



June 29, 2017

Mr. Craig Rankine
Site Manager
Department of Ecology
2108 Grand Blvd, MS: S-70
Vancouver, Washington 98661-4622

Re: Interim Action Summary Report
NuStar Vancouver Facility
Vancouver, Washington

Dear Mr. Rankine:

Enclosed, please find the *Interim Action Summary Report*. The report was prepared on behalf of NuStar Terminals Services, Inc. (NuStar) by Apex Companies, LLC and Cascadia Associates, LLC.

If you have any questions, please do not hesitate to contact me at 503-906-6577 ext. 107 or Renee Robinson at 210-918-2975 while Stephanie Bosze Salisbury is out on family leave.

Sincerely,

A handwritten signature in black ink, appearing to read "Amanda Spencer", with a stylized flourish at the end.

Amanda Spencer
Principal Hydrogeologist

ENCLOSURE

Interim Action Summary Report (1 hard copy and 1 digital [CD] copy)

cc: Ms. Renee Robinson, NuStar Energy, L.P. (electronic deliverable)
Ms. Patty Boyden, Port of Vancouver (1 digital [CD] copy)
Mr. Richard Roché, Parametrix (1 digital [CD] copy)
Mr. Stephan Rosen, NuStar Energy L.P. (1 digital [CD] copy)
Mr. Aaron Flett, NuStar Energy L.P. (1 digital [CD] copy)



*Interim Action Summary Report
NuStar Vancouver Facility
Vancouver, Washington*

Prepared for:
NuStar Terminals Services, Inc.

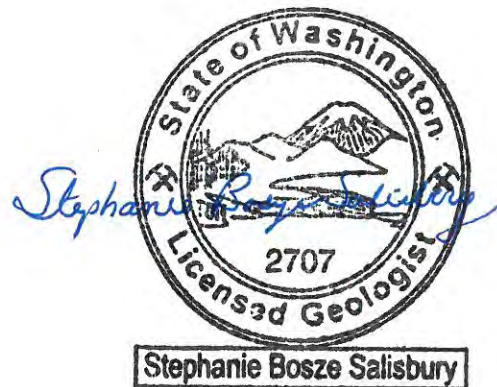
June 29, 2017
1126-20



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NuStar Vancouver Facility
Vancouver, Washington***

Prepared for:
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Stephanie Bosze Salisbury, L.G.
Associate Geologist

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1.0 Introduction

This Interim Action Summary Report (Report) presents the implementation of an interim action at the NuStar Terminals Services, Inc. (NuStar) bulk storage terminal at the Port of Vancouver Terminal No. 2, located at 2565 NW Harborside Drive in Vancouver, Washington (the Property). A Property location map is provided as Figure 1, and a Property plan is provided on Figure 2. The interim action was performed in general accordance with the *Revised 2015 Interim Action Work Plan* (Apex, 2016a), which was submitted to Ecology on April 7, 2016 and approved on June 14, 2016. The implementation was initiated in July 2016, and included baseline sediment and surface water sampling, bioremediation injections, and quarterly performance groundwater sampling events in December 2016 and March 2017.

A Remedial Investigation (RI) and Feasibility Study (FS) were conducted at the Property to collect, develop, and evaluate information sufficient for selecting a cleanup action. An RI report was submitted to Ecology on August 14, 2013 (Apex, 2013), and was approved on November 6, 2013. A Draft FS was prepared jointly with the Port of Vancouver (POV) for the Cadet Manufacturing Company (Cadet) and Swan Manufacturing Company (SMC) sites and the Property (collectively referred to as the Site), and was submitted to Ecology in March 2014. Ecology provided comments and the Draft FS was revised and resubmitted on January 13, 2015. Ecology posted the FS for public comment between January 22 and April 7, 2015, and provided additional comments in 2015 and 2016, including comments received during the public comment period. The POV and NuStar submitted a revised Draft FS on December 31, 2016 and Ecology is currently reviewing the revised Draft FS. To continue the ongoing remedial efforts at the Facility, NuStar voluntarily proposed to implement portions of the FS, including the NuStar source area cleanup action, baseline sediment sampling, and surface water sampling, as an interim action. This interim action is being performed concurrently with Ecology's review of the 2015 Draft FS and the 2016 revised Draft FS to maintain the progress of the remedial efforts at the NuStar facility without incurring delay from the FS approval process.

Prior to this 2016 interim action, NuStar conducted three previous interim actions at the Property. Between 2000 and 2005, NuStar operated a groundwater recirculation treatment system in conjunction with a soil vapor extraction (SVE) system. In 2008, enhanced bioremediation was conducted by injecting food-grade oil into the subsurface to promote the anaerobic degradation of volatile organic compounds (VOCs) in source area groundwater, and a new SVE system was constructed and operated to address vadose zone VOCs in the source area. In 2011, an additional round of enhanced bioremediation injections was implemented and the 2008 SVE system was expanded. Because of the historical success of enhanced bioremediation at the Facility, the current interim action at the NuStar Facility included bioremediation injections along the river shoreline portion of the facility and off-Property to the northwest of the NuStar terminal (NW Area). The SVE will continue to be operated to address residual VOCs in vadose zone soils at the Facility.

1.1 Purpose

The purpose of this Report is to document the implementation of the interim action activities performed during the period July 2016 to March 2017. The implementation included baseline sediment and surface water sampling and bioremediation injections performed from July to September 2016, and quarterly performance groundwater sampling events in December 2016 and March 2017.

1.2 Report Organization

Background information and a summary of the RI and FS and previous interim actions are summarized in Section 2. The implementation of the interim action is presented in Section 3; and results of the interim action including performance groundwater sampling, are summarized in Section 4. A summary and conclusions are presented in Section 5. Supporting information, including field documentation, laboratory reports and data quality review are included in appendices.

1.3 Definition of Property, Site, and Facility

As used in this Report, the Property refers to the NuStar 2006 leasehold area. The 2006 leasehold boundary is shown on Figure 1. Changes in business lines have led to minor revisions in the NuStar leasehold. The 2006 leasehold boundary was selected as it is representative of the Property throughout much of the terminal operational period.

The Site is defined consistent with the Model Toxics Control Act (MTCA) and the Agreed Order (AO) to include the area where a hazardous substance from a release at the Property has "come to be located." Therefore, the boundaries of the Site are determined by the results of the RI (Apex, 2013). The AO states that the Site constitutes a Facility under RCW 70.105D.020(4).

2.0 Background

2.1 Property Location, Description, and History

Location. The Property is located at the POV Terminal No. 2 in Vancouver, Washington (as shown on Figure 1). 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.

Physical Features. Figure 2 is a Property Plan. Until 2006, NuStar consisted of a roughly rectangular area with nominal dimensions of 600 by 1,300 feet; in 2006, the leasehold was expanded to include additional area to the north (see Figure 2). The total area of the facility is approximately 19 acres, which includes the leasehold extent up to 2006 and the additional leased area after 2006. The NuStar facility is on the north

shore of the Columbia River. Land on all other sides is industrial property also owned by the POV. The NuStar facility is located on Clark County Tax Lot (TL) 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.

The Property includes five buildings (Warehouses 9, 13, 14, 15, and 17), a loading dock, three aboveground storage tank (AST) farms, two tank truck loading/unloading racks, a rail tank car loading/unloading area, marine vessel dock and piping, and an office. The ground surface is nearly flat at an elevation typically between 32 and 34 feet above mean sea level (MSL). The majority of product piping is aboveground, except for the buried pipeline that extends from the marine vessel dock to the north to the NuStar Vancouver Annex terminal located approximately 1.7 miles to the north/northeast of the property.

The Property includes extensive underground utilities. Utilities are within about 10 feet of the ground surface, above the groundwater table.

2.2 Property Operations

In general, the NuStar terminal was developed to receive, store, and handle bulk fuel and chemicals. Typically, these chemicals were not owned by the terminal operator. Rather, the terminal operator entered into agreements as a wholesale distributor to handle chemicals for owners. The terminal was owned/operated by GATX from the early 1960s through 1998 (GATX has since been acquired by Kinder Morgan). The terminal was acquired in 1998 by Support Terminals (ST) Services, a subsidiary of Kaneb Pipeline Partners L.P. (Kaneb). Kaneb was acquired in 2005 by Valero L.P. Valero L.P. changed its name to NuStar Energy L.P. in 2007 and changed the name of ST Services to NuStar Terminals Services, Inc. The terminal property is currently leased and operated by NuStar Terminals Services, Inc.

Although a variety of products have been handled at the NuStar facility over the years, historical sampling has identified chlorinated solvents as the chemicals of interest, particularly tetrachloroethene (PCE), trichloroethene (TCE), and 1,1,1-trichloroethane (1,1,1-TCA). Chlorinated solvents were direct loaded from rail trucks to tank trucks through 1981; after 1981, the solvents were transferred from rail trucks to ASTs, then from ASTs to tank trucks (Apex, 2013). Historical company records indicate that handling of chlorinated solvents ended by 1994 and may have ended as early as 1994, but that end date is uncertain.

Currently, sodium hydroxide is received via water vessel and transported out by rail and truck. Jet A fuel is received via water vessel and transported out via barge. Calcium chloride is received via rail and transported out via truck, and dry bulk materials are received via water vessel and transported out via truck.

2.3 Geology and Hydrogeology

This section presents the understanding of the geology and hydrogeology at the Property. Additional information on the geology and hydrogeology at the NuStar Property are discussed in the RI (Apex, 2013).

2.3.1 Geology

Regional Geology. The regional geology is summarized below based on SECOR (2001) and AMEC (2005). The vicinity of the Site is dominated by two primary units: the Unconsolidated Sedimentary Aquifer (USA) and the Troutdale Formation.

The USA is the upper unit. The upper portion of the USA contains unconsolidated silt and sand. The lower portion generally consists of sand or sand and gravel. The Troutdale Formation underlies the USA and can be in excess of 1,000 feet thick. There is an unconformity in the Troutdale Formation, representing exposure and a period of erosion prior to the deposition of unconsolidated sediments through catastrophic flooding events. These catastrophic floods were caused by periodic failures of ice dams, releasing large volumes of lake waters and sediments from Idaho and Montana during the Pleistocene Age. The resulting Pleistocene flood deposits are made up of cemented sandy gravels and semi-consolidated sands, silts, and clays.

Local Geology. The vicinity of the Site is dominated by two primary units: the USA, and the Troutdale Formation. Figures 3 and 4 present geologic cross-sections through the Site. The upper part of the USA that underlies the Facility consists of fine to coarse sand with variable layers of silt or silty sand. The upper sandy zone extends from the ground surface to a depth of up to 50 feet beneath the western and central portions of the Facility and extending south to the Columbia River. Within the upper USA, a silt layer is present on the north and east parts of the Facility. At the northern Facility boundary, the silt is encountered at depths as shallow as 9 to 10 feet below ground surface (bgs) and extends to depths of approximately 40 feet bgs. This layer is continuous along the north, west, and east of the Facility, forming a low-permeability ridge at the Facility boundary.

A silty gravel layer underlies the sandy/silty layers of the upper USA beneath the Facility. The silty gravel grades into the coarse sand and/or gravel of the lower portion of the USA. The depth to the top of the silty gravel varies from 39 (north) to 50 (south) feet bgs beneath the Facility.

2.3.2 Hydrogeology

This section presents the understanding of the regional and local hydrogeology.

Regional Hydrogeology. The regional aquifers follow the regional geology discussed above. The regional hydrogeology summarized below is based on SECOR (2001) and AMEC (2005).

The USA is unconfined and receives recharge directly from the land surface and/or surface water features. It is a productive aquifer with high well yields (several thousand gallons per minute [gpm] without significant drawdown). Based on numerous studies conducted in the POV area, the following aquifer terminology has been adopted:

- Shallow Zone – The Shallow Zone corresponds to first encountered groundwater, generally the upper 20 to 30 feet of the saturated zone. At the Facility, depth to first encountered groundwater is general 21 to 33 feet below grade (elevation of 5 to 12 feet). The bottom of the Shallow Zone is about elevation -10 to -20 feet, or a depth of about 40 to 50 feet.
- Intermediate Zone – The Intermediate Zone generally corresponds to the middle of the USA. This zone is most directly influenced by pumping wells in the USA. The Intermediate Zone lies between approximate elevations -15 and -100 feet. At the Facility, the Intermediate Zone is between depths of about 55 and 130 feet.
- Deep Zone – The Deep Zone includes the Troutdale Formation and, in some areas, the lower part of the USA. It generally corresponds to portions of the aquifers that are less influenced by groundwater pumping and more by regional influences.

Local Hydrogeology. Figures 3 and 4 show interpretations of the hydrogeologic units at the Site. Beneath most of the Property, the Shallow Zone lies within the sand layer overlying the silty gravel. Along the northern Property boundary and continuing to the north, the silty gravel grades into predominantly silt and the Shallow Zone lies entirely within the silt layer. As a result, the silt layer forms a low-permeability zone that greatly impedes hydrogeologic communication between the Shallow and Intermediate Zones on the Property, and effectively isolates the Shallow Zone on-Property from the Shallow Zone off-Property. The presence of silt in the Shallow Zone, particularly at the lower contact of the groundwater zone, results in a Shallow Zone that has an overall lower permeability than the Intermediate Zone.

The lower reaches of the Columbia River – where the Site is located – are subject to tidal variations as well as seasonal and stage variations due to precipitation and regulation of river flow by dams. Due to these tidal variations and the presence of the silt layer in the Shallow Zone, a groundwater divide is present in the central portion of the Property within the Shallow Zone, generally corresponding to the southern edge of the “silt ridge” at the Property. Groundwater south of the groundwater divide is more sensitive to tidal variations. Shallow groundwater to the north of the divide appears to be less tidally influenced and generally flows away from the river. The Shallow Zone groundwater elevation contour map from December 2016 depicts the typical northwest/southeast trending groundwater divide in Shallow Zone groundwater and is shown on Figure 5.

Figure 6 shows the groundwater elevation contour map for the Intermediate Zone in December 2016. Groundwater flow in the Intermediate Zone at the Facility is variable and at times flows towards the Columbia River and at other times, flow is away from the river and to the north. Intermediate Zone flow was evaluated within a regional context in 2012 (*2012 Groundwater Flow Evaluation Report*; Ash Creek, 2012a). Several

factors influence groundwater flow in the Intermediate Zone in the vicinity of the Facility, including pumping from municipal supply wells and industrial production wells as well as changes in Columbia River water levels. The 2011 annualized groundwater gradient further from the river (as measured between POV wells MW-32i and MW-33i) was essentially flat with a gradient of 0.000018 ft/ft to the northeast (Ash Creek, 2012a).

2.4 Remedial Investigation

Since 1980, numerous investigations have been conducted by various parties. These investigations identified the presence of chlorinated solvents and associated breakdown products, primarily PCE, TCE, and cis-1,2-dichloroethene (cis-1,2-DCE) in soil, groundwater, and soil vapor. Investigation activities were completed between 1980 and 2012. Together, these activities comprise the RI (Apex, 2013) summarized in this section.

Surface Water. The Columbia River, adjacent and to the southwest of the Site, serves as an active channel for large commercial ships. Throughout its course, the river is used by many communities (not Vancouver) as a source of drinking water. However, within at least several miles of the Site, the river is not used for drinking water purposes and is not likely to be used within the foreseeable future. In 2006, the U.S. Environmental Protection Agency (EPA) designated the Troutdale aquifer beneath Clark County as a Sole Source Aquifer. In the designation, published in the Federal Register on September 6, 2006 (Vol. 71, No. 172), the EPA indicated that 99.4 percent of Clark county's population (approximately 450,000 people; U.S. Census Bureau, 2014) used the aquifer as their source of drinking water. Further, the EPA indicated that it was not economically feasible to replace groundwater with surface water.

Anadromous and resident fish species use parts of the river during various stages in their life cycles, including spawning, rearing, and migration. The Columbia River is also used for fishing for sport and consumption, recreational boating, general recreation, and aesthetic value. A number of local American Indian tribes have fishing rights on the Columbia River. River water is also used for stock, agriculture, and industrial water supplies at various points along the course of the river.

Chemicals of Potential Concern. A screening of chemical data identified the chemicals of potential concern (COPCs) in soil and groundwater at the NuStar site to be chlorinated solvents and associated degradation products. Three COPCs (PCE, TCE, and vinyl chloride) account for greater than 95.9 percent of potential risk based on comparison to screening levels (Apex, 2013). Although cis-1,2 DCE is not a risk driver, it is the daughter product of TCE and breaks down to form vinyl chloride. Therefore, these four compounds represent the primary COPCs. Vinyl chloride is not widely detected across the Site; therefore, PCE, TCE, and cis-1,2-DCE were used in the RI as indicator compounds for assessing chemical fate and extent.

Primary Source Area. Based on a review of historical Facility use information, three potential source areas were present at the Property (Ash Creek, 2006a). Targeted sampling was performed in and around these

three areas, and the results demonstrated that the primary source area at the Property is the historical direct load area near the northwest corner of Warehouse 13 (Figure 2).

Extent of COPCs in Soil. VOCs in vadose zone soil are predominantly PCE, with lesser concentrations of TCE and cis-1,2-DCE. As summarized in the RI (Apex, 2013), the extent of PCE in soil is defined by chemical analytical results up to the river and is confined to the NuStar facility. A soil investigation was conducted in 2010 to evaluate the overall performance of the 2008 soil interim action (see Section 2.5.2). The 2010 investigation showed that the majority of the VOC mass had been removed within the SVE area of influence between 2008 and 2010, and the SVE system was expanded in 2011 to cover a larger area of influence (detailed in Section 2.5.3). To date, SVE has removed over 5,200 pounds of VOC mass from the source area. As the focus of the 2016 interim action is on groundwater, surface water, and sediments, and the SVE cleanup action is ongoing, the soil cleanup effort will not be discussed further in this interim action summary report.

Extent of COPCs in Shallow Zone Groundwater. Isocontours of PCE, TCE, and cis-1,2-DCE in Shallow Zone groundwater in March 2008 and March 2013 are provided in Figures 7 through 9. As can be seen from the figures, VOCs in the Shallow Zone on the northern portion of the leasehold have been and continue to be generally confined to the NuStar facility. There is a small, localized off-property source to the northwest of the NuStar facility; the extent of shallow groundwater impacted by this off-property source is limited to an area of approximately 100 by 300 feet and does not extend to the Columbia River (NW Area). It has not impacted the underlying intermediate zone. At the southern portion of the NuStar facility, groundwater flow is towards the river where it is understood to interact with river sediments. As can also be seen by the figures, there has been a significant reduction in Shallow Zone VOC concentrations since implementation of the 2008 and 2011 groundwater interim actions.

The source area at the NuStar facility is confined to the Shallow Zone groundwater. VOC concentrations are one to two orders of magnitude less in the intermediate zone groundwater relative to Shallow Zone groundwater due to the presence of the silty gravel layer beneath the Shallow Zone in the central and southern portions of the property and the silt ridge at the northern property boundary. The intermediate zone groundwater at the NuStar facility extends beyond the property and is considered part of the project area dispersed plume, as described in the draft revised FS (Parametrix and Apex, 2016).

Extent of COPCs in Sediments. Figure 10 shows the extent of COPCs in river sediments adjacent to the NuStar Facility based on sediment investigations conducted in 2011 and 2012. Sediment data are presented for the uppermost samples collected (typically the mudline and first subsurface sample) as this definition of "sediment" is consistent with the Sediment Management Standards (SMS) Rule (Ecology, 2013) and is representative of the portion of the river channel where "humans or biota may be exposed". A conceptual site model for the distribution of VOCs in sediments was initially presented to Ecology in the RI (Apex, 2013). The magnitude and distribution of VOCs in sediments suggest that river sediments were impacted from the migration of upland groundwater containing source-level VOC concentrations. As evaluated in the NuStar

risk assessment (Ash Creek, 2008) and in the updated NuStar risk assessment (Apex, 2013), VOC exposure point concentrations (EPCs) in upland groundwater were used to estimate potential impacts to river sediments using the three phase partitioning model in WAC 173-340-747(4) and (5). The estimated VOC concentrations in sediment from groundwater containing VOCs were consistent with the empirical sediment data collected during investigations in 2011 and 2012.

VOCs detected one or more times in sediment were considered to be COI. The maximum detected concentration was compared to ecological effects-based screening level concentrations in the NuStar RI. COI that exceeded screening levels included PCE, TCE, cis-1,2-DCE, 1,1-Dichloroethene (1,1-DCE), and vinyl chloride. Because each of the sediment COI were included in the list of COPCs for groundwater, and the sediments are understood to be impacted by groundwater, the full list of COI were retained as COPCs in sediments. Four indicator compounds were used to evaluate the extent of VOCs in sediment, and are: PCE, TCE, cis-1,2-DCE, and vinyl chloride.

As shown on Figure 10, COPC concentrations above risk-based screening levels extend approximately 600 feet along the southern Property boundary and approximately 100 feet riverward from the boundary. A depiction of the Site and river bathymetry extending from the seawall is shown on the cross-section on Figure 11 and is based on river bathymetry maps and seawall structural drawings provided by the POV. As depicted on Figure 11, a seawall borders much of the Property along the boundary with the Columbia River. The Columbia River in the vicinity of the terminal is dredged to a depth of about -42 to -44 feet (Columbia River Datum [CRD]), which is equivalent to approximately -36.5 to -43.5 feet MSL referenced to the North American Vertical Datum of 1988 (NAVD88) and is maintained up to the vessel docking berths. The area between the docking berths and the seawall is not dredged as no vessels navigate the landward side of the docking berths. Rip-rap has been placed at the riverward side of the seawall and on the slope where the seawall is absent (downstream portion of the Property). During the 2011 sediment investigation, large cobbles to small boulder-sized rocks (likely rip-rap) were encountered at depths ranging from -32 feet to -40 feet MSL. The extent (and depth) to which the boulder cover extends into the channel was further evaluated during the 2012 sediment investigation, and in some areas, extends to the dredged zone which is roughly -42 feet MSL. As also can be seen on Figure 11, similar to the one to two order magnitude decrease in groundwater concentrations between the Shallow and Intermediate Zone, VOC concentrations in sediments in contact with Intermediate Zone groundwater are generally a half to one order of magnitude less than in sediments in contact with Shallow Zone groundwater. The areas of highest impact (locations "C", "3", and "D", Figure 10) are located directly downgradient from the primary source area at the Property. The extent of VOCs in sediment to the west/northwest and east/southeast generally correlate with the northwest-southeast boundaries of the Shallow Zone groundwater plume at the Site.

2.5 Interim Actions

The results of the RI indicate that the primary release area is located between Warehouses 13 and 15, beneath the rail siding north of these warehouses, and extending south toward the sea wall. Rail car

off-loading historically occurred at the north end of this area. Three interim actions have been conducted in this area. A summary of each is provided below.

2.5.1 Interim Action – 2000 through 2005

Pursuant to a 1998 AO between Ecology and Support Terminals Services, Inc. (a.k.a. ST Services), an interim remedial action system was installed at the Property in 2000. Detailed work scopes, procedures, and methods for these activities were presented in the *Final Interim Action Pilot Study Work Plan*, (SECOR, 1999b), *Response to Ecology's Comments Letter* (SECOR, 1999c), and the *Final Interim Action Work Plan* (SECOR, 2000a). The primary objective of the interim action was to reduce VOC concentrations in soil and groundwater within the interim action areas. The interim action consisted of two components: (1) a re-circulating system to treat groundwater; and (2) vapor extraction to treat soil. The groundwater treatment system was designed to treat shallow groundwater (less than 45 feet deep) with PCE concentrations in excess of 1 milligram per liter (mg/L). The interim action system extracted groundwater from wells installed near the river (EX-3 through EX-5), treated the extracted water with potassium permanganate, and then filtered and pumped the water into a series of injection wells along the railroad tracks (IN-1 through IN-9). For soil, an SVE system withdrew soil vapors from wells IW-1, IN-2, IN-3, IN-4, EX-1, EX-3, EX-4, and EX-5. A detailed description of the installation of the interim action system is provided in the *Final Remedial Investigation Report* (SECOR, 2001). This interim remedial action continued through 2005. The interim action successfully removed VOC mass at the Property (based on the decrease in concentration of VOCs in some wells), but overall the system was not efficient at addressing the release area.

2.5.2 Interim Action – 2008: Combined Enhanced Bioremediation and Soil Vapor Extraction

In 2008, an interim action was implemented to address the primary source area at the NuStar facility while the RI, risk assessment (RA), and FS were being completed. An analysis of interim action alternatives was completed to select the appropriate action (Ash Creek, 2006b). Based on the results of the interim action analysis, enhanced bioremediation and SVE was selected and described in detail in a design report (Ash Creek, 2007). Ecology accepted the design report on January 10, 2008, contingent upon a response to comments. Ash Creek submitted a comment response letter to Ecology on May 7, 2008. The interim action was initiated in April 2008 and consisted of installation of temporary injection points, injection of a bioremediation substrate, installation of SVE wells and associated trenching/pipe, installation and startup of the SVE system, and routine operations, maintenance and monitoring of the SVE system. The bio-injection substrate, CAP18-ME, was derived from food-grade vegetable oil components (triacylglycerols and esterified fatty acids) and provided a carbon source for the anaerobic reductive dechlorination treatment pathway. The bioremediation substrate was injected into Shallow Zone groundwater at 38 locations within the source area; injection locations are shown on Figure 12. The SVE system consisted of 18 SVE wells and operated nearly continuously (with the exception of minor shutdowns for maintenance or monitoring purposes) until the system was expanded and reconfigured in August 2011.

2.5.3 Interim Action – 2011 Additional Interim Action (Enhanced Bioremediation and Expanded SVE)

A soil and groundwater investigation was conducted in the source area in 2010 to assess the progress of the 2008 interim action. The investigation confirmed the success of the 2008 interim action and provided the data needed to develop a work scope for continued interim action. The *2011 Interim Action Work Plan* (2011 IA Work Plan; Ash Creek, 2011) detailing the proposed additional 2011 interim action was submitted to Ecology on November 30, 2010. Ecology approved the 2011 IA Work Plan in an email on March 30, 2011 and the expanded (2011) interim action was implemented from July through October 2011. The 2011 interim action included additional enhanced bioremediation injections and an expansion of the 2008 SVE system. The additional interim action doubled the areal extent of the 2008 SVE system and included four times the number of bio-substrate injection points across an area that was four times larger than the 2008 bioremediation area. The locations of the 2011 injection points are shown on Figure 12. During the 2011 interim action, the selected bio-injection substrate (EOSPro® electron donor, manufactured by EOS Remediation, Inc., of Raleigh, North Carolina) was injected at 155 locations within the primary release (source) area. The SVE system was expanded to include an additional 34 extraction wells and the installation of a second blower. Approximately five months after the interim action was implemented, the 2011 Interim Action Evaluation Report was submitted to Ecology, summarizing the expansion of the SVE system and startup activities, the enhanced bioremediation injections, and groundwater and SVE effluent monitoring results during the first five months of operation (Ash Creek, 2012b).

Success of Interim Actions. Concentrations of COCs have decreased by up to four orders of magnitude in the primary source area, where the 2008 and 2011 interim actions were focused. For example, monitoring well MW-7 is located in the center of the primary source area and historically exhibited PCE concentrations as high as 73,000 micrograms per liter ($\mu\text{g/L}$). PCE concentrations in well MW-7 decreased to levels below the drinking water cleanup standard of 4 $\mu\text{g/L}$. Similarly, monitoring wells MW-12, MGMS2-40, EX, and MP-1, also located in the 2008 and/or 2011 interim action injection areas, have exhibited reductions in total VOC concentrations ranging from 80 percent in well MP-1 to over 99 percent in wells EX, and MGMS2-40 (Apex, 2016a). The data from the 2008 and 2011 interim actions confirm that enhanced bioremediation is a successful technology for addressing VOC concentrations in groundwater at the Facility.

2.6 Feasibility Study – Summary of Preferred Remedial Alternative

As discussed in Section 1.0, a joint FS was prepared by the POV and NuStar for the Swan, Cadet and NuStar sites (Parametrix and Apex, 2015). Based on the results of the FS, the recommended cleanup action for groundwater at the NuStar Property is additional enhanced bioremediation combined with monitored natural attenuation (MNA). The 2015 Draft FS recommended enhanced bioremediation to treat groundwater with concentrations above 200 $\mu\text{g/L}$. As discussed in Section 2.5, bioremediation injections have already been

demonstrated to reduce source area VOC concentrations to below laboratory reporting limits. MNA would be used to address residual concentrations of COPC in peripheral upland areas of the groundwater plume.

As summarized in the RI (Apex, 2013) and in Appendix G of the 2015 Draft FS (Parametrix and Apex, 2015), the magnitude and distribution of sediment impacts suggested that river sediments were directly impacted from the migration of upland impacted groundwater. Based on our understanding of the source of sediment impacts, upland source control was the preferred remedial alternative for sediments presented in the FS. For this alternative, active treatment of the groundwater source would be used to eliminate the ongoing source of VOCs to sediment via the groundwater pathway. Thereafter, monitored natural recovery (MNR) would result in reduction of sediment concentrations to below cleanup levels.

3.0 Implementation of 2016 Interim Action

NuStar and the Port of Vancouver originally submitted a joint Feasibility Study to Ecology in March 2014 (Apex and Parametrix, 2015), and the FS approval process is ongoing. To avoid potential delays in groundwater and sediment remediation while working through the FS 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. The interim action consisted of bioremediation injections along the southern portion of the NuStar terminal near the seawall, where source material remains. Per Ecology's request, the interim action was expanded to include baseline sediment and surface water sampling in the Columbia River. Additionally, the area of bioremediation injections was expanded to include injections in an isolated area to the northwest of the NuStar terminal which has been less responsive to monitored natural attenuation than the VOCs at the NuStar terminal. The "Northwest Area (NW Area) bioremediation injections" were completed as a joint project between NuStar and the Port of Vancouver. The *2015 Interim Action Work Plan* was revised to include this expanded scope and re-submitted in April 2016 (Apex, 2016a). After a 30-day public comment period from May 12 to June 10, 2016, the revised work plan was approved on June 14, 2016.

The interim action implementation was initiated in July 2016 and included baseline surface water and sediment sampling, and injections of a food grade oil-substrate into the shallow groundwater zone to support *in-situ* bioremediation. This section presents the approach and procedures used to implement these activities.

3.1 Surface Water Sampling

Surface water data were collected to assess the habitat for fish swimming near sediments at the Site. Surface water samples were collected with passive diffusion bag (PDB) samplers, which were deployed by Apex personnel on August 22 and retrieved on August 24, 2016. To maintain a safe working environment, deployment of the surface water samplers was conducted from a barge operated by Ballard Construction.

Sampling locations are shown on Figure 13. The surface water samples were collected from four locations: two samples (SURF-2 and -3) were collected from the area where the highest VOC concentrations have been detected in sediment, one sample (SURF-4) in an upstream location where historical VOC concentrations in sediment have been low to non-detect, and one downstream sample (SURF-1) where historical VOC concentrations in sediment have been low to non-detect.

