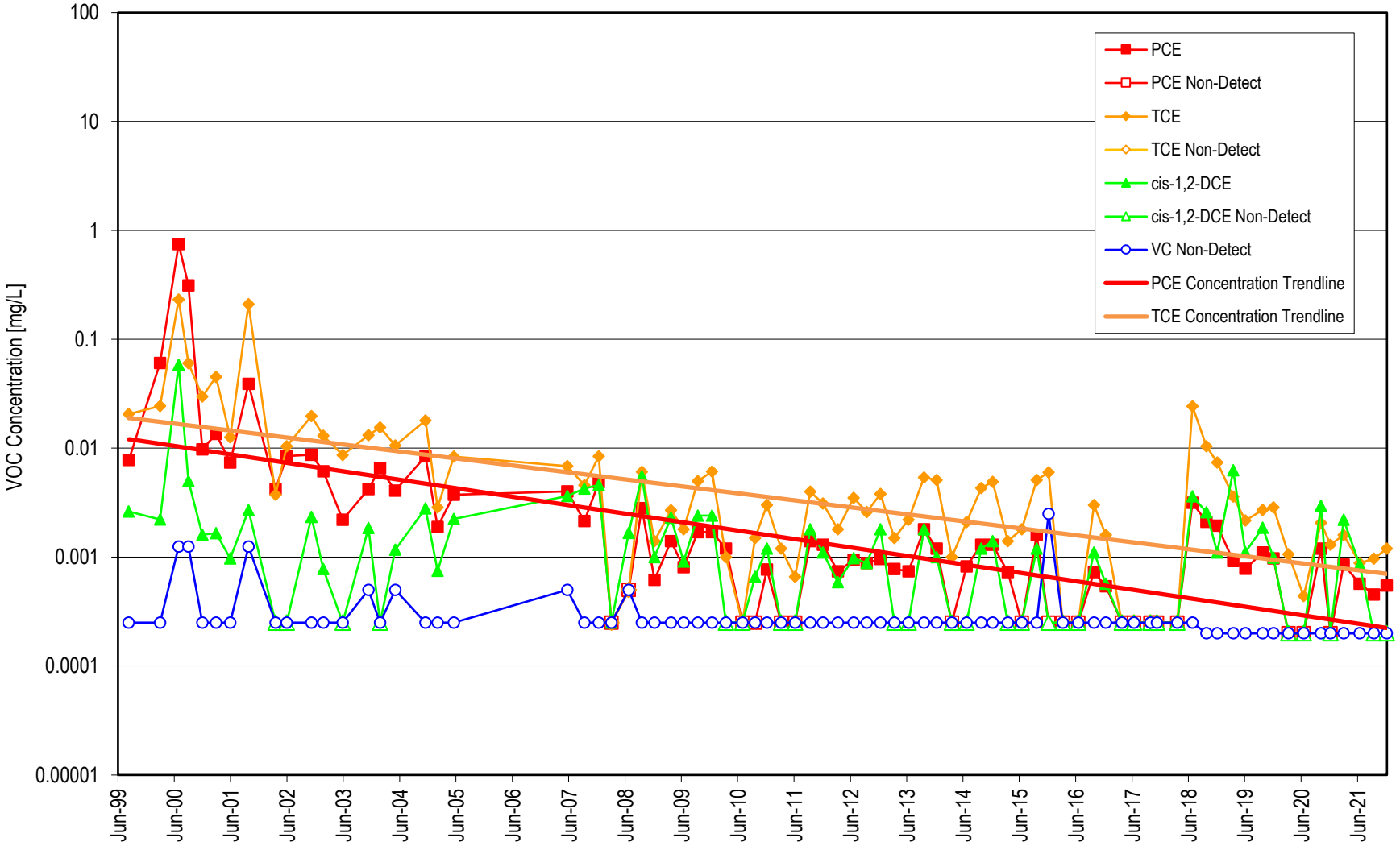
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-24i



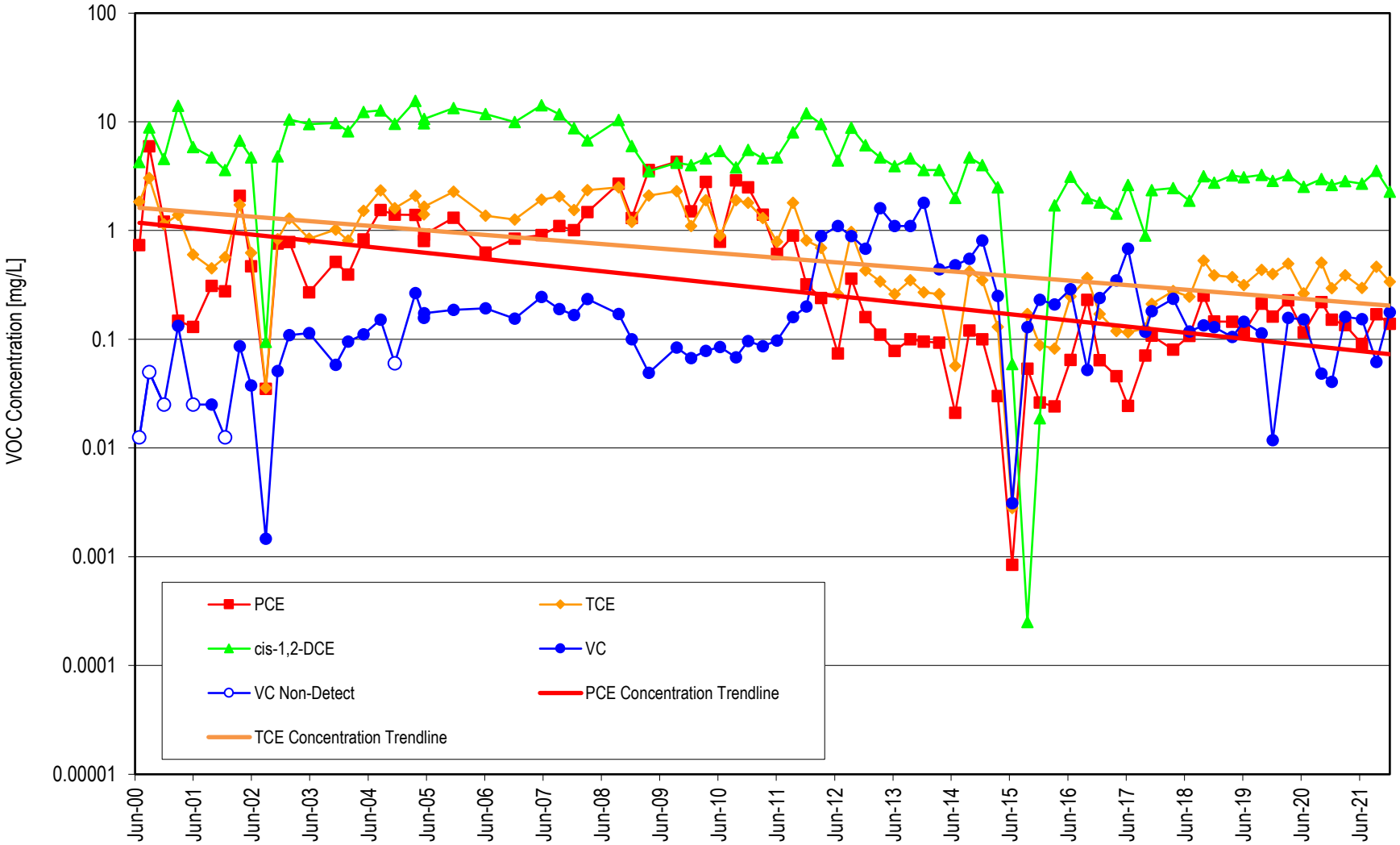
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in S-1



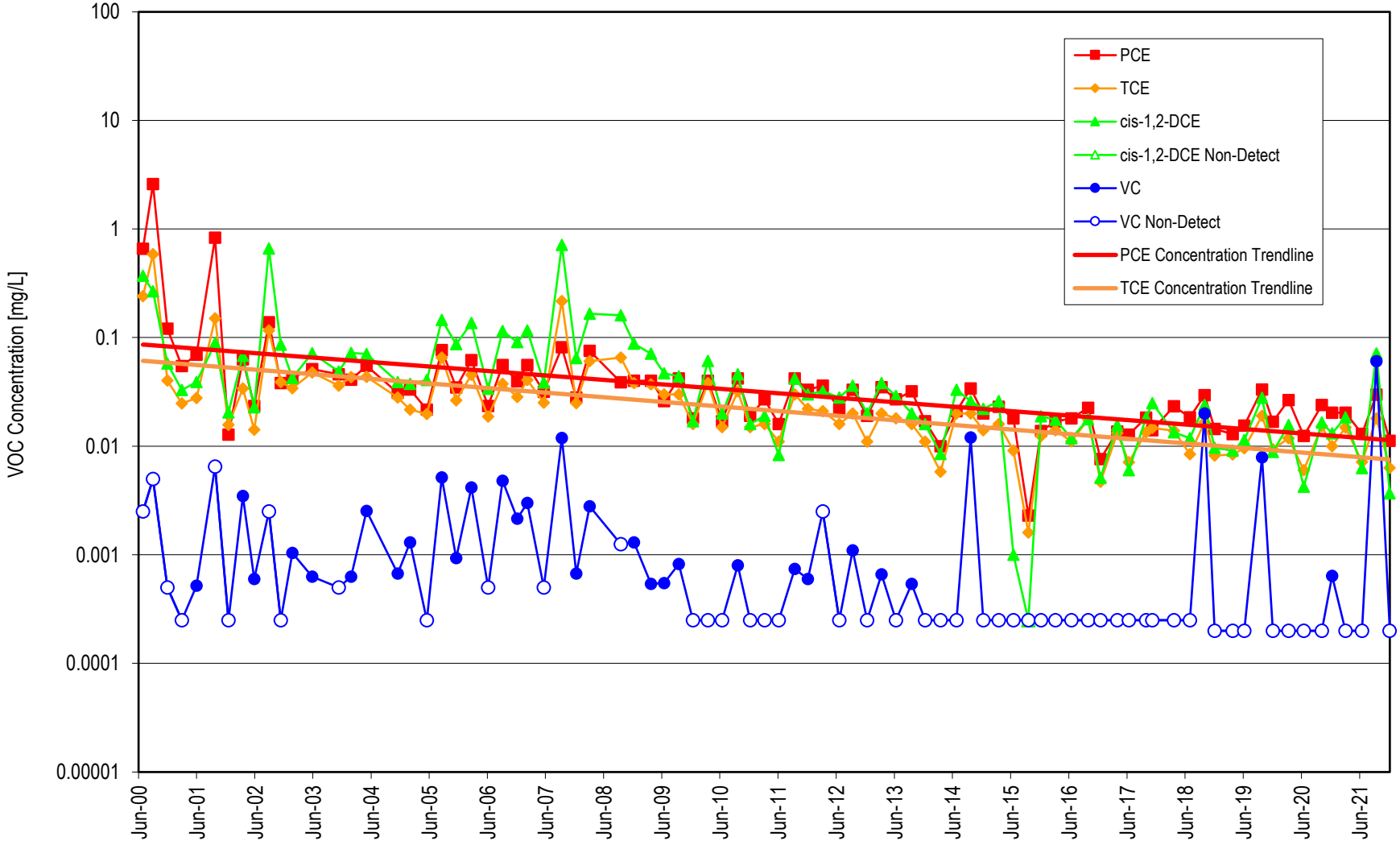
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS1-43



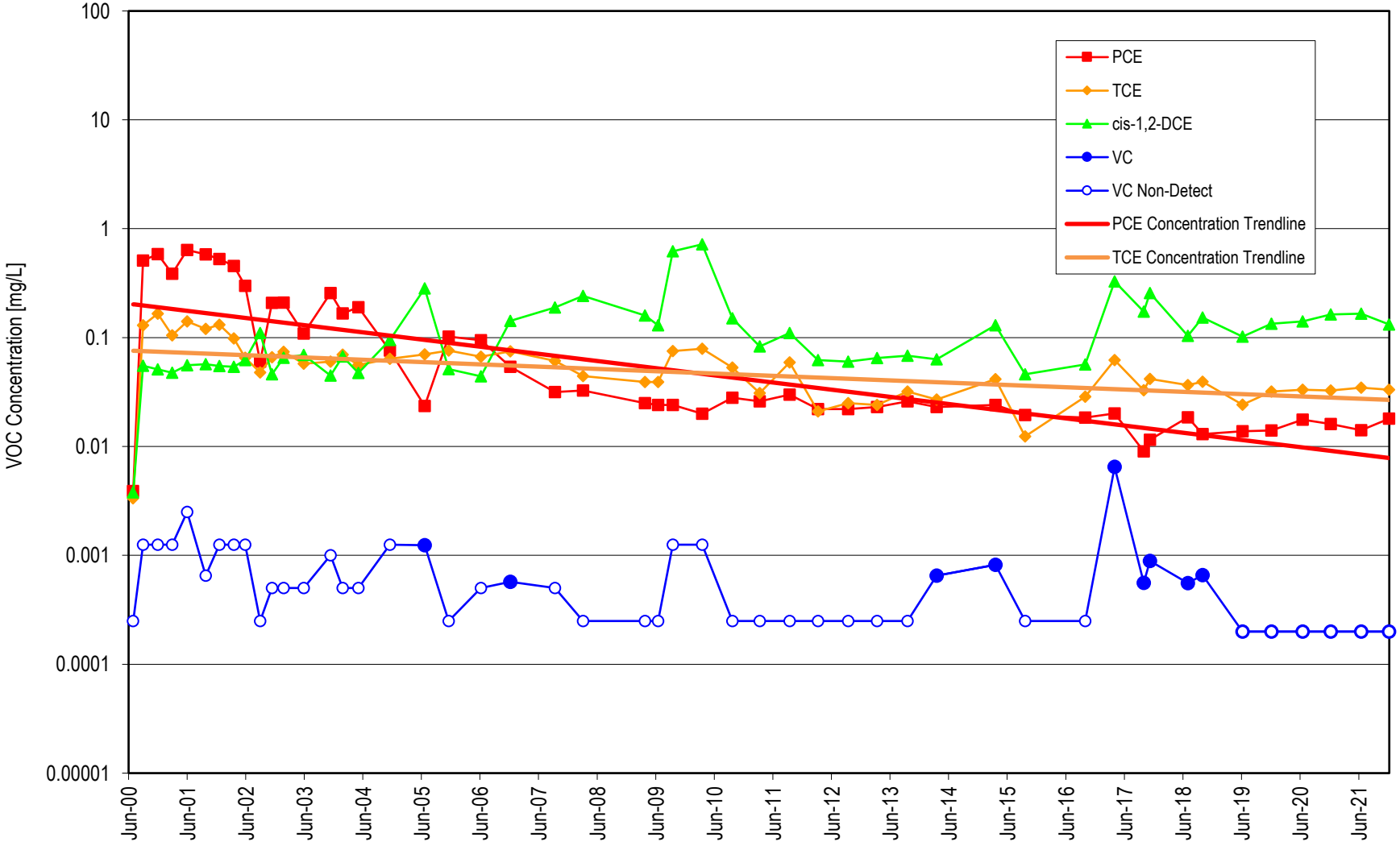
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS1-60



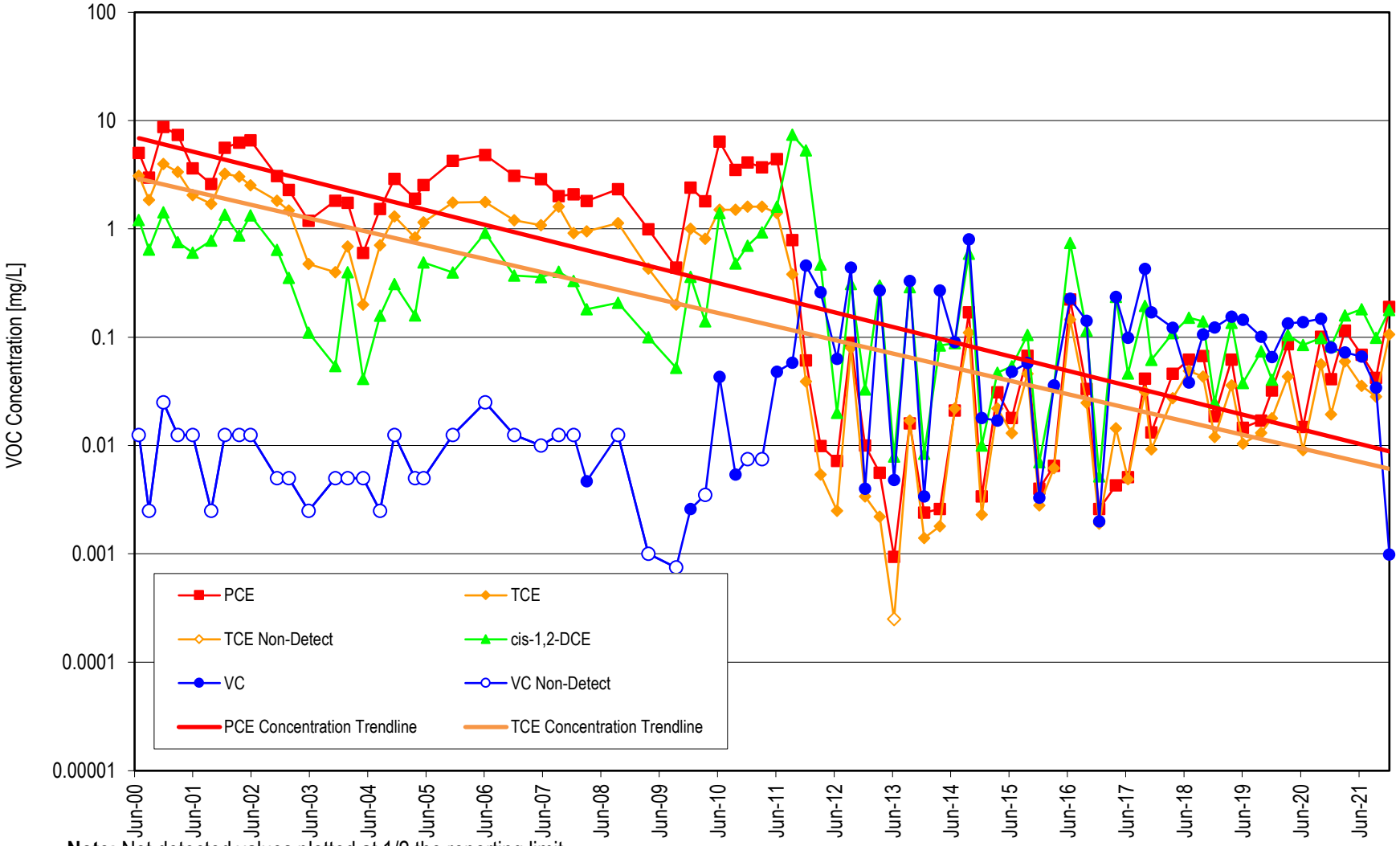
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS1-110



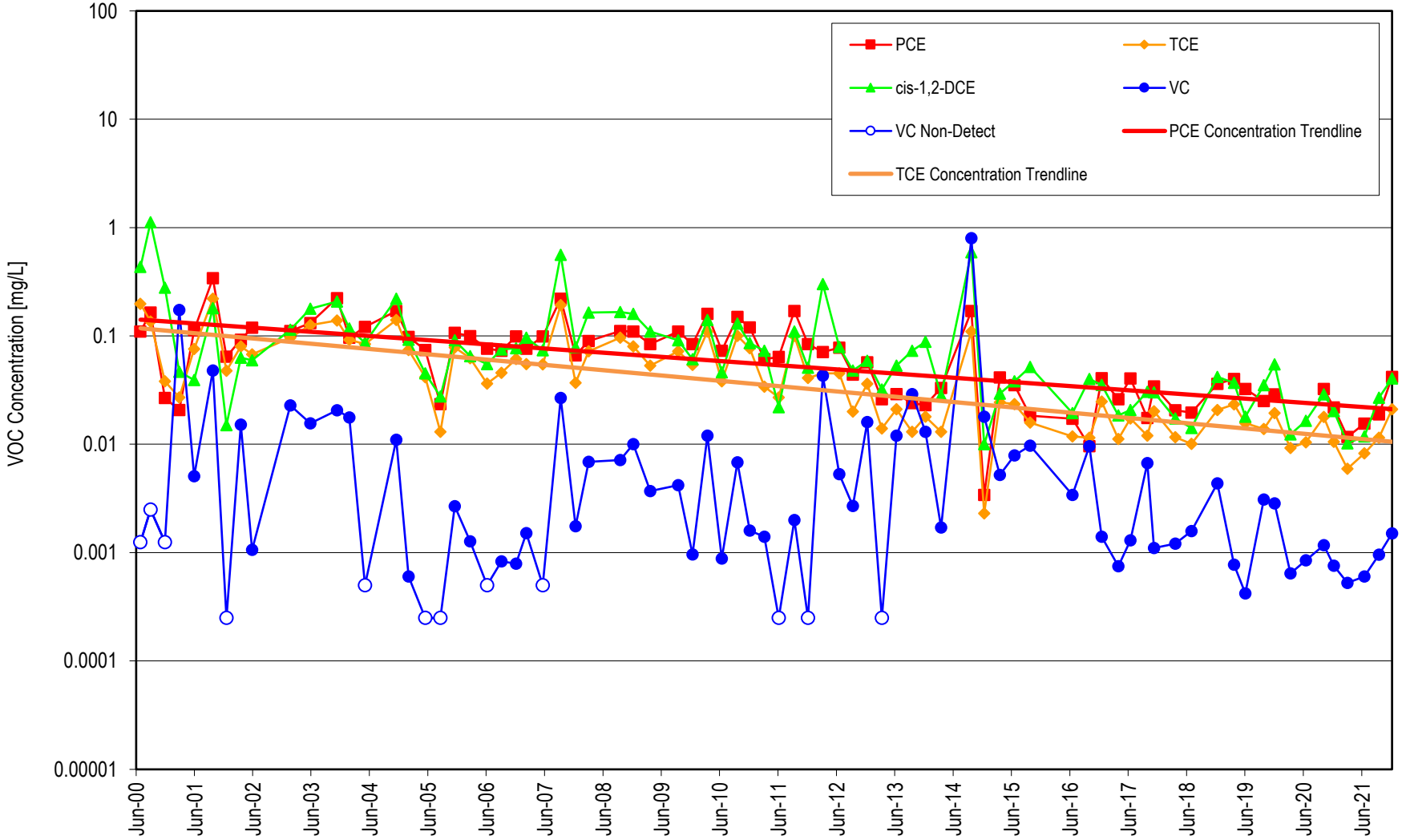
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS2-40



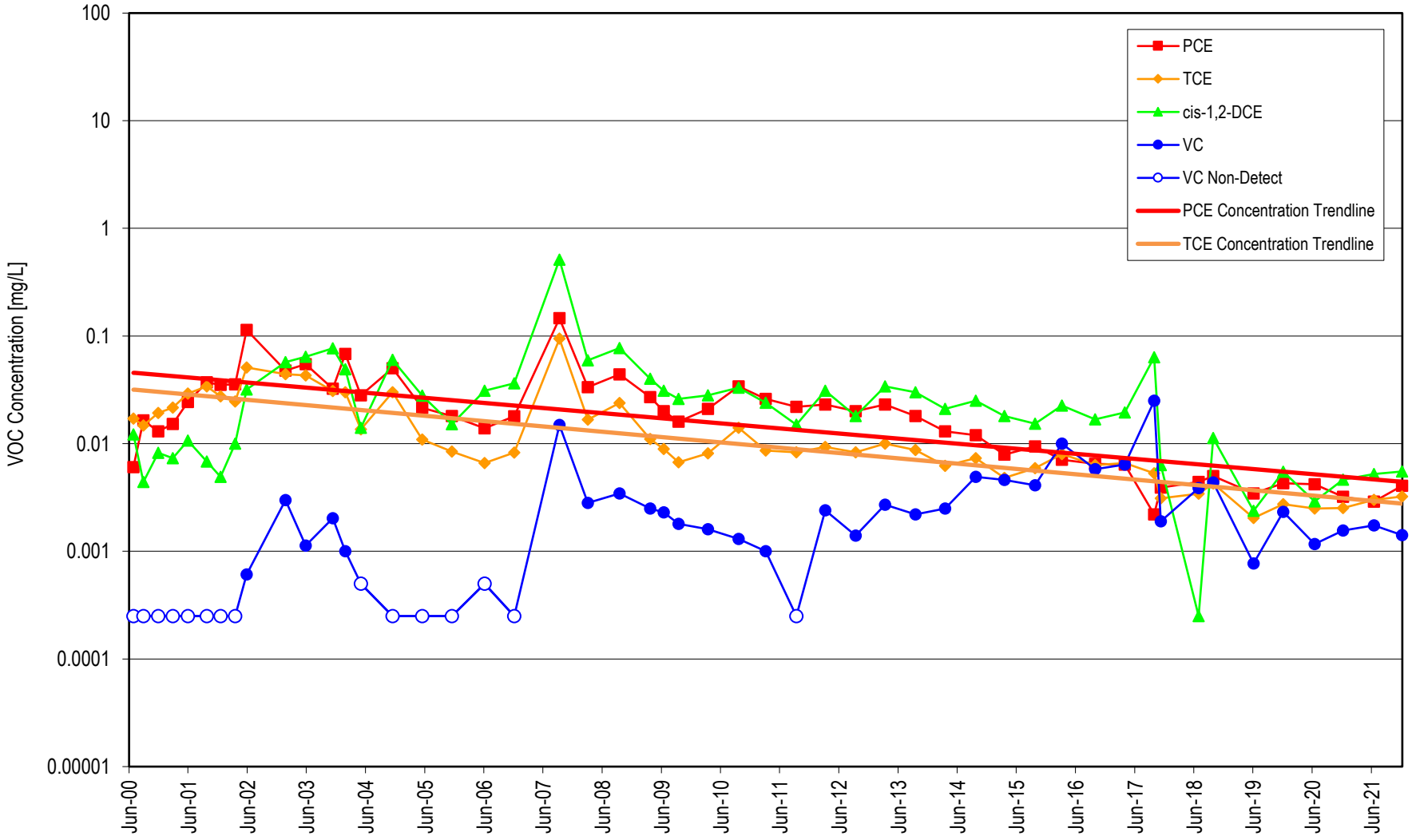
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS2-60



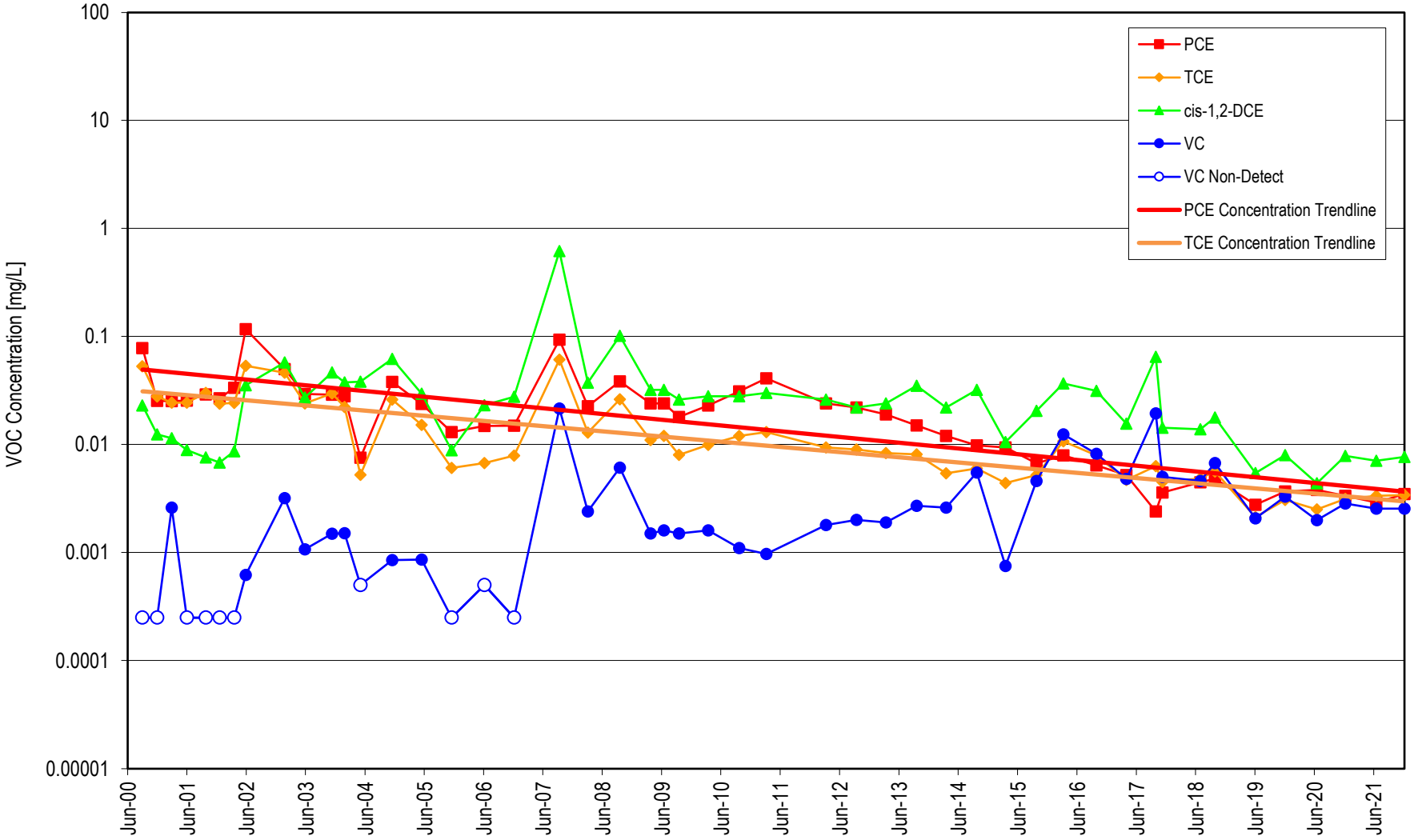
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS2-110



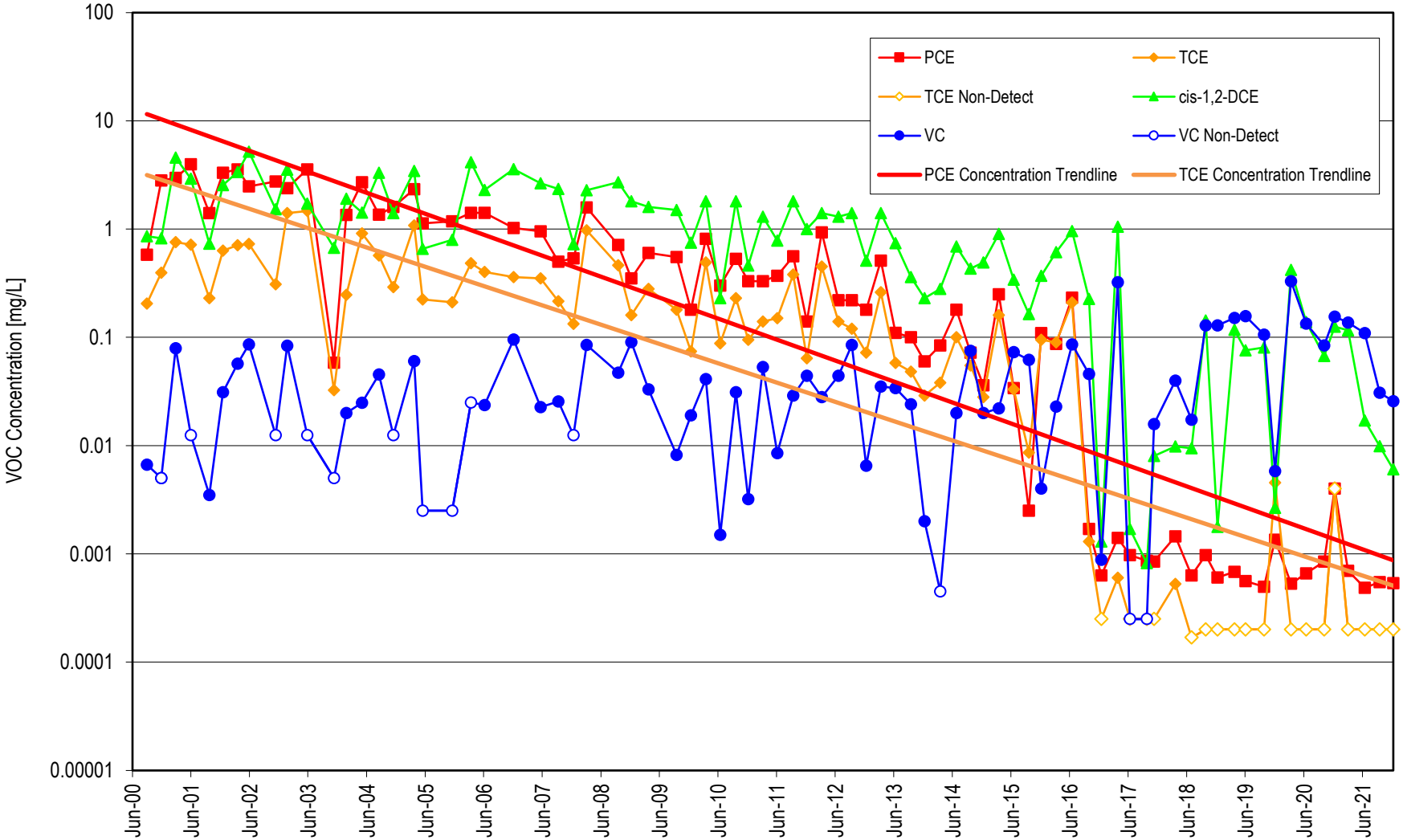
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS2-132