Sample Collection Method. At the request of Ecology, surface water samples were collected by using PDBs placed at the surface water-sediment interface. The sampling methodology is described below:

- The PDB sampler was a minimum of 24 inches long and 1.5 inches in diameter, providing a capacity of 220 milliliter (mL) of water, which is adequate to fill five (5) 40-mL VOA containers. The PDB was prefilled with ASTM Type II certified, laboratory-grade, analyte-free, deionized water.
- The PDB was attached with zip ties to a horizontal platform comprised of an approximately 1-foot-by-2-foot expanded-steel sheet and angle iron. The holes in the expanded metal allowed water to pass through as it was lowered into the river to the river bottom. A section of angle iron was attached to each corner, providing a point of attachment for rope to lower and raise the sheet and PDB through the water. Also, steel rebar was zip-tied to each sheet for additional weight. The use of an expanded-metal sheet allowed the passive membrane to lie at the sediment interface while not sinking into the sediment, and allowed for easy deployment and retrieval without the use of a diver. Photographs of the PDB sampling set-up and staging platform are contained in Appendix A.
- A line was attached to the expanded-metal sheet and attached to a buoy, to allow for retrieval. Upon retrieving the PDB, it was removed from the expanded-metal sheet for sample processing.
- The PDB samplers were deployed on August 22, 2016 and retrieved on August 24, 2016, with a deployment duration of approximately 50 hours for each sampler. The deployment and retrieval times were recorded in field notes, which are contained in Appendix B.

Sample Handling and Analysis. Upon retrieval, a simple cut was made at the top of the PDB sampler in order to pour the sample water directly into 40-mL VOA glass vials, which were then placed on ice in a cooler for transport to the laboratory. As the samples were analyzed for volatile constituents, care was taken to close each VOA vial to minimize the opportunity for headspace. The surface water samples were submitted to Pace Analytical Services, Inc., a Washington-accredited laboratory, for analysis of VOCs by EPA Method 8260B. Copies of the laboratory reporting sheets are contained in Appendix C and includes a Quality Assurance/Quality Control (QA/QC) evaluation of the data. The samples were analyzed within the 14-day recommended hold time for VOC analysis.

3.2 Sediment Sampling

In accordance with the approved Interim Action Work Plan, sediment samples were collected in the Columbia River adjacent to the Facility prior to initiating the 2016 bioremediation injections at the Property to document

baseline sediment concentrations. Sediment sampling was conducted from August 22, to August 24, 2016. Key elements of the sampling were documented in field notes, which are contained in Appendix B. Sediment samples were collected from locations SED-1 through SED-11 (Figure 13). As shown on Figure 13, sample locations SED-5, SD-7, and SED-10 were co-located with historical sediment samples collected downgradient of the upland source areas to assess the effects of the 2011 groundwater interim action on sediment concentrations.

Sampling Collection Method. Sediment cores were collected using a barge operated by Ballard Construction and equipped with a Vibracore sediment coring instrument. After collection, the sediment cores were sealed and stored upright on the barge until they could be processed on shore. The sediment cores were logged for lithology and screened for VOCs using a photoionization detector (PID).

Up to three samples per location were collected from each core for laboratory analysis. The top 6 inches of the core was collected as the surface sample. Additional samples were collected on 2-foot intervals (i.e., 0.5 to 2.5 feet, 2.5 to 4.5 feet, etc.). Due to sampler refusal, the maximum depth sampled was 4.75 feet below the mudline. Duplicate samples were collected at locations SED-6 and SED-11.

Control of Station and Sample Locations. Sample locations were consistent with the locations proposed in the *Revised 2015 Interim Action Work Plan* (Apex, 2016a) and were identified in the field using proposed coordinates, mud-line elevation, and the presence or absence of rip-rap. A positioning procedure was utilized to ensure that the proposed sampling stations were achieved and to accurately determine the horizontal and vertical positions of the sampling stations. This determination was achieved by referencing each sampling location to state plane coordinates using known survey control points, onshore landmarks, and a differential global positioning system (GPS). The following parameters were documented at each sampling location (Appendix B):

- Time and date;
- Horizontal location in local grid coordinates, referenced to North American Datum of 1983 (NAD83); and
- River level and mudline elevations referenced to NAVD88.

These parameters were measured from the sampling barge using a combination of differential GPS, single beam echo sounder data, and weighted tape measures.

Sample Handling and Analysis. Because the samples were analyzed for VOCs, samples were not composited. As required in the *Sediment Cleanup User's Manual II* (SCUM II; Ecology, 2015), sediment samples collected for VOC analyses were collected in laboratory-approved borosilicate glass containers (50 gram sample minimum) with a T-polytetrafluorethylene (PTFE, Teflon®)-lined septa, with no headspace. Each container was appropriately labeled and transferred into coolers, where ice cooled the samples for

transport to a Washington-accredited laboratory for analysis. The sediment samples were analyzed for VOCs by EPA Method 8260B and for total organic carbon (TOC) by EPA Method 9060A. Copies of the laboratory reports are contained in Appendix C, along with a QA/QC review of the data.

3.3 Bioremediation Injections into Shallow Groundwater

Figure 14 illustrates the locations of the bioremediation injections. The 2016 interim remedial action was performed in general accordance with the approved *Revised 2015 Interim Action Work Plan* (Apex, 2016a). However, there were a few deviations as follows:

- 1) The *Revised 2015 Interim Action Work Plan* identified a dilution rate between 5:1 to 10:1 of oil water to substrate to facilitate the injection of the substrate. However, the geologic formation of the Shallow Zone in the off-Property NW Area is siltier than beneath the Property and the viscosity of a 5:1 to 10:1 dilution was too high to allow efficient injection. Therefore, the water to substrate dilution in the NW Area was 15:1.
- 2) Locations of many of the injection borings along the riverbank of the Property encountered rip-rap or infrastructure and needed to be shifted from the proposed locations to accommodate these features. However, overall coverage was achieved and the program was successfully completed.
- 3) The *Revised 2015 Interim Action Work Plan* specified that only two riverbank injections would be installed each day for the first three days and the river would be observed for indications of discharge of oil substrate. This was proposed as a precaution due to the small possibility that oil substrate could migrate from the riverbank injections to discharge into the river. This approach was attempted; however, refusal was encountered at multiple riverbank locations and many needed to be shifted north as identified in deviation 2, above. Ultimately, three riverbank borings were completed with 24 hours of observation to ensure that discharge to the river did not occur.
- 4) Approximately 10 percent more oil substrate was ordered than the estimated required quantity to ensure sufficient supply to complete the program. The program was completed without needing to access the surplus, so seven additional injection locations were completed in the former source area near wells MP-1 and EX, as shown on Figure 14.

The off-Property NW Area injections were completed between July 27, and August 1, 2016 and included the injection of 52,000 gallons of bioremediation oil substrate diluted with water into the Shallow Zone groundwater through 30 boreholes. The initial intent of the injection locations was to place MW-14 and MW-26 along the centerline of three lines of injections; however, due to infrastructure constraints identified during the preparation of the Interim Action Work Plan, the lines were shifted slightly to the northwest. The injections in the NW Area proceeded consistent with the work plan. Injections at the NuStar terminal were completed between August 29 and September 16, 2016. Approximately 100,000 gallons of bioremediation oil substrate (diluted with water) were injected into 72 borings along the southern portion of the NuStar facility at the locations shown on Figure 14.

Selected Injection Substrate. An emulsified oil substrate (EOSPro®), manufactured by EOS Remediation, Inc., of Raleigh, North Carolina and supplemented with a vitamin B-12 additive, was utilized for the 2016 interim action. The EOSPro® electron donor consists of a blend of fast- and slow-release electron donors in a micro-emulsion form with uniform droplets that are smaller than soil pore spaces. EOSPro® is a non-toxic emulsified soybean oil product that includes biodegradable substrate (e.g., sodium lactate) and slowly degradable substrates (e.g., edible oil). The sodium lactate in the solution stimulates microbial growth and rapidly produces anaerobic conditions in the subsurface. After the lactate has been consumed, the less-soluble vegetable oil portion of the product is retained on the soil surfaces and pore spaces. The vegetable oil slowly ferments to release volatile fatty acids and molecular hydrogen, which support the anaerobic microbial community. The EOSPro® injection substrate does not float on the water table and the small oil droplets are not prone to agglomeration (flocculation). This facilitates spreading the emulsion during injection to the designed distance in the subsurface while adsorbing substrate to soil surfaces along the way.

The EOSPro® vendor estimated a three year timeline for their product. This timeline is consistent with the effective duration of the previous interim action injections at the Facility. The presence of nitrate in the injection area was taken into consideration when estimating injection volumes and product timeline as nitrate competes with chlorinated VOCs for the electrons needed for the degradation process. Nitrate, however, can be beneficial in this system as it provides nutrients for the microbes that anaerobically breakdown the PCE and TCE.

Preparatory Activities. Prior to the bio-injections, a public and private utility locating service was contacted to identify subsurface infrastructure or utilities in the proposed injection areas and boring locations were shifted as needed to avoid identified infrastructure. As an additional safety precaution, each borehole was cleared to 5 feet bgs using air knife, hand auger, or other minimally invasive excavation technology.

Injection Strategy. To distribute the injection substrate evenly throughout the proposed treatment area, where possible, the injections were spaced 25 feet apart with alternate rows offset by half of the spacing. As noted above, some injection point locations near the riverbank at the Property needed to be shifted slightly away from proposed locations due to infrastructure or rip-rap. The corresponding layout resulted in a total of 102 injection points, as shown on Figure 14. Of the 102 injection points, 30 were located off-Property to the northwest of the NuStar Terminal and 72 were located along the southern portion of the NuStar terminal Property.

Substrate was injected in the saturated zone over the depth range corresponding to Shallow Zone groundwater. Prior to substrate injection at the NW Area, soil borings (SB-North and SB-South) were advanced at the northern and southern extents of the injection area to a depth of approximately 50 feet bgs to confirm the depth to groundwater and lithology at the desired injection depth intervals. Boring logs for these two borings are presented in Appendix B.

Water level measurements from groundwater monitoring in the first semester of 2016 was used to identify the anticipated depth to groundwater within the injection area at the NuStar Terminal; these data are summarized in Table 1. The upper limit corresponded to the top of the water table as determined by the depth to groundwater in monitoring wells within the injection area (generally on the order of 25 feet bgs). The lower limit was determined by the observed depth to the silty gravel layer separating the Shallow and Intermediate Zones on the Property. Accordingly, boring depths varied from 40 to 57 feet bgs with most injections terminating at a depth of 45 feet bgs.

The substrate material was first injected at locations IB-1, IB-8, and IB-12, as shown on Figure 14. The field crew waited approximately 24 hours prior to initiating other riverbank injections and monitored the river for the presence of substrate material in the river. As noted above, the oil-substrate will not float on water, but when mixed with water, it will make the water milky in appearance. No substrate was observed in the river, and the riverbank injections proceeded as proposed in the approved *Revised 2015 Interim Action Work Plan* (Apex, 2016a). The river water was visually monitored throughout the injection process and no evidence of substrate was observed.

Delivery Method. The injection points were completed using direct-push technology. A five-foot injection screen was advanced to the pre-designated depth at each injection location, withdrawn in five-foot intervals, and emulsified oil was injected through the drill stem via an air diaphragm pump. This process was repeated until the substrate was injected to the top of the saturated zone.

Solution Preparation/Injection Volume. Approximately 165,000 pounds (50 totes) of EOSPro® emulsified oil concentrate was injected as part of the expanded interim action. The substrate material of emulsified oil concentrate was diluted with water obtained from the municipal water supply and dechlorinated using sodium thiosulfate. Injections locations in the off-Property NW Area were diluted at a ratio of 15:1 (water: EOSPro®) and locations at the Property were diluted at a ratio ranging from 6:1 to 10:1 (water: EOSPro®). A lower dilution rate was utilized for injections in portions of the interim action area where concentrations of VOCs in groundwater are understood to be the most elevated (*e.g.*, near MW-19 and MW-13). Two 1,000-gallon polyethylene tanks were used to allow simultaneous mixing and injection. Dilution of the solution was conducted by combining the EOSPro® concentrate with water and stirring with a recirculation pump. Injection rates were evaluated based on site conditions at the time of drilling, and adjusted accordingly.

Abandonment. The injected oil-substrate (EOSPro®) was allowed to distribute into the groundwater for at least 24 hours prior to abandonment of each borehole. The injection borings were then abandoned in accordance with Washington Well Construction and Licensing System (WCLS) regulations and procedures. The abandonment procedure consisted of filling the borehole with granular bentonite to approximately 3 feet bgs. The top few feet of the borehole was then backfilled with concrete. The surface was patched with similar material to the adjacent surroundings (*e.g.*, concrete, asphalt, gravel, etc.) to meet grade.

4.0 Interim Action Results – August 2016 through March 2017

As described in Section 2, Site data support that historical migration of upland groundwater containing source-level concentrations of VOCs have led to the presence of VOCs in Columbia River sediment adjacent to the Property. Based on this sediment conceptual model, the Draft FS (Parametrix and Apex, 2015) proposed cleanup of shallow groundwater as it is anticipated that once the groundwater source of VOCs is removed, natural flushing of the sediments will attenuate the remaining VOCs in sediments. As detailed above, the 2016 bioremediation injections were completed as an interim action to continue the groundwater remedial progress at the Property. Baseline sediment and surface water sampling was conducted to document VOC concentrations in sediment and surface water directly prior to the 2016 interim action and provide a benchmark against which future sediment and surface water monitoring results could be evaluated to assess progress towards Site remedial goals.

This section presents and evaluates the results from the baseline sediment and surface water sampling, and groundwater monitoring results from events conducted three and six months following completion of the bioremediation injections.

4.1 Sediment Results

Sediment sampling results are shown on Figure 15 and tabulated in Table 2. As shown on Figure 15, a total of 28 sediment samples were collected from 11 locations, at depths ranging from the sediment surface to 4.75 feet below the mudline.

While the primary purpose of the 2016 sediment and surface water sampling was to provide a benchmark for comparison with future monitoring results for these media, the 2016 sediment results can also be compared to sediment data collected in 2011 and 2012 to refine the understanding of the effects of groundwater remediation on sediment restoration. Figure 10 shows VOC concentrations detected in sediment samples collected in 2011 and 2012. As can be seen by comparison of Figures 10 and 15, the lateral extent of detected VOCs in sediments is consistent with the previous investigations. However, comparison of concentrations depicted on the figures indicates that the magnitude of the detections in 2016 is significantly less.

To better assess potential concentration trends, several samples locations in the 2016 sediment sampling were co-located to the extent feasible with samples collected in 2011 or 2012. These locations were SED-5 which was co-located with SS-2; SED-7 which was co-located with locations C and SS-3; and SED-10 which was co-located with SS-6. Table 3 summarizes the 2011, 2012, and 2016 results for the four COPCs for these locations: PCE, TCE, cis-1,2-DCE, and vinyl chloride. As can be seen from Table 3, except for the subsurface sample collected from location SED-7, PCE and TCE concentrations are typically one to two

orders of magnitude less in the 2016 samples than in the 2011 or 2012 samples. For example, PCE in the surface sediment sample at SS-2 was 5,400 micrograms per kilogram ($\mu\text{g}/\text{kg}$) in 2011 and was 196 $\mu\text{g}/\text{kg}$ at co-located sample SED-5 in 2016; TCE in surface sediment sample SS-2 was 560 $\mu\text{g}/\text{kg}$ in 2011 and dropped to 60.9 $\mu\text{g}/\text{kg}$ in 2016. PCE dropped from 11,000 $\mu\text{g}/\text{kg}$ at surface sediment sample location C in 2012 to 47.5 $\mu\text{g}/\text{kg}$ at location SED-7 in 2016. Only PCE in the 0.5 to 1.5 foot depth sample from SED-7 was higher than its co-located sample collected in 2012, the 1 to 2 foot sample from location C; however, the 2016 PCE concentration was half the 2011 concentration at this location/depth (Table 3).

While the decreases in cis-1,2-DCE and vinyl chloride were not as dramatic, this is largely because the cis-1,2-DCE and vinyl chloride concentrations in sediments are generally much lower than the PCE and TCE concentrations. Where these compounds were detected, decreases of cis-1,2-DCE and vinyl chloride were observed at all depths and locations, with the exception of a slight detection of vinyl chloride of 9.7 $\mu\text{g}/\text{kg}$ in the surface sample at 2016 location SED-5 (Table 3). The co-located 2011 sediment sample was non-detect for vinyl chloride with a method reporting limit of 7 $\mu\text{g}/\text{kg}$.

Comparison of the data to proposed cleanup levels also identifies promising progress. Observed 2016 concentrations in the co-located sediment sampling points are all below the proposed sediment cleanup levels, whereas one or more of the COPCs exceeded the proposed cleanup levels at all but one location/depth in the 2011 and 2012 sampling events.

Sediment sampling conducted in 2016 was completed prior to the initiation of the 2016 interim groundwater action; therefore, the co-located sediment sample results are an evaluation of the effectiveness of the 2011 interim groundwater action on sediment restoration. Both the concentration trends and the fact that the concentrations started above proposed cleanup levels at most locations and ended below cleanup levels at all the co-located sampling locations, provides a strong indicator that the 2011 groundwater interim action has had a measurable effect at reducing sediment concentrations. Furthermore, the results lend confidence to the sediment conceptual model whereby sediments were historically impacted by source-level concentrations of VOCs in groundwater and provide a strong indication that cleanup of the shallow groundwater will result in VOC concentrations in sediments that are below cleanup levels.

4.2 Surface Water Results

Surface water sampling results are shown on Figure 16 and tabulated in Table 4. Surface water samples were collected from four locations: two in the river area where upland groundwater historically exhibiting the highest VOC concentrations discharges (Surf-2 and Surf-3); one upstream from this area (Surf-4); and one downstream from this area (Surf-1). Surface water samples at three of the four locations did not contain VOCs above method reporting limits and the fourth, Surf-3, located in the area where the highest groundwater concentrations discharge, contained PCE and TCE at concentrations slightly above method reporting limits at 1.1 and 0.65 $\mu\text{g}/\text{L}$, respectively.

4.3 Groundwater Monitoring Results

Quarterly monitoring is conducted to evaluate the progress of the interim actions at the Property and results are submitted in semi-annual reports in February and August of each year. In accordance with the *Revised 2015 Interim Action Work Plan* (Apex, 2016a), quarterly monitoring conducted three months (December 2016) and six months (March 2017) following the completion of the bioremediation injections were used to assess the preliminary progress of the 2016 interim action. Table 5 identifies the scope of the monitoring performed in December 2016 and March 2017. Complete copies of the laboratory reports for the December 2016 monitoring event were included in the *Second Semi-Annual 2016 Groundwater Monitoring Report* (Apex, 2017) submitted to Ecology on February 13, 2017. Laboratory reports for the March 2017 groundwater monitoring event will be submitted with the *First Semi-Annual 2017 Groundwater Monitoring Report*; however, copies of the laboratory reports have been included in Appendix C of this report for reference.

Results from the December 2016 and March 2017 sampling events are tabulated in Table 6, and include the results from quarterly monitoring performed in June and September 2016 for additional reference. Figures 17 and 18 map the detected VOCs in Shallow Zone and Intermediate Zone groundwater for the December 2016 and March 2017 events, respectively. The following presents an evaluation of the initial groundwater sampling results following the 2016 bioremediation injections. It must be emphasized that the anticipated remediation timeframe for the oil-substrate injected into the Shallow Groundwater zone is approximately three years; therefore, the results collected three and six months following the injections provide only a preliminary indicator of the remedial progress.

Evaluation of Post-Injection Results. Figures 19 to 22 show the September 2016, December 2016, and March 2017 Shallow Groundwater Zone results for PCE, TCE, cis-1,2-DCE, and vinyl chloride, respectively. The September 2016 data was collected directly following the completion of the bioremediation injections and provide baseline VOC concentrations for comparison (i.e., insufficient time had passed between the completion of the injections and the performance of the September 2016 monitoring for significant groundwater treatment to have occurred). As can be seen on Figures 19 and 20, PCE and TCE concentrations in wells MW-12, MW-13, MW-19, MGMS1-40, EX, and MP-1, located within the 2016 treatment area at the Main Terminal, show steady and significant decreases. As shown on Figures 21 and 22, cis-1,2-DCE and vinyl chloride concentrations generally increased or stayed approximately the same in these wells, supporting that dechlorination of PCE and TCE is occurring and has led to an anticipated short-term increase in the daughter product concentrations in the wells within the treatment zone.

Of interest and note is that PCE, TCE, DCE and vinyl chloride concentrations in shallow well MW-16 followed the same trends as the wells within the treatment area. Well MW-16 is a Shallow Zone well located in an isolated area of slightly higher VOC concentrations north and outside of the historical source area. Concentrations in this well have tended to be variable and trends are decreasing but at a slower rate than other wells at the Property. The area around well MW-16 was not included in the 2016 interim action; however, PCE and TCE in well MW-16 showed a distinct decrease from September 2016 to March 2017 and

cis-1,2-DCE showed a slight increase. This well will be closely monitored to further assess this preliminary but apparent favorable response to the 2016 bioremediation injections.

Evaluation of Areal Extent of COPCs in Shallow Zone Groundwater. Figures 23 to 26 present isoconcentration maps for PCE, TCE, cis-1,2-DCE, and vinyl chloride, respectively, from the March 2017 groundwater monitoring event conducted approximately six months after the completion of the 2016 bioremediation injections. As shown on the figures, the preliminary response to the bioremediation injections indicate significant progress. PCE and TCE concentrations above 200 µg/L are limited to one well at the Main terminal, well MW-19, and one well in the NW Area, well MW-26 (see Figures 23 and 24). As can be seen from Figure 25, the areal extent of cis-1,2-DCE concentrations above 200 µg/L is larger than that for PCE and TCE, as would be anticipated at this stage of the bioremediation process as the PCE and TCE are being broken down into DCE.

Vinyl chloride is the breakdown product of cis-1,2-DCE. While the extent of vinyl chloride that is above 200 µg/L is slightly larger than that for PCE or TCE, it is smaller than the extent of cis-1,2-DCE, and the magnitude of the vinyl chloride concentrations is less (see Figure 26). These results are promising and demonstrate that the vinyl chloride is rapidly breaking down to ethene, the non-toxic end product of PCE and TCE.

On each of the figures, the blue isoconcentration line represents the drinking water standard for the compound represented. As can be seen, COPC concentrations in shallow groundwater are at or below drinking water standards beneath a majority of the Property. Vinyl chloride concentrations above drinking water standards are limited to a small area south of the former source area (Figure 26).

Evaluation of Areal Extent of COPCs in Intermediate Zone Groundwater. Figures 27 to 30 illustrate isoconcentrations for upper Intermediate Zone Groundwater for PCE, TCE, cis-1,2-DCE, and vinyl chloride, respectively, for the March 2017 data. As shown on Figure 27, no wells in the upper Intermediate Zone have PCE concentrations above 200 µg/L and only two of the Intermediate Zone wells have concentrations just slightly above 20 µg/L. No TCE or cis-1,2-DCE concentrations exceeded 20 µg/L and, with the exception of 0.75 µg/L in groundwater from well MGMS2-60, vinyl chloride concentrations were below method reporting limits in upper Intermediate Zone groundwater (see Figures 28, 29, and 30).

On each of the Intermediate Zone isoconcentration maps, the blue contour line represents the drinking water standard. As can be seen from Figures 27 to 30, COPC concentrations above drinking water standards in the upper Intermediate Zone groundwater are limited to a small area at the southern property line and a second isolated area at the northern property boundary.

Comparison of COPC Extent in Shallow Zone from 2008 to 2017. Figures 31 to 33 show isoconcentration maps from first quarter 2008 and first quarter 2017 side-by-side for PCE, TCE, and cis-1,2-DCE, respectively.

Data collected in first quarter 2008 was prior to the initial 2008 bioremediation interim action and can be used to illustrate the progress to date of the interim actions conducted at the Property. As shown on Figure 31, PCE concentrations in Shallow Groundwater beneath the majority of the Property exceeded 200 µg/L in 2008 and concentrations up to 26,300 µg/L were observed in the former source area around well MW-7. Concentrations at well MW-7 are now near or below method reporting limits and only one on-Property well contains PCE above 200 µg/L.

TCE concentrations above 1,000 µg/L were formerly observed across a large area in the off-Property NW Area and near the former on-Property source area; no Shallow Groundwater Zone wells contained TCE concentrations above 1,000 µg/L in the March 2017 event and only one shallow on-Property and one shallow well in the NW Area contain concentrations above 200 µg/L (see Figure 32). While higher concentrations of cis-1,2-DCE are still observed in a few wells in the southern Property area (MW-12, MGMS1, MW-19, MGMS3), the magnitude of the concentrations in these wells is approximately half those observed in 2008 and the aerial extent of cis-1,2-DCE above drinking water standards has diminished by more than half (Figure 33).

5.0 Summary and Conclusions

The 2016 interim action was conducted from July to September 2016 and included baseline sediment and surface water sampling, and injections of a food grade oil-substrate into the shallow groundwater zone to support *in situ* bioremediation. The interim action implementation was performed in general accordance with the approved *Revised 2015 Interim Action Work Plan* (Apex, 2016a), with a few deviations. The deviations consisted of: 1) moving several of the bioremediation injection locations from locations proposed in the *Revised 2015 Interim Action Work Plan* (Apex, 2016a) due to the presence of rip-rap or facility infrastructure; 2) completing three instead of six riverfront injection points and waiting 24 hours to observe for the potential migration of the oil substrate to the river prior to proceeding with the remainder of the riverfront injections; and 3) including additional injection locations in the former source area near wells MP-1 and EX. The deviations did not negatively affect the successful completion of the program. A near constant watch for potential migration of the substrate to the river was maintained throughout the injection program and no substrate was observed in the river.

Results from the sediment and surface water sampling indicated the following:

- The lateral extent of sediment containing VOCs is approximately the same as identified in the 2011 and 2012 sediment investigations; however, the magnitude of the concentrations is significantly less.
- Sediment samples collected in 2016 that were co-located with 2011 and/or 2012 locations showed one to two orders of magnitude decreases in COPC concentrations from 2011 to 2016.
- COPC concentrations in the co-located sediment sampling points are now below the proposed sediment cleanup levels.

-
- VOC concentrations in surface water samples collected via passive diffusion bags were below method reporting limits at three of four locations. PCE and TCE were detected slightly above method reporting limits in the sample collected in the river area where groundwater from the source area at the Property discharges.

The sediment sampling conducted in 2016 was completed prior to the initiation of the 2016 interim groundwater action at the Property. Therefore, the sediment sample results are an evaluation of the effectiveness of the 2008 and 2011 interim groundwater actions on sediment restoration. The 2008 and 2011 did not target groundwater near the river; rather, these interim actions were targeted to reduce VOC concentrations in the former source area at the Property. Groundwater monitoring has demonstrated up to 99 percent mass reduction in wells within these treatment areas (Apex, 2016b). Even though the 2008 and 2011 interim actions did not target groundwater adjacent to the river, the significant mass removal in upland groundwater appears to have had a measurable effect at reducing sediment concentrations. These results support the sediment conceptual model presented in the 2013 RI and indicate that cleanup of the VOCs in shallow groundwater will result in cleanup of VOC in sediments.

The 2016 groundwater interim action included 72 bioremediation injections at the Property and 30 bioremediation injections at the off-site NW Area. The injections at the Property were focused in the southern portion along the riverbank, but several locations were also installed in the former source area near wells MP and EX using remaining oil substrate. The off-property injections were focused on an apparent separate source area located northwest of the Property referred to as the NW Area, which has not been as amenable to natural attenuation.

Two quarters of monitoring have been conducted since the 2016 interim action implementation. The initial results are very favorable and indicate the following:

- PCE and TCE concentrations in wells located within the 2016 treatment area at the Main Terminal, show steady and significant decreases between September 2016 and March 2017. Cis-1,2-DCE and vinyl chloride concentrations generally increased or stayed approximately the same in these wells, supporting that dechlorination of PCE and TCE is occurring and has led to an anticipated short-term increase in the daughter product concentrations in the wells within the treatment zone.
- The aerial extent of the COPCs in Shallow Groundwater is continuously decreasing and the majority of groundwater beneath the Property is now below drinking water standards and only one well contains PCE above 200 µg/L. In 2008, most of the Shallow Groundwater beneath the Property contained COPC concentrations above 200 µg/L and concentrations of PCE in the source area were measured at concentrations up to 26,300 µg/L.
- There are just two localized areas in the Intermediate Zone with concentrations above drinking water standards.

While it is recognized that groundwater concentrations in wells along the river will ultimately need to meet surface water criteria, which for PCE and vinyl chloride is near or below the practical quantification limits of the laboratory methods for VOC analysis, the results for the December 2016 and March 2017 show promising remedial gains in a relatively short period. The results support that enhanced bioremediation via injection of oil-substrate into the higher concentration areas of VOCs in shallow groundwater will be a viable and effective method for achieving Site goals.

6.0 References

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Table 1
 Groundwater Elevation Data — Shallow Zone: 2016 and 2017
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
<i>Groundwater Monitoring Wells</i>			
MW-1 (32.60)	06/15/16	26.76	5.84
	09/26/16	28.92	3.68
	12/12/16	24.68	7.92
	03/27/17	14.17	18.43
MW-2 (34.04)	06/15/16	28.34	5.70
	09/26/16	30.52	3.52
	12/12/16	26.34	7.70
	03/27/17	16.04	18.00
MW-3 (34.41)	06/15/16	27.20	7.21
	09/26/16	30.22	4.19
	12/12/16	26.48	7.93
	03/27/17	16.77	17.64
MW-5 (33.86)	06/15/16	26.47	7.39
	09/26/16	29.50	4.36
	12/12/16	25.99	7.87
	03/27/17	16.94	16.92
MW-6 (32.83)	06/15/16	25.84	6.99
	09/26/16	28.50	4.33
	12/12/16	24.65	8.18
	03/27/17	15.10	17.73
MW-7 (33.74)	06/15/16	26.24	7.50
	09/26/16	29.20	4.54
	12/12/16	26.04	7.70
	03/27/17	16.93	16.81
MW-8 (33.97)	06/15/16	25.91	8.06
	09/26/16	28.54	5.43
	12/12/16	26.00	7.97
	03/27/17	17.60	16.37
MW-9 (33.86)	06/15/16	26.29	7.57
	09/26/16	29.27	4.59
	12/12/16	26.21	7.65
	03/27/17	17.25	16.61
MW-10 (34.83)	06/15/16	26.25	8.58
	09/26/16	29.01	5.82
	12/12/16	26.75	8.08
	03/27/17	19.44	15.39
MW-12 (31.43)	06/15/16	25.60	5.83
	09/26/16	27.34	4.09
	12/12/16	23.44	7.99
	03/27/17	13.05	18.38

Please refer to notes at end of table.

Table 1
 Groundwater Elevation Data — Shallow Zone: 2016 and 2017
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-13 (33.15)	06/15/16	26.32	6.83
	09/26/16	28.74	4.41
	12/12/16	25.38	7.77
	03/27/17	14.99	18.16
MW-14 (33.81)	06/15/16	Not gauged; monument damaged.	
	09/26/16	29.27	4.54
	12/12/16	26.15	7.66
	03/27/17	17.14	16.67
MW-15 (39.13)	06/15/16	31.42	7.71
	09/26/16	34.20	4.93
	12/12/16	31.75	7.38
	03/27/17	22.50	16.63
MW-16 (33.05)	06/28/16	Not gauged; monument under water.	
	09/26/16	29.60	3.45
	12/14/16	24.85	8.20
	03/27/17	14.95	18.10
MW-17 (32.65)	06/15/16	25.84	6.81
	09/26/16	28.35	4.30
	12/12/16	24.76	7.89
	03/27/17	14.72	17.93
MW-18i (33.40)	06/15/16	28.10	5.30
	09/26/16	30.34	3.06
	12/12/16	25.71	7.69
	03/27/17	14.98	18.42
MW-19 (33.59)	06/15/16	26.61	6.98
	09/26/16	29.18	4.41
	12/12/16	25.91	7.68
	03/27/17	15.98	17.61
MW-19i (33.62)	06/15/16	28.38	5.24
	09/26/16	30.65	2.97
	12/12/16	25.99	7.63
	03/27/17	15.20	18.42
MW-20i (33.14)	06/15/16	27.85	5.29
	09/26/16	30.13	3.01
	12/12/16	25.50	7.64
	03/27/17	14.77	18.37
MW21i-40 (34.10)	06/15/16	28.90	5.20
	09/26/16	31.11	2.99
	12/12/16	26.44	7.66
	03/27/17	15.75	18.35
MW-21i-105 (33.99)	06/15/16	28.64	5.35
	09/26/16	30.98	3.01
	12/12/16	26.31	7.68
	03/27/17	15.64	18.35

Please refer to notes at end of table.

Table 1
 Groundwater Elevation Data — Shallow Zone: 2016 and 2017
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-22i (34.39)	06/15/16	29.10	5.29
	09/26/16	31.28	3.11
	12/12/16	26.69	7.70
	03/27/17	16.01	18.38
MW-23i (33.80)	06/15/16	28.67	5.13
	09/26/16	30.95	2.85
	12/12/16	26.17	7.63
	03/27/17	15.35	18.45
MW-24i (33.47)	06/15/16	28.37	5.10
	09/26/16	30.68	2.79
	12/12/16	26.12	7.35
	03/27/17	14.98	18.49
MW-25i (33.58)	06/15/16	28.38	5.20
	09/26/16	30.72	2.86
	12/12/16	25.92	7.66
	03/27/17	15.22	18.36
MW-26 (33.73)	06/15/16	26.05	7.68
	09/26/16	29.15	4.58
	12/12/16	26.22	7.51
	03/27/17	17.76	15.97
MW-24d (33.91)	06/15/16	28.79	5.12
	09/26/16	30.58	3.33
	12/12/16	26.04	7.87
	03/27/17	15.53	18.38
EW-1 (31.40)	06/15/16	25.40	6.00
	09/26/16	27.54	3.86
	12/12/16	23.40	8.00
	03/27/17	12.64	18.76
<i>Secor Interim Action Pilot Study Wells</i>			
S-1 (33.24)	06/15/16	28.11	5.13
	09/26/16	30.39	2.85
	12/12/16	25.52	7.72
	03/27/17	14.81	18.43
S-2 (33.15)	06/15/16	27.97	5.18
	09/26/16	29.59	3.56
	12/12/16	25.44	7.71
	03/27/17	14.76	18.39
<i>Multi-Level Monitoring Wells</i>			
MGMS1-3 (43)* (32.86)	06/15/16	26.42	6.44
	09/26/16	28.73	4.13
	12/12/16	22.96	9.90
	03/27/17	15.04	17.82

Please refer to notes at end of table.

Table 1
 Groundwater Elevation Data — Shallow Zone: 2016 and 2017
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MGMS1-2(60)* (32.86)	06/15/16	27.80	5.06
	09/26/16	30.10	2.76
	12/12/16	23.23	9.63
	03/27/17	14.41	18.45
MGMS1-1(110)* (32.86)	06/15/16	27.81	5.05
	09/26/16	30.11	2.75
	12/12/16	23.12	9.74
	03/27/17	14.38	18.48
MGMS2-4(40)* (32.59)	06/15/16	25.54	7.05
	09/26/16	28.19	4.40
	12/12/16	24.36	8.23
	03/27/17	15.11	17.48
MGMS2-3(60)* (32.59)	06/15/16	27.51	5.08
	09/26/16	29.68	2.91
	12/12/16	24.91	7.68
	03/27/17	14.05	18.54
MGMS2-2(110)* (32.59)	06/15/16	27.42	5.17
	09/26/16	29.7	2.89
	12/12/16	24.71	7.88
	03/27/17	13.98	18.61
MGMS2-1(132)* (32.59)	06/15/16	27.4	5.19
	09/26/16	29.65	2.94
	12/12/16	24.91	7.68
	03/27/17	14.02	18.21
MGMS3-4(40)* (31.65)	06/15/16	26.24	5.41
	09/26/16	28.42	3.23
	12/12/16	24.06	7.59
	03/27/17	15.11	16.54
MGMS3-3(60)* (31.65)	06/15/16	26.68	4.97
	09/26/16	28.92	2.73
	12/12/16	23.93	7.72
	03/27/17	13.08	18.57
MGMS3-2(101)* (31.65)	06/15/16	26.75	4.90
	09/26/16	28.91	2.74
	12/12/16	24.05	7.60
	03/27/17	13.09	18.56
MGMS3-1(132)* (31.65)	06/15/16	26.74	4.91
	09/26/16	28.93	2.72
	12/12/16	24.11	7.54
	03/27/17	13.03	18.62

Please refer to notes at end of table.

Table 1
 Groundwater Elevation Data — Shallow Zone: 2016 and 2017
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
<i>Port of Vancouver Wells</i>			
MW-30i (29.77)	06/15/16	24.39	5.38
	09/26/16	26.74	3.03
	12/12/16	22.13	7.64
	03/27/17	11.42	18.35
MW-31i** (31.33)	06/15/16	Did not measure; under water	
	09/26/16	31.36	-0.03
	12/12/16	26.84	4.49
	03/27/17	16.15	15.18
MW-32s (34.34)	06/15/16	27.93	6.41
	09/26/16	30.35	3.99
	12/14/16	26.18	8.16
	03/27/17	23.45	10.89
MW-32i (34.41)	06/15/16	29.12	5.29
	09/26/16	31.28	3.13
	12/14/16	26.50	7.91
	03/27/17	16.08	18.33
MW-E ** (30.64)	06/15/16	25.74	4.90
	09/26/16	26.89	3.75
	12/12/16	Well not found; under asphalt.	
	03/27/17	14.39	16.25
MW-F (33.48)	06/15/16	28.67	4.81
	09/26/16	31.02	2.46
	12/12/16	26.43	7.05
	03/27/17	15.65	17.83
MW-G (31.50)	06/15/16	27.11	4.39
	09/26/16	29.37	2.13
	12/12/16	24.77	6.73
	03/27/17	13.92	17.58

Notes:

1. TOC = Top of casing; BTOC = Below top of casing.
2. Utilizes new survey information from June 2010. NGVD29 datum (ft MSL).
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 2
 2016 Baselines Sediment Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Location ID	Sample Interval (below mudline)*	Date	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Total Organic Carbon
			Concentrations in µg/kg										percent
SED-1 0.0'-0.5'	0.0-0.5	8/24/2016	<7	8.4	<7	35.2	<7	37.2	<7	<7	131	23.9	0.56%
SED-1 0.5'-2.5'	0.5-2.5	8/24/2016	<6.2	<6.2	<6.2	11.0	<6.2	25.9	<6.2	<6.2	54.9	<6.2	0.49%
SED-1 2.5'-4.2'	2.5-4.2	8/24/2016	<6.1	<6.1	<6.1	32.1	<6.1	<6.1	<6.1	<6.1	14.9	<6.1	0.36%
SED-2 0.0'-0.5'	0.0-0.5	8/22/2016	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	<7.5	2.23%
SED-2 0.5'-2.5'	0.5-2.5	8/22/2016	<7.6	<7.6	<7.6	<7.6	<7.6	<7.6	<7.6	<7.6	<7.6	<7.6	1.95%
SED-2 2.5'-4.25'	2.5-4.25	8/22/2016	<7.7	<7.7	<7.7	<7.7	<7.7	<7.7	<7.7	<7.7	<7.7	<7.7	1.96%
SED-3 0.0'-0.5'	0.0-0.5	8/22/2016	<6.5	<6.5	<6.5	<6.5	<6.5	25.1	<6.5	<6.5	10.4	<6.5	0.25%
SED-3 0.5'-2.5'	0.5-2.5	8/22/2016	<6.1	<6.1	<6.1	<6.1	<6.1	96.6	<6.1	<6.1	16.2	<6.1	0.85%
SED-3 2.5'-4.25'	2.5-4.25	8/22/2016	<6.4	<6.4	<6.4	9.2	<6.4	1,340	<6.4	<6.4	113	<6.4	0.29%
SED-4 0.0'-0.5'	0.0-0.5	8/22/2016	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	0.87%
SED-4 0.5'-2.5'	0.5-2.5	8/22/2016	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	1.03%
SED-4 2.5'-4.5'	2.5-4.5	8/22/2016	<6.7	<6.7	<6.7	58.8	<6.7	645	<6.7	<6.7	156	<6.7	1.27%
SED-4 4.5'-4.75'	4.5-4.75	8/22/2016	<7.6	<7.6	<7.6	38.8	<7.6	218	<7.6	<7.6	132	<7.6	0.50%
SED-5 0.0'-0.5'	0.0-0.5	8/22/2016	<9.2	<9.2	<9.2	89.2	<9.2	196	<9.2	<9.2	60.9	9.7	2.03%
SED-5 0.5'-2.5'	0.5-2.5	8/22/2016	<6.3	<6.3	<6.3	31.2	<6.3	114	<6.3	<6.3	26.3	<6.3	0.16%
SED-5 2.5'-3.85'	2.5-3.85	8/22/2016	<6.6	<6.6	<6.6	105	<6.6	214	<6.6	<6.6	241	<6.6	0.27%
SED-6 0.0'-0.5'	0.0-0.5	8/23/2016	<7.8	<7.8	<7.8	24.4	<7.8	5,020	<7.8	<7.8	77.9	<7.8	0.58%
SED-6 DUP 0.0'-0.5'	0.0-0.5	8/23/2016	<11.5	<11.5	<11.5	36.6	<11.5	5,490	<11.5	<11.5	80.4	<11.5	2.33%
SED-6 0.5'-1.5'	0.5-1.5	8/23/2016	<5.5	<5.5	<5.5	10.8	<5.5	2,400	<5.5	<5.5	47.1	<5.5	0.40%
SED-6 DUP 0.5'-1.5'	0.5-1.5	8/23/2016	<5.5	<5.5	<5.5	<5.5	<5.5	193	<5.5	<5.5	6.4	<5.5	0.64%
SED-7 0.0'-0.5'	0.0-0.5	8/23/2016	<7	<7	<7	<7	<7	47.8	<7	<7	<7	<7	0.21%
SED-7 0.5'-1.5'	0.5-1.5	8/23/2016	<61.4	<61.4	<61.4	<61.4	<61.4	564	<61.4	<61.4	<61.4	<61.4	0.31%
SED-8 0.0'-0.5'	0.0-0.5	8/23/2016	<7.5	<7.5	<7.5	<7.5	<7.5	4,100	<7.5	<7.5	137	21.8	1.47%
SED-8 0.5'-2.25'	0.5-2.25	8/23/2016	<59.4	<59.4	<59.4	87.8	<59.4	1,640	<59.4	<59.4	240	<59.4	0.39%
SED-9 0.0-0.5	0.0-0.5	8/23/2016	<7.1	<7.1	<7.1	66.6	<7.1	<7.1	<7.1	<7.1	<7.1	12.5	0.59%
SED-9 0.5-2.7	0.5-2.7	8/23/2016	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	0.10%

Please refer to notes at end of table.

Table 2
 2016 Baselines Sediment Analytical Results
 NuStar Vancouver Facility
 Vancouver, Washington

Location ID	Sample Interval (below mudline)*	Date	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Total Organic Carbon
			Concentrations in µg/kg										
Concentrations in µg/kg (reported as dry weight)													
SED-10 0.0'-0.5'	0.0-0.5	8/23/2016	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	0.11%
SED-10 0.5'-2.66'	0.5-2.66	8/23/2016	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	0.12%
SED-11 0.0'-0.5'	0.0-0.5	8/23/2016	<66.5	<66.5	<66.5	125	<66.5	852	<66.5	<66.5	133	<66.5	0.33%
SED-11 DUP 0.0'-0.5'	0.0-0.5	8/23/2016	<69.3	<69.3	<69.3	232	<69.3	1,780	<69.3	<69.3	231	<69.3	0.48%
SED-11 0.5'-2.5'	0.5-2.5	8/23/2016	<6.1	<6.1	<6.1	27.8	<6.1	190	<6.1	<6.1	31.2	<6.1	0.45%
SED-11 DUP 0.5'-2.5'	0.5-2.5	8/23/2016	<51	<51	<51	<51	<51	419	<51	<51	<51	<51	0.87%
"No Effects" Level - Minimum of Benchmarks (Proposed Cleanup Levels)			NA	NA	NA	200	NA	500	NA	NA	100	10	NA
"Minor Effects" Level - Maximum of benchmarks			200	15,000	30	1,000	3,900	1,000	NA	1,100	1,600	100	NA

Notes:

1. NA = Not applicable or not available.
2. µg/kg = Micrograms per kilogram.
3. VOCs = Volatile Organic Compounds
4. * = During July and November 2012 sampling events, the sample depth was logged as a discrete point.
 The tabulated sample interval includes the one foot of core surrounding the sample point and is determined by the required sample volume for analysis.

Table 3
 Comparison of 2011/2012 and 2016 Co-Located Sediment Sample Results for PCE, TCE, cis-1,2-DCE, and Vinyl Chloride
 NuStar Vancouver Facility
 Vancouver, Washington

Location ID	Sample Interval (feet below mudline)*	Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
			<i>Concentrations in µg/kg</i>			
SS-2	0 - 1	11/7/2011	5,400	560	290	<7
SED-5	0.0-0.5	8/22/2016	196	60.9	89.2	9.7
SS-2	1 - 3		1,100	120.0	90.0	<7
SED-5	0.5-2.5	8/22/2016	114	26.3	31.2	<6.3
SS-3	0 - 1	11/8/2011	9,200	1,900	2,800	<7
C	0.0 - 0.5	7/24/2012	11,000	529	110	<7
SED-7	0.0-0.5	8/23/2016	47.8	<7	<7	<7
SS-3	1 - 3	11/8/2011	1,100	78	40	46
C	1 - 2	7/24/2012	94.0	14	12	<7
SED-7	0.5-1.5	8/23/2016	564	<61.4	<61.4	<61.4
SS-6	0 - 1	11/8/2011	1,000	270	43.0	<7
SED-10	0.0-0.5	8/23/2016	<6.8	<6.8	<6.8	<6.8
SS-6	1 - 2.5	11/8/2012	<7	<7	<7	<7
SED-10	0.5-2.66	8/23/2016	<6	<6	<6	<6
Proposed Cleanup Levels			500	100	200	10

Notes:

1. NA = Not applicable or not available.
2. µg/kg = Micrograms per kilogram.
3. VOCs = Volatile Organic Compounds
4. * = During July and November 2012 sampling events, the sample depth was logged as a discrete point.
 The tabulated sample interval includes the one foot of core surrounding the sample point and is determined by the required sample volume for analysis.

Table 4
 Surface Water Analytical Results: 2016
 NuStar Vancouver Facility
 Vancouver, Washington

Sample Location	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloro-ethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
Surf 1	8/24/2016	<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
Surf 2	8/24/2016	<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
Surf 2 DUP	8/24/2016	<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
Surf 3	8/24/2016	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	0.65	<0.50
Surf 4	8/24/2016	<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

Notes:

1. µg/L (ppb) = Micrograms per liter (parts per billion).
2. Bold values represents detected concentration of listed analyte.
3. < = Not detected at or above the specified laboratory method reporting limit (MRL).

Table 5
 Groundwater Monitoring Plan
 NuStar Vancouver Facility
 Vancouver, Washington

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

Please refer to notes at end of table.

Table 5
 Groundwater Monitoring Plan
 NuStar Vancouver Facility
 Vancouver, Washington

Monitoring Program	Well ID	Groundwater Zone	Included Monitoring Wells	
			First Quarter	Second Quarter
Groundwater monitoring includes depth-to-water measurement.	MGMS3-3(60)	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	MGMS3-2(101)	Lower Intermediate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	MGMS3-1(132)	Lower Intermediate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	MW-E	Shallow	<input type="checkbox"/>	<input type="checkbox"/>
	MW-F	Shallow	<input type="checkbox"/>	<input type="checkbox"/>
	MW-G	Shallow	<input type="checkbox"/>	<input type="checkbox"/>
	EW-1	Shallow	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	EX	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	MP-1	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	MP-2	Shallow	<input type="checkbox"/>	<input type="checkbox"/>
	MP-3	Shallow	<input type="checkbox"/>	<input type="checkbox"/>
	MP-4	Shallow	<input type="checkbox"/>	<input type="checkbox"/>
	S-1	Intermediate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	S-2	Shallow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Notes:

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

Table 6
Groundwater Analytical Results: July 2016 to March 2017
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MW-1	6/15/2016	<0.50	<2.0	<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	<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	<0.50	<0.50	3.4	<0.50	<0.50	22.5	<0.50	<0.50	8.0	<0.50	<0.50	5.8	0.86
	3/30/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	4.6	<0.50	<0.50	1.6	<0.50
MW-2	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	<0.50	<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	<0.50	<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
MW-3	6/16/2016	<0.50	<2.0	<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	0.67	<0.50	8.2	0.73	<0.50	95.3	1.5	1.6	145	2.0	<0.50	40.1	<0.50
	12/16/2016	<0.50	<2.0	0.52	<0.50	1.1	<0.50	<0.50	26.8	0.90	0.57	86.2	1.2	<0.50	23.9	<0.50
	3/29/2017	<0.50	<2.0	<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
MW-5	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	<5.0	<20	<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
	12/14/2016	<0.50	<2.0	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	8.4	<0.50	<0.50	6.5	<0.50	<0.50	5.8	<0.50
MW-6	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	<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
	3/30/2017	<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
MW-7	6/17/2016	<0.50	<2.0	<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
	6/17/16 DUP	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	0.62	<0.50	<0.50	2.0	5.4
	9/29/2016	<0.50	<2.0	<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	<0.50	<0.50	1.1	<0.50	<0.50	10.9	<0.50	<0.50	<0.50	<0.50	<0.50	6.0	5.5
	12/14/2016	<0.50	<2.0	<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	<0.50	<0.50	<0.50	<0.50	<0.50	9.4	<0.50	<0.50	0.78	<0.50	<0.50	<0.50	1.0
	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	0.73	<0.50
	3/28/2017 DUP	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	0.69	<0.50

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results: July 2016 to March 2017
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MW-8	6/15/2016	<0.50	<2.0	<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	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	35.7	0.96	<0.50	2.3	<0.50	<0.50	0.57	<0.50
MW-9	6/17/2016	<0.50	<2.0	<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	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	<0.50	27.9	0.89	<0.50	12.5	<0.50
MW-10	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	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	1.5	<0.50
MW-12	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
	6/16/16 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	<10.0	<40	<10.0	<10.0	26 D	<10.0	<10.0	525 D	<10.0	<10.0	67.6 D	<10.0	<10.0	45.4 D	14.8
	9/27/2016 DUP	<2.5	<10.0	<2.5	<2.5	44.4 D	<2.5	11.5	867 D	11.4	<2.5	387 D	3.9	<2.5	163 D	22.6
	12/14/2016	<1.0	<4	<1.0	<1.0	<1.0	<1.0	<1.0	6.9 D	2.3	<1.0	<1.0	<1.0	<1.0	<1.0	20.5
	12/14/2016 DUP	<2.5	29.1	<2.5	<2.5	16.5	<2.5	4.7	744 D	<2.5	<2.5	62.3	<2.5	<2.5	42.2	21.2
	3/30/2017	<10.0	<40	<10.0	<10.0	<10.0	<10.0	<10.0	1,120	<10.0	<10.0	55.9	<10.0	<10.0	29.6	<37.8
3/30/2017 DUP	<2.5	<10.0	<2.5	<2.5	11.4	<2.5	3.8	853	6.1	<2.5	49.0	<2.5	<2.5	26.0	28.3	
MW-13	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	<25	<100	<25	<25	<2.5	<2.5	<25	148	<25	<25	4,840	<25	<25	895	<25
	9/28/16 DUP	<25	<100	<25	<25	<2.5	<2.5	<25	145	<25	<25	5,090	<25	<25	951	<25
	12/16/2016	<5.0	<20	<5.0	<5.0	<5.0	<5.0	<5.0	509	<5.0	<5.0	1,020	<5.0	<5.0	394	<5.0
	3/30/2017	<5.0	<20	<5.0	<5.0	<5.0	<5.0	<5.0	101	<5.0	<5.0	176	<5.0	<5.0	57.6	<5.0
MW-14	3/8/2016	<0.50	<2.0	<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	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	0.57	69.2	<0.50	<0.50	14.7	<0.50	<0.50	33.4	0.62

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results: July 2016 to March 2017
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MW-15	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	<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	<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	<0.50	<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
MW-16	12/7/2015	Not sampled; well monument under water.														
	9/28/2016	<0.50	<2.0	<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	<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	<0.50	<2.0	<0.50	<0.50	1.6	<0.50	<0.50	19.0	<0.50	<0.50	27.0	<0.50	<0.50	6.4	<0.50
MW-17	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	<0.50	<0.50	0.83	<0.50	<0.50	3.3	<0.50	<0.50	9.4	<0.50	<0.50	22.7	<0.50
	9/27/2016	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	4.2	<0.50	<0.50	10.4	<0.50
	3/29/2017	<0.50	<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
MW-18i	6/16/2016	<0.50	<2.0	<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	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	1.4	<0.50	<0.50	1.2	<0.50
MW-19	6/16/2016	<10.0	<40	<10.0	<10.0	<10.0	<10.0	22.2	507	<10.0	<10.0	3,250	29.2	<10.0	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	<5.0	<20	<5.0	<5.0	10.4	<5.0	11	235	<5.0	<5.0	1,520	14.5	<5.0	592	10.1
	12/12/2016	<5.0	<20	<5.0	<5.0	72.8	<5.0	11.2	1,030	10.7	<5.0	1,730	10.9	<5.0	812	28.2
	12/12/2016 DUP	<2.5	<10.0	<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	<5.0	<20	<5.0	<5.0	197	<5.0	25.5	1,930	19.7	<5.0	664	17	<5.0	826	58.5
3/28/2017 DUP	<5.0	<20	<5.0	<5.0	214	<5.0	26.7	1,990	21.5	<5.0	755	19.9	<5.0	896	63.2	
MW-19i	6/16/2016	<0.50	<2.0	<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	<0.50	<2.0	<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	<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	<0.50	<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

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results: July 2016 to March 2017
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MW-20i	6/16/2016	<0.50	<2.0	<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	<0.50	<0.50	<0.50	<0.50	<0.50	8.7	<0.50	<0.50	4.0	<0.50	<0.50	2.2	<0.50
	12/14/2016	<0.50	<2.0	<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
	3/30/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
MW-21i-105	6/16/2016	<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
	9/26/2016	<0.50	<2.0	<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	<0.50	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	4.8	<0.50	<0.50	5.7	<0.50	<0.50	2.9	<0.50
MW-21i-40	6/16/2016	<0.50	<2.0	<0.50	<0.50	2.3	<0.50	0.80	67.8	<0.50	<0.50	18.1	<0.50	<0.50	17.1	<0.50
	9/26/2016	<0.50	<2.0	<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	<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	<0.50	<2.0	<0.50	<0.50	2.6	<0.50	0.91	87.6	0.58	<0.50	21.8	<0.50	<0.50	16.2	<0.50
MW-22i	6/16/2016	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	1.0	<0.50	<0.50	7.9	<0.50
	9/28/2016	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	8.1	<0.50	<0.50	1.3	<0.50	<0.50	9.0	<0.50
	12/13/2016	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	8.6	<0.50	<0.50	2.0	<0.50	<0.50	10.2	<0.50
	3/29/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	10.0	<0.50	<0.50	1.1	<0.50	<0.50	9.7	<0.50
MW-23i	6/16/2016	<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
	9/27/2016	<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
	12/13/2016	<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
	3/27/2017	<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
MW-24i	6/17/2016	<0.50	<2.0	<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	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	0.70	<0.50	<0.50	1.0	<0.50	<0.50	<0.50	<0.50
MW-24d	6/17/2016	<0.50	<2.0	<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	<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	<0.50	<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

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results: July 2016 to March 2017
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MW-25i	6/15/2016	<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
	9/29/2016	<0.50	<2.0	<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	<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	<0.50	<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
MW-26	6/15/2016	<1.0	<4	<1.0	<1.0	4.6	<1.0	1.4	83.1	2.2	<1.0	192	2.2	<1.0	343	<1.0
	9/27/2016	<0.50	<2.0	<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	<0.50	<0.50	8.9	<0.50	2.4	85.9	2.0	<0.50	167	3.3	<0.50	410	<0.50
	3/29/2017	<5.0	<20	<5.0	<5.0	<5.0	<5.0	<5.0	170	<5.0	<5.0	214	<5.0	<5.0	452	<5.0
MW-32s	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	<0.50	<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	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
EW-1	9/21/2015	<0.50	<0.50	2.0	<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	<2.0	2.0	<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	<2.0	1.1	<0.50	<0.50	<0.50	<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	<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
S-1	6/16/2016	<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
	9/27/2016	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	0.73	<0.50	<0.50	3.0	<0.50
	12/13/2016	<0.50	<2.0	<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	<0.50	<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
S-2	6/16/2016	<0.50	<2.0	<0.50	<0.50	4.3	<0.50	<0.50	6.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/26/2016	<0.50	<2.0	<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	<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	<0.50	<2.0	<0.50	<0.50	2.6	<0.50	<0.50	4.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
MGMS1-3(43)	6/17/2016	<8.3	<33.3	<8.3	<8.3	163	<8.3	26.6	3,130	36.1	<8.3	64.6	<8.3	<8.3	248	288
	9/30/2016	<8.3	<33.3	<8.3	<8.3	81.9	<8.3	13.5	1,980	24.2	<8.3	230	<8.3	<8.3	366	52
	12/16/2016	<8.4	<33.4	<8.4	<8.4	92.6	<8.4	9.5	1,810	20.1	<8.4	64.1	<8.4	<8.4	171	239
	3/31/2017	<8.4	<33.4	<8.4	<8.4	90.8	<8.4	12.5	1,430	15.2	<8.4	45.8	<8.4	<8.4	119	348

Please refer to notes at end of table.