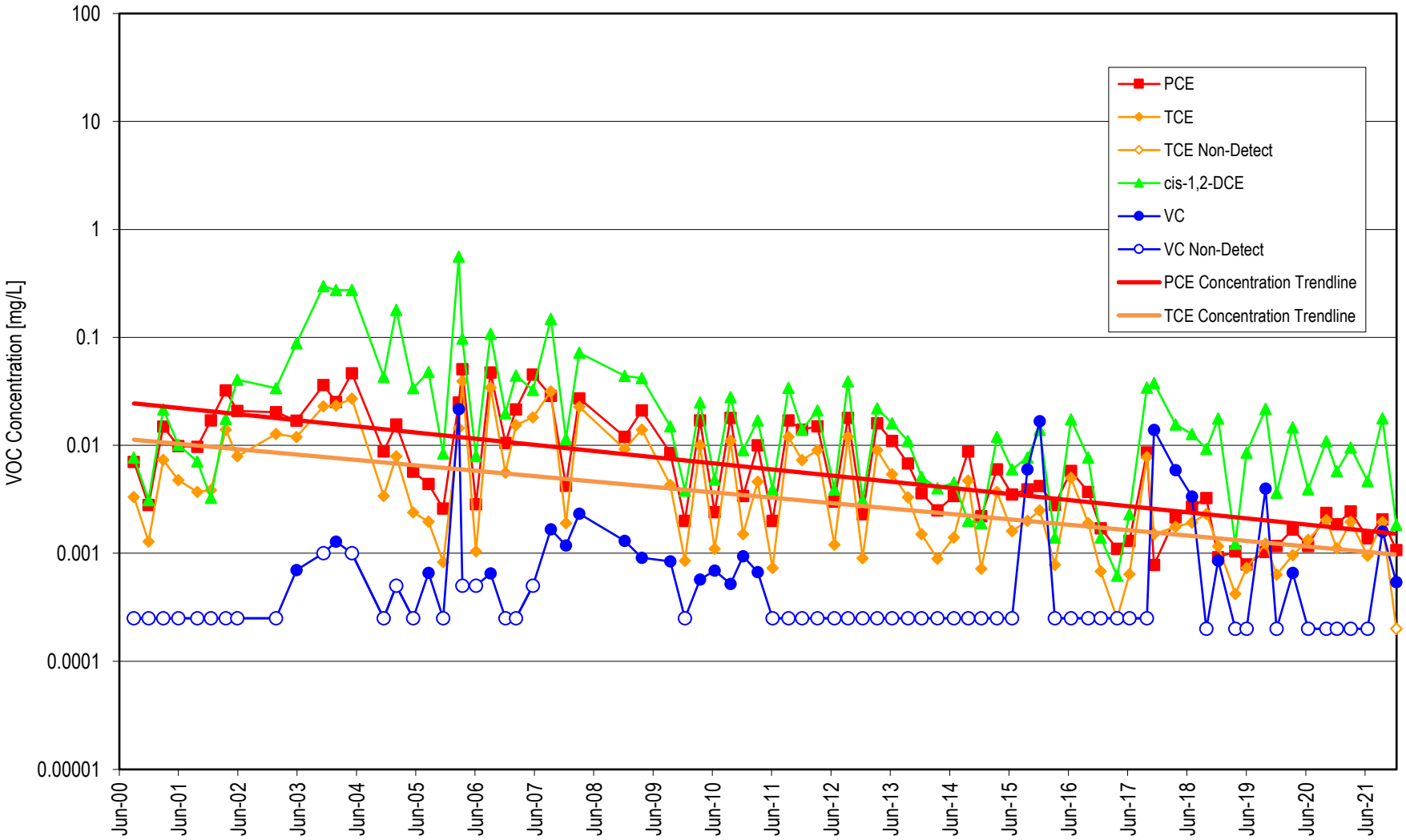
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS3-40



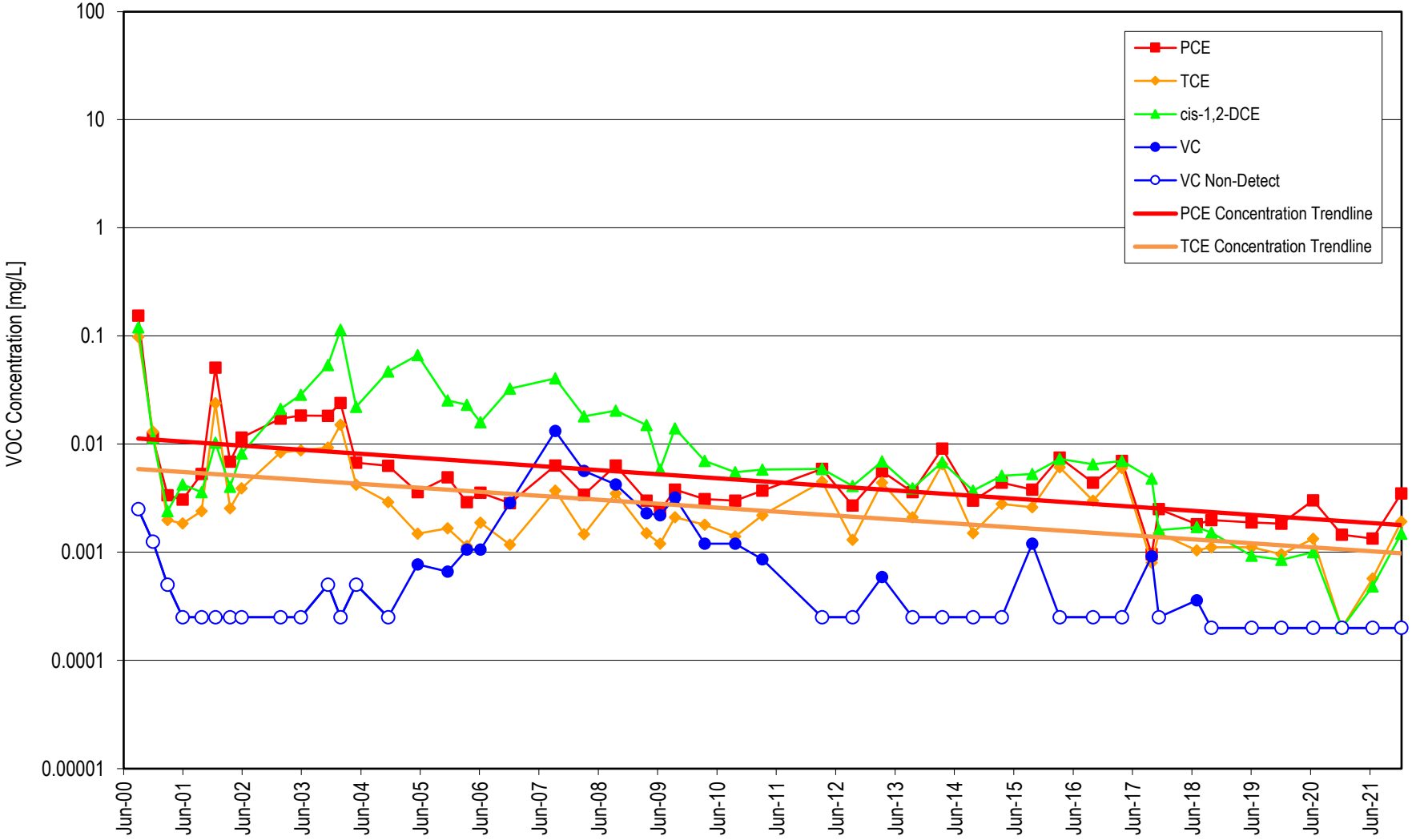
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS3-60



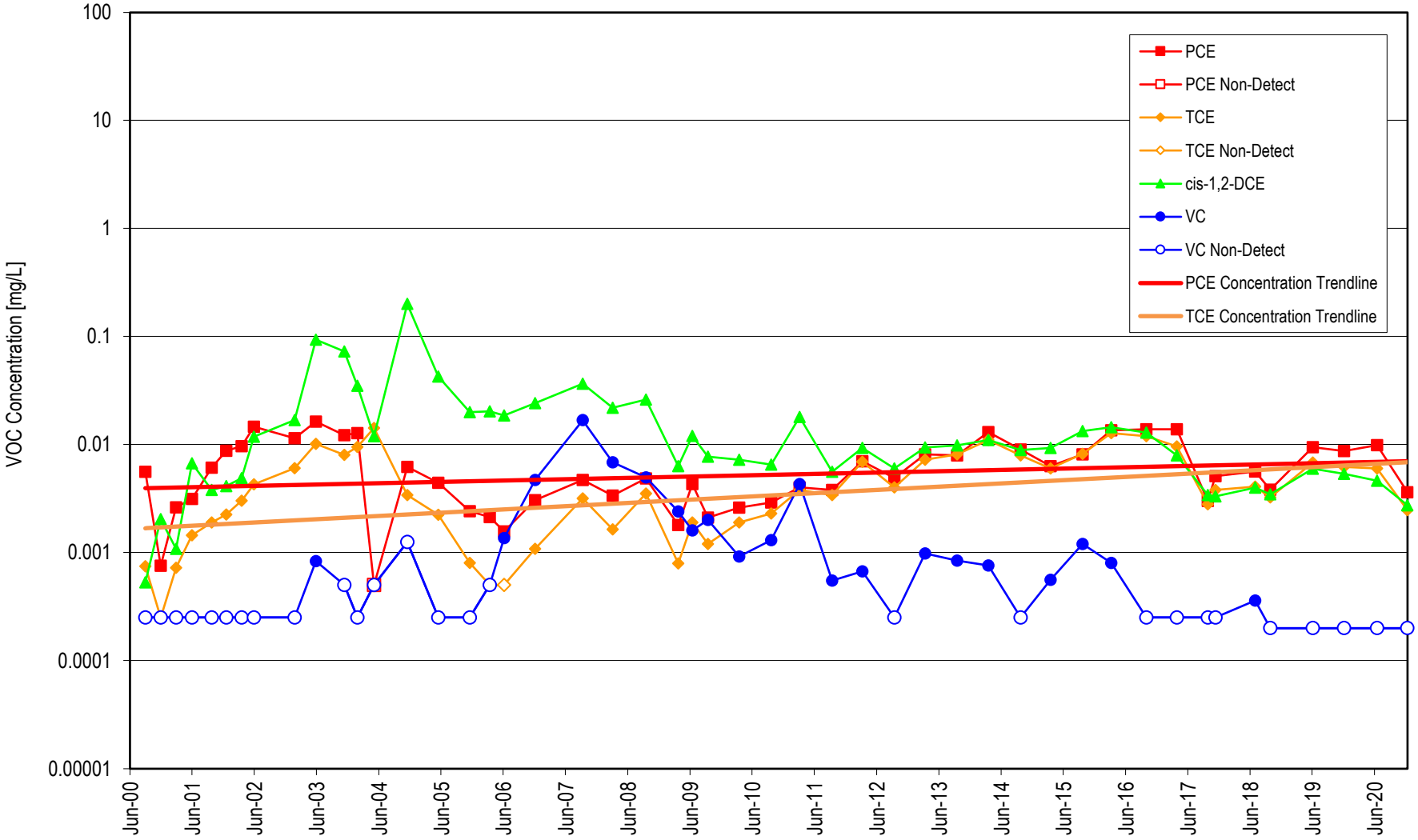
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS3-101



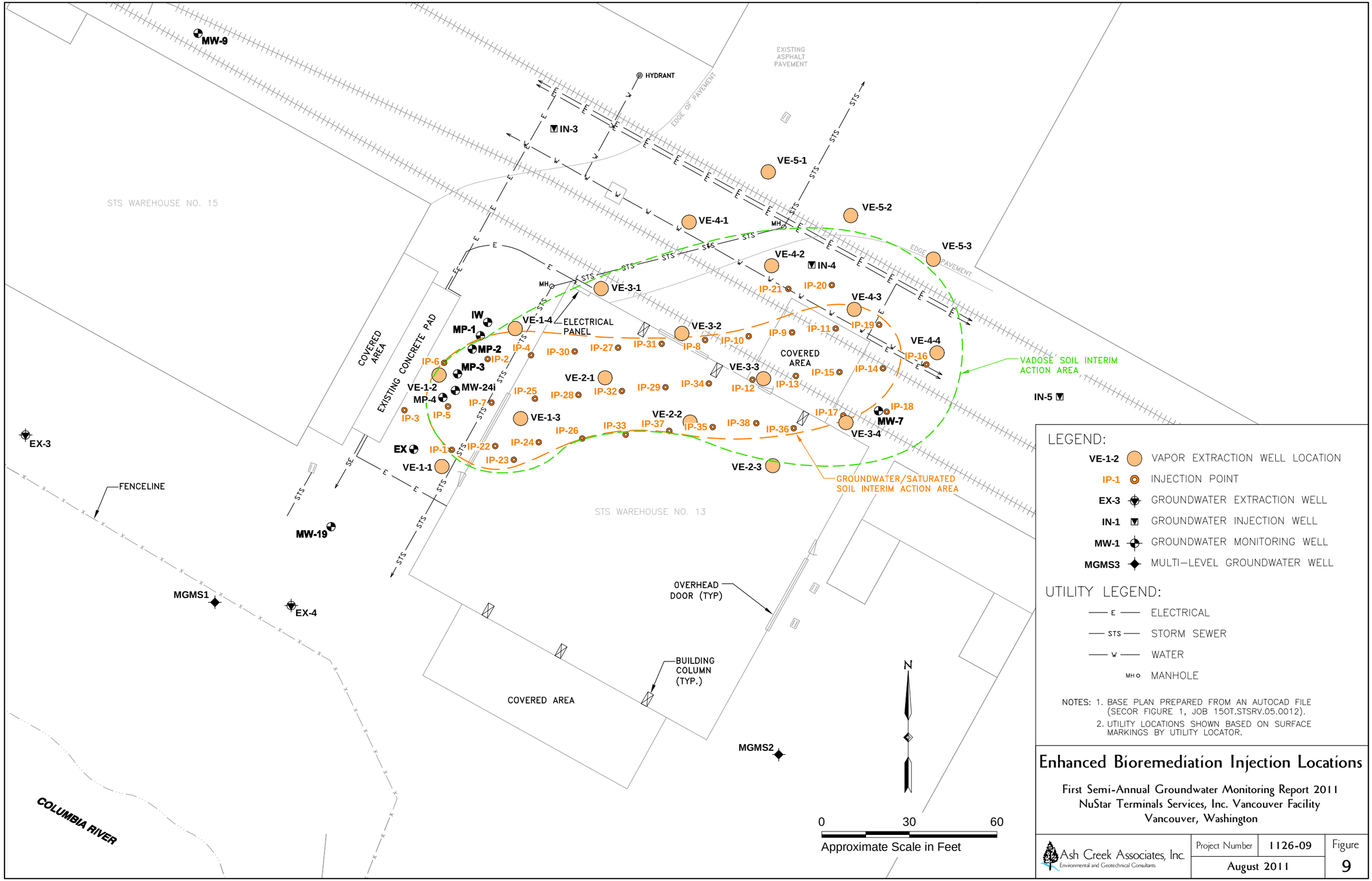
Note: Not detected values plotted at 1/2 the reporting limit.

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
IP-1	INJECTION POINT
EX-3	GROUNDWATER EXTRACTION WELL
IN-1	GROUNDWATER INJECTION WELL
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL

UTILITY LEGEND:

E	ELECTRICAL
STS	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.

Enhanced Bioremediation Injection Locations

First Semi-Annual Groundwater Monitoring Report 2011
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
August 2011		9

SOIL VAPOR EXTRACTION SYSTEM
(SEE FIGURES 7 and 8)

ELECTRICAL SERVICE
INSTALLED FROM EXISTING
BUILDING SERVICE

VAPOR EXTRACTION
PIPING IN TRENCH
(TYPICAL OF 5
ZONES).

WELL VAULT INSTALLED
AT EACH WELLHEAD
(TYPICAL OF 18).

VADOSE SOIL INTERIM
ACTION AREA

SOIL VAPOR
EXTRACTION WELL
(TYPICAL OF 18;
NUMBER REPRESENTS
MANIFOLD ZONE).

IN-1
IN-2
IN-3
IN-4
IN-5
MW-9
MW-13
EX-3
MW-19
EX-4
MGMS1
EX-5
MW-12
MGMS2
MW-7
MW-24i
MP-1
MP-2
MP-3
MP4
IW
EX
VE-1-1
VE-1-2
VE-1-3
VE-1-4
VE-2-1
VE-2-2
VE-2-3
VE-3-1
VE-3-2
VE-3-3
VE-3-4
VE-4-1
VE-4-2
VE-4-3
VE-4-4
VE-5-1
VE-5-2
VE-5-3
STS WAREHOUSE NO. 15
STS WAREHOUSE NO. 13
COVERED AREA
EXISTING CONCRETE PAD
ELECTRICAL PANEL
COVERED AREA
EXISTING ASPHALT PAVEMENT
EDGE OF PAVEMENT
EDGE OF GRAVEL
HYDRANT
OVERHEAD DOOR (TYP)
BUILDING COLUMN (TYP.)
COVERED AREA
COLUMBIA RIVER

N

0 40 80
Approximate Scale in Feet

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

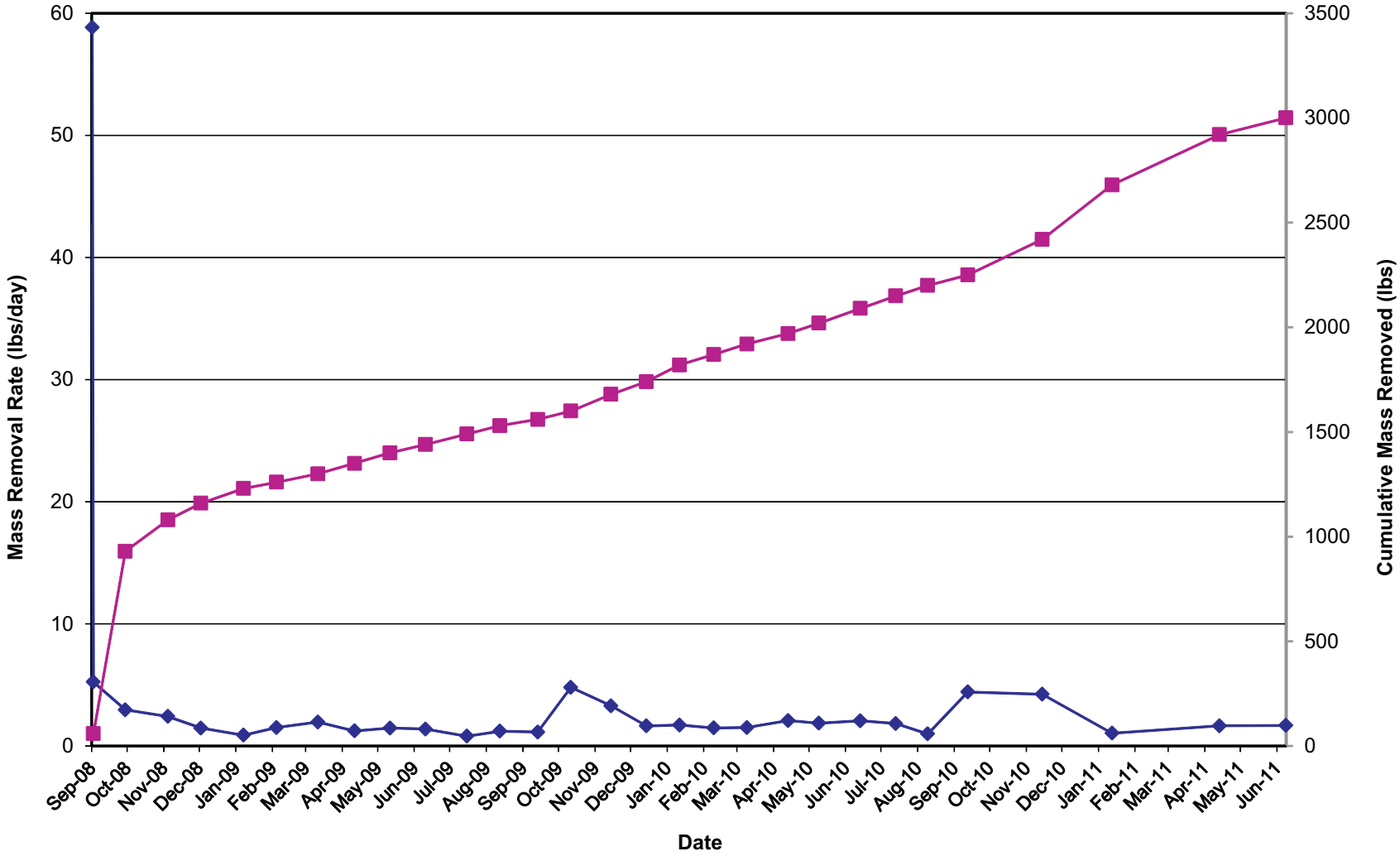
NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.
3. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.

Soil Vapor Extraction System Site Plan

First Semi-Annual Groundwater Monitoring Report 2011
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
August 2011		10



Legend:

Removal Rate (lbs/day)

Cumulative Mass Removal

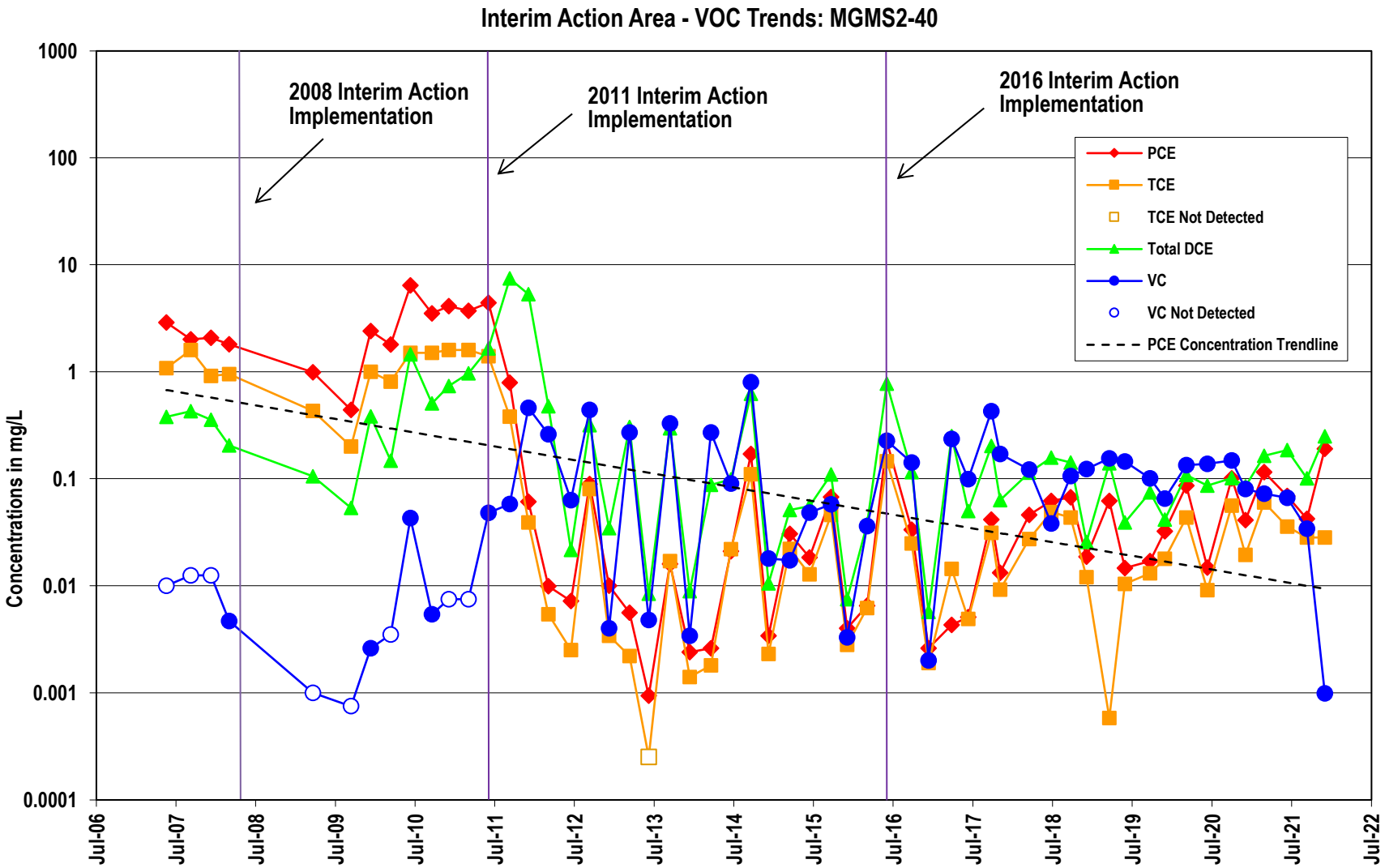
2008 SVE System - VOC Mass Removal

Second Semi-Annual Groundwater Monitoring Report 2011
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

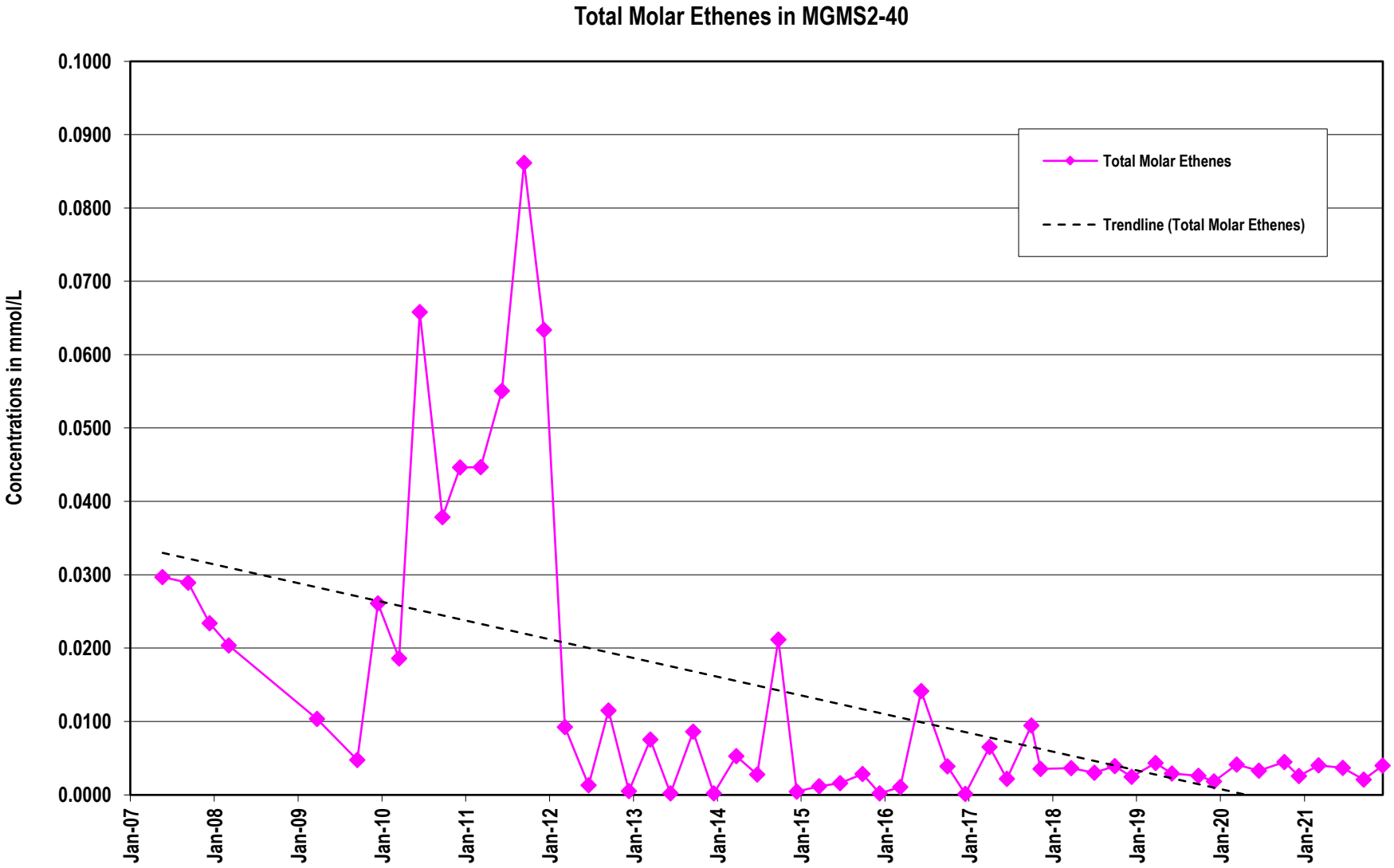
Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
January 2012		11

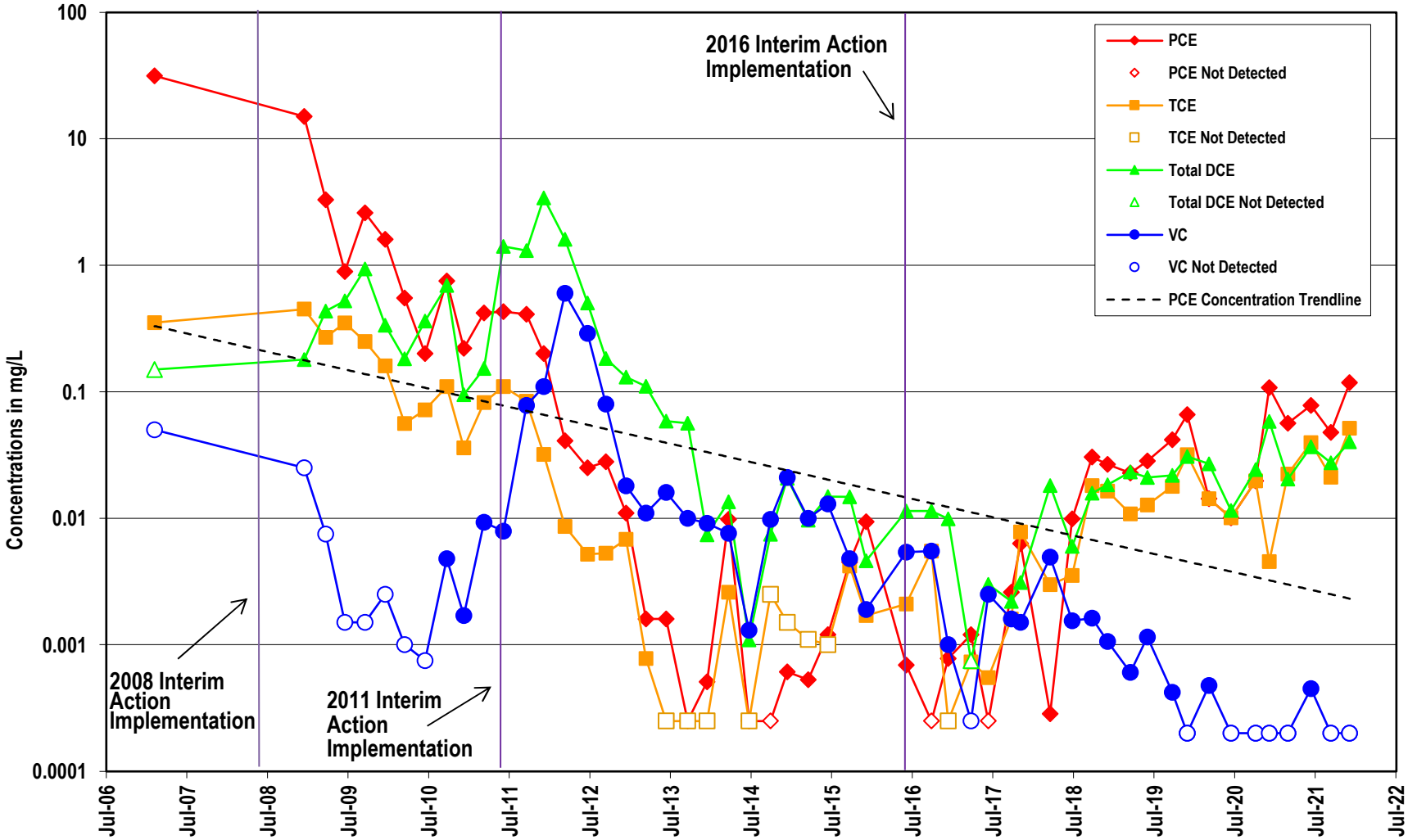
APPENDIX F
Molar Concentration Trend Plots—Interim Action Wells



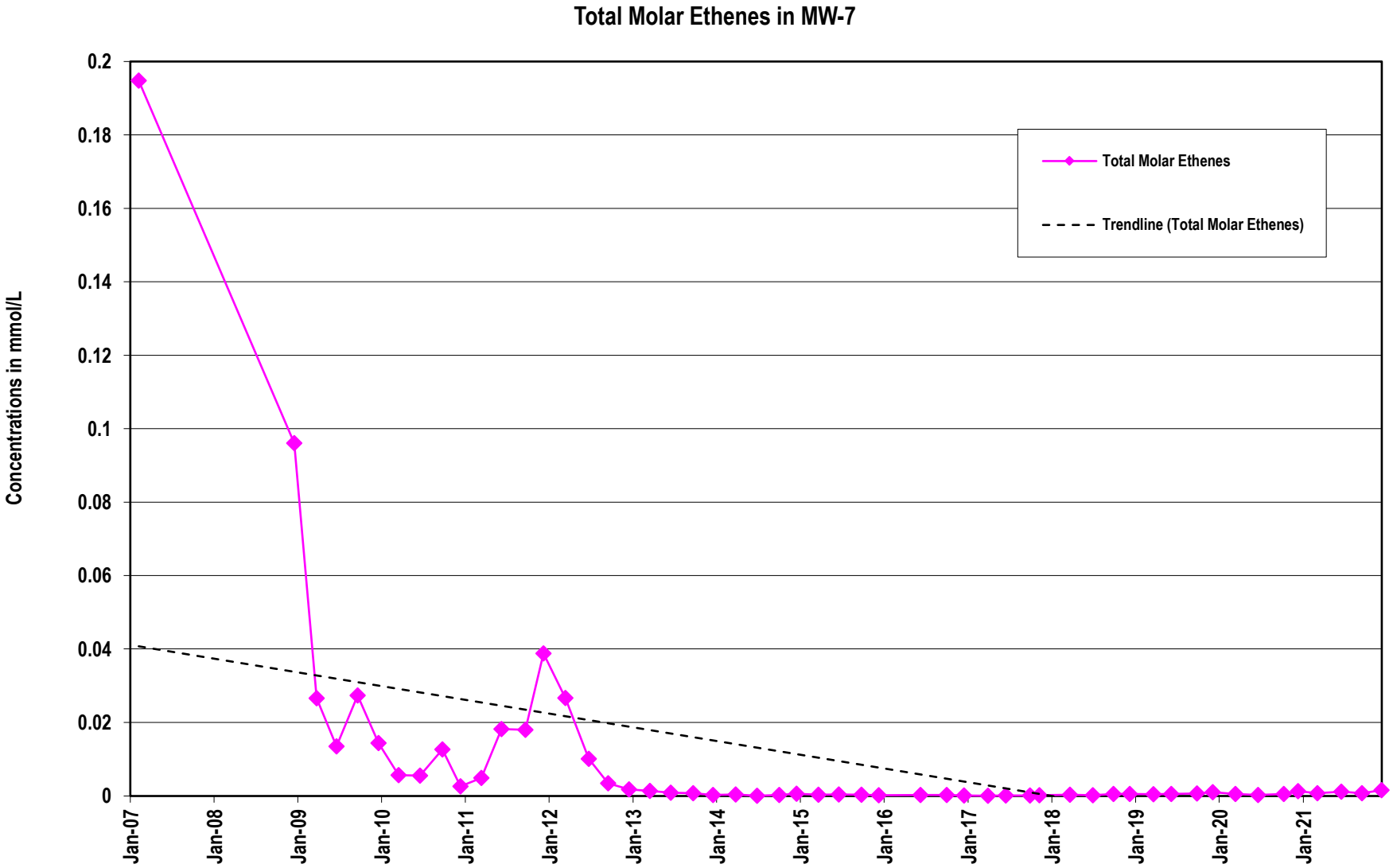
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MGMS2-40
Concentrations in mmol/L
0.1000
0.0900
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)