Table 6
 Groundwater Analytical Results: July 2016 to March 2017
 NuStar Vancouver Facility
 Vancouver, Washington

Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MGMS1-2(60)	6/17/2016	<0.50	<2.0	<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	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	15.6	<0.50	<0.50	13.6	<0.50	<0.50	13.2	<0.50
MGMS1-1(110)	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
MGMS1-132	3/31/2017	<0.50	<2.0	<0.50	<0.50	13.3	<0.50	1.1	328	<0.50	<0.50	20.1	<0.50	<0.50	62	6.5
MGMS2-4(40)	6/17/2016	<0.50	<2.0	<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	<5.0	<20	<5.0	<5.0	12.1	<5.0	<5.0	115	<5.0	<5.0	33.3	<5.0	<5.0	24.8	142
	12/16/2016	<0.50	<2.0	<0.50	<0.50	10.3	<0.50	<0.50	5.2	<0.50	<0.50	2.6	<0.50	<0.50	1.9	2.0
	3/31/2017	<0.50	<2.0	<0.50	<0.50	57.6	<0.50	14.3	236	0.60	<0.50	4.3	<0.50	<0.50	14.4	235
MGMS2-3(60)	6/17/2016	<0.50	<2.0	<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	<0.50	<0.50	2.0	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	18.5	<0.50	<0.50	26.0	<0.50	<0.50	11.2	0.75
MGMS2-2(110)	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	<0.50	<0.50	0.73	<0.50	<0.50	22.6	<0.50	<0.50	7.1	<0.50	<0.50	8.0	10
	9/29/2016	<0.50	<2.0	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	19.5	<0.50	<0.50	6.4	<0.50	<0.50	6.6	6.4
MGMS2-1(132)	9/25/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20.5	<0.50	<0.50	6.7	<0.50	<0.50	5.2	4.6
	3/9/2016	<0.50	<0.50	<0.50	<0.50	0.86	<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	<2.0	<0.50	<0.50	0.70	<0.50	<0.50	31.4	<0.50	<0.50	6.4	<0.50	<0.50	7.9	8.2
	3/31/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	15.6	<0.50	<0.50	5.2	<0.50	<0.50	4.7	4.8

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results: July 2016 to March 2017
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MGMS3-4(40)	6/17/2016	<1.2	<5.0	<1.2	<1.2	24.5	<1.2	6.0	955	9.1	<1.2	232	<1.2	<1.2	209	85.9
	9/30/2016	<0.50	<2.0	<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	<0.50	<0.50	4.5	<0.50	0.60	219	2.0	<0.50	1.5	<0.50	<0.50	1.4	52.1
	12/16/2016	<0.50	<2.0	<0.50	<0.50	1.0	<0.50	<0.50	1.3	0.97	<0.50	0.63	<0.50	<0.50	<0.50	0.88
	3/28/2017	<0.50	<2.0	<0.50	<0.50	22.5	0.68	2.8	979	5.5	<0.50	1.4	<0.50	<0.50	0.60	257
	3/28/2017 DUP	<2.5	<10.0	<2.5	<2.5	20.7	<2.5	3.3	1,050	6.0	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
MGMS3-3(60)	6/17/2016	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	17.4	<0.50	<0.50	5.8	<0.50	<0.50	5.0	<0.50
	9/30/2016	<0.50	<2.0	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50
MGMS3-2(101)	9/22/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	3.8	<0.50	<0.50	2.6	1.2
	3/9/2016	<0.50	<2.0	<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	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	4.4	<0.50	<0.50	3.0	<0.50
MGMS3-110	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	7.0	<0.50	<0.50	7.0	<0.50	<0.50	6.0	<0.50
MGMS3-1(132)	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	<0.50	<0.50	1.0	<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	<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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	7.9	<0.50	<0.50	13.8	<0.50	<0.50	9.6	<0.50
EX-1	6/17/2016	<5.0	<20	<5.0	<5.0	<5.0	<5.0	<5.0	1,040	<5.0	<5.0	592	<5.0	<5.0	90.8	<5.0
	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	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	5.2	<0.50	<0.50	6.1	<0.50	<0.50	1.9	<0.50

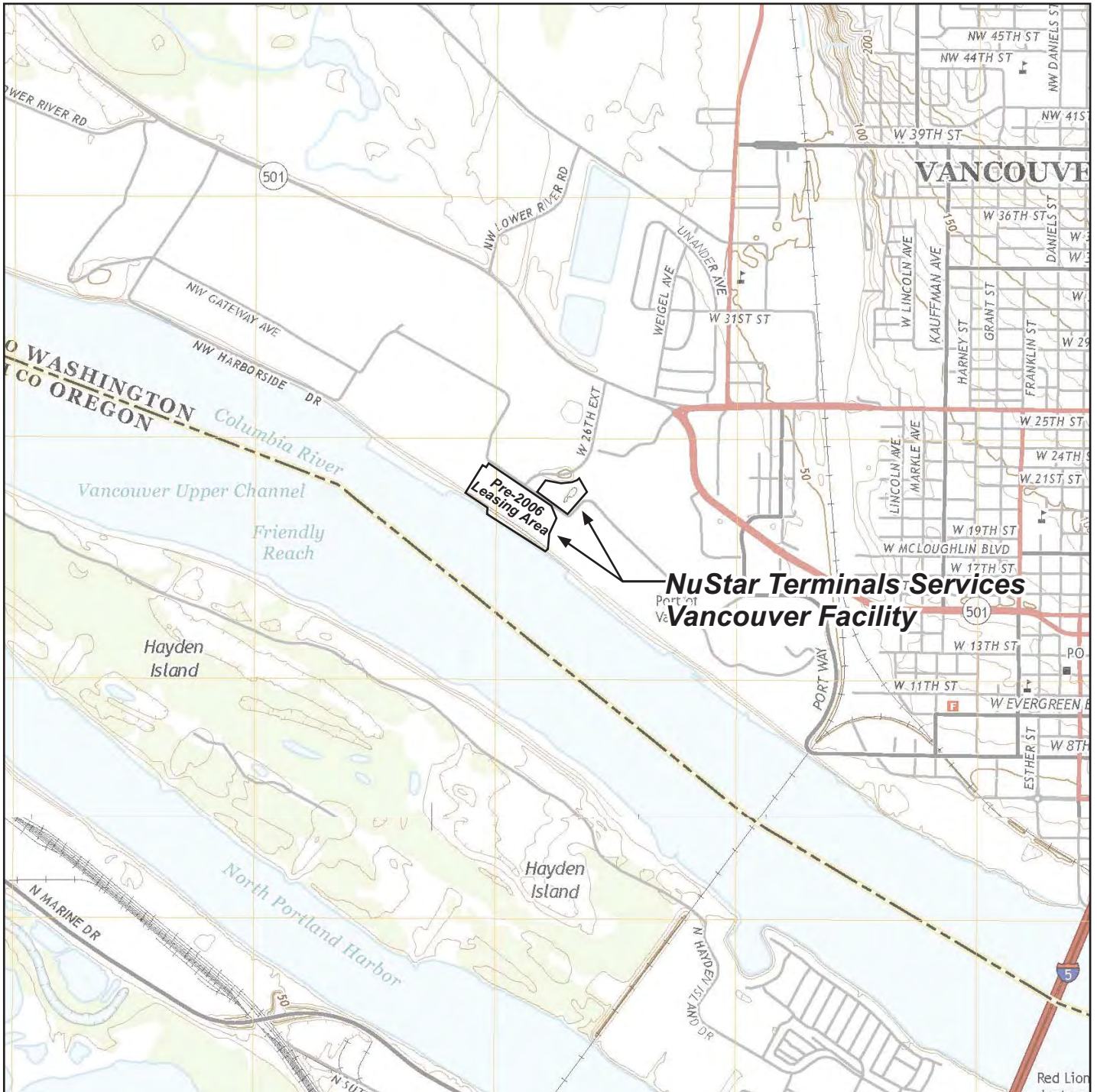
Please refer to notes at end of table.

Table 6
 Groundwater Analytical Results: July 2016 to March 2017
 NuStar Vancouver Facility
 Vancouver, Washington

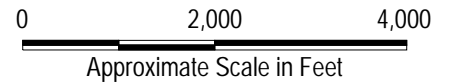
Well Number	Sample Date	Bromoform	Chloroethane	Chloroform	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	Tetrachloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
		<i>Concentrations in µg/L (ppb)</i>														
MP-1	6/17/2016	<0.50	<2.0	<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	<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	<0.50	<0.50	0.64	<0.50	0.92	209	0.55	<0.50	2.9	<0.50	<0.50	1.0	4.3
	3/30/2017	<0.50	71.4	<0.50	<0.50	7.5	<0.50	<0.50	177	6.0	<0.50	<0.50	<0.50	<0.50	0.79	186

Notes:

1. µg/L (ppb) = Micrograms per liter (parts per billion).
2. Bold values represents detected concentration of listed analyte.
3. < = Not detected at or above the specified laboratory method reporting limit (MRL).
4. E = Analyte concentration exceeded the calibration range. Reported result is estimated.
5. D = Relative percent difference (RPD) between sample and duplicate is outside of the acceptable range of +/- 30%.



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



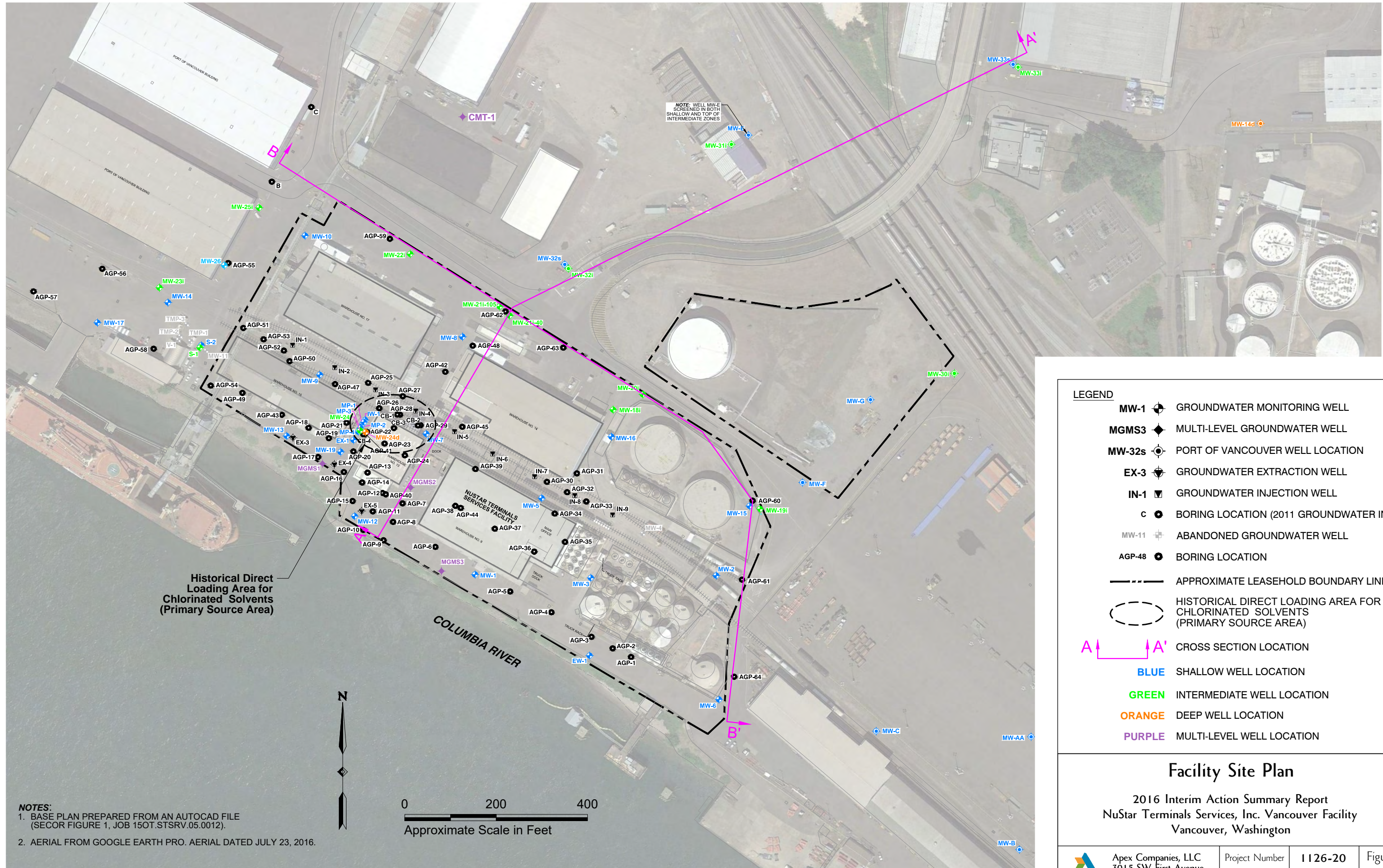
Facility Location Map

2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

 Apex Companies, LLC
 3015 SW First Avenue
 Portland, Oregon 97201

Project Number	1126-20
June 2017	

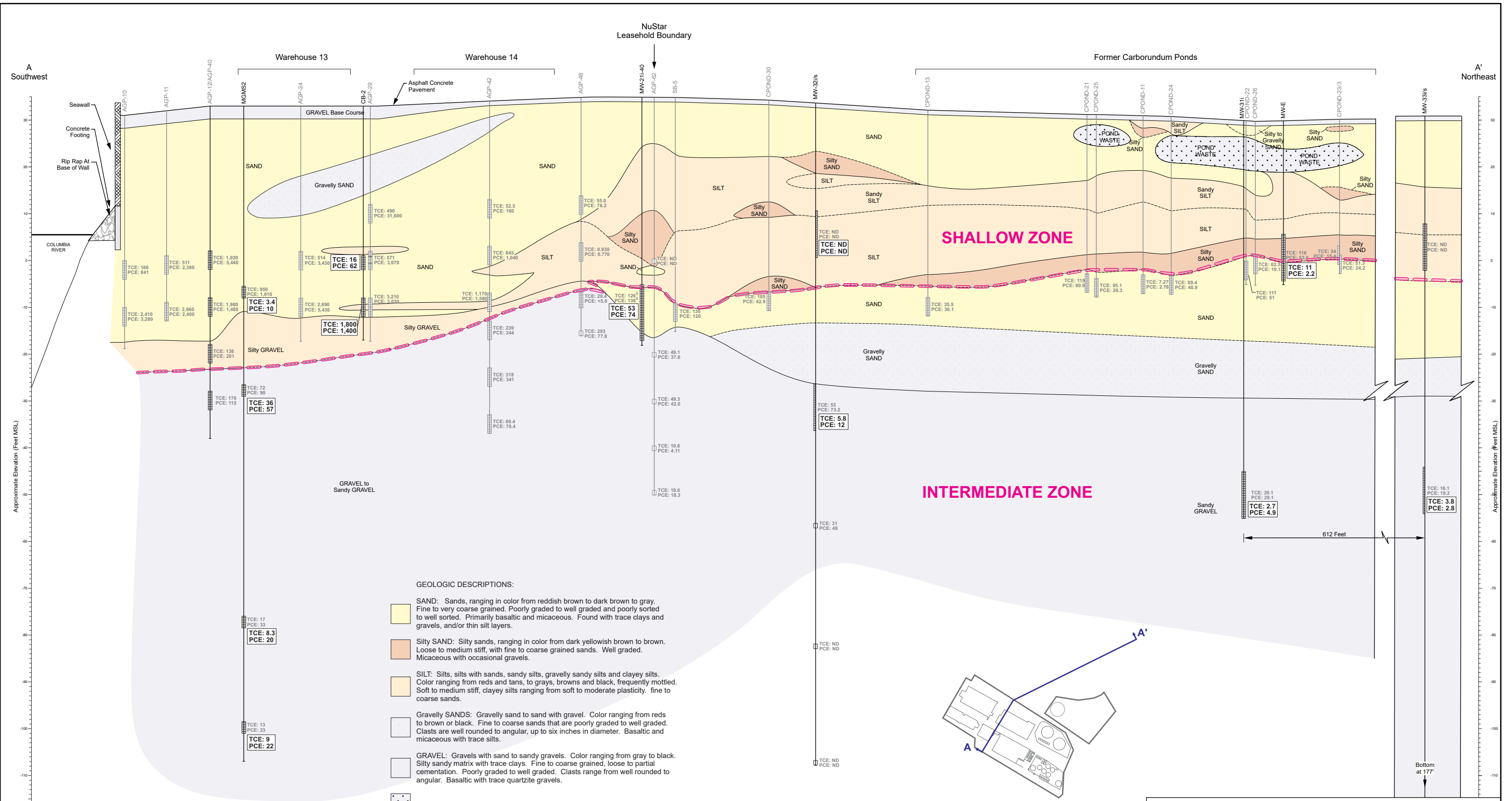
Figure	1
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NOTES:
 1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
 2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.

LEGEND	
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL LOCATION
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)
A-A'	CROSS SECTION LOCATION
BLUE	SHALLOW WELL LOCATION
GREEN	INTERMEDIATE WELL LOCATION
ORANGE	DEEP WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Facility Site Plan
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

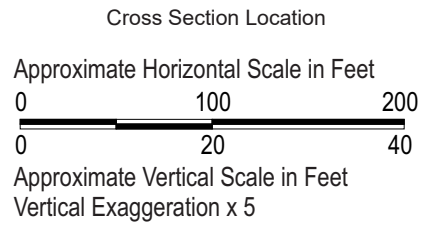
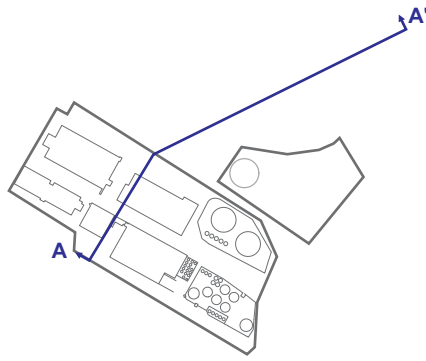


- GEOLOGIC DESCRIPTIONS:**
- SAND:** Sands, ranging in color from reddish brown to dark brown to gray. Fine to very coarse grained. Poorly graded to well graded and poorly sorted to well sorted. Primarily basaltic and micaceous. Found with trace clays and gravels, and/or thin silt layers.
 - Silty SAND:** Silty sands, ranging in color from dark yellowish brown to brown. Loose to medium stiff, with fine to coarse grained sands. Well graded. Micaceous with occasional gravels.
 - SILT:** Silts, silts with sands, sandy silts, gravelly sandy silts and clayey silts. Color ranging from reds and tans, to grays, browns and black, frequently mottled. Soft to medium stiff, clayey silts ranging from soft to moderate plasticity. fine to coarse sands.
 - Gravelly SANDS:** Gravelly sand to sand with gravel. Color ranging from reds to brown or black. Fine to coarse sands that are poorly graded to well graded. Clasts are well rounded to angular, up to six inches in diameter. Basaltic and micaceous with trace silts.
 - GRAVEL:** Gravels with sand to sandy gravels. Color ranging from gray to black. Silty sandy matrix with trace clays. Fine to coarse grained, loose to partial cementation. Poorly graded to well graded. Clasts range from well rounded to angular. Basaltic with trace quartzite gravels.
 - POND WASTE**

- Legend:**
- Borehole
 - Recent Trichloroethene (TCE) Concentration in µg/L
 - Recent Tetrachloroethene (PCE) Concentration in µg/L
 - Screened Interval
 - Depth Discrete Sample Location

- TCE: 176 PCE: 115 Historical TCE Concentration in µg/L
- TCE: 176 PCE: 115 Historical PCE Concentration in µg/L
- Boundary Between Shallow and Intermediate Zone Groundwater

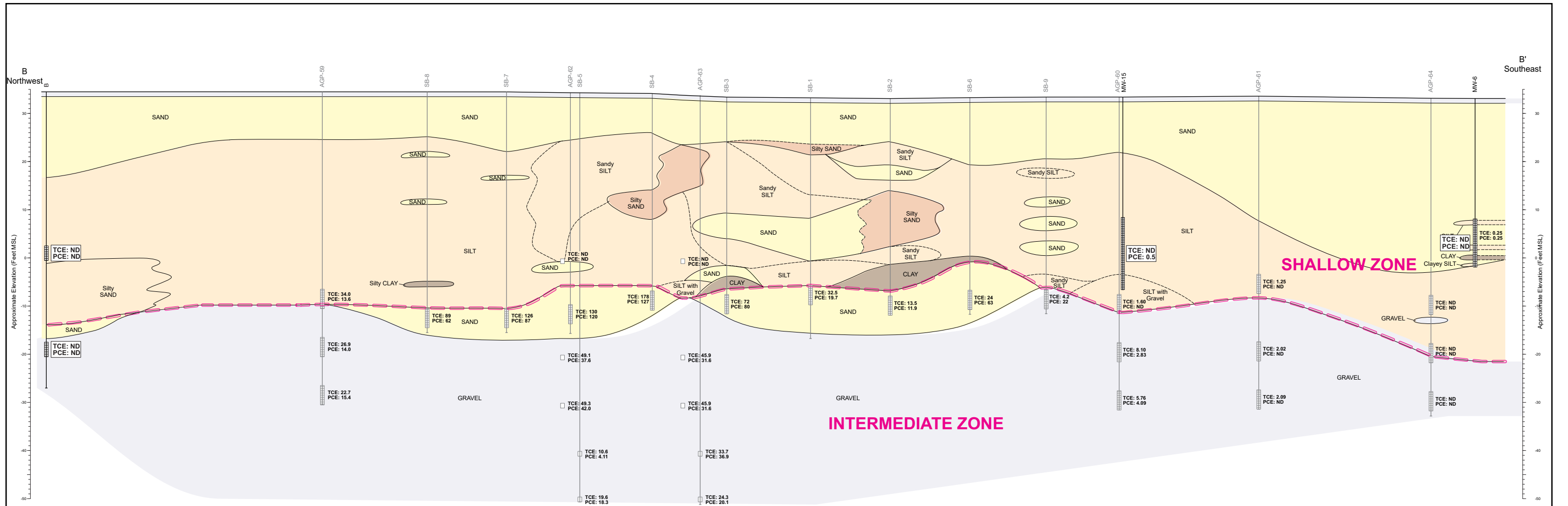
- Sampling Notes:**
1. Historical Data (in grey):
 - a. NuStar (AGP) data from 2006; "SB" boring data from March 2005.
 - b. Off-facility well data from March 2006; "C-Pond" data collected by Parametrix in March 2005.
 - c. Historical monitoring well data from March/June 2008.
 2. Recent Data (in black; boxed):
 - a. Monitoring well data from September or December 2012.
 - b. Boring CB-2 data from September 2010.
 3. ND = Not detected (reporting limit of 0.5 µg/L unless otherwise specified).



Geologic Cross-Section A-A'

2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1126-20	Figure	3
	June 2017			



GEOLOGIC DESCRIPTIONS:

- SAND:** Sands, ranging in color from reddish brown to dark brown to gray. Fine to very coarse grained. Poorly graded to well graded and poorly sorted to well sorted. Primarily basaltic and micaceous. Found with trace clays and gravels, and/or thin silt layers.
- Silty SAND:** Silty sands, ranging in color from dark yellowish brown to brown. Loose to medium stiff, with fine to coarse grained sands. Well graded. Micaceous with occasional gravels.
- SILT:** Silts, silts with sands, sandy silts, gravelly sandy silts and clayey silts. Color ranging from reds and tans, to grays, browns and black, frequently mottled. Soft to medium stiff, clayey silts ranging from soft to moderate plasticity. fine to coarse sands.
- GRAVEL:** Gravels with sand to sandy gravels. Color ranging from gray to black. Silty sandy matrix with trace clays. Fine to coarse grained, loose to partial cementation. Poorly graded to well graded. Clasts range from well rounded to angular. Basaltic with trace quartzite gravels.
- CLAY:** Clays to silty clays. Color ranging from green/gray to black. Medium plasticity, sticky, stiff, ranging from dry to moist.

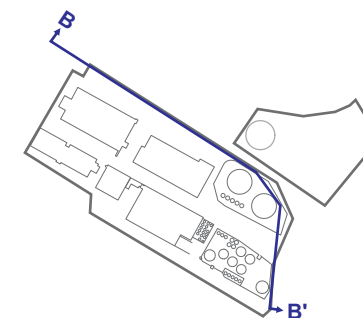
Legend:

- Borehole
- Recent Trichloroethene (TCE) Concentration in µg/L
Recent Tetrachloroethene (PCE) Concentration in µg/L
- Screened Interval
- Depth Discrete Sample Location

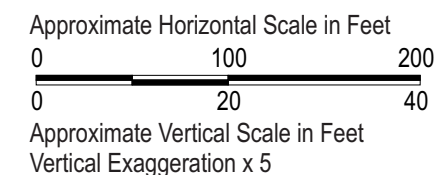
- Historical TCE Concentration in µg/L
Historical PCE Concentration in µg/L
- Boundary Between Shallow and Intermediate Zone Groundwater

Sampling Notes:

1. Historical Data (in grey):
 - a. NuStar (AGP) data from 2006; "SB" boring data from March 2005.
 - b. Historical monitoring well data from March/June 2008.
2. Recent Data (in black; boxed):
 - a. Monitoring well data from September or December 2012.
3. ND = Not detected (reporting limit of 0.5 µg/L unless otherwise specified).



Cross Section Location

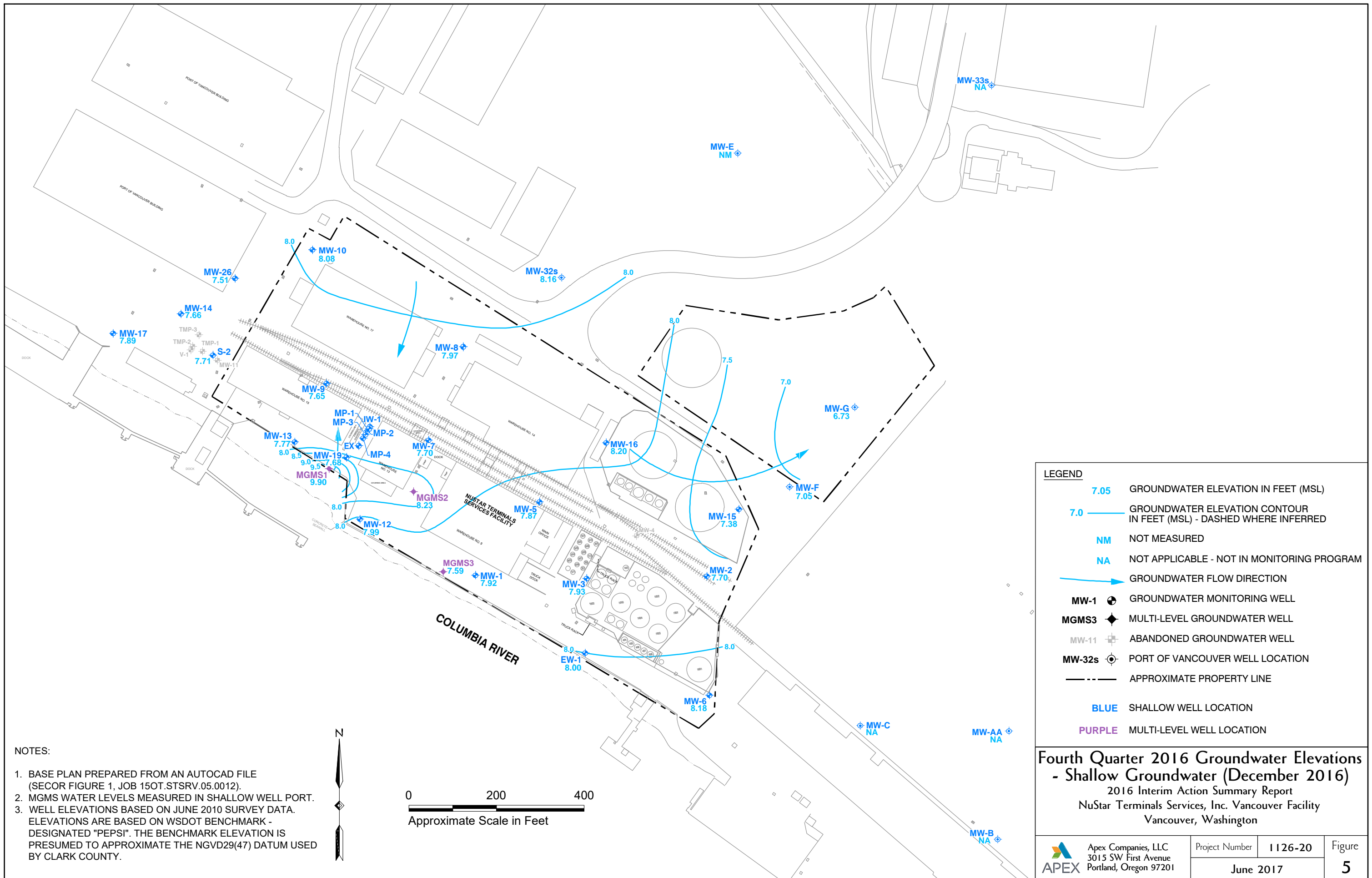


Geologic Cross-Section B-B

2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

APEX Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1126-20	Figure
June 2017		4



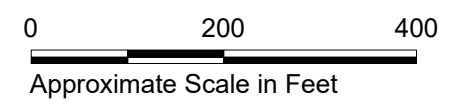
LEGEND

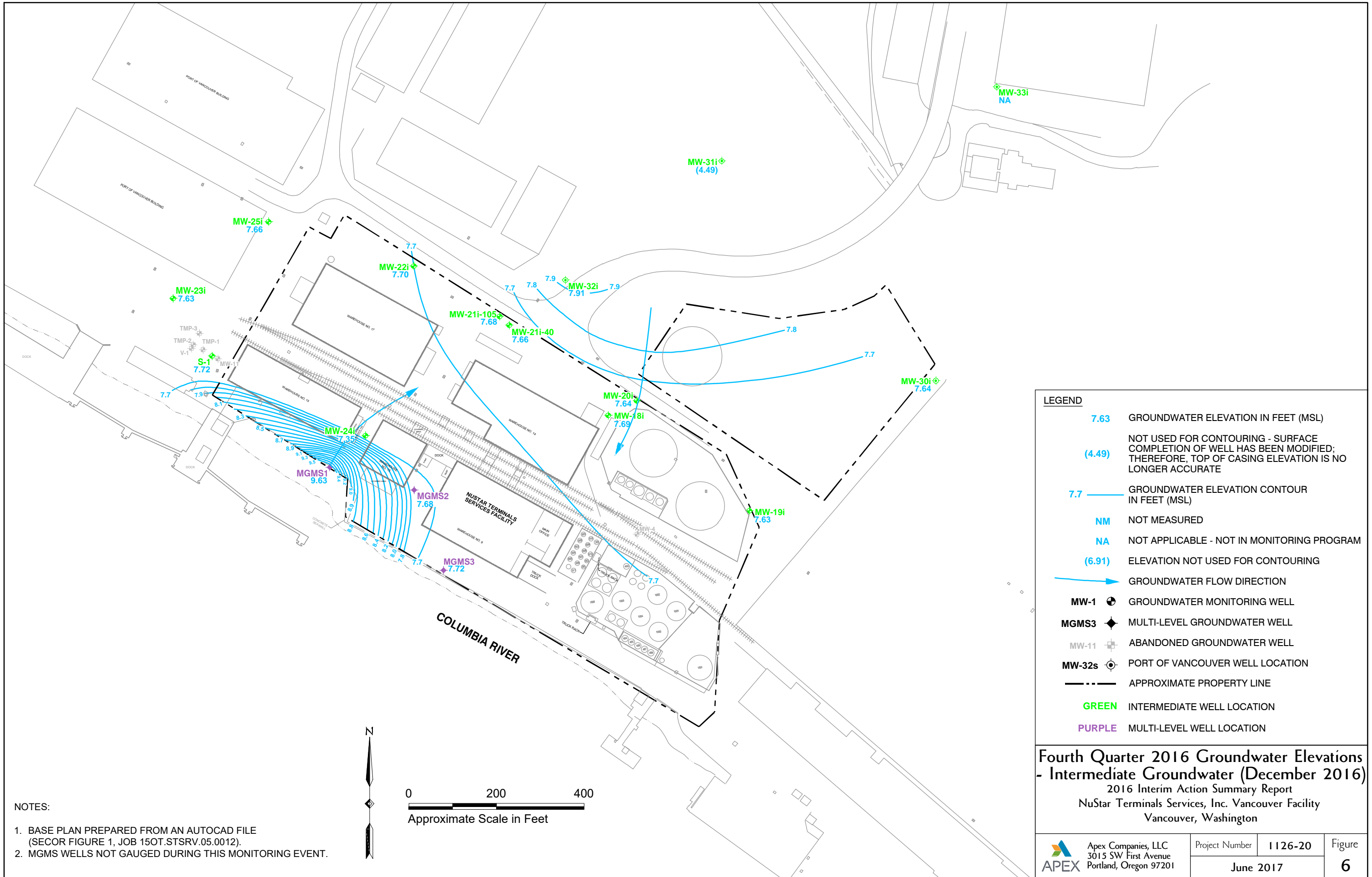
- 7.05 GROUNDWATER ELEVATION IN FEET (MSL)
- 7.0 GROUNDWATER ELEVATION CONTOUR IN FEET (MSL) - DASHED WHERE INFERRED
- NM NOT MEASURED
- NA NOT APPLICABLE - NOT IN MONITORING PROGRAM
- GROUNDWATER FLOW DIRECTION
- MW-1 GROUNDWATER MONITORING WELL
- MGMS3 MULTI-LEVEL GROUNDWATER WELL
- MW-11 ABANDONED GROUNDWATER WELL
- MW-32s PORT OF VANCOUVER WELL LOCATION
- APPROXIMATE PROPERTY LINE
- BLUE SHALLOW WELL LOCATION
- PURPLE MULTI-LEVEL WELL LOCATION

Fourth Quarter 2016 Groundwater Elevations - Shallow Groundwater (December 2016)
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. MGMS WATER LEVELS MEASURED IN SHALLOW WELL PORT.
3. WELL ELEVATIONS BASED ON JUNE 2010 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.





LEGEND

7.63	GROUNDWATER ELEVATION IN FEET (MSL)
(4.49)	NOT USED FOR CONTOURING - SURFACE COMPLETION OF WELL HAS BEEN MODIFIED; THEREFORE, TOP OF CASING ELEVATION IS NO LONGER ACCURATE
7.7	GROUNDWATER ELEVATION CONTOUR IN FEET (MSL)
NM	NOT MEASURED
NA	NOT APPLICABLE - NOT IN MONITORING PROGRAM
(6.91)	ELEVATION NOT USED FOR CONTOURING
	GROUNDWATER FLOW DIRECTION
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL LOCATION
	APPROXIMATE PROPERTY LINE
GREEN	INTERMEDIATE WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Fourth Quarter 2016 Groundwater Elevations - Intermediate Groundwater (December 2016)
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

- NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
 2. MGMS WELLS NOT GAUGED DURING THIS MONITORING EVENT.

PCE in Shallow Zone 1Q 2008



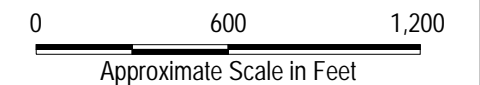
PCE in Shallow Zone 1Q 2013



LEGEND:

- ⊙ Swan Manufacturing (POV) Monitoring Well
- ⊙ ST Services (NuStar) Monitoring Well
- - - - - Property Line

1.16	Concentration in Groundwater (µg/L)
NA	Not Available; Well MW-26 Installed in 2011 *Groundwater data from boring AGP-55 are presented in 2008 figure to define the extent of Volatile Organic Compounds to the northwest. Well MW-26 was installed in 2011 at the same location as boring AGP-55.
	5µg/L Isoconcentration Contour (MCL)
	20µg/L Isoconcentration Contour (MCL)
	200µg/L Isoconcentration Contour (MCL)
	1,000µg/L Isoconcentration Contour (MCL)
	10,000µg/L Isoconcentration Contour (MCL)



NOTE:
Base Map, Legend and Scale from S.S. Papadopoulos & Associates, Inc. Expert Report of Dimitrios Vlassopoulos Port of Vancouver v. Cadet Manufacturing Company, May 2005

2008 and 2013 Isocontours of Tetrachloroethene (PCE) Concentrations in Shallow Zone Groundwater
2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1126-20
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Figure
7

TCE in Shallow Zone 1Q 2008



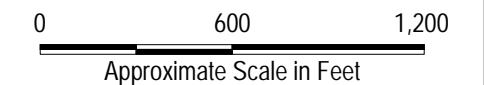
TCE in Shallow Zone 1Q 2013



LEGEND:

- ⊙ Swan Manufacturing (POV) Monitoring Well
- ST Services (NuStar) Monitoring Well
- - - - - Property Line

19.9	Concentration in Groundwater (µg/L)
NA	Not Available; Well MW-26 Installed in 2011 *Groundwater data from boring AGP-55 are presented in 2008 figure to define the extent of Volatile Organic Compounds to the northwest. Well MW-26 was installed in 2011 at the same location as boring AGP-55.
—	4µg/L Isoconcentration Contour (MCL)
—	20µg/L Isoconcentration Contour (MCL)
—	200µg/L Isoconcentration Contour (MCL)
—	1,000µg/L Isoconcentration Contour (MCL)



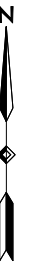
NOTE:
Base Map, Legend and Scale from S.S. Papadopoulos & Associates, Inc. Expert Report of Dimitrios Vlassopoulos Port of Vancouver v. Cadet Manufacturing Company, May 2005

2008 and 2013 Isocontours of Trichloroethene (TCE) Concentrations in Shallow Zone Groundwater
2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

cis-1,2-DCE in Shallow Zone 1Q 2008



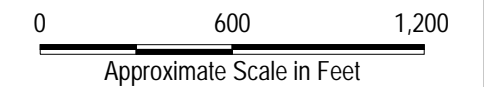
cis-1,2-DCE in Shallow Zone 1Q 2013



LEGEND:

- ⊙ Swan Manufacturing (POV) Monitoring Well
- ST Services (NuStar) Monitoring Well
- - - - - Property Line

5.75	Concentration in Groundwater (µg/L)
NA	Not Available; Well MW-26 Installed in 2011 *Groundwater data from boring AGP-55 are presented in 2008 figure to define the extent of Volatile Organic Compounds to the northwest. Well MW-26 was installed in 2011 at the same location as boring AGP-55.
—	16µg/L Isoconcentration Contour (MCL)
—	200µg/L Isoconcentration Contour (MCL)
—	1,000µg/L Isoconcentration Contour (MCL)



NOTE:
Base Map, Legend and Scale from S.S. Papadopoulos & Associates, Inc. Expert Report of Dimitrios Vlassopoulos Port of Vancouver v. Cadet Manufacturing Company, May 2005

2008 and 2013 Isocontours of cis-1,2-Dichloroethene (cis-1,2-DCE) Concentrations in Shallow Zone Groundwater
2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

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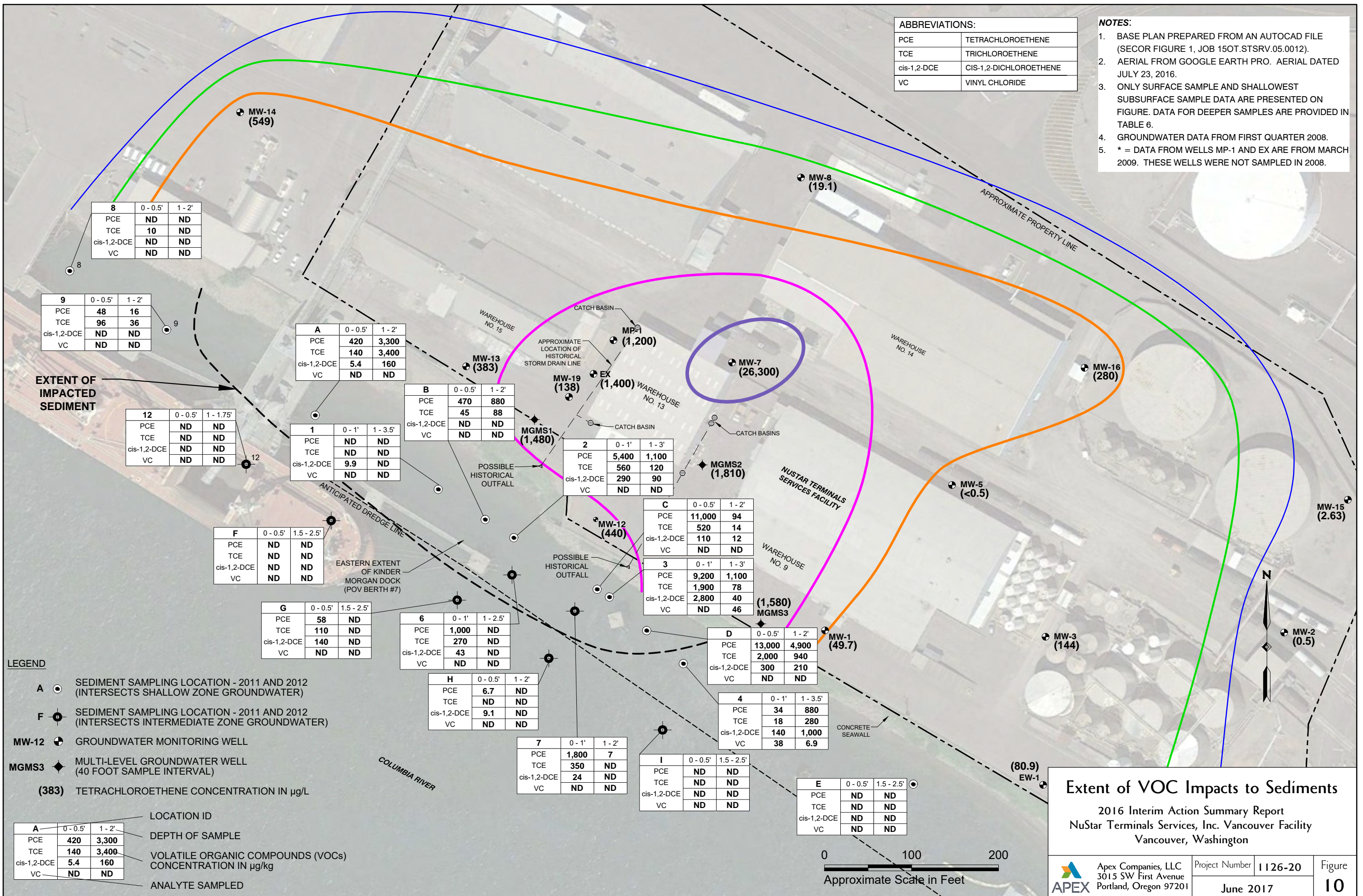
Project Number	1126-20
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Figure
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ABBREVIATIONS:

PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
cis-1,2-DCE	CIS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE

- NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.
 3. ONLY SURFACE SAMPLE AND SHALLOWEST SUBSURFACE SAMPLE DATA ARE PRESENTED ON FIGURE. DATA FOR DEEPER SAMPLES ARE PROVIDED IN TABLE 6.
 4. GROUNDWATER DATA FROM FIRST QUARTER 2008.
 5. * = DATA FROM WELLS MP-1 AND EX ARE FROM MARCH 2009. THESE WELLS WERE NOT SAMPLED IN 2008.



8	0 - 0.5'	1 - 2'
PCE	ND	ND
TCE	10	ND
cis-1,2-DCE	ND	ND
VC	ND	ND

9	0 - 0.5'	1 - 2'
PCE	48	16
TCE	96	36
cis-1,2-DCE	ND	ND
VC	ND	ND

A	0 - 0.5'	1 - 2'
PCE	420	3,300
TCE	140	3,400
cis-1,2-DCE	5.4	160
VC	ND	ND

B	0 - 0.5'	1 - 2'
PCE	470	880
TCE	45	88
cis-1,2-DCE	ND	ND
VC	ND	ND

2	0 - 1'	1 - 3'
PCE	5,400	1,100
TCE	560	120
cis-1,2-DCE	290	90
VC	ND	ND

C	0 - 0.5'	1 - 2'
PCE	11,000	94
TCE	520	14
cis-1,2-DCE	110	12
VC	ND	ND

3	0 - 1'	1 - 3'
PCE	9,200	1,100
TCE	1,900	78
cis-1,2-DCE	2,800	40
VC	ND	46

D	0 - 0.5'	1 - 2'
PCE	13,000	4,900
TCE	2,000	940
cis-1,2-DCE	300	210
VC	ND	ND

4	0 - 1'	1 - 3.5'
PCE	34	880
TCE	18	280
cis-1,2-DCE	140	1,000
VC	38	6.9

E	0 - 0.5'	1.5 - 2.5'
PCE	ND	ND
TCE	ND	ND
cis-1,2-DCE	ND	ND
VC	ND	ND

12	0 - 0.5'	1 - 1.75'
PCE	ND	ND
TCE	ND	ND
cis-1,2-DCE	ND	ND
VC	ND	ND

1	0 - 1'	1 - 3.5'
PCE	ND	ND
TCE	ND	ND
cis-1,2-DCE	9.9	ND
VC	ND	ND

F	0 - 0.5'	1.5 - 2.5'
PCE	ND	ND
TCE	ND	ND
cis-1,2-DCE	ND	ND
VC	ND	ND

G	0 - 0.5'	1.5 - 2.5'
PCE	58	ND
TCE	110	ND
cis-1,2-DCE	140	ND
VC	ND	ND

6	0 - 1'	1 - 2.5'
PCE	1,000	ND
TCE	270	ND
cis-1,2-DCE	43	ND
VC	ND	ND

H	0 - 0.5'	1 - 2'
PCE	6.7	ND
TCE	ND	ND
cis-1,2-DCE	9.1	ND
VC	ND	ND

7	0 - 1'	1 - 2'
PCE	1,800	7
TCE	350	ND
cis-1,2-DCE	24	ND
VC	ND	ND

I	0 - 0.5'	1.5 - 2.5'
PCE	ND	ND
TCE	ND	ND
cis-1,2-DCE	ND	ND
VC	ND	ND

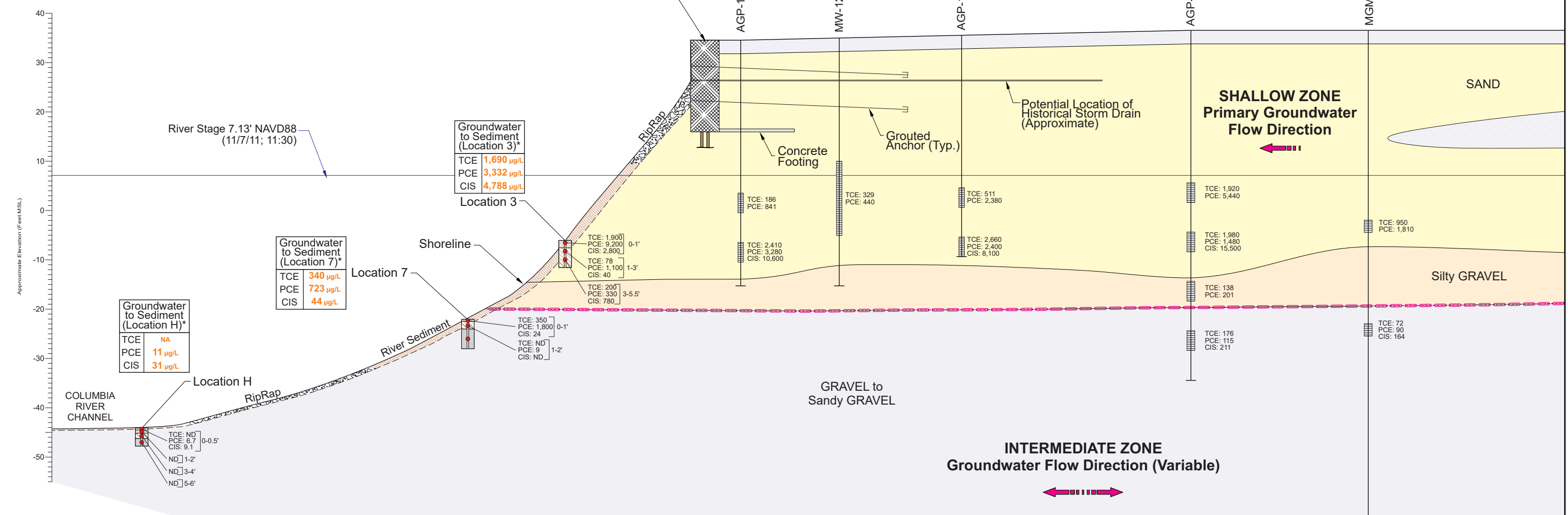
LEGEND

- A** ○ SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS SHALLOW ZONE GROUNDWATER)
- F** ● SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS INTERMEDIATE ZONE GROUNDWATER)
- MW-12** ● GROUNDWATER MONITORING WELL
- MGMS3** ◆ MULTI-LEVEL GROUNDWATER WELL (40 FOOT SAMPLE INTERVAL)
- (383)** TETRACHLOROETHENE CONCENTRATION IN µg/L

LOCATION ID		
A	0 - 0.5'	1 - 2'
DEPTH OF SAMPLE		
PCE	420	3,300
TCE	140	3,400
cis-1,2-DCE	5.4	160
VC	ND	ND
VOLATILE ORGANIC COMPOUNDS (VOCs) CONCENTRATION IN µg/kg		
ANALYTE SAMPLED		

Extent of VOC Impacts to Sediments
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

A
Southwest



Legend

Sediment Log Lithology:

Sediment Sample Location
TCE: 350, PCE: 1,800, CIS: 24 (0-1')
Concentration in µg/kg and Depth of Sample in Feet BGS

- SILT
- Sandy SILT
- SAND
- Silty SAND
- GRAVEL and/or COBBLES

GEOLOGIC DESCRIPTIONS:

- SAND:** Sands, ranging in color from reddish brown to dark brown to gray. Fine to very coarse grained. Poorly graded to well graded and poorly sorted to well sorted. Primarily basaltic and micaceous. Found with trace clays and gravels, and/or thin silt layers.
- SILT:** Silts, silts with sands, sandy silts, gravelly sandy silts and clayey silts. Color ranging from reds and tans, to grays, browns and black, frequently mottled. Soft to medium stiff, clayey silts ranging from soft to moderate plasticity. Fine to coarse sands.
- Gravelly SANDS:** Gravelly sand to sand with gravel. Color ranging from reds to brown or black. Fine to coarse sands that are poorly graded to well graded. Clasts are well rounded to angular, up to six inches in diameter. Basaltic and micaceous with trace silts.
- GRAVEL:** Gravels with sand to sandy gravels. Color ranging from gray to black. Silty sandy matrix with trace clays. Fine to coarse grained, loose to partial cementation. Poorly graded to well graded. Clasts range from well rounded to angular. Basaltic with trace quartzite gravels.
- River Sediment**

Borehole Lithology:

Borehole Location
TCE: 176, PCE: 115, CIS: 211

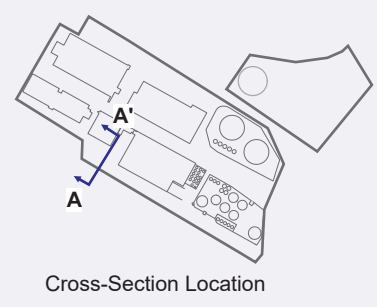
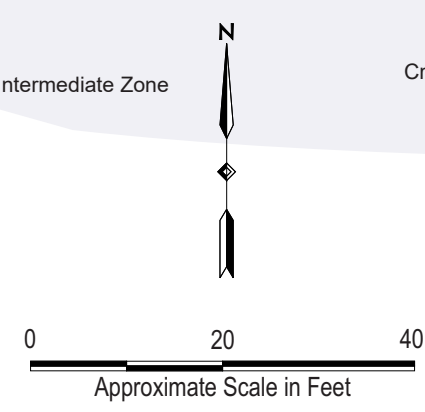
TCE Concentration in µg/L
PCE Concentration in µg/L
CIS Concentration in µg/L

Screened Interval

Approximate Boundary Between Shallow and Intermediate Zone

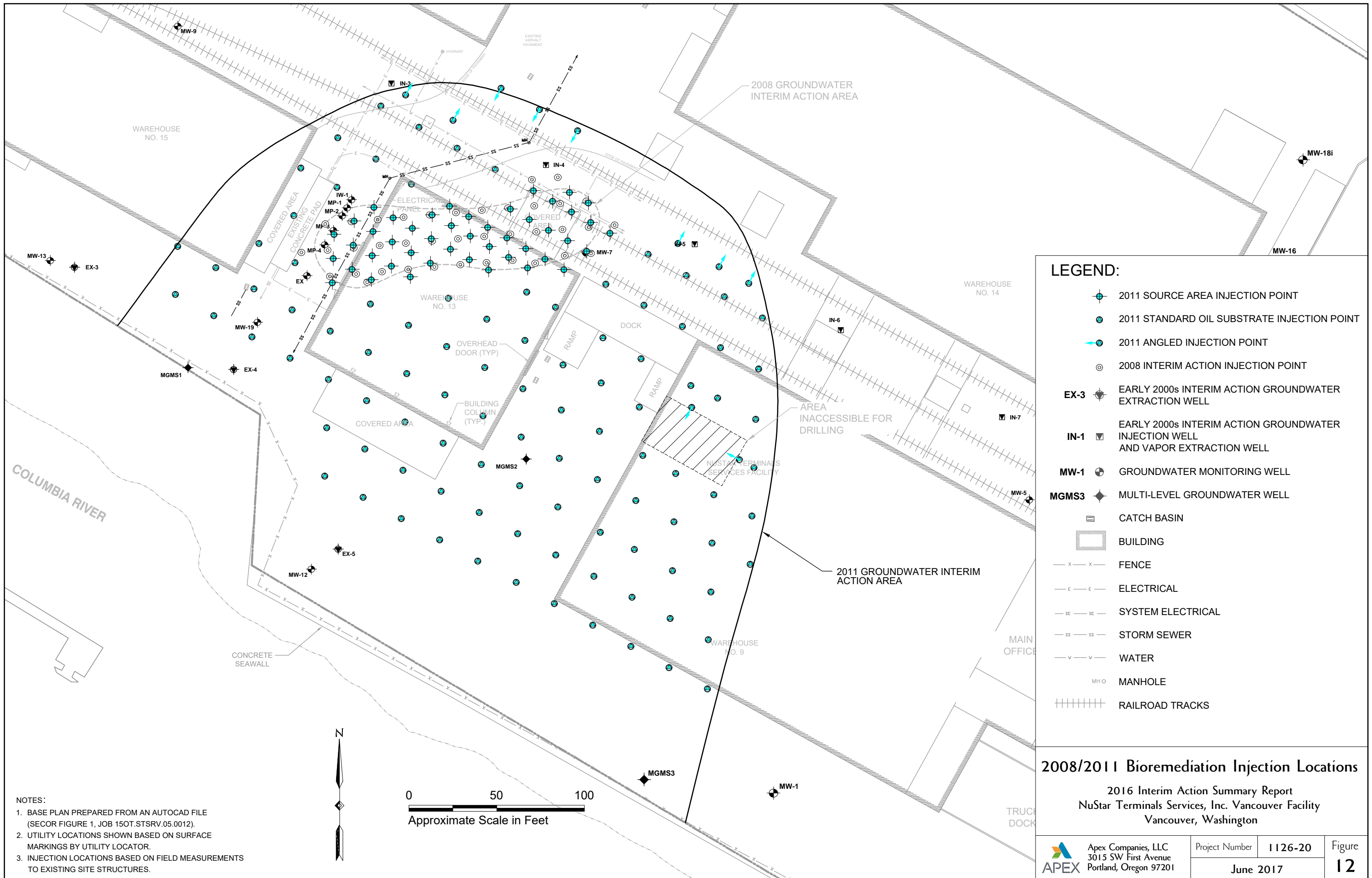
* Using the MTCA Three Phase Equilibrium Partitioning Equation (Eqn. 747-1), represents the minimum VOC concentration in groundwater needed to partition to sediments at the concentration present in the surface-most sediment sample. Concentration data for the surface-most sediment sample are depicted on the sediment core diagram.

NOTE: Mean Sea Level (MSL) referenced to NAVD88 Datum.



Shoreline Geologic Cross-Section A-A'

2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

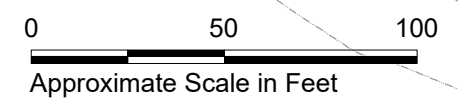


LEGEND:

- 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
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

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



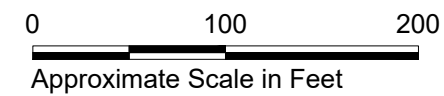


NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.

LEGEND

- | | | | |
|-----------------|---|-----------------|--|
| LOC. A ● | SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS SHALLOW ZONE GROUNDWATER) | SED-1 ■ | SEDIMENT SAMPLING LOCATION (2016) |
| LOC. F ● | SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS INTERMEDIATE ZONE GROUNDWATER) | SURF-1 ▲ | SURFACE WATER SAMPLING LOCATION (2016) |
| MW-12 ● | GROUNDWATER MONITORING WELL | | |
| MGMS3 ◆ | MULTI-LEVEL GROUNDWATER WELL (40 FOOT SAMPLE INTERVAL) | | |



2016 Sediment and Surface Water Sample Locations

2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

APEX Apex Companies, LLC
 3015 SW First Avenue
 Portland, Oregon 97201

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Figure
13

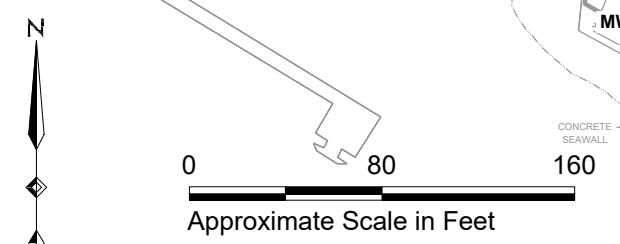


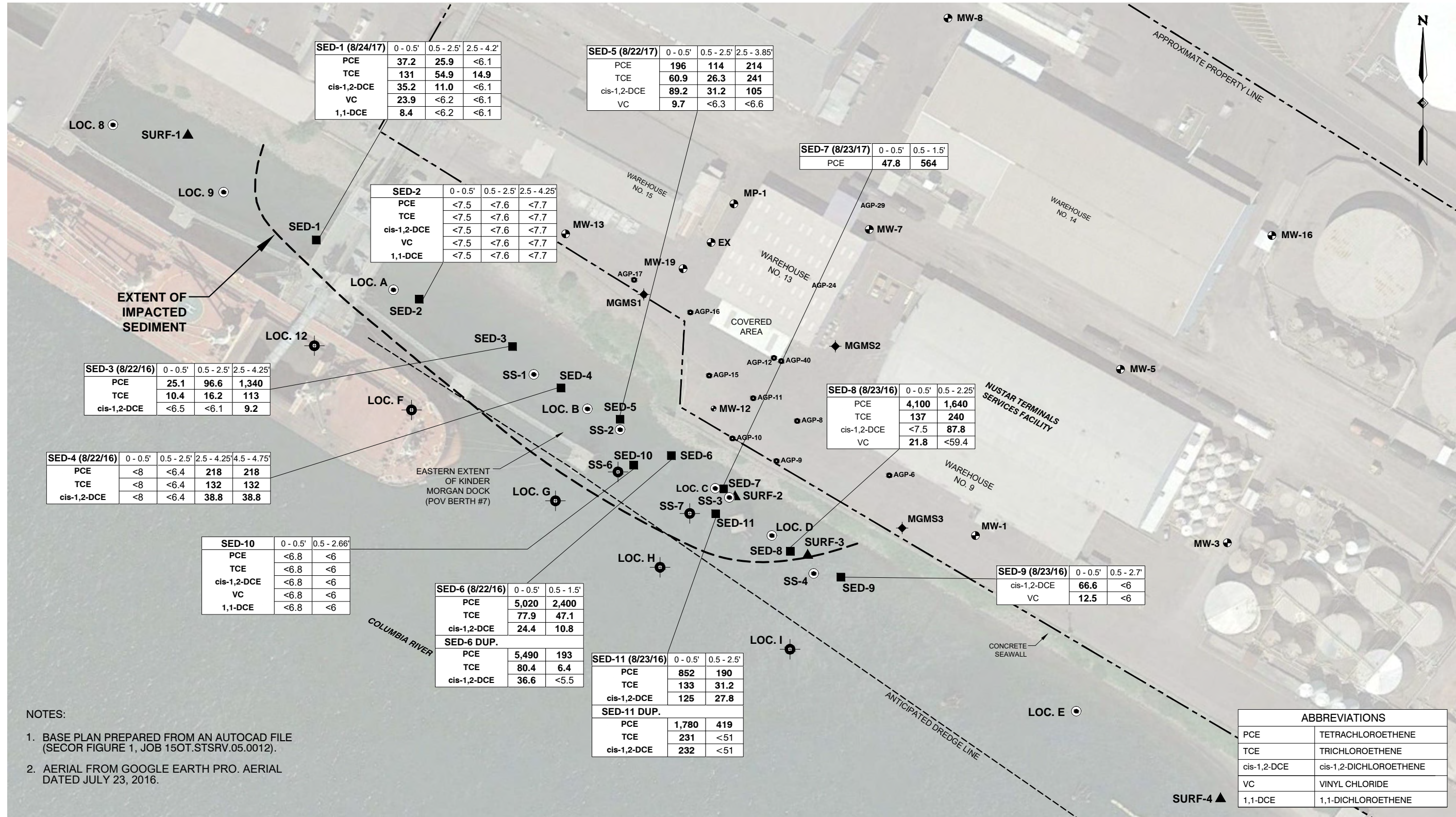
LEGEND:

- ENHANCED BIOREMEDIATION INJECTION POINT
- IB-1 INITIAL OBSERVATION BORING
- 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
- MANHOLE
- RAILROAD TRACKS

2016 Bioremediation Injection Locations
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

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





SED-1 (8/24/17)	0 - 0.5'	0.5 - 2.5'	2.5 - 4.2'
PCE	37.2	25.9	<6.1
TCE	131	54.9	14.9
cis-1,2-DCE	35.2	11.0	<6.1
VC	23.9	<6.2	<6.1
1,1-DCE	8.4	<6.2	<6.1

SED-5 (8/22/17)	0 - 0.5'	0.5 - 2.5'	2.5 - 3.85'
PCE	196	114	214
TCE	60.9	26.3	241
cis-1,2-DCE	89.2	31.2	105
VC	9.7	<6.3	<6.6

SED-7 (8/23/17)	0 - 0.5'	0.5 - 1.5'
PCE	47.8	564

SED-2	0 - 0.5'	0.5 - 2.5'	2.5 - 4.25'
PCE	<7.5	<7.6	<7.7
TCE	<7.5	<7.6	<7.7
cis-1,2-DCE	<7.5	<7.6	<7.7
VC	<7.5	<7.6	<7.7
1,1-DCE	<7.5	<7.6	<7.7

SED-3 (8/22/16)	0 - 0.5'	0.5 - 2.5'	2.5 - 4.25'
PCE	25.1	96.6	1,340
TCE	10.4	16.2	113
cis-1,2-DCE	<6.5	<6.1	9.2

SED-4 (8/22/16)	0 - 0.5'	0.5 - 2.5'	2.5 - 4.25'	4.5 - 4.75'
PCE	<8	<6.4	218	218
TCE	<8	<6.4	132	132
cis-1,2-DCE	<8	<6.4	38.8	38.8

SED-10	0 - 0.5'	0.5 - 2.66'
PCE	<6.8	<6
TCE	<6.8	<6
cis-1,2-DCE	<6.8	<6
VC	<6.8	<6
1,1-DCE	<6.8	<6

SED-6 (8/22/16)	0 - 0.5'	0.5 - 1.5'
PCE	5,020	2,400
TCE	77.9	47.1
cis-1,2-DCE	24.4	10.8
SED-6 DUP.		
PCE	5,490	193
TCE	80.4	6.4
cis-1,2-DCE	36.6	<5.5

SED-11 (8/23/16)	0 - 0.5'	0.5 - 2.5'
PCE	852	190
TCE	133	31.2
cis-1,2-DCE	125	27.8
SED-11 DUP.		
PCE	1,780	419
TCE	231	<51
cis-1,2-DCE	232	<51

SED-8 (8/23/16)	0 - 0.5'	0.5 - 2.25'
PCE	4,100	1,640
TCE	137	240
cis-1,2-DCE	<7.5	87.8
VC	21.8	<59.4

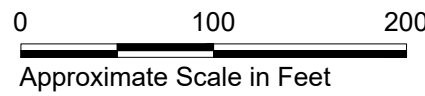
SED-9 (8/23/16)	0 - 0.5'	0.5 - 2.7'
cis-1,2-DCE	66.6	<6
VC	12.5	<6

ABBREVIATIONS	
PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
cis-1,2-DCE	cis-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
1,1-DCE	1,1-DICHLOROETHENE

- NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.