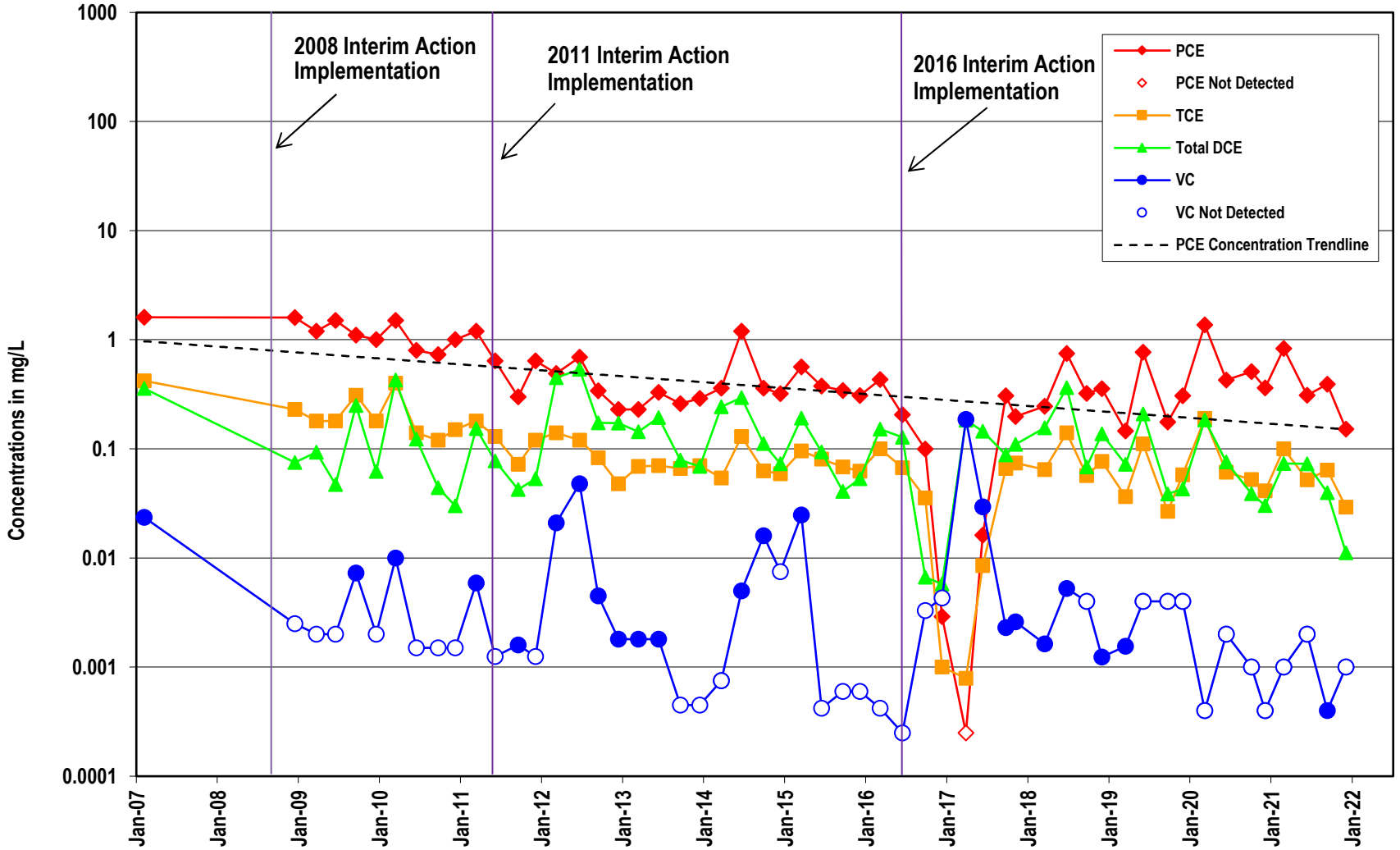
Interim Action Area - VOC Trends: MW-7



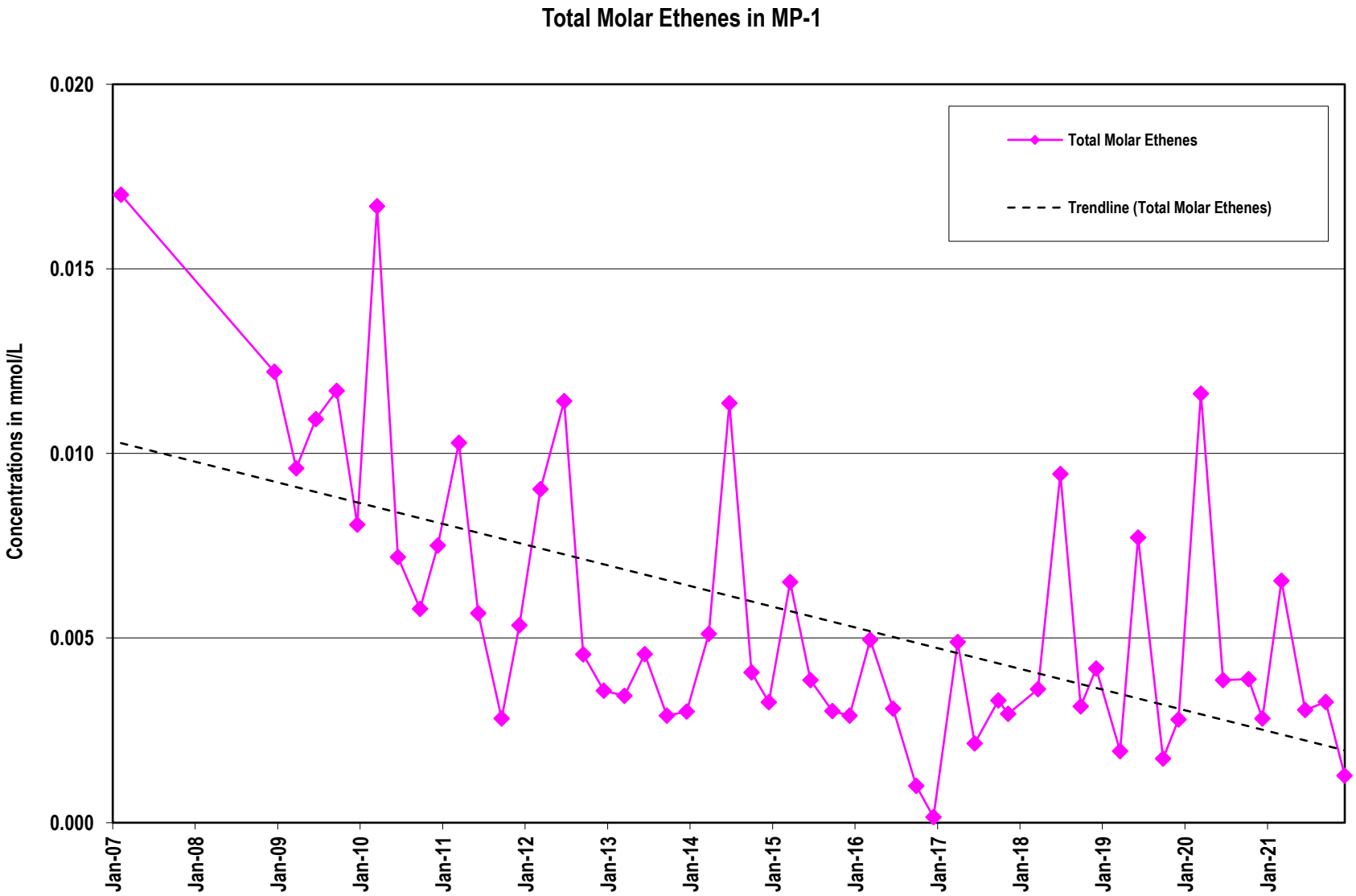
Notes: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-7
Concentrations in mmol/L
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)

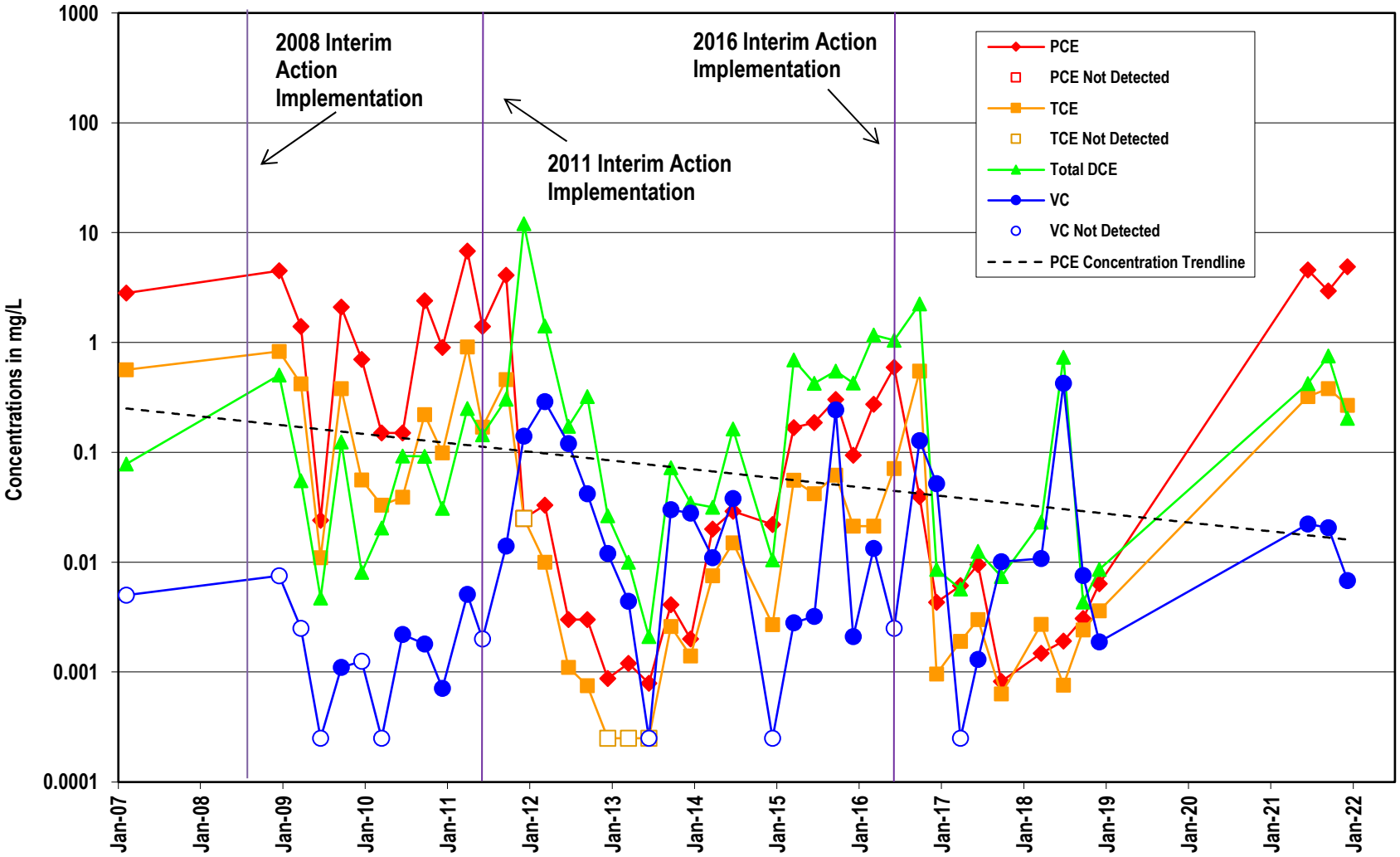
Interim Action Area - VOC Trends: MP-1



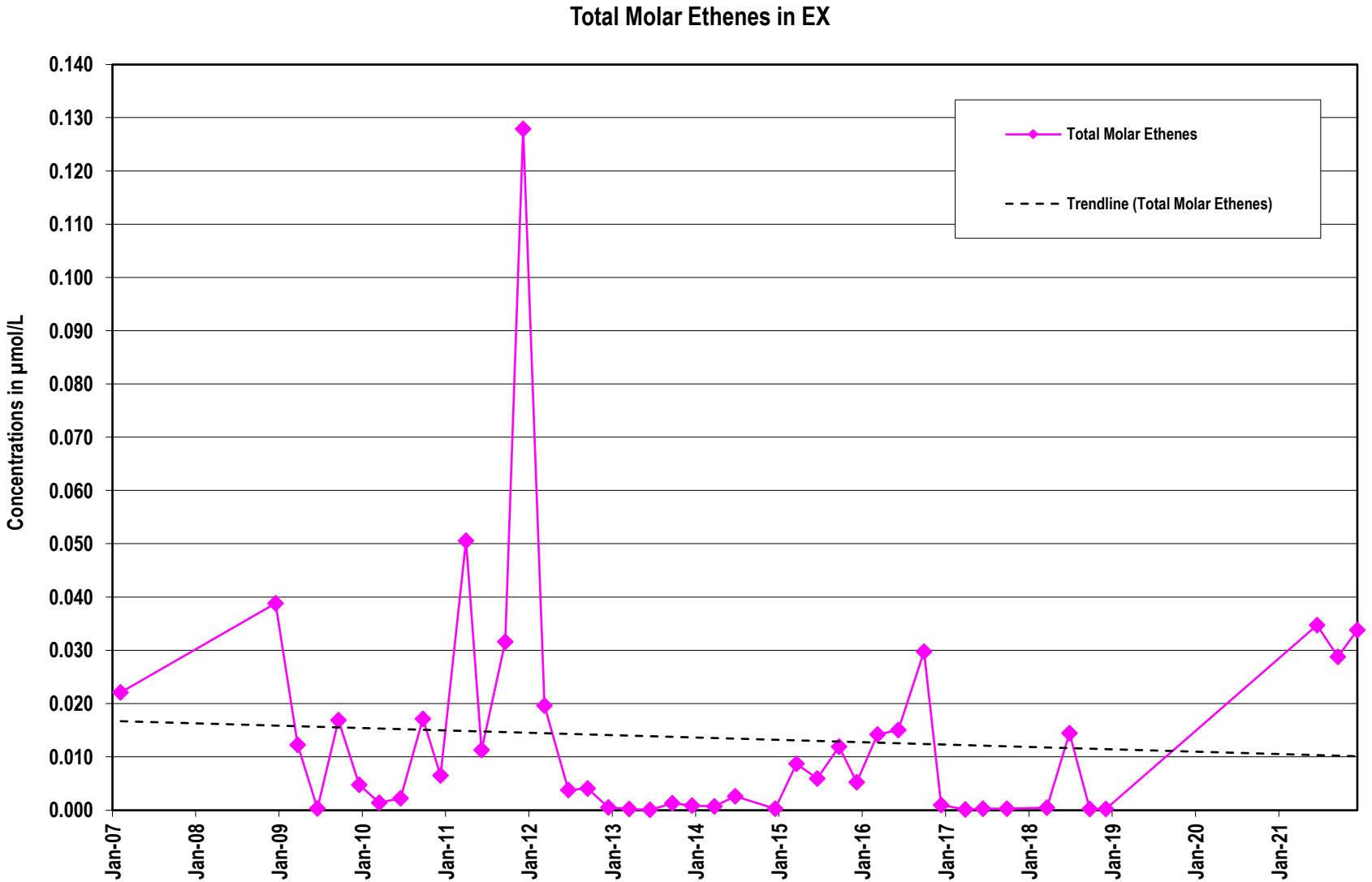
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MP-1
Concentrations in mmol/L
0.020
0.015
0.010
0.005
0.000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)