LEGEND

- LOC. A ● SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS SHALLOW ZONE GROUNDWATER)
- LOC. F ● SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS INTERMEDIATE ZONE GROUNDWATER)
- MW-12 ● GROUNDWATER MONITORING WELL
- MGMS3 ◆ MULTI-LEVEL GROUNDWATER WELL (40 FOOT SAMPLE INTERVAL)
- SED-1 ■ SEDIMENT SAMPLING LOCATION (2016)
- SURF-1 ▲ SURFACE WATER SAMPLING LOCATION (2016)

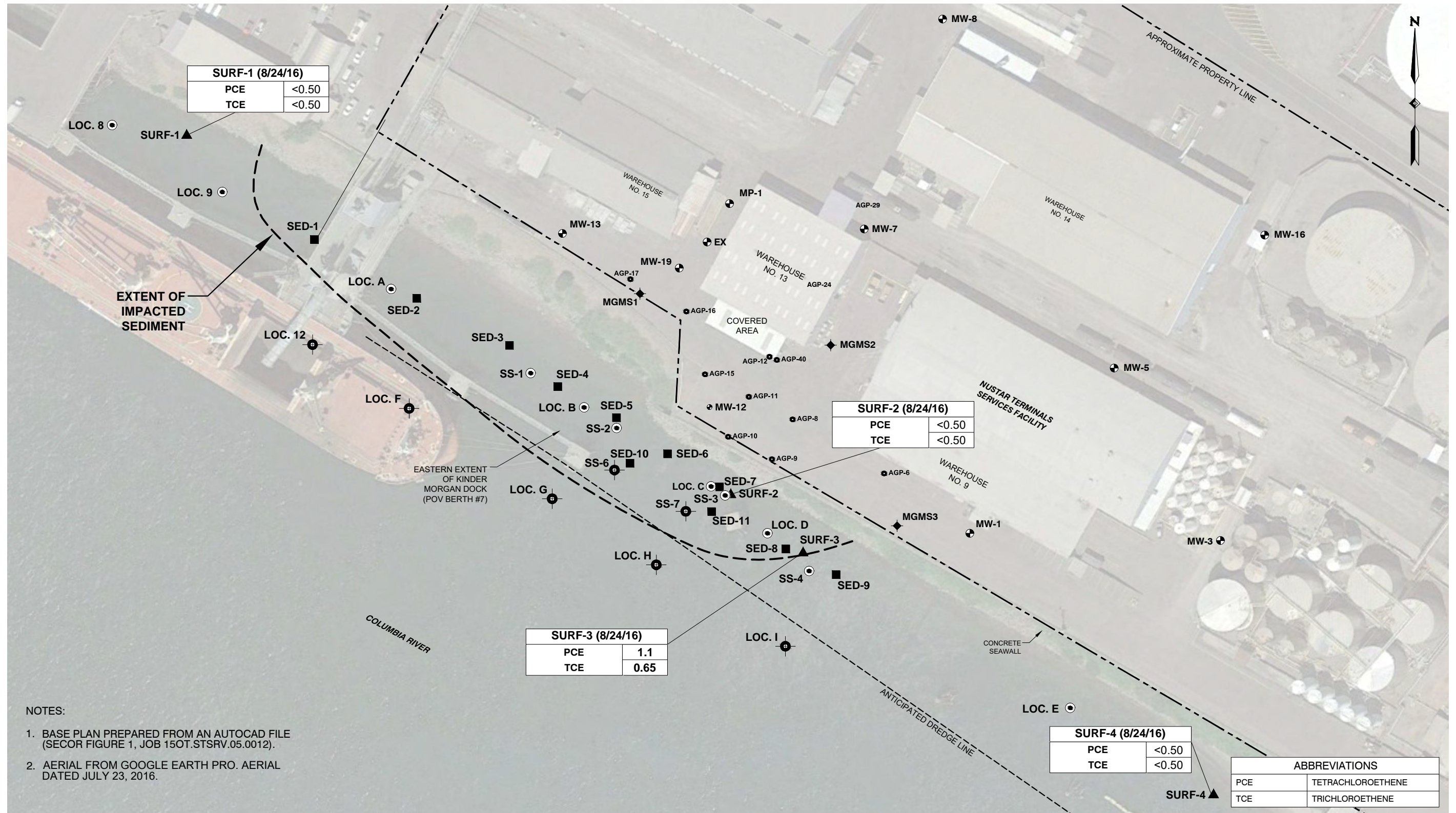


SED-8 (8/23/16)	0 - 0.5'	0.5 - 2.25'
PCE	4,100	1,640
TCE	137	240
cis-1,2-DCE	<7.5	87.8
VC	21.8	<59.4

SAMPLE IDENTIFICATION AND (DATE)
 DEPTH OF SAMPLE
 CHEMICAL CONCENTRATION IN µg/kg (ONLY DETECTED COMPOUNDS ARE SHOWN)
 < = NOT DETECTED AT OR ABOVE THE SPECIFIED LABORATORY METHOD REPORTING LIMIT (MRL)
 ANALYTE SAMPLED

2016 Sediment Analytical Results - PCE, TCE, cis-1,2-DCE, 1,1-DCE, and Vinyl Chloride
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1126-20	Figure
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SURF-1 (8/24/16)	
PCE	<0.50
TCE	<0.50

SURF-2 (8/24/16)	
PCE	<0.50
TCE	<0.50

SURF-3 (8/24/16)	
PCE	1.1
TCE	0.65

SURF-4 (8/24/16)	
PCE	<0.50
TCE	<0.50

ABBREVIATIONS	
PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE

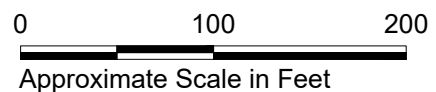
NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.

LEGEND

- LOC. A ● SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS SHALLOW ZONE GROUNDWATER)
- LOC. F ● SEDIMENT SAMPLING LOCATION - 2011 AND 2012 (INTERSECTS INTERMEDIATE ZONE GROUNDWATER)
- MW-12 ● GROUNDWATER MONITORING WELL
- MGMS3 ◆ MULTI-LEVEL GROUNDWATER WELL (40 FOOT SAMPLE INTERVAL)

- SED-1 ■ SEDIMENT SAMPLING LOCATION (2016)
- SURF-1 ▲ SURFACE WATER SAMPLING LOCATION (2016)



SURF-3 (8/24/16)	
PCE	1.1
TCE	0.65

SAMPLE IDENTIFICATION AND (DATE)

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

< = NOT DETECTED AT OR ABOVE THE SPECIFIED LABORATORY METHOD REPORTING LIMIT (MRL)

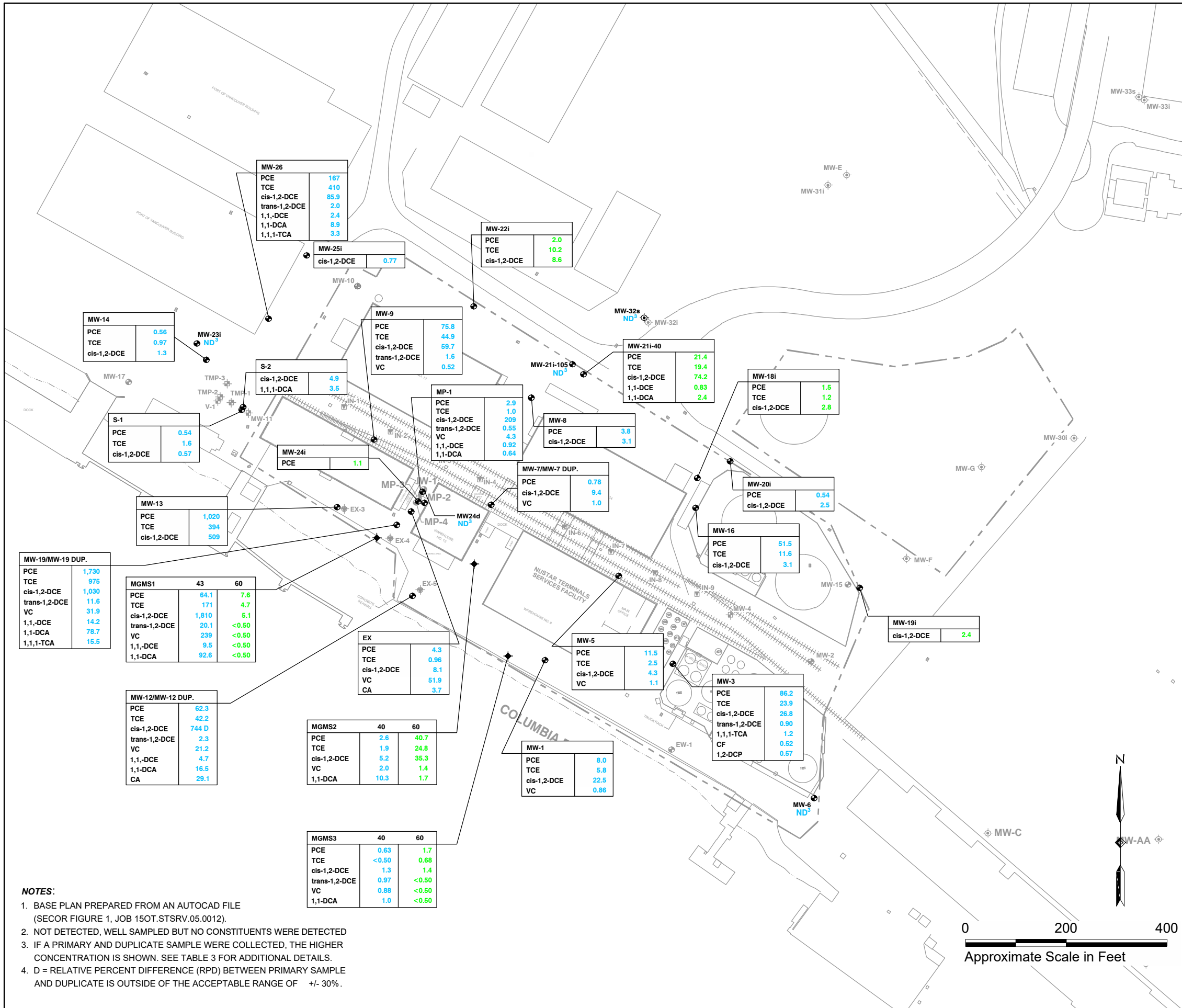
ANALYTE SAMPLED

2016 Surface Water Analytical Results - PCE and TCE
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

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 3015 SW First Avenue
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Figure **16**



LEGEND

WELL IDENTIFICATION

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

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

MGMS1	60
PCE	7.6
TCE	4.7
cis-1,2-DCE	5.1
trans-1,2-DCE	<0.50
VC	<0.50
1,1,-DCE	<0.50
1,1,-DCA	<0.50

ANALYTE SAMPLED

- EX-3** GROUNDWATER EXTRACTION WELL
- IN-1** GROUNDWATER INJECTION WELL
- MW-1** GROUNDWATER MONITORING WELL
- MGMS3** MULTI-LEVEL GROUNDWATER WELL
- MW-11** ABANDONED GROUNDWATER WELL
- MW-32s** PORT OF VANCOUVER WELL LOCATION

BLUE SHALLOW ZONE CONCENTRATION DATA (DEPTHS OF 0 TO 45 FEET)

GREEN INTERMEDIATE ZONE CONCENTRATION DATA (DEPTHS OF 45 TO 100 FEET)

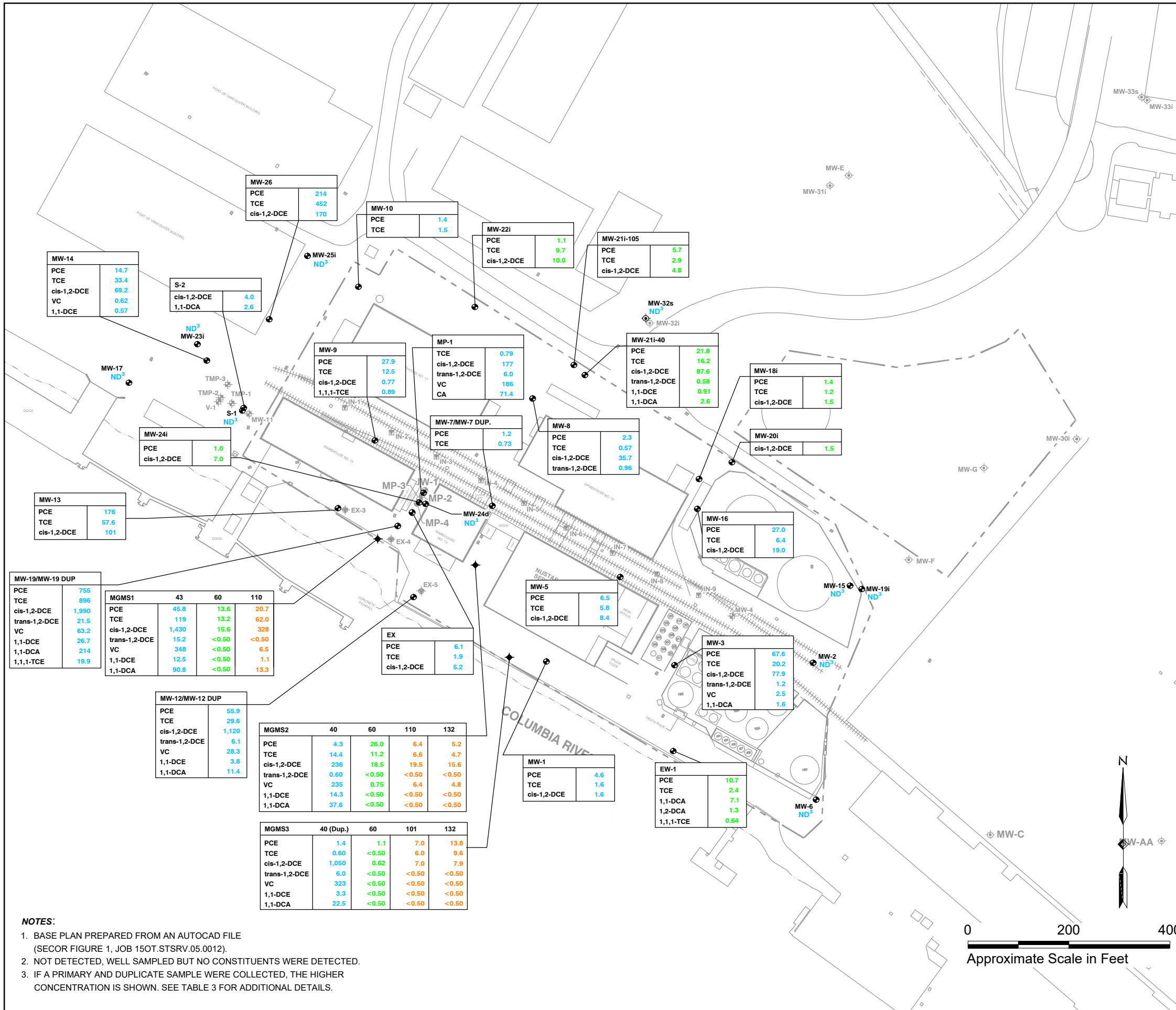
ABBREVIATIONS

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
1,1,1,-TCA	1,1,1-TRICHLOROETHANE
CF	CHLOROFORM
1,2,-DCP	1,2-DICHLOROPROPANE
CA	CHLOROETHANE

- NOTES:**
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. NOT DETECTED, WELL SAMPLED BUT NO CONSTITUENTS WERE DETECTED
 3. IF A PRIMARY AND DUPLICATE SAMPLE WERE COLLECTED, THE HIGHER CONCENTRATION IS SHOWN. SEE TABLE 3 FOR ADDITIONAL DETAILS.
 4. D = RELATIVE PERCENT DIFFERENCE (RPD) BETWEEN PRIMARY SAMPLE AND DUPLICATE IS OUTSIDE OF THE ACCEPTABLE RANGE OF +/- 30%.

Fourth Quarter 2016 Groundwater Concentrations - Shallow and Intermediate Zones (December 2016)

2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington



LEGEND

WELL IDENTIFICATION

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

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

MGMS1	60
PCE	13.6
TCE	13.2
cis-1,2-DCE	15.6
trans-1,2-DCE	<0.50
VC	<0.50
1,1-DCE	<0.50
1,1-DCA	<0.50

ANALYTE SAMPLED

- EX-3** GROUNDWATER EXTRACTION WELL
- IN-1** GROUNDWATER INJECTION WELL
- MW-1** GROUNDWATER MONITORING WELL
- MGMS3** MULTI-LEVEL GROUNDWATER WELL
- MW-11** ABANDONED GROUNDWATER WELL
- MW-32s** PORT OF VANCOUVER WELL LOCATION
- APPROXIMATE PROPERTY LINE
- BLUE** SHALLOW ZONE CONCENTRATION DATA (DEPTHS OF 0 TO 45 FEET)
- GREEN** INTERMEDIATE ZONE CONCENTRATION DATA (DEPTHS OF 45 TO 100 FEET)
- ORANGE** DEEP ZONE CONCENTRATION DATA (DEPTHS OVER 100 FEET)

ABBREVIATIONS

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
1,2-DCA	1,2-DICHLOROETHANE
1,1,1-TCE	1,1,1-TRICHLOROETHENE
CA	CHLOROETHANE

MW-19/MW-19 DUP	
PCE	755
TCE	896
cis-1,2-DCE	1,990
trans-1,2-DCE	21.5
VC	63.2
1,1-DCE	28.7
1,1-DCA	214
1,1,1-TCE	19.9

MGMS1		43	60	110
PCE	45.8	13.6	20.7	
TCE	119	13.2	62.0	
cis-1,2-DCE	1,430	15.6	328	
trans-1,2-DCE	15.2	<0.50	<0.50	
VC	348	<0.50	6.5	
1,1-DCE	12.5	<0.50	1.1	
1,1-DCA	90.8	<0.50	13.3	

MW-12/MW-12 DUP	
PCE	55.9
TCE	29.6
cis-1,2-DCE	1,120
trans-1,2-DCE	6.1
VC	28.3
1,1-DCE	3.8
1,1-DCA	11.4

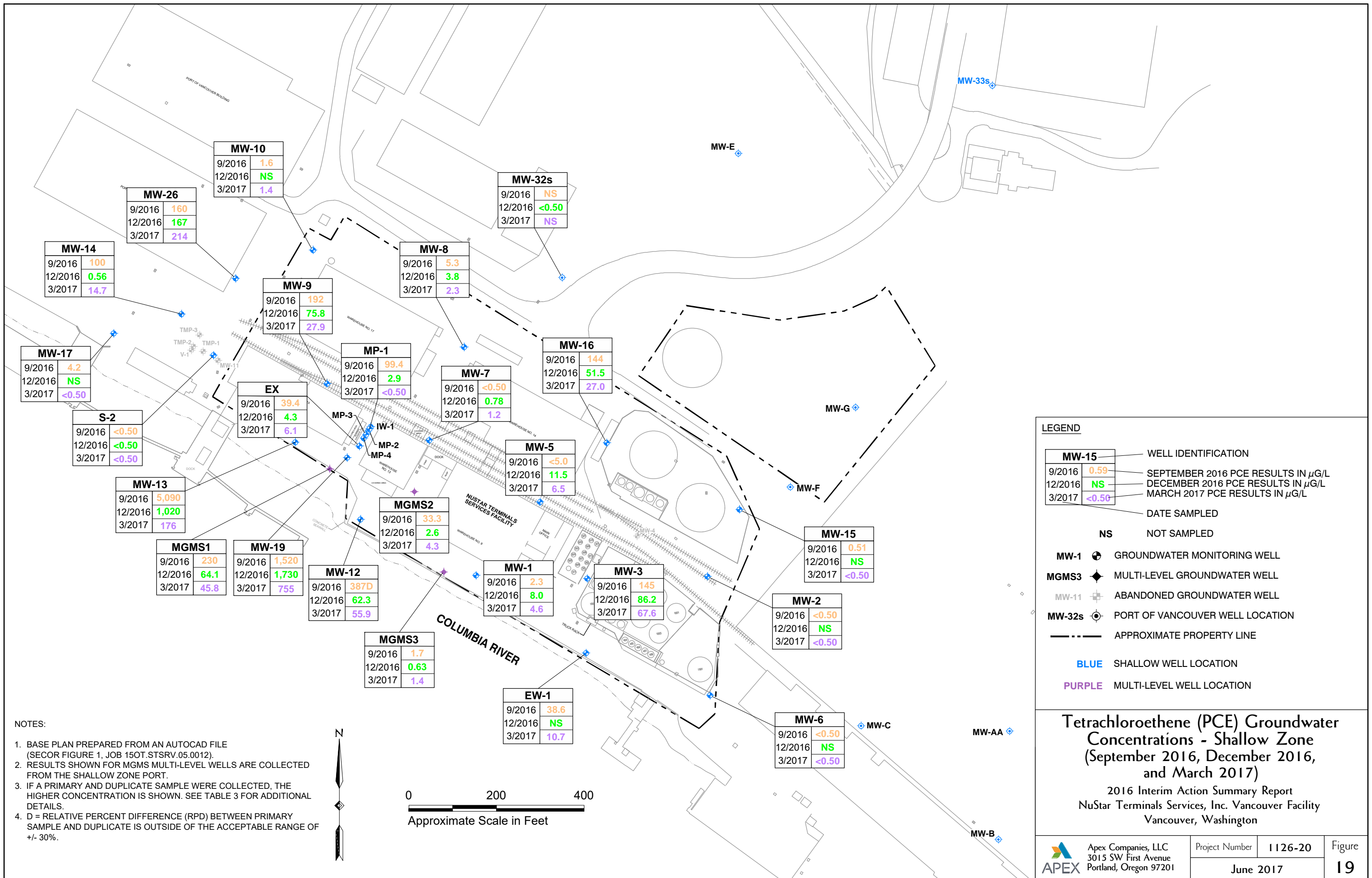
MGMS2		40	60	110	132
PCE	4.3	26.0	6.4	5.2	
TCE	14.4	11.2	6.6	4.7	
cis-1,2-DCE	236	18.5	19.5	15.6	
trans-1,2-DCE	0.60	<0.50	<0.50	<0.50	
VC	235	0.75	6.4	4.8	
1,1-DCE	14.3	<0.50	<0.50	<0.50	
1,1-DCA	37.6	<0.50	<0.50	<0.50	

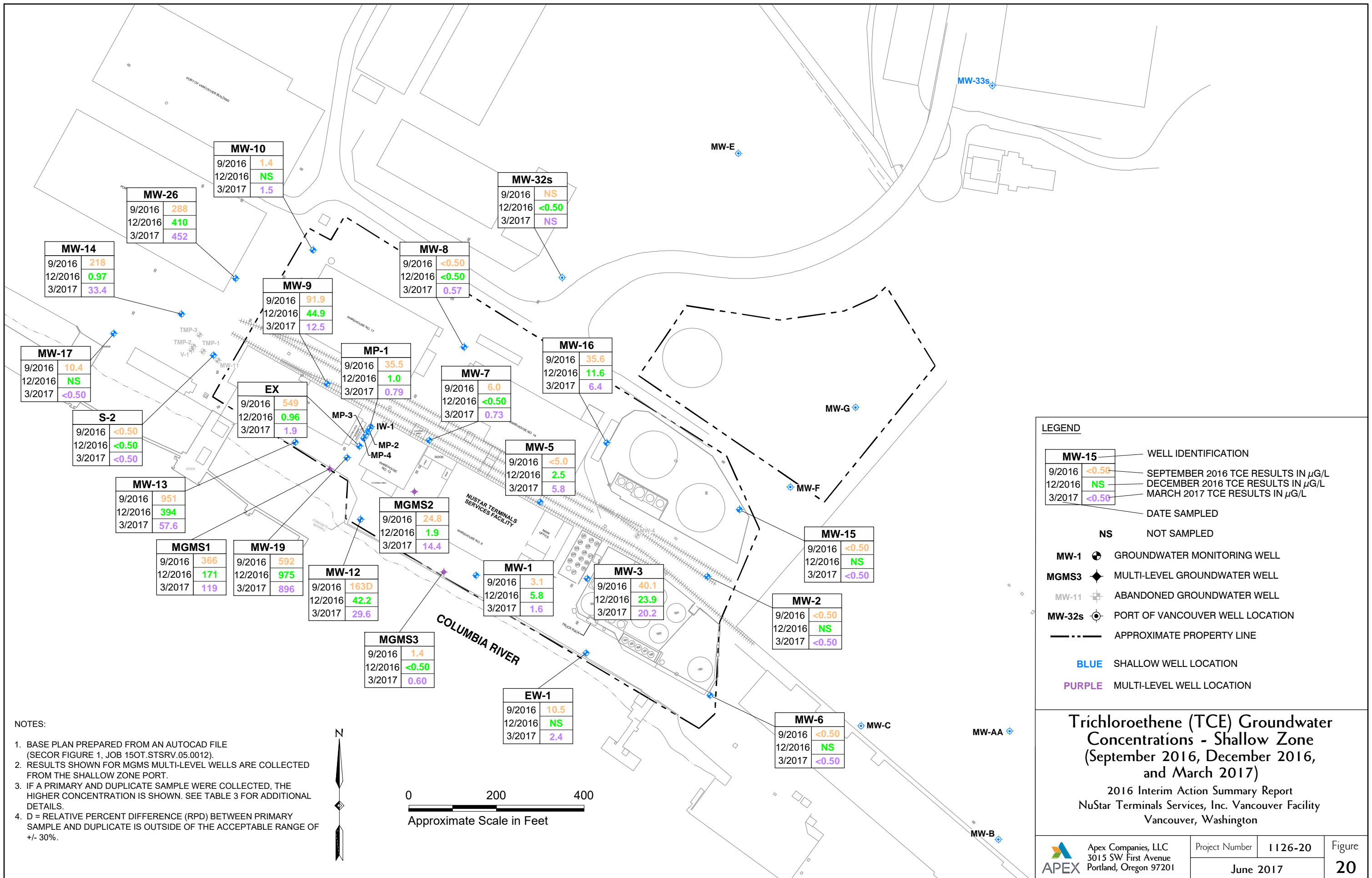
MGMS3		40 (Dup.)	60	101	132
PCE	1.4	1.1	7.0	13.8	
TCE	0.60	<0.50	6.0	9.6	
cis-1,2-DCE	1,050	0.62	7.0	7.9	
trans-1,2-DCE	6.0	<0.50	<0.50	<0.50	
VC	323	<0.50	<0.50	<0.50	
1,1-DCE	3.3	<0.50	<0.50	<0.50	
1,1-DCA	22.5	<0.50	<0.50	<0.50	

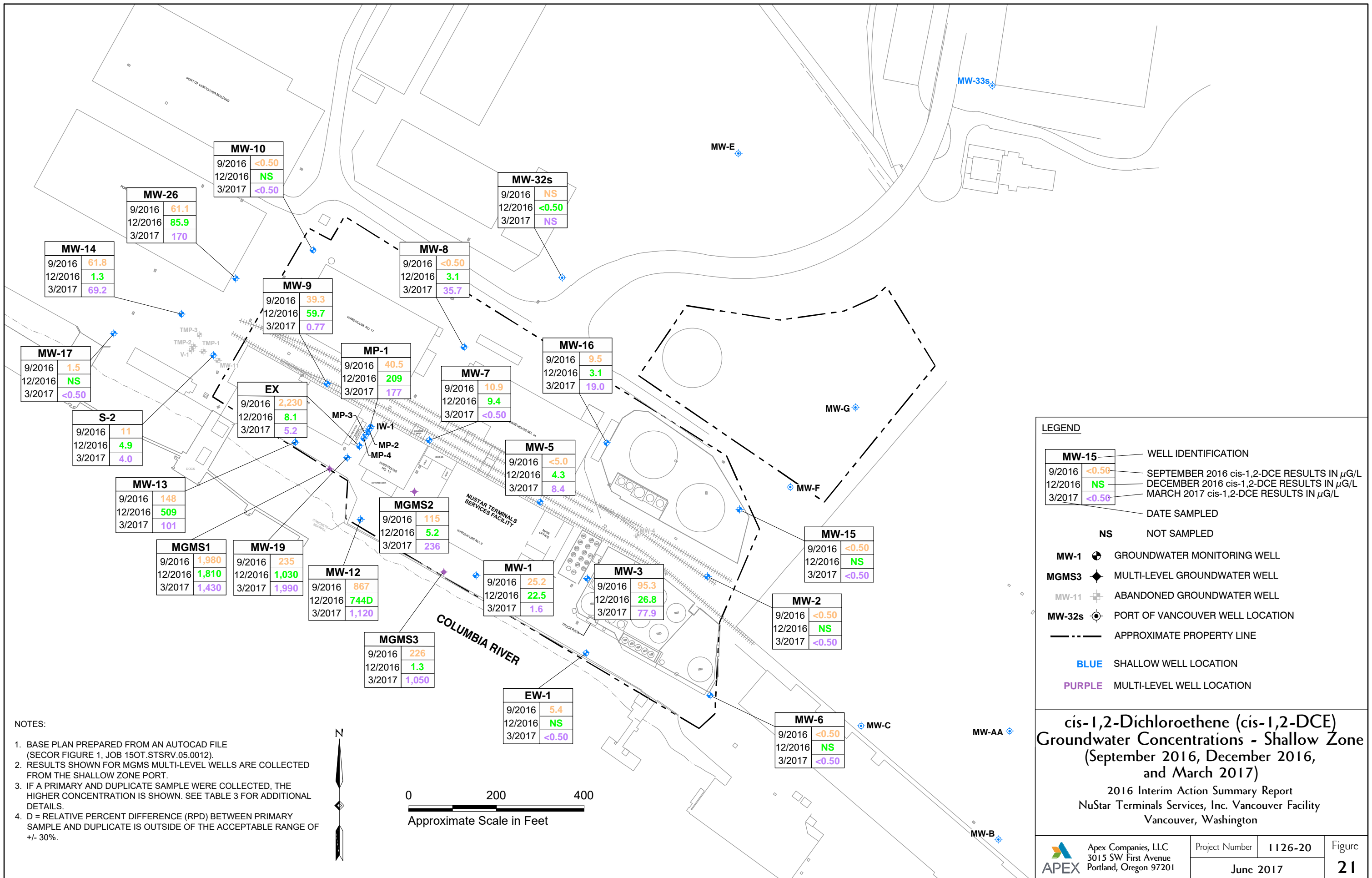
- NOTES:**
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. NOT DETECTED, WELL SAMPLED BUT NO CONSTITUENTS WERE DETECTED.
 3. IF A PRIMARY AND DUPLICATE SAMPLE WERE COLLECTED, THE HIGHER CONCENTRATION IS SHOWN. SEE TABLE 3 FOR ADDITIONAL DETAILS.