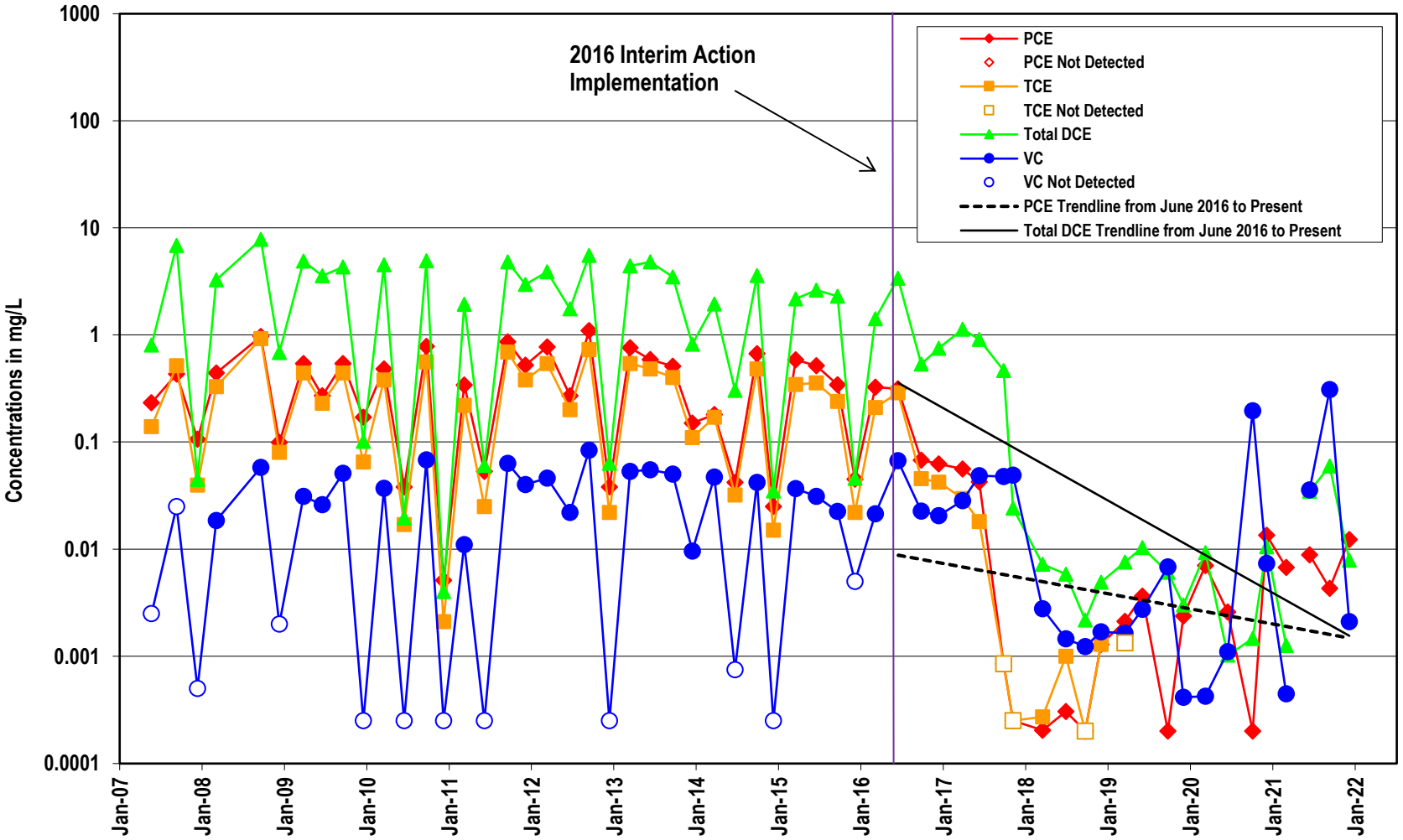
Interim Action Area - VOC Trends: EX



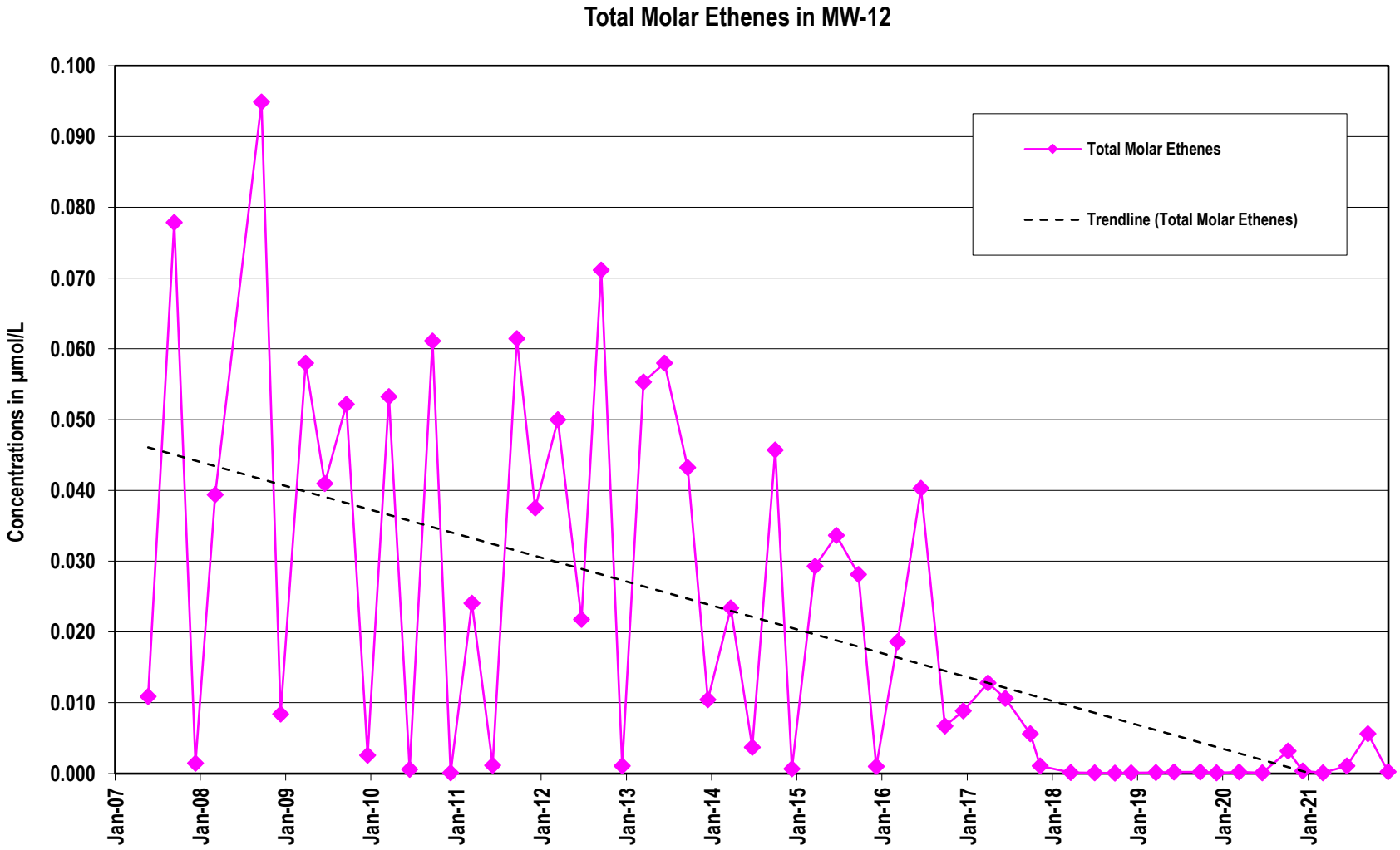
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in EX
Concentrations in µmol/L
0.140
0.130
0.120
0.110
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)

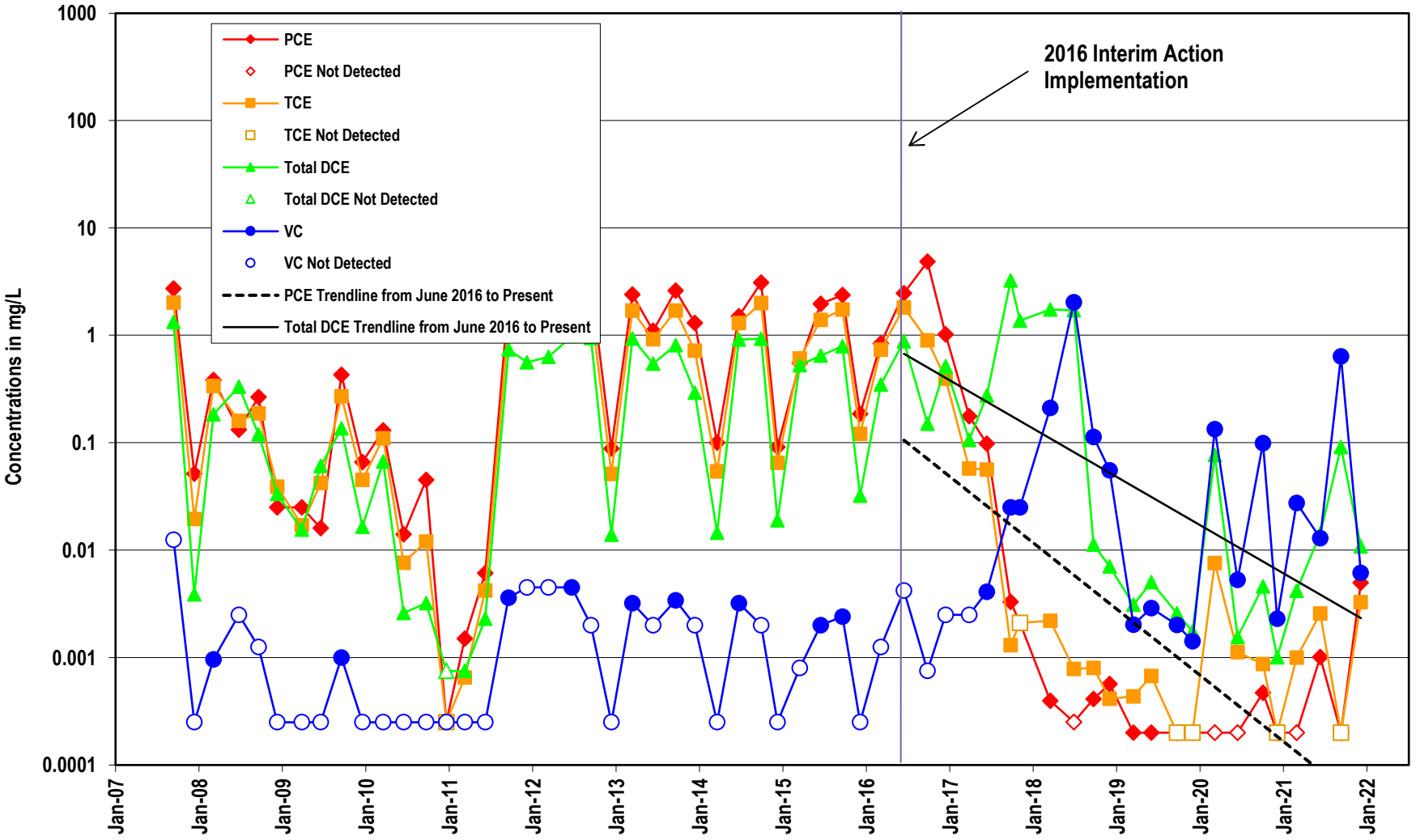
Interim Action Area - VOC Trends: MW-12



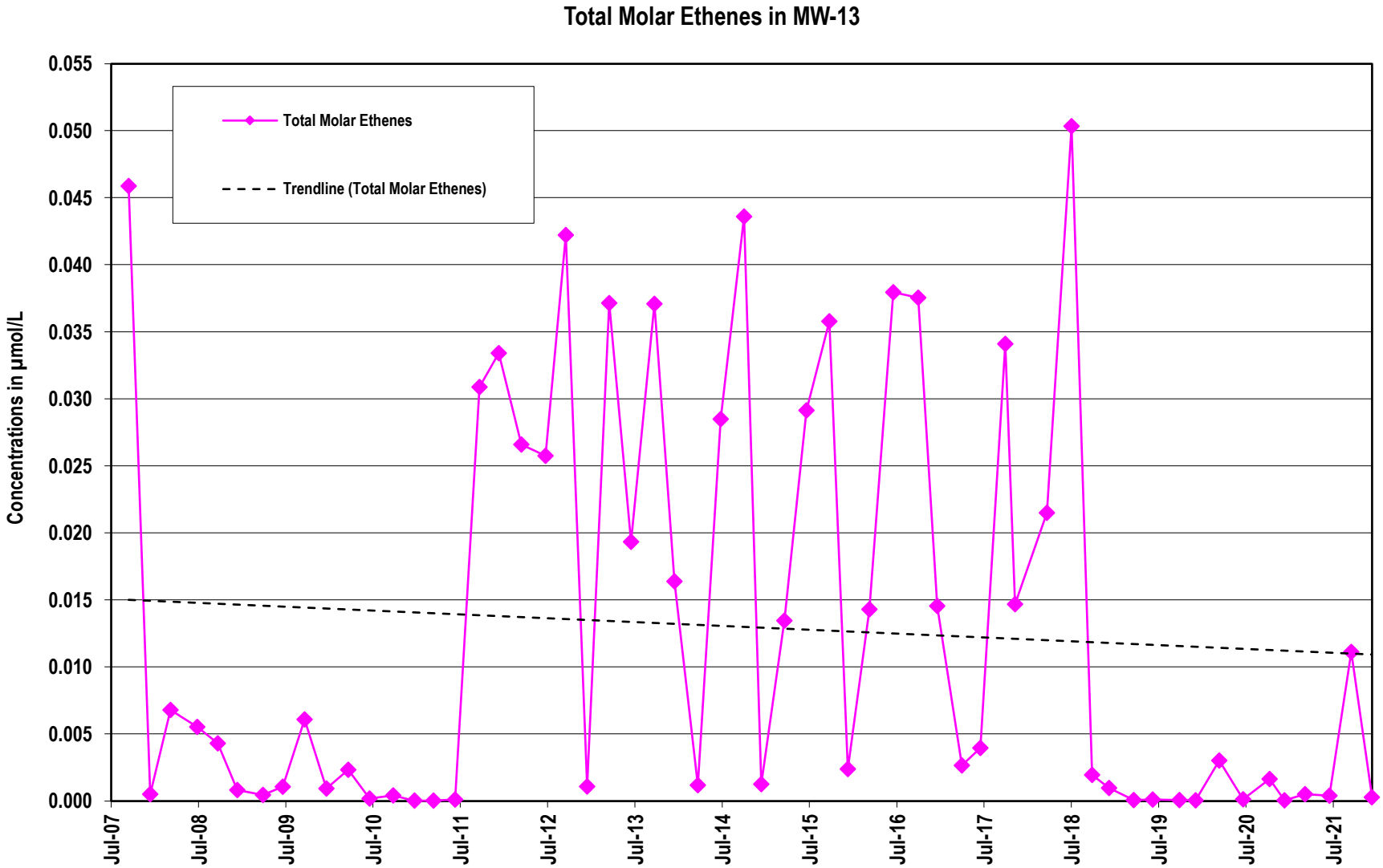
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-12
Concentrations in µmol/L
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)