First Quarter 2017 Groundwater Concentrations - Shallow and Intermediate Zones (March 2017)

2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington





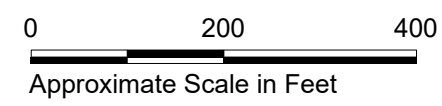


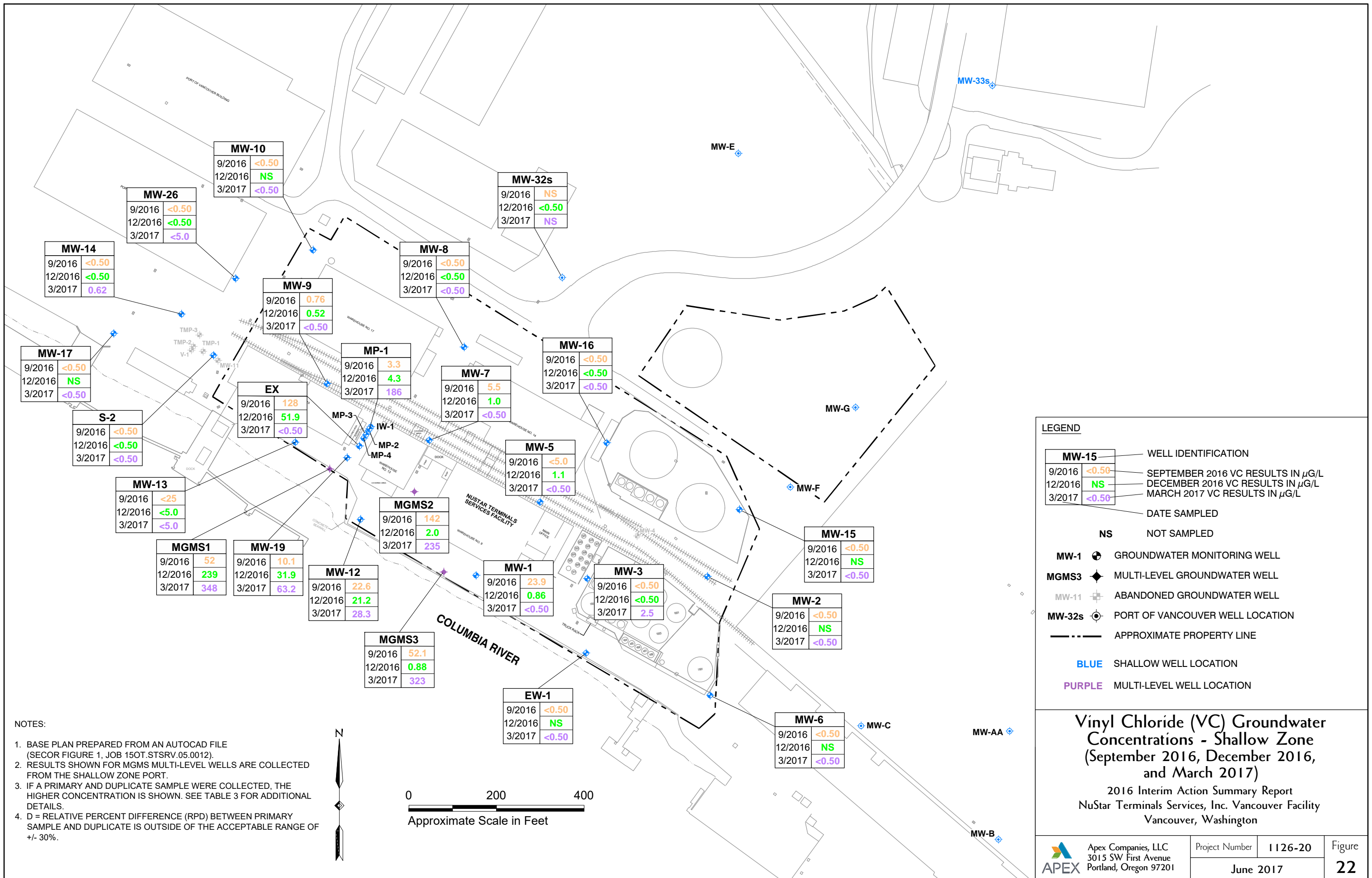
LEGEND

MW-15	WELL IDENTIFICATION
9/2016 <0.50	SEPTEMBER 2016 cis-1,2-DCE RESULTS IN µG/L
12/2016 NS	DECEMBER 2016 cis-1,2-DCE RESULTS IN µG/L
3/2017 <0.50	MARCH 2017 cis-1,2-DCE RESULTS IN µG/L
	DATE SAMPLED
NS	NOT SAMPLED
MW-1 (circle with dot)	GROUNDWATER MONITORING WELL
MGMS3 (diamond)	MULTI-LEVEL GROUNDWATER WELL
MW-11 (square with cross)	ABANDONED GROUNDWATER WELL
MW-32s (circle with dot and line)	PORT OF VANCOUVER WELL LOCATION
---	APPROXIMATE PROPERTY LINE
BLUE	SHALLOW WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

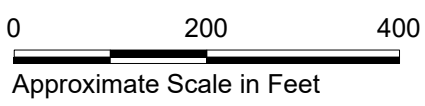
cis-1,2-Dichloroethene (cis-1,2-DCE)
Groundwater Concentrations - Shallow Zone
 (September 2016, December 2016,
 and March 2017)
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

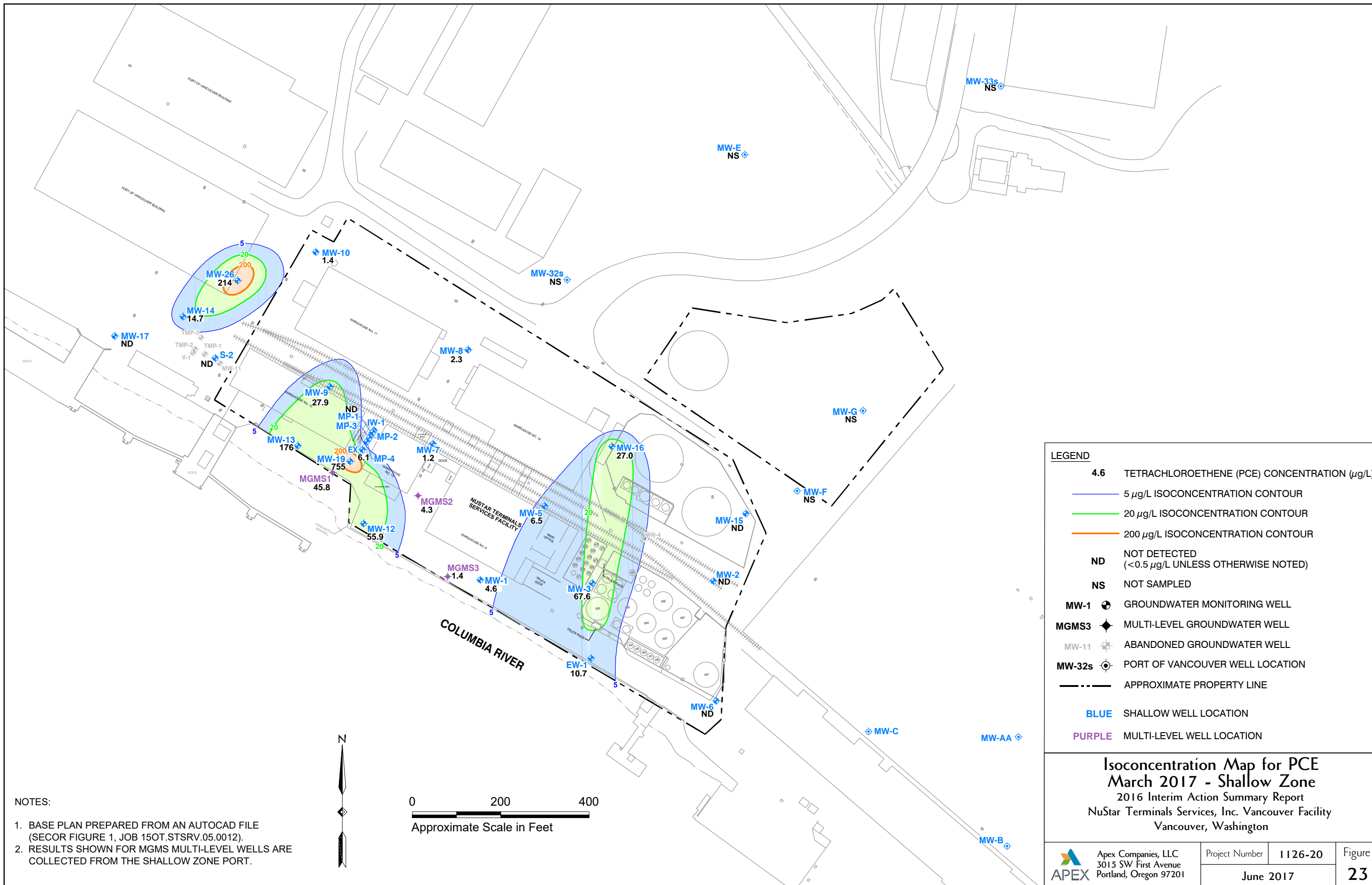
- NOTES:**
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. RESULTS SHOWN FOR MGMS MULTI-LEVEL WELLS ARE COLLECTED FROM THE SHALLOW ZONE PORT.
 3. IF A PRIMARY AND DUPLICATE SAMPLE WERE COLLECTED, THE HIGHER CONCENTRATION IS SHOWN. SEE TABLE 3 FOR ADDITIONAL DETAILS.
 4. D = RELATIVE PERCENT DIFFERENCE (RPD) BETWEEN PRIMARY SAMPLE AND DUPLICATE IS OUTSIDE OF THE ACCEPTABLE RANGE OF +/- 30%.

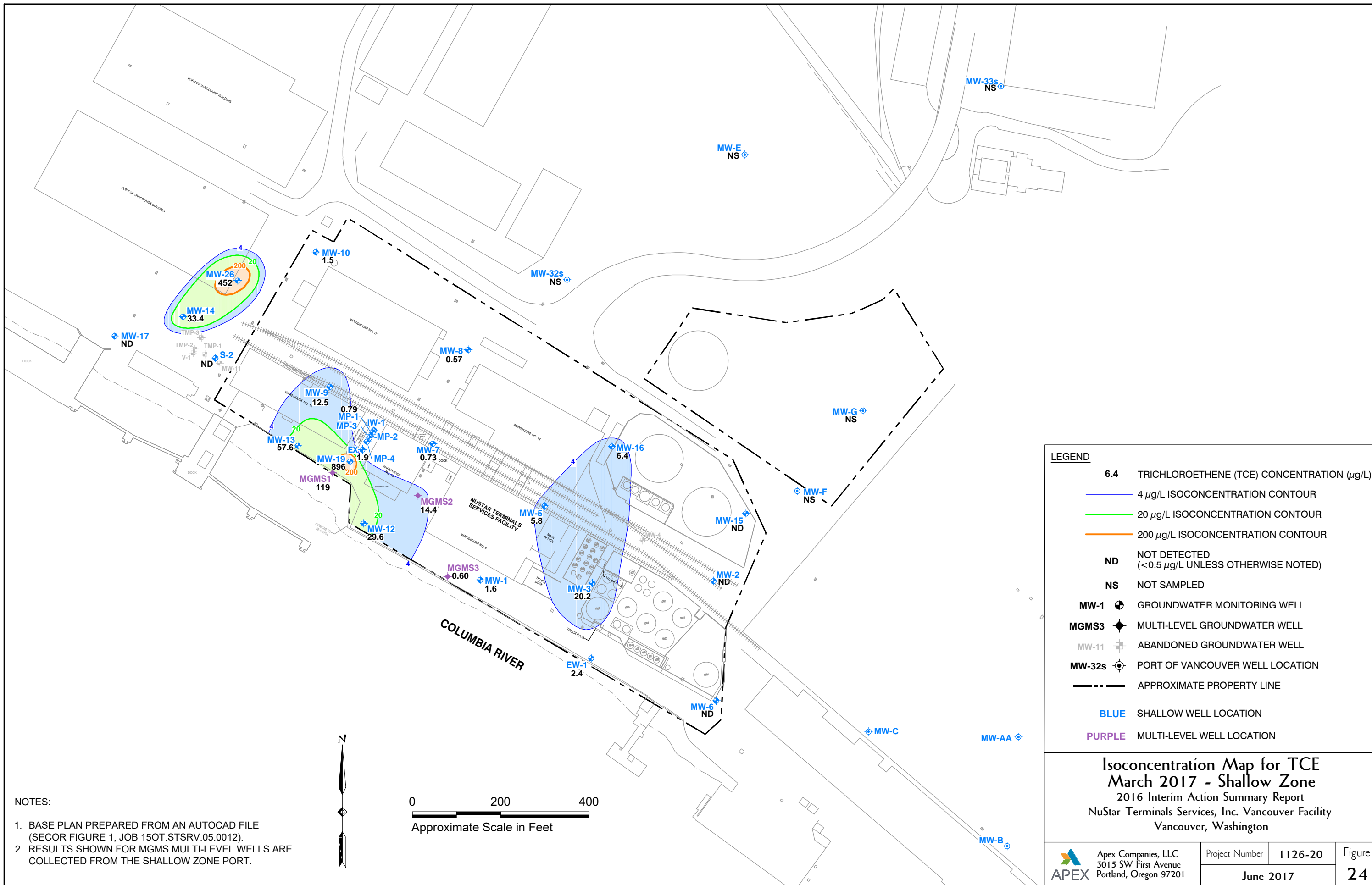


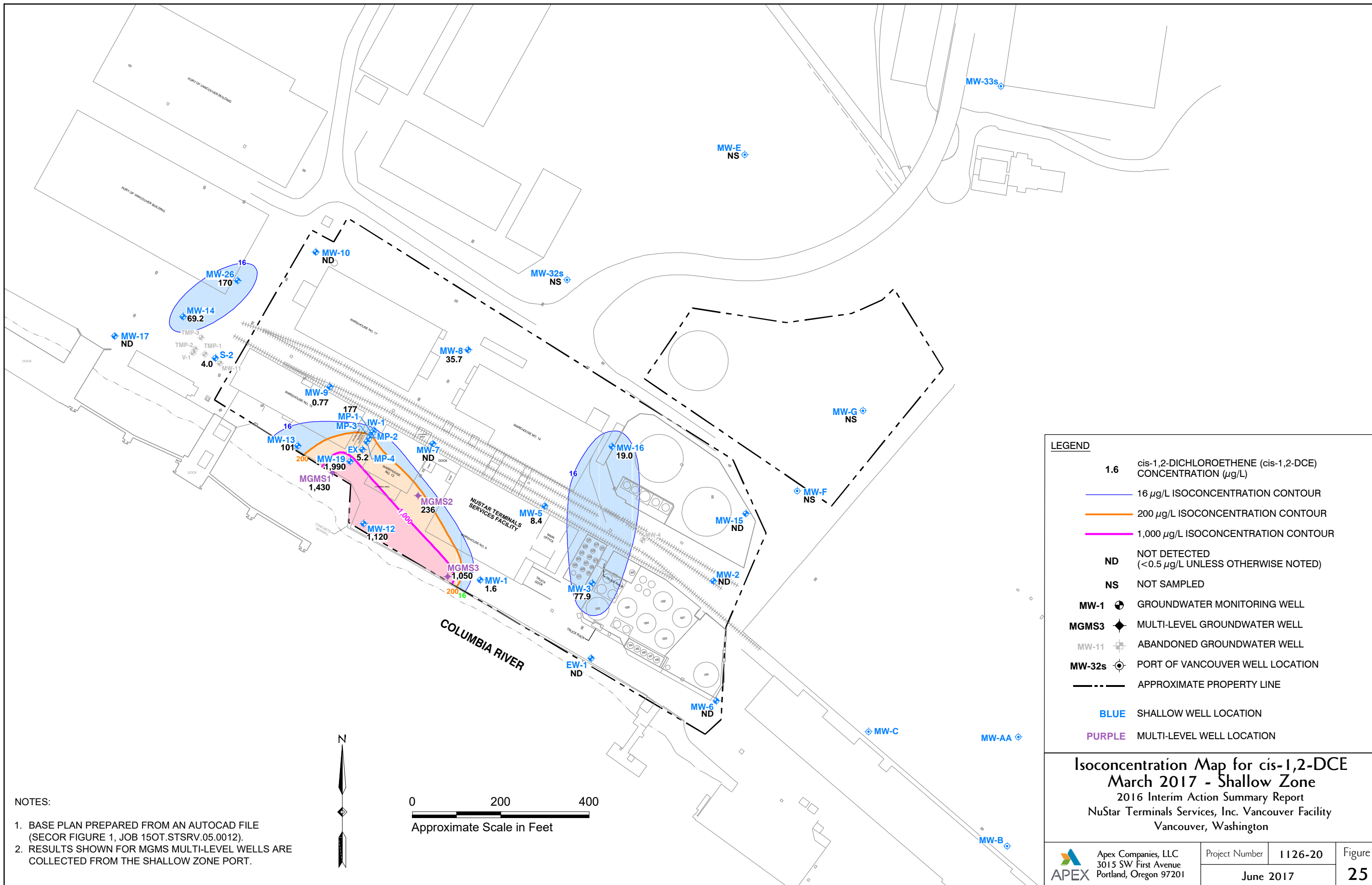


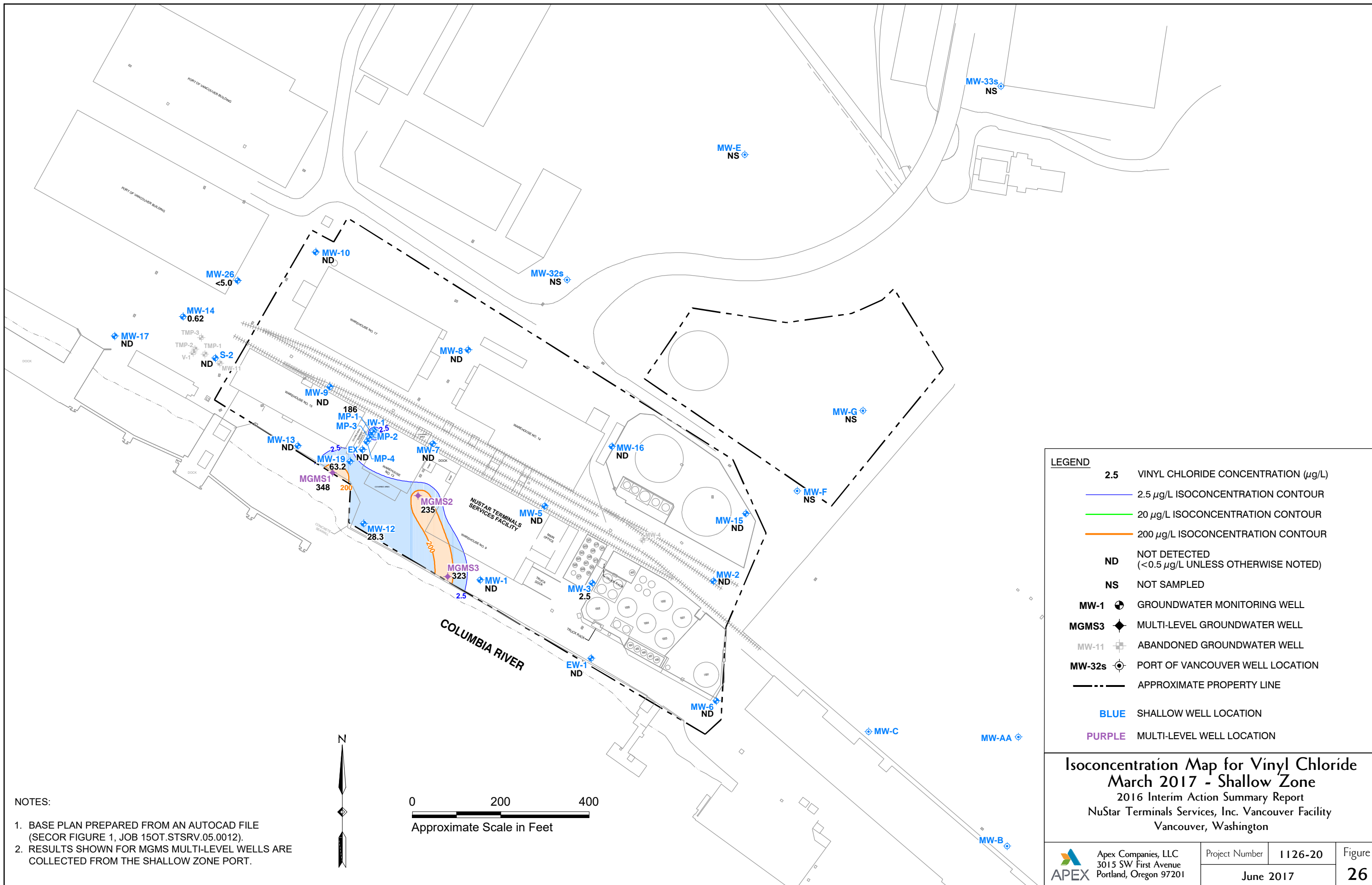
- NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. RESULTS SHOWN FOR MGMS MULTI-LEVEL WELLS ARE COLLECTED FROM THE SHALLOW ZONE PORT.
 3. IF A PRIMARY AND DUPLICATE SAMPLE WERE COLLECTED, THE HIGHER CONCENTRATION IS SHOWN. SEE TABLE 3 FOR ADDITIONAL DETAILS.
 4. D = RELATIVE PERCENT DIFFERENCE (RPD) BETWEEN PRIMARY SAMPLE AND DUPLICATE IS OUTSIDE OF THE ACCEPTABLE RANGE OF +/- 30%.











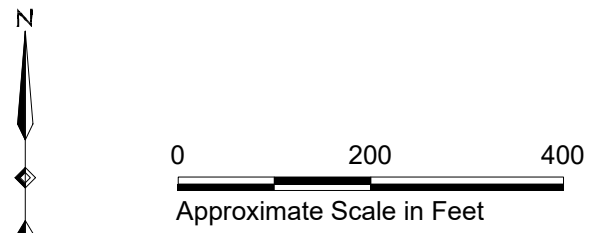
LEGEND

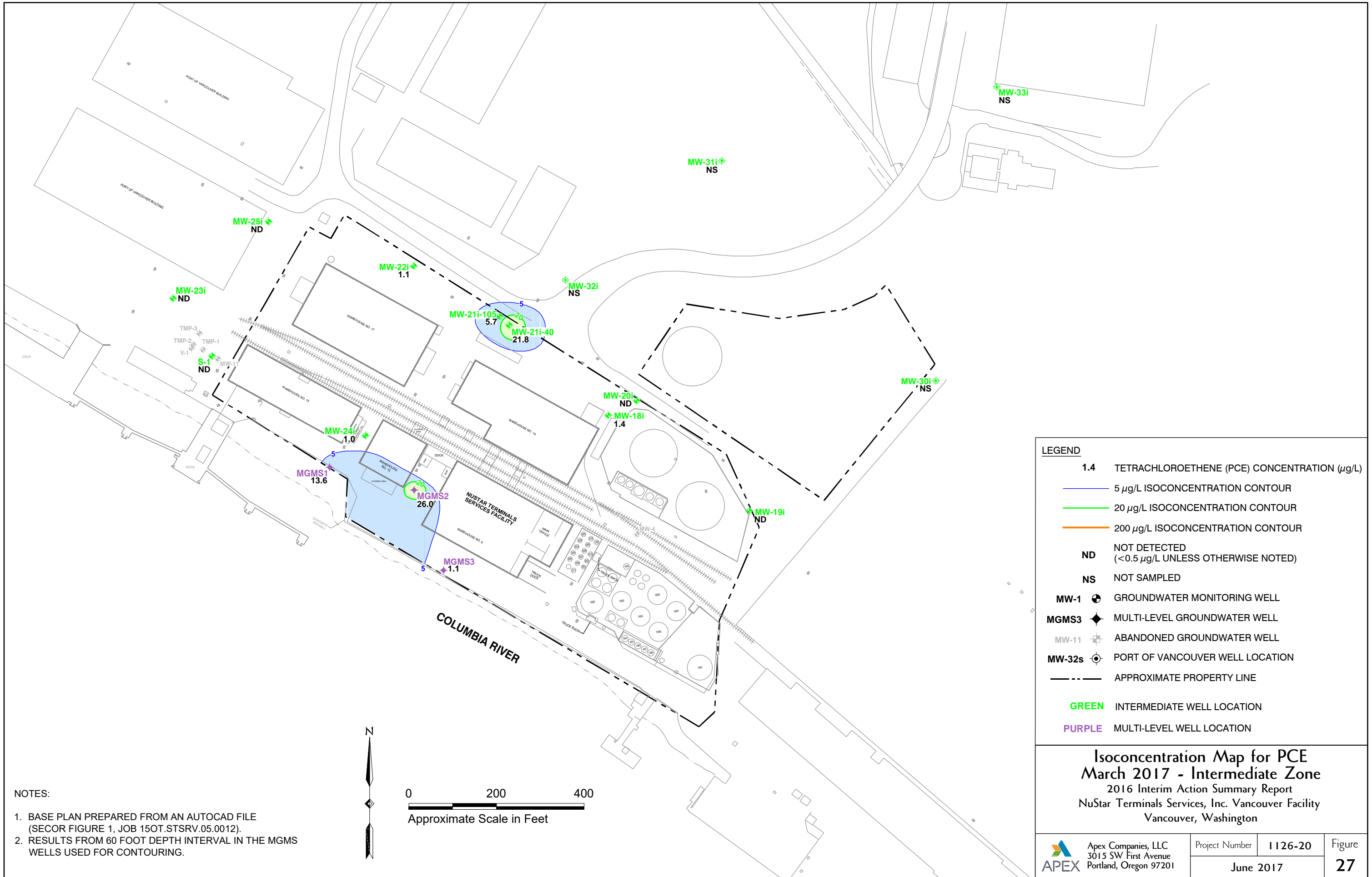
- 2.5 VINYL CHLORIDE CONCENTRATION (µg/L)
- 2.5 µg/L ISOCONCENTRATION CONTOUR
- 20 µg/L ISOCONCENTRATION CONTOUR
- 200 µg/L ISOCONCENTRATION CONTOUR
- ND NOT DETECTED (<0.5 µg/L UNLESS OTHERWISE NOTED)
- NS NOT SAMPLED
- MW-1 GROUNDWATER MONITORING WELL
- MGMS3 MULTI-LEVEL GROUNDWATER WELL
- MW-11 ABANDONED GROUNDWATER WELL
- MW-32s PORT OF VANCOUVER WELL LOCATION
- APPROXIMATE PROPERTY LINE
- BLUE SHALLOW WELL LOCATION
- PURPLE MULTI-LEVEL WELL LOCATION

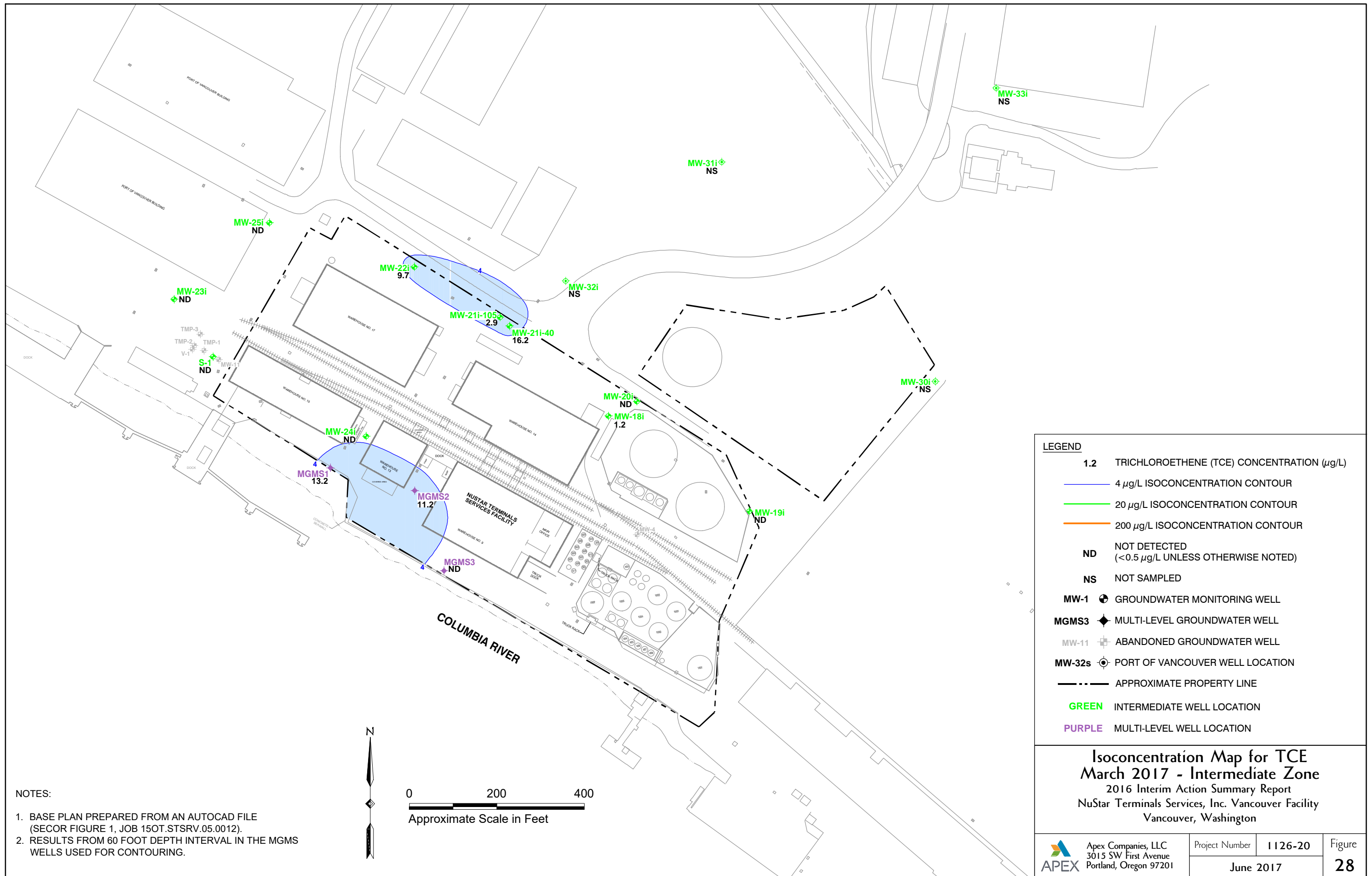
Isoconcentration Map for Vinyl Chloride
March 2017 - Shallow Zone
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. RESULTS SHOWN FOR MGMS MULTI-LEVEL WELLS ARE COLLECTED FROM THE SHALLOW ZONE PORT.