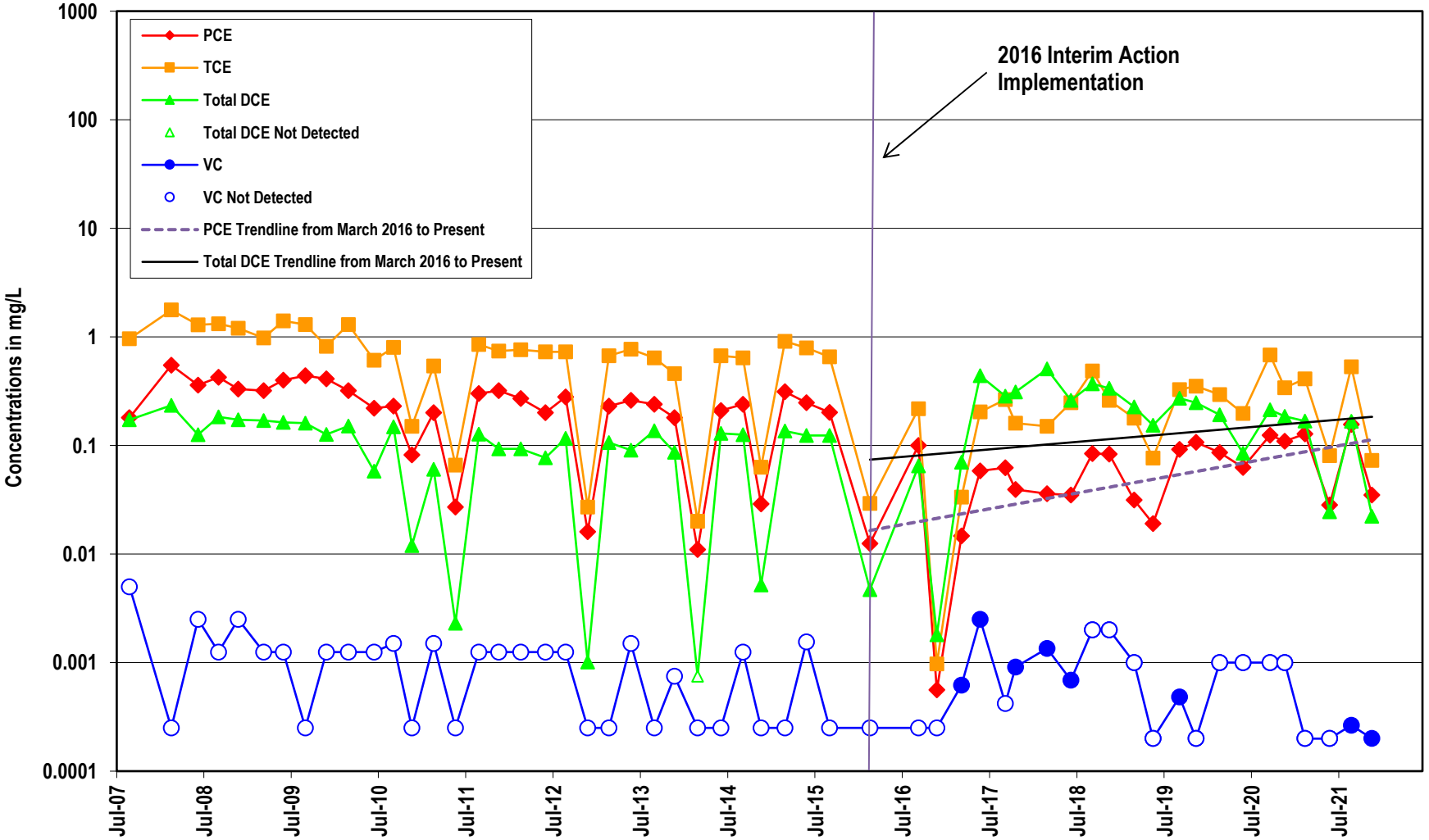
Interim Action Area - VOC Trends: MW-13



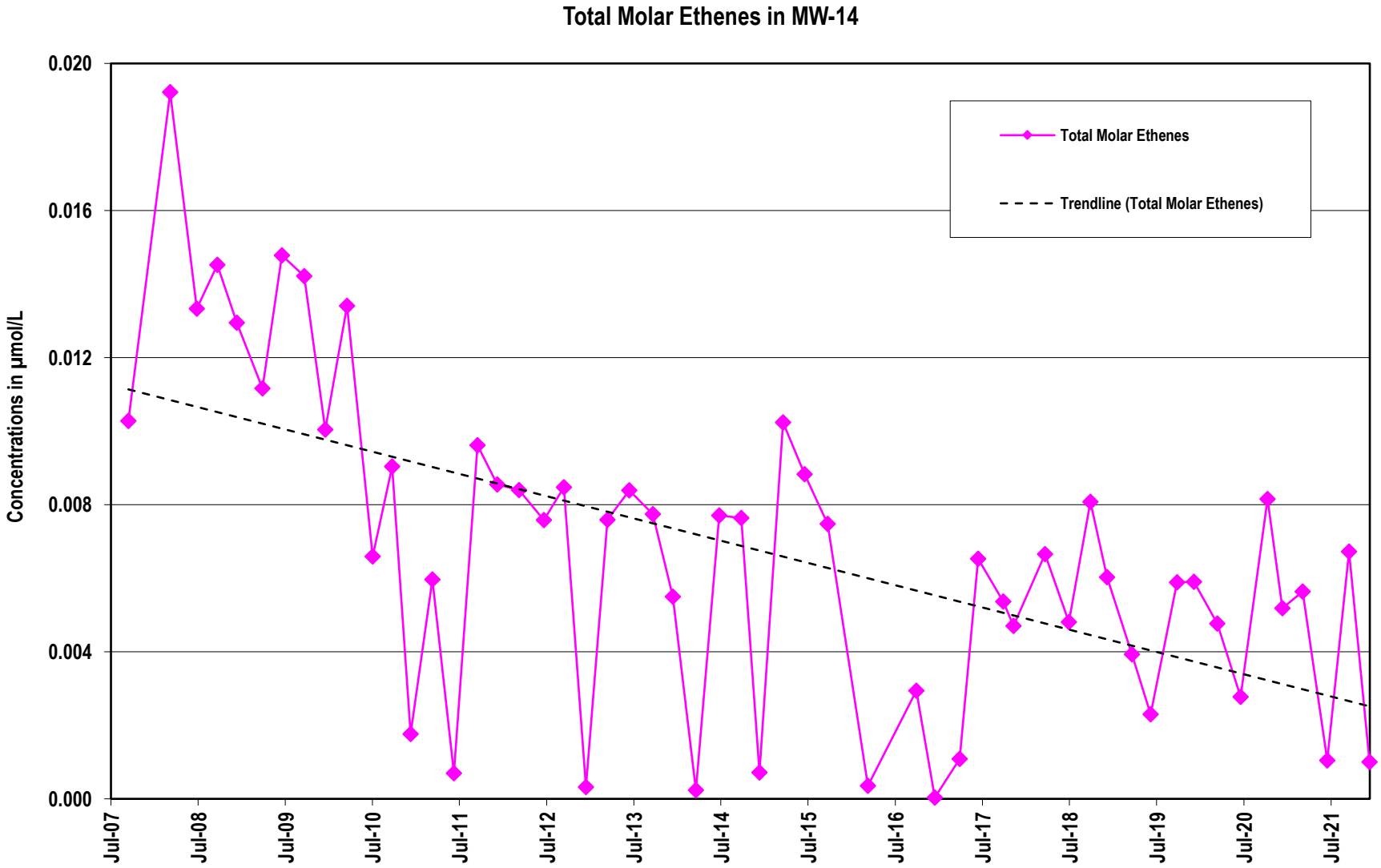
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-13
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Concentrations in µmol/L
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Jul-07
Jul-08
Jul-09
Jul-10
Jul-11
Jul-12
Jul-13
Jul-14
Jul-15
Jul-16
Jul-17
Jul-18
Jul-19
Jul-20
Jul-21

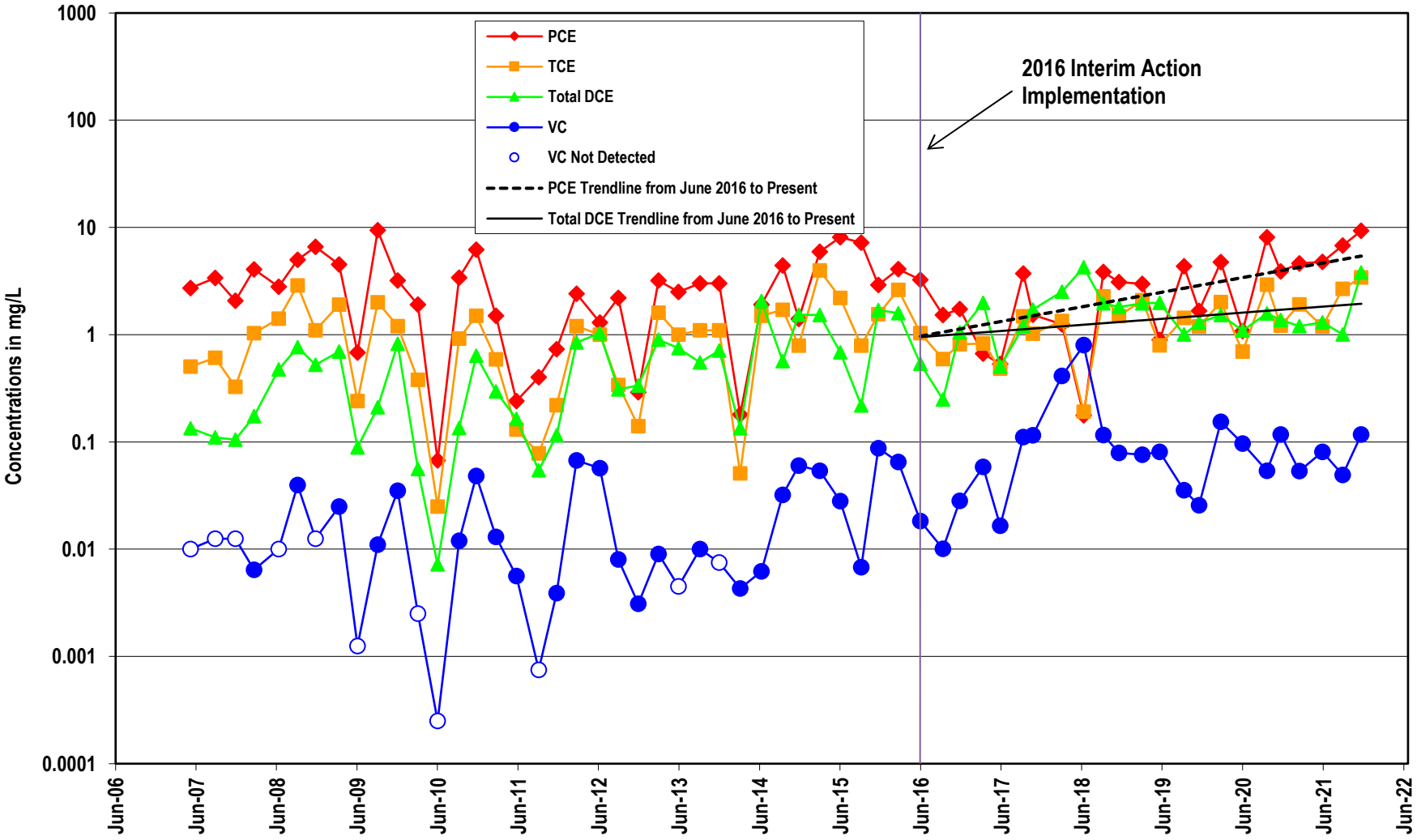
Interim Action Area - VOC Trends: MW-14



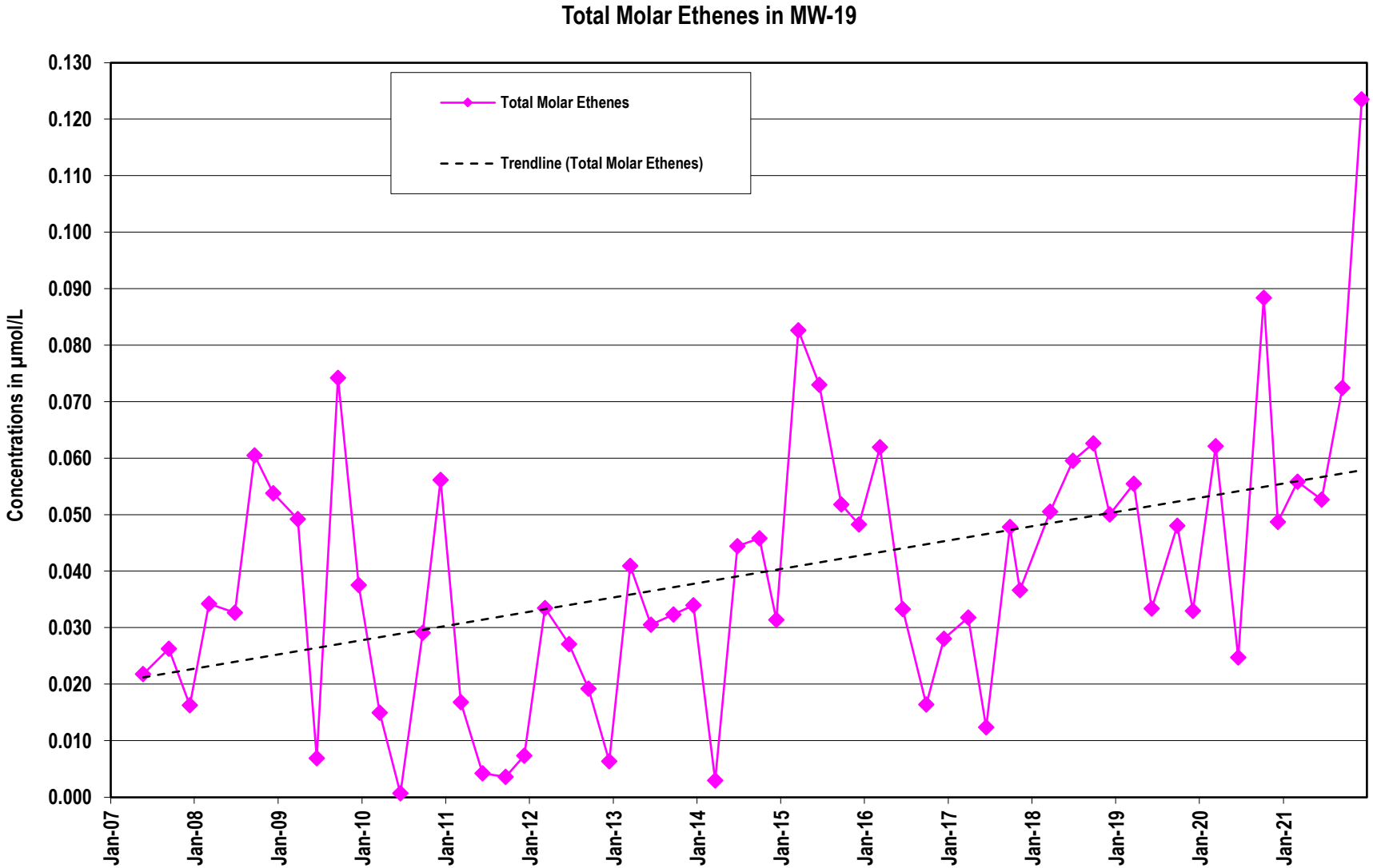
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-14
Concentrations in µmol/L
0.020
0.016
0.012
0.008
0.004
0.000
Jul-07
Jul-08
Jul-09
Jul-10
Jul-11
Jul-12
Jul-13
Jul-14
Jul-15
Jul-16
Jul-17
Jul-18
Jul-19
Jul-20
Jul-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)

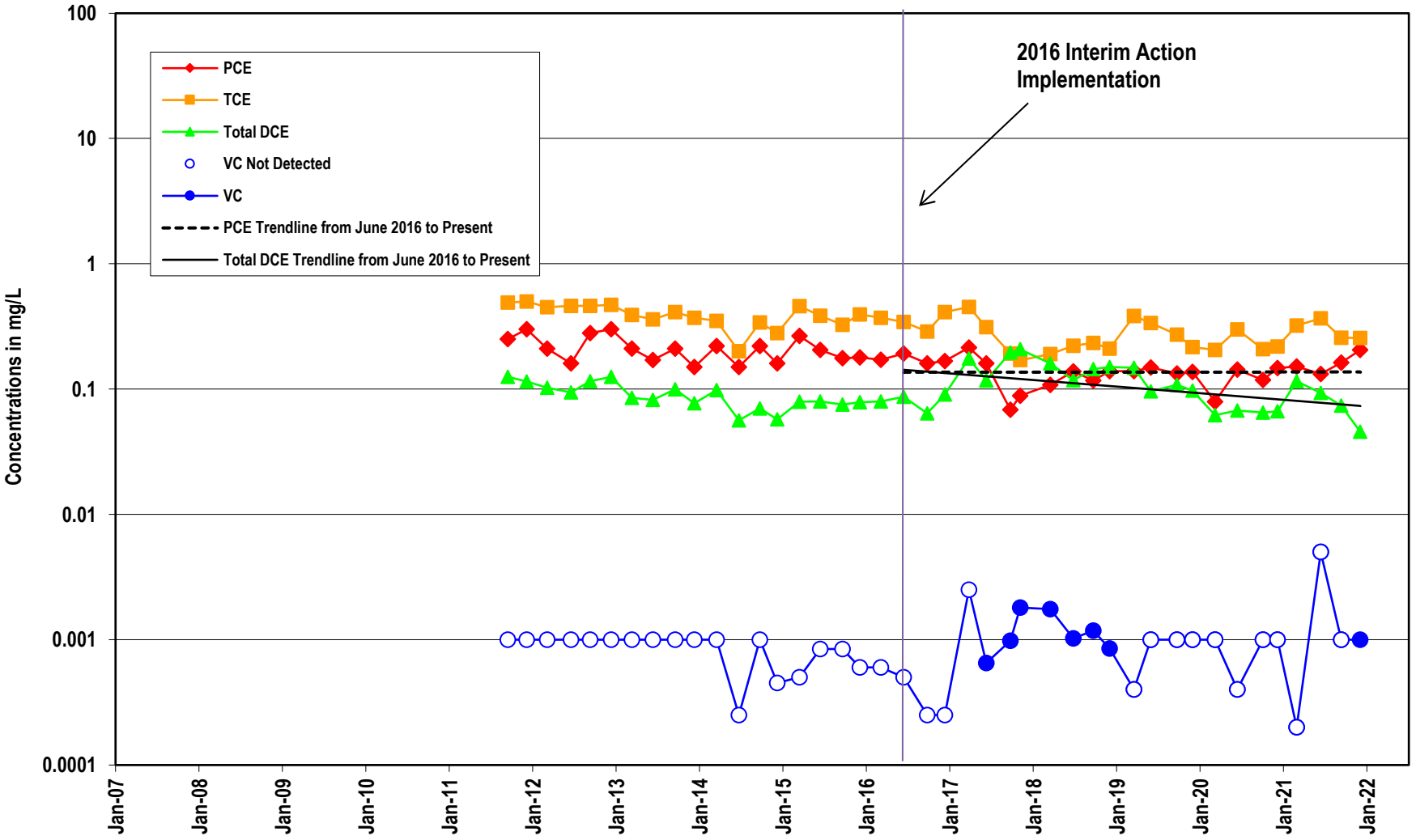
Interim Action Area - VOC Trends: MW-19



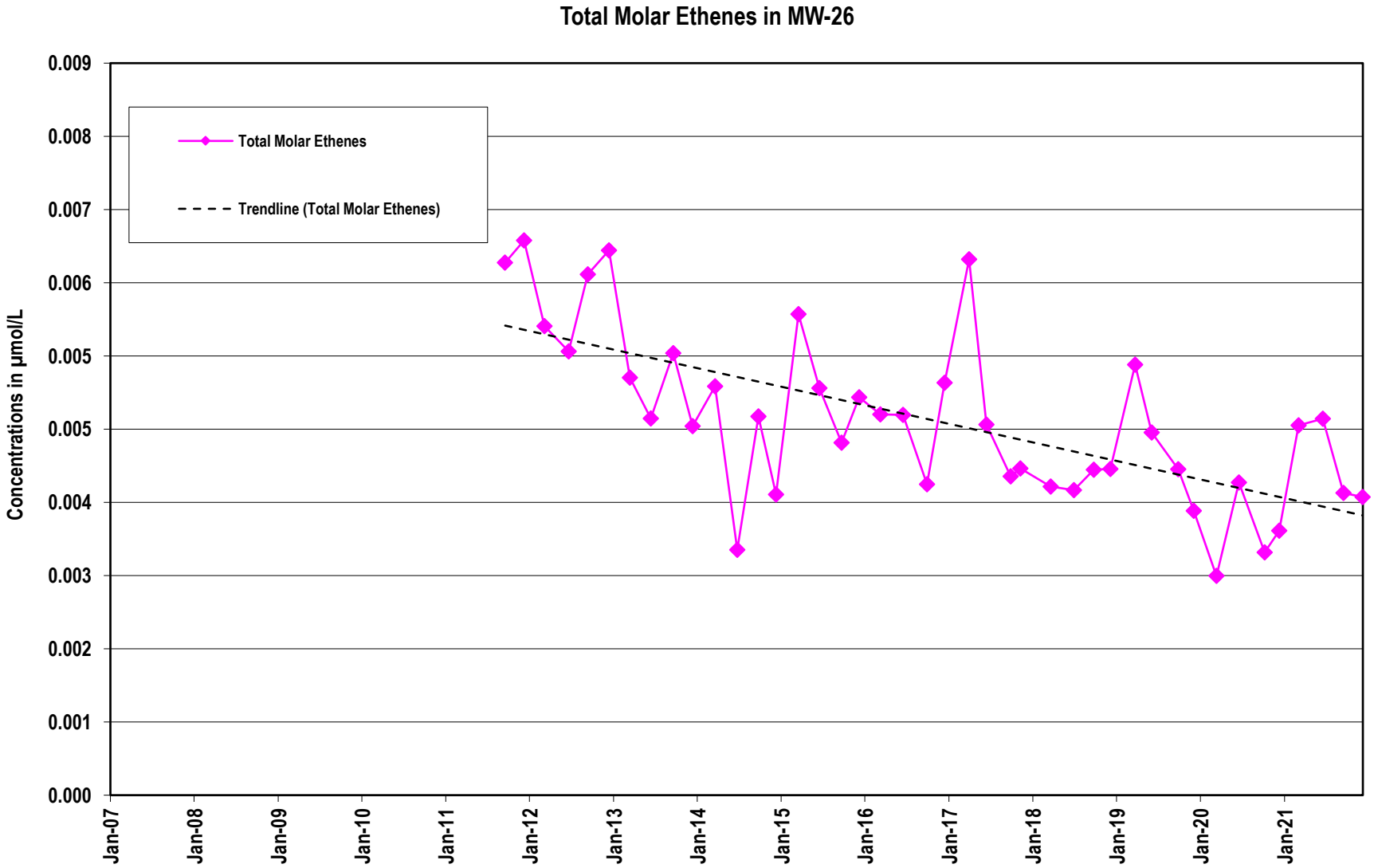
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-19
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Concentrations in µmol/L
0.130
0.120
0.110
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21

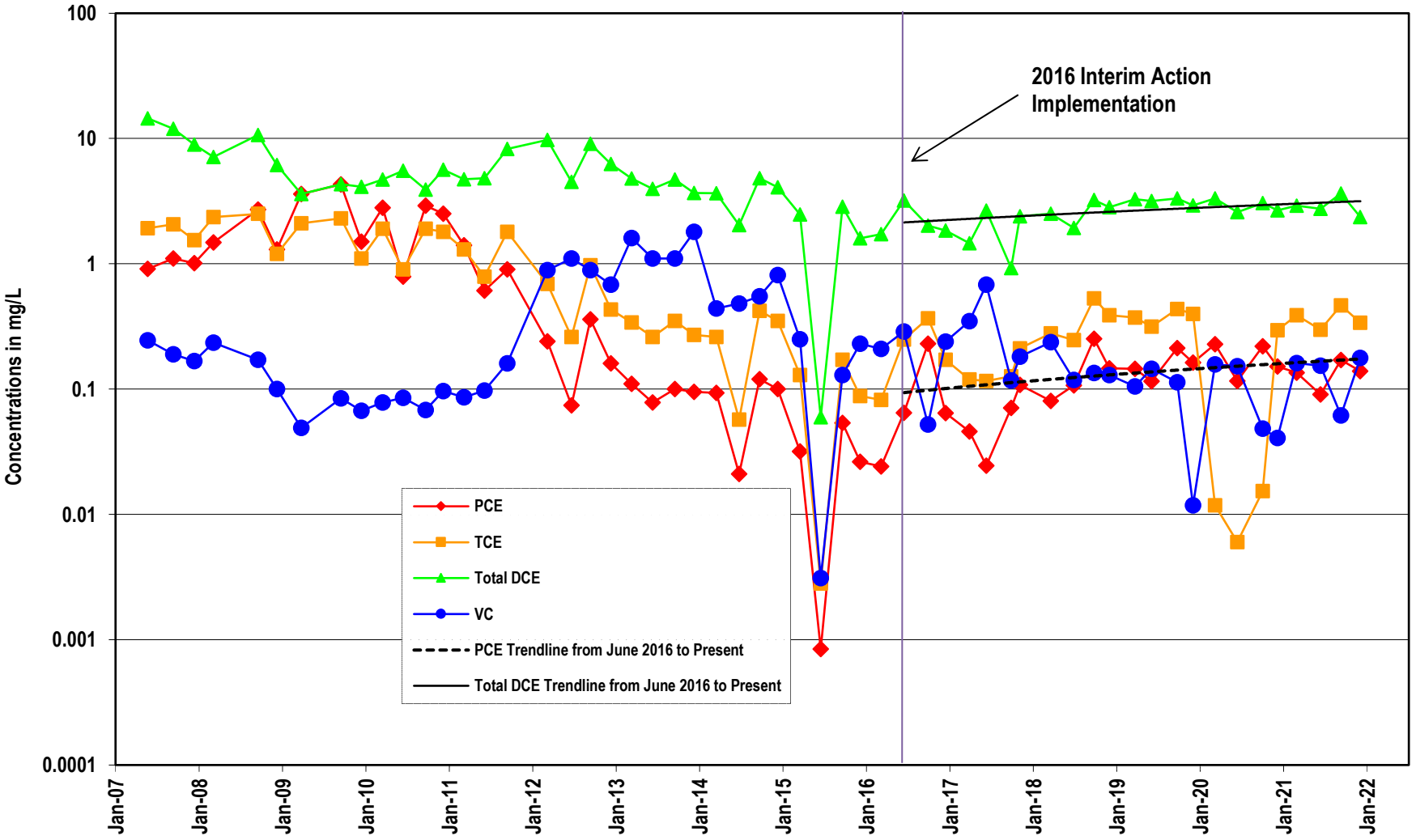
Interim Action Area - VOC Trends: MW-26



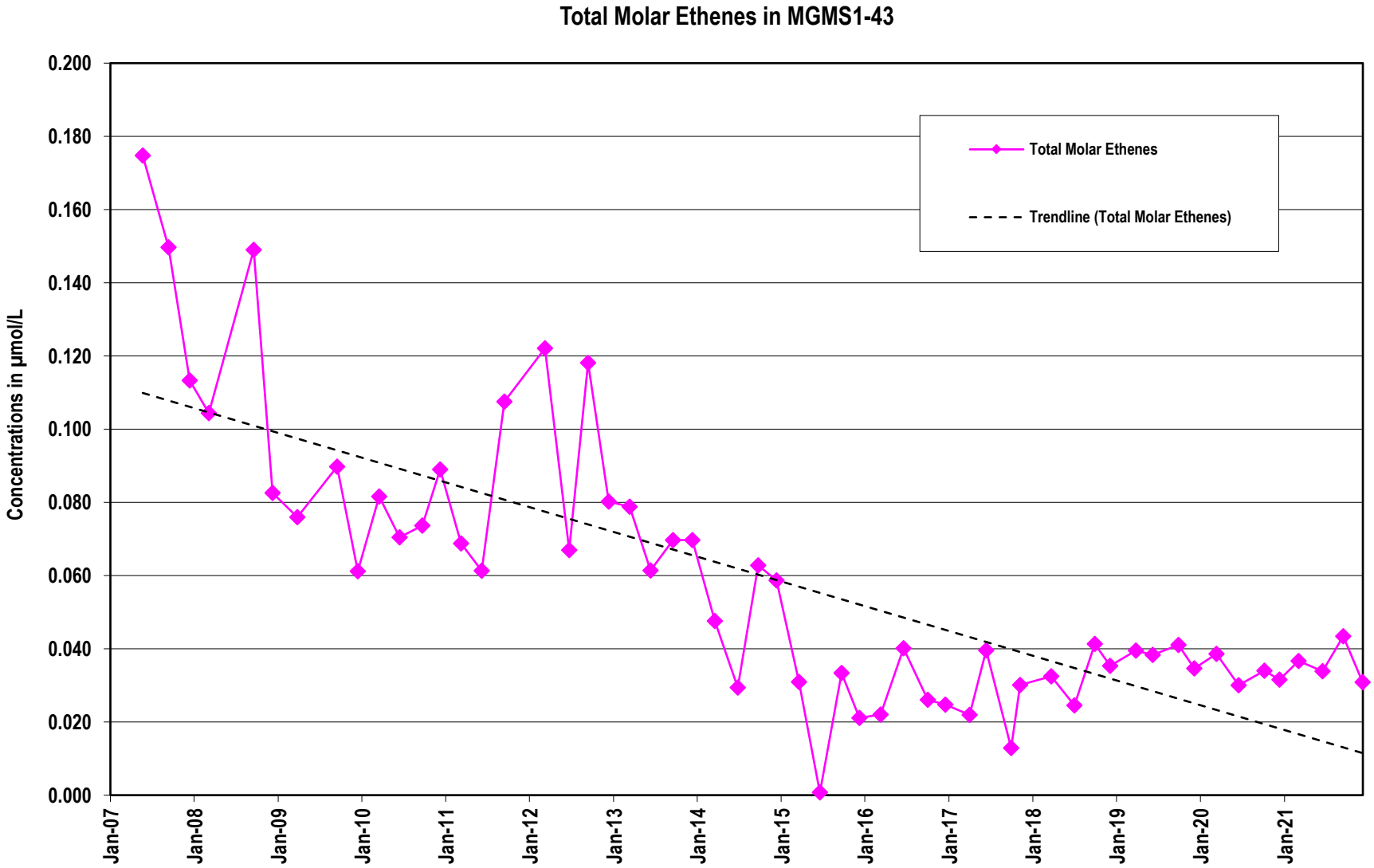
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-26
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Concentrations in µmol/L
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21

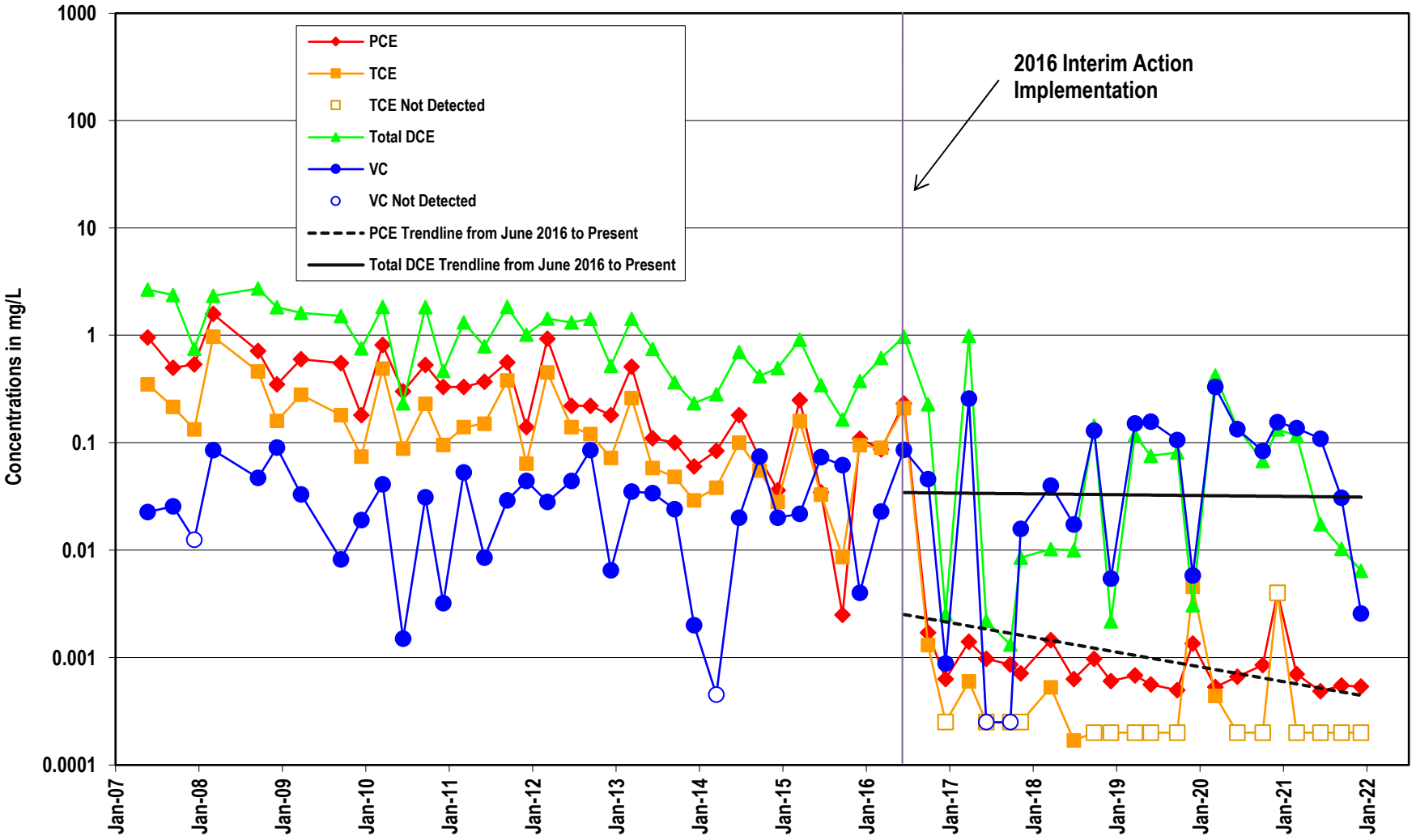
Interim Action Area - VOC Trends: MGMS1-43



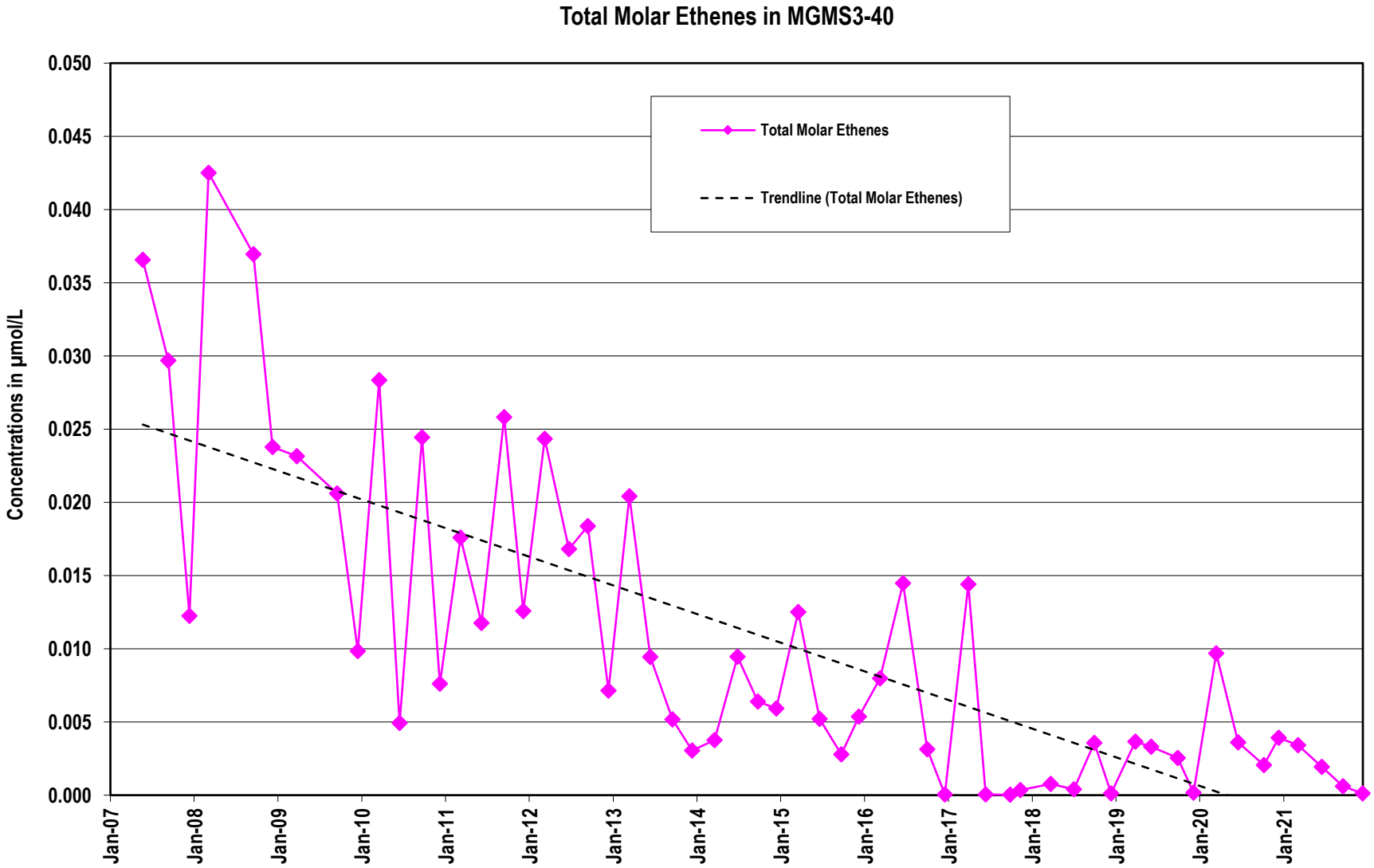
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MGMS1-43
Concentrations in µmol/L
0.200
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)

Interim Action Area - VOC Trends: MGMS3-40



Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MGMS3-40
Concentrations in µmol/L
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Total Molar Ethenes
Trendline (Total Molar Ethenes)