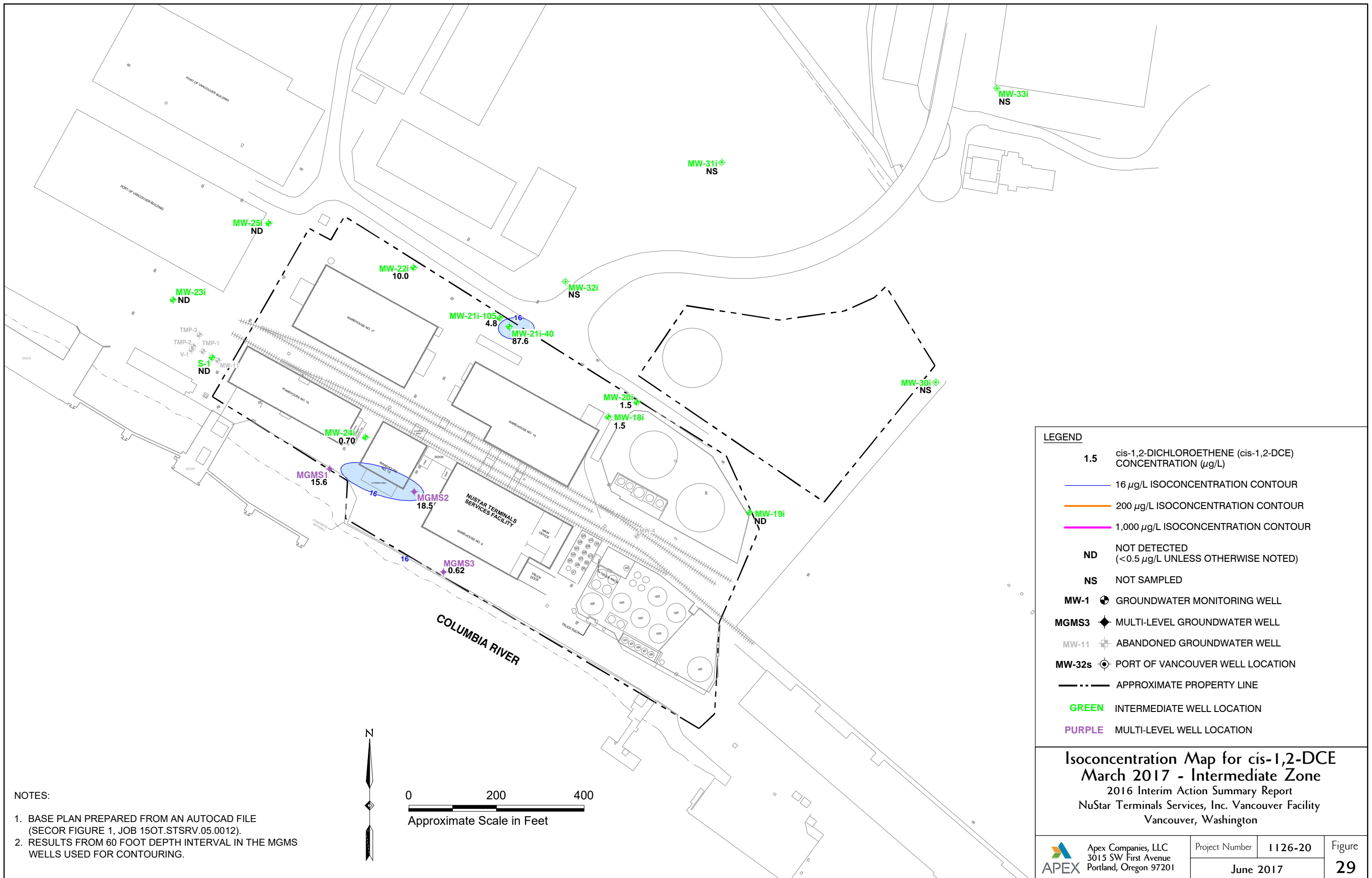




LEGEND	
1.2	TRICHLOROETHENE (TCE) CONCENTRATION (µg/L)
	4 µg/L ISOCONCENTRATION CONTOUR
	20 µg/L ISOCONCENTRATION CONTOUR
	200 µg/L ISOCONCENTRATION CONTOUR
ND	NOT DETECTED (<0.5 µg/L UNLESS OTHERWISE NOTED)
NS	NOT SAMPLED
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL LOCATION
	APPROXIMATE PROPERTY LINE
	INTERMEDIATE WELL LOCATION
	MULTI-LEVEL WELL LOCATION

Isoconcentration Map for TCE
March 2017 - Intermediate Zone
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

NOTES:
 1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
 2. RESULTS FROM 60 FOOT DEPTH INTERVAL IN THE MGMS WELLS USED FOR CONTOURING.



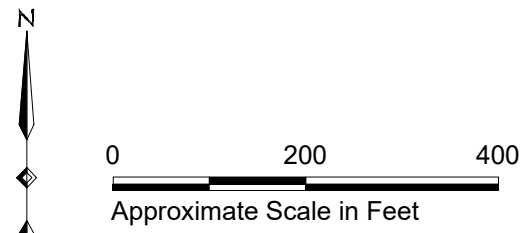
LEGEND

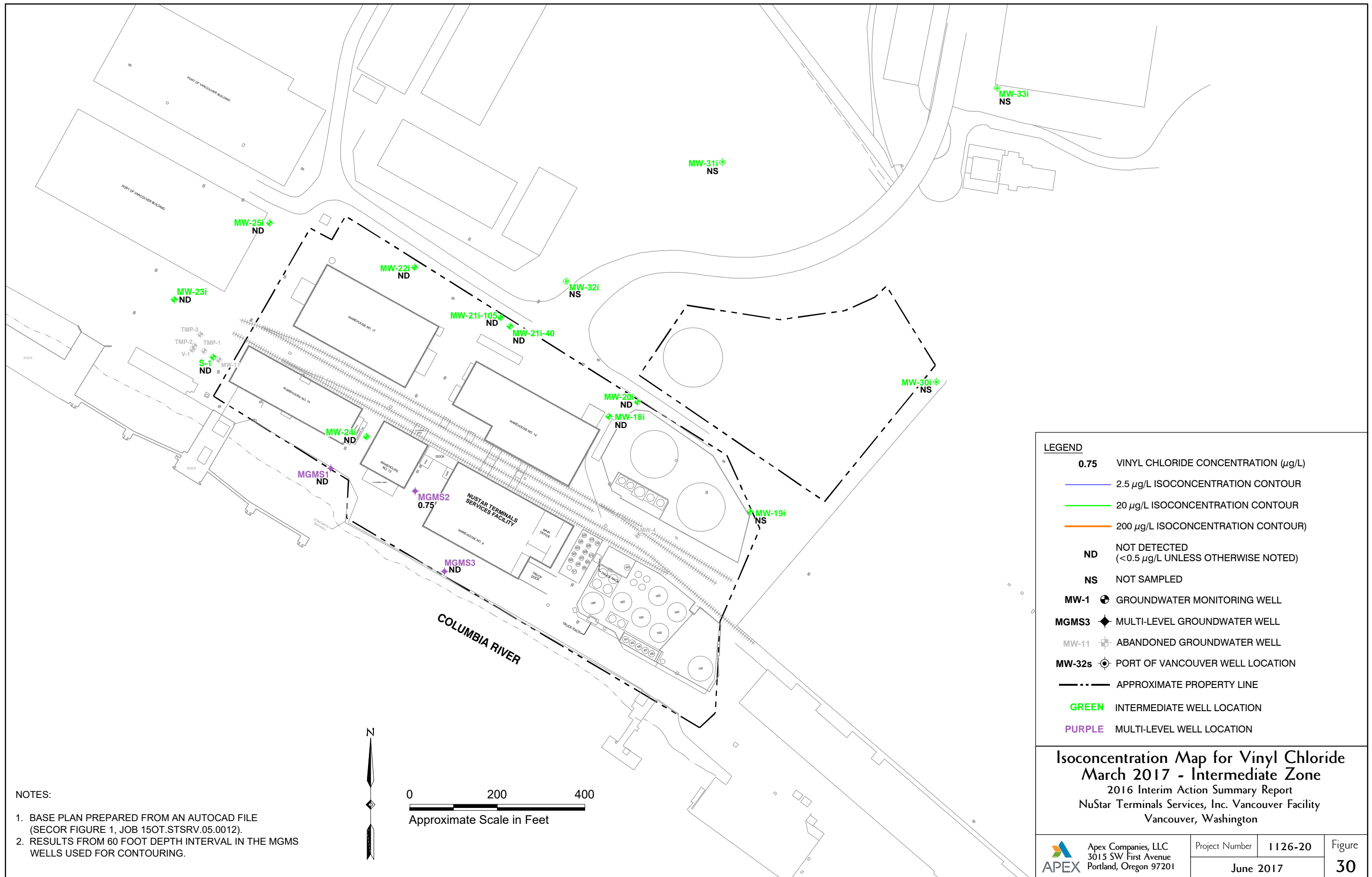
- 1.5 cis-1,2-DICHLOROETHENE (cis-1,2-DCE) CONCENTRATION (µg/L)
- 16 µg/L ISOCONCENTRATION CONTOUR
- 200 µg/L ISOCONCENTRATION CONTOUR
- 1,000 µg/L ISOCONCENTRATION CONTOUR
- ND NOT DETECTED (<0.5 µg/L UNLESS OTHERWISE NOTED)
- NS NOT SAMPLED
- MW-1 GROUNDWATER MONITORING WELL
- MGMS3 MULTI-LEVEL GROUNDWATER WELL
- MW-11 ABANDONED GROUNDWATER WELL
- MW-32s PORT OF VANCOUVER WELL LOCATION
- APPROXIMATE PROPERTY LINE
- GREEN INTERMEDIATE WELL LOCATION
- PURPLE MULTI-LEVEL WELL LOCATION

Isoconcentration Map for cis-1,2-DCE
March 2017 - Intermediate Zone
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. RESULTS FROM 60 FOOT DEPTH INTERVAL IN THE MGMS WELLS USED FOR CONTOURING.

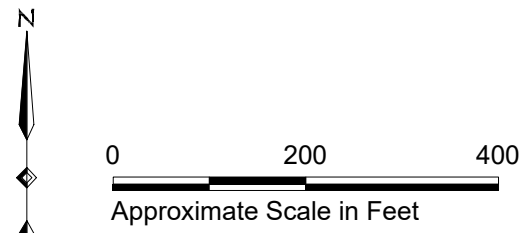




LEGEND	
0.75	VINYL CHLORIDE CONCENTRATION (µg/L)
— (Blue)	2.5 µg/L ISOCONCENTRATION CONTOUR
— (Green)	20 µg/L ISOCONCENTRATION CONTOUR
— (Orange)	200 µg/L ISOCONCENTRATION CONTOUR
ND	NOT DETECTED (<0.5 µg/L UNLESS OTHERWISE NOTED)
NS	NOT SAMPLED
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL LOCATION
---	APPROXIMATE PROPERTY LINE
GREEN	INTERMEDIATE WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Isoconcentration Map for Vinyl Chloride
March 2017 - Intermediate Zone
 2016 Interim Action Summary Report
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

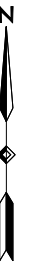
- NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
 2. RESULTS FROM 60 FOOT DEPTH INTERVAL IN THE MGMS WELLS USED FOR CONTOURING.



PCE in Shallow Zone 1Q 2008



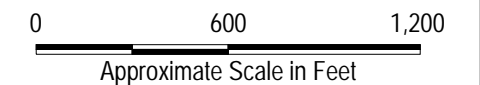
PCE in Shallow Zone 1Q 2017



LEGEND:

- ⊙ Swan Manufacturing (POV) Monitoring Well
- ⊙ ST Services (NuStar) Monitoring Well
- Property Line

1.16	Concentration in Groundwater (µg/L)
NA	Not Available; Well MW-26 Installed in 2011 *Groundwater data from boring AGP-55 are presented in 2008 figure to define the extent of Volatile Organic Compounds to the northwest. Well MW-26 was installed in 2011 at the same location as boring AGP-55.
	5µg/L Isoconcentration Contour (MCL)
	20µg/L Isoconcentration Contour (MCL)
	200µg/L Isoconcentration Contour (MCL)
	1,000µg/L Isoconcentration Contour (MCL)
	10,000µg/L Isoconcentration Contour (MCL)



NOTE:
Base Map, Legend and Scale from S.S. Papadopoulos & Associates, Inc. Expert Report of Dimitrios Vlassopoulos Port of Vancouver v. Cadet Manufacturing Company, May 2005

2008 and 2017 Isocontours of Tetrachloroethene (PCE) Concentrations in Shallow Zone Groundwater
2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

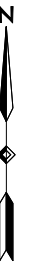
Project Number	1126-20
June 2017	

Figure
31

TCE in Shallow Zone 1Q 2008



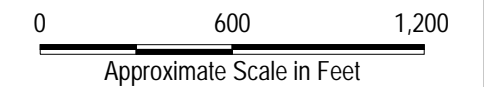
TCE in Shallow Zone 1Q 2017



LEGEND:

- ⊙ Swan Manufacturing (POV) Monitoring Well
- ⊙ ST Services (NuStar) Monitoring Well
- - - - - Property Line

19.9	Concentration in Groundwater (µg/L)
NA	Not Available; Well MW-26 Installed in 2011 *Groundwater data from boring AGP-55 are presented in 2008 figure to define the extent of Volatile Organic Compounds to the northwest. Well MW-26 was installed in 2011 at the same location as boring AGP-55.
—	4µg/L Isoconcentration Contour (MCL)
—	20µg/L Isoconcentration Contour (MCL)
—	200µg/L Isoconcentration Contour (MCL)
—	1,000µg/L Isoconcentration Contour (MCL)



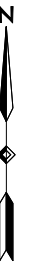
NOTE:
Base Map, Legend and Scale from S.S. Papadopoulos & Associates, Inc. Expert Report of Dimitrios Vlassopoulos Port of Vancouver v. Cadet Manufacturing Company, May 2005

2008 and 2017 Isocontours of Trichloroethene (TCE) Concentrations in Shallow Zone Groundwater
2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

cis-1,2-DCE in Shallow Zone 1Q 2008



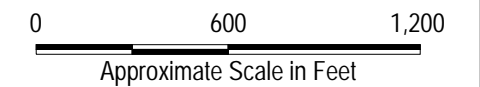
cis-1,2-DCE in Shallow Zone 1Q 2017



LEGEND:

- ⊙ Swan Manufacturing (POV) Monitoring Well
- ST Services (NuStar) Monitoring Well
- - - - - Property Line

5.75	Concentration in Groundwater (µg/L)
NA	Not Available; Well MW-26 Installed in 2011 *Groundwater data from boring AGP-55 are presented in 2008 figure to define the extent of Volatile Organic Compounds to the northwest. Well MW-26 was installed in 2011 at the same location as boring AGP-55.
—	16µg/L Isoconcentration Contour (MCL)
—	200µg/L Isoconcentration Contour (MCL)
—	1,000µg/L Isoconcentration Contour (MCL)



NOTE:
Base Map, Legend and Scale from S.S. Papadopoulos & Associates, Inc. Expert Report of Dimitrios Vlassopoulos Port of Vancouver v. Cadet Manufacturing Company, May 2005

2008 and 2017 Isocontours of cis-1,2-Dichloroethene (cis-1,2-DCE) Concentrations in Shallow Zone Groundwater
2016 Interim Action Summary Report
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

APEX Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1126-20
June 2017	

Figure
33

Appendix A

Photographs of Surface Water Passive Diffusion Bag Sampler and Sampling Platform

APPENDIX A

Project Name: Interim Action Summary Report
Project Number: 1126-20

Client: NuStar Terminals Services, Inc.
Location: Vancouver, Washington



Photo No: 1	
Photo Date: 08/22/2016	
Orientation: –	
Description: Surface water sampler. Note: passive diffusion bags are in the black mesh sleeves (for protection).	

Photo No: 2	
Photo Date: 08/22/2016	
Orientation: –	
Description: Surface water sampler being deployed off back of sampling vessel.	

Appendix B

Field Sampling Data Sheets

3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-18
FIELD REPORT NUMBER -
PAGE 1 OF 1
DATE 9/16/16

PROJECT	<u>Nuster Vane Injections</u>	ARRIVAL TIME	<u>0650</u>
LOCATION	<u>Vancouver, WA</u>	DEPARTURE TIME	
CLIENT	<u>Nuster</u>	WEATHER	<u>Overcast</u>
PURPOSE OF OBSERVATIONS	<u>Injection onsite</u>		
APEX REPRESENTATIVE	<u>Jim</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>CTS</u>	PERMIT NO.	<u>246313</u>
CONTRACTOR REP.	<u>Kyle King</u>	H&S REVIEW	<u>✓</u>

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0650 - Apex, CTS onsite
0700 - Contractor meeting 1st permit,
0720 - CTS works to move Injection truck to south end of small A-frame structure, complete moving equipment, begin placing Injection points @ Locations 66-70
0950 - Contractor onsite to remove CTS Baker Tank (no longer needed)
1120 - Complete placement of injection points @ 66-70, work to connect Injection hoses.
1200 - begin injections @ locations 66-70. Injection point #69, and #68, clogged, have to pull out and clean Injection points (clogged during 45-40 interval)
1245 - screens un-clogged continue injections
1636 Complete injections, work to clean up site
1700 - Complete removing rods
1730 - Offsite

CTS: Steven/Kyle onsite

BY

REVIEWED BY

APEX REPRESENTATIVE

APEX PROJECT MANAGER



3015 SW First Avenue
 Portland, Oregon 97201-4707
 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER 1126-18-003
 FIELD REPORT NUMBER —
 PAGE 1 OF —
 DATE 9/15/16

PROJECT	<u>Nustar Vancouver</u>	ARRIVAL TIME	<u>6700</u>
LOCATION	<u>Nustar Vancouver</u>	DEPARTURE TIME	<u>—</u>
CLIENT	<u>Nustar</u>	WEATHER	<u>Overcast</u>
PURPOSE OF OBSERVATIONS	<u>Injection Oversight</u>		
APEX REPRESENTATIVE	<u>Jim</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>CTS</u>	PERMIT NO.	<u>- 246335</u>
CONTRACTOR REP.	<u>Kyle</u>	H&S REVIEW	<u>✓</u>

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0700 - Onsite / Safety Meeting / get permits / Mob to work area, prep for Drill work. Mob EOS to Job site, and work to place rods for injections
 0800 - CTS works to set Injection points @ Locations 61, 60, 59, 58, and 57
 1000 - complete setting injection points, begin Injecting @ Locations 57 through 61
 1445 - complete injections @ above locations, work to pull out all rods
 1615 - complete pulling rods and patching injection locations work to delineate site for the night
 1700 - Offsite

BY

REVIEWED BY


 APEX REPRESENTATIVE

 APEX PROJECT MANAGER



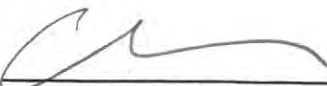
3015 SW First Avenue
 Portland, Oregon 97201-4707
 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER _____
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 9/14/16

PROJECT _____	ARRIVAL TIME _____
LOCATION <u>VANCOUVER</u>	DEPARTURE TIME _____
CLIENT <u>NSTAR</u>	WEATHER _____
PURPOSE OF OBSERVATIONS _____	
APEX REPRESENTATIVE <u>C. CLOUGH</u>	APEX PROJECT MANAGER _____
CONTRACTOR _____	PERMIT NO. _____
CONTRACTOR REP. _____	H&S REVIEW <u>✓</u>

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0655 - ON SITE, ATTEND SAFETY MEETING
 0730 - MOVE EQUIP OUT OF PART OF VANCOUVER WAREHOUSE.
 = PREP FOR INJECTIONS.
 0950 - INJECTIONS READY TO START.
 1025 - AIR KNIFING STARTS SOUTH OF A-FRAME WAREHOUSE
 (WEST END OF INJECTION AREA).
 1440 - INJECTIONS COMPLETED @ 52, 54, 55, 56, & 65. AIR KNIFING
 ALMOST COMPLETED.
 1635 - ALL HOLES ARE AIR KNIFED TO DEPTH. INJECTIONS FROM
 TODAY HAVE BEEN PATCHED. CASCADE IS CLEANING
 UP SITE & EQUIPMENT.

BY


 APEX REPRESENTATIVE

REVIEWED BY

 APEX PROJECT MANAGER

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Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-18
FIELD REPORT NUMBER -
PAGE 1 OF 1
DATE 9/13/16

PROJECT Mustat Vancouver ARRIVAL TIME 0645
LOCATION Port of Vancouver DEPARTURE TIME _____
CLIENT Mustat WEATHER Subby/Warm
PURPOSE OF OBSERVATIONS Injection, Air Knife oversight
APEX REPRESENTATIVE Jake Mussen APEX PROJECT MANAGER Stephanie S.
CONTRACTOR Cascade PERMIT NO. _____
CONTRACTOR REP. Kyle King H&S REVIEW ✓

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0645 Onsite H&S Meeting
0710 Issued work permits.
0730 Prep Equipment for the Day
Decoh Injection Screens,
Set up for Injections/Clean Injections
~~0930~~ Locations 1100 → 29, 30, 31, 32, 33
1115 begin Injecting 29, 30, 31, 32, 33
1200 continue to Air Knife @
57, 58, 59, 60, & 61
1545 Finish Injections & begin
pulling Rods - continue Air Knifing
@ 50 & 49
1645 → continue to pick up
abd back fill baking
1715 Patch Holes 29, 30, 31, 32, 33
with concrete → Move equipment
from Wake House 2385.
* Minimal amount left to move
in morning.
1815 → off site
11.5 HRS Onsite

BY _____
Jake Mussen
APEX REPRESENTATIVE

REVIEWED BY _____
APEX PROJECT MANAGER

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(503) 943-6357 Fax

PROJECT NUMBER 1126-18
FIELD REPORT NUMBER -
PAGE 1 OF 1
DATE 9/12/16

PROJECT MUSTAR Vancouver ARRIVAL TIME 0710
LOCATION Port of Vancouver DEPARTURE TIME _____
CLIENT Mustar WEATHER Sunny
PURPOSE OF OBSERVATIONS Injection/Air Knife Oversight
APEX REPRESENTATIVE Jake Munsey APEX PROJECT MANAGER Stephanie S.
CONTRACTOR Cascade PERMIT NO. _____
CONTRACTOR REP. Kyle King H&S REVIEW X

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0710 - arrive onsite 10 minutes late
because of back up on 26 East
0730 issued work permits
0740 Daily prep → HAST & JSA Review
0800 Begin Driving Reds @ H's 41, 42,
43 & 44
0930 - Begin Injections and Patch
Holes from Friday Injection activities
at 11, 37, 38, 39, & 40
1410 Finish Injections @
Clean up
1630 Move Injection Truck to
North side of Injection area
& prep for future injections.
→ Patch Holes @ 41, 42, 43, & 44.
1710 APEX OFFSITE, Cascade
remains onsite until 1810 to
Refill Trucks and bring back
to staging for the night
* Equipment will have to be out
BY 2385 by COB on 9/13/16

BY

REVIEWED BY

Jake Munsey
APEX REPRESENTATIVE

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(503) 943-6357 Fax

PROJECT NUMBER 1126-18
FIELD REPORT NUMBER _____
PAGE 1 OF 1
DATE 9/9/16

PROJECT MUSTAR Vancouver ARRIVAL TIME 0655
LOCATION POV DEPARTURE TIME _____
CLIENT MUSTAR WEATHER Sunny
PURPOSE OF OBSERVATIONS Injection Oversight
APEX REPRESENTATIVE Jake Mursey APEX PROJECT MANAGER Stephanie S.
CONTRACTOR Cascade PERMIT NO. _____
CONTRACTOR REP. Kyle King H&S REVIEW

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0700 APEX, Cascade on site
0730 MUSTAR ISSUED WORK PERMITS
0800 BEGIN DRIVING INJECTION
RODS
0830 Refusal @ #11(22) moved 1' to
The north clear + new #11 to S' and
Drove Rods
→ Drove Rods @ #40, 39, 37, 36, & 11
1030 → Begin INJECTIONS
→ Cascade clears INJECTION locations
67, 66, 70, 68, & 69
with POV
* 1415 Matt Graves asks me to answer
some questions in front of camera with
POV public relations personnel, Tom
with MUSTAR comes by immediately
and says they will have to go through
Aaron with MUSTAR before any filming
would be allowed at MUSTAR Facility
Per Lease agreement. POV personnel
leave Facility @ 1425
1530 FINISH INJECTIONS, pull rods,
clean up off site @ 1610

BY

REVIEWED BY

Jake Mursey
APEX REPRESENTATIVE

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PROJECT NUMBER 1126-18
FIELD REPORT NUMBER -
PAGE 1 OF 1
DATE 9/8/2016

PROJECT	<u>MUSTAR Vancouver</u>	ARRIVAL TIME	<u>0650</u>
LOCATION	<u>Vancouver, WA</u>	DEPARTURE TIME	
CLIENT	<u>MUSTAR</u>	WEATHER	<u>Partly Sunny</u>
PURPOSE OF OBSERVATIONS	<u>Injection</u>	<u>OVERSIGHT</u>	
APEX REPRESENTATIVE	<u>Jake Munsey</u>	APEX PROJECT MANAGER	<u>Stephanie S</u>
CONTRACTOR	<u>Cascade</u>	PERMIT NO.	
CONTRACTOR REP.	<u>Kyle King</u>	H&S REVIEW	

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0650 APEX & Cascade ONSITE
0700 HAS Meeting, JSA
0730 → MUSTAR ISSUES WORK PERMIT
0740 → PREP FOR INJECTIONS
0900 → MOVE INJECTION TRUCK INTO PLACE
Clear Injection Locations 14, 15, & 19
Drive Rods @ 14, 15 & 19
1015 → CHRIS CLOUGH ONSITE
Separate Contractors, Hagg & Shaw
Request Room TO UNLOAD 2 Large DROP BOXES.
We agree TO give them ~ 1 Hour TO complete.
Cascade & APEX CONTINUE TO PREP,
Patch completed INJECTIONS, & SWAP
Flow Meter back TO Hydrant ON
West Side OF INJECTION LOCATION
& Near Shoreline. UNION OKS WORK
1130 Begin INJECTIONS
1430 Finish INJECTIONS, Pull Rods
and Patch Holes
1530 JM OFFSITE IN ROUTE TO PACIFIC
meets. CHRIS CLOUGH REMAINS ONSITE

BY

REVIEWED BY

Jake Munsey
APEX REPRESENTATIVE

APEX PROJECT MANAGER

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PROJECT NUMBER 1126-18
FIELD REPORT NUMBER _____
PAGE 1 OF 1
DATE 9/17/16

PROJECT MUSTAR Vancouver ARRIVAL TIME 0700
LOCATION Vancouver DEPARTURE TIME _____
CLIENT Mustar WEATHER Overcast
PURPOSE OF OBSERVATIONS Injection Over Sight
APEX REPRESENTATIVE Jake Mubsey APEX PROJECT MANAGER Stephanie S
CONTRACTOR Cascade PERMIT NO. _____
CONTRACTOR REP. _____ H&S REVIEW _____

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0700 APEX, Cascade ONSITE
0730 SRT UP INJECTION SITE
INSIDE "LITTLE A"
0930 SWAP METER ON HYDRANT TO
CLOSER HYDRANT
1000 BEGIN INJECTIONS AND FINISH
PATCHING HOLES FROM 9/16/16

INJECTIONS COMPLETED 64, 63, 62
* INJECTION TRUCK INSIDE "LITTLE A"

1450 → PULL RODS & SCREENS

1530 → PATCH HOLED &
CLEAN UP
1630 → DEPART SITE

BY _____

REVIEWED BY _____

APEX REPRESENTATIVE

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PROJECT NUMBER 1126-18
FIELD REPORT NUMBER _____
PAGE 1 OF 1
DATE 9/16/16

PROJECT MUSTAK Vancouver ARRIVAL TIME 0700
LOCATION Vancouver DEPARTURE TIME _____
CLIENT MUSTAK WEATHER OVERCAST
PURPOSE OF OBSERVATIONS Injection Oversight
APEX REPRESENTATIVE Jake Munsey APEX PROJECT MANAGER Stephanie S.
CONTRACTOR Cascade PERMIT NO. _____
CONTRACTOR REP. _____ H&S REVIEW _____

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0700 APEX, Cascade Onsite
0730 Move Injection Rig TO
Reach #1's 13, 10, 7 & 2
1 Cascade Helper is Not Showing
UP 1 Helper is En Route from Boise
1100 Drive Injection Rods
at #1's 13, 10, 7 & 2
1330 Begin Injections
1620 Complete Injections
and Pull Rods
1700 Patch Holes
1800 Depart Site.

BY

REVIEWED BY

APEX REPRESENTATIVE

APEX PROJECT MANAGER

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(503) 943-6357 Fax

PROJECT NUMBER 1126-18
FIELD REPORT NUMBER _____
PAGE 1 OF _____
DATE 9/2/16

PROJECT MUSTAR Vancouver ARRIVAL TIME 0650
LOCATION Vancouver DEPARTURE TIME _____
CLIENT MUSTAR WEATHER Overcast
PURPOSE OF OBSERVATIONS Injection
APEX REPRESENTATIVE Jake Joel APEX PROJECT MANAGER Stephanie S.
CONTRACTOR Cascade PERMIT NO. _____
CONTRACTOR REP. Kyle King H&S REVIEW X

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0650 Apex, Cascade ONSITE
0700 MUSTAR Safety Meeting
0730 SETUP work zone
0800 continue Air Knifing Air Knife
in Little A Frame
* Drive injection rods @ 18, 20, 21, & 22
* Refusal @ #19 @ 23 Feet
* 1100 Begin injections

* 1400 Complete injections and pull rods

* 1500 clean work area, patch holes, secure
Exclusion zone.

1530, APEX & Cascade DEPART SITE

BY

REVIEWED BY

Jake Joel
APEX REPRESENTATIVE

APEX PROJECT MANAGER



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(503) 943-6357 Fax

PROJECT NUMBER 1126-18
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 9-1-16

0650 → Cascade, APEX onsite
0700 → Obtain Permit / HASP Review / JSA
0730 → Prepake For injections
* Moved Injections 15 & 16 North 5 feet to avoid concrete footing of cantilever wall. → Reason for 17' Refusal @ #'s 13, 15, 16, 17, 18, 19, 20, 21 & 22
0830
* Drive Rods & begin Injecting 45'-40' Interval @ #9, #16, #17, and #3
* Hand clear new 16, 17, 18, 19, 20, 21, & 22 approx 20' North of Guard Rail to avoid concrete footing, → Abandon 16, 17, 18, 19, 20, 21, & 22 that are too close to Sea wall
1200 - Speak w/ Tom w/ Nuster, Request is made to move drop box to new location along w/ Baker tank to accommodate Fertilizer Transfer.
1345 Complete Injections 9, 16, 17, & 3
1440 Add Vitamin B12 with chase H2O
1500 Prep for 9/2/16 activities. ?
1600 Move injection Rig to leave room for belt loader removal.
→ Pull Rods
1700 APEX and Cascade off site

BY

REVIEWED BY


APEX REPRESENTATIVE

APEX PROJECT MANAGER

0645 APEX ONSITE, Cascade ONSITE
 0700 MUSTAR PVE JOB Meeting
 0730 ISSUED WORK PERMITS
 0735 HASP Review
 0800 Setup & begin advancing
 Rods @ 16, 4, 5

0845 Refusal @ #16 (17") → TRY #17
 Refusal @ (17"), Refusal @ #18 (17")

1045 Drive Injection Rods & begin
 Injections @ #4, 5, 6.
 * 1140 Matt graves stops by 10:15min
 Clearing crew continues to clear
 #19, 20, & 21

1300 → MARK Locations To be Air Knifed
 1635 COMPLETE injections @ with #'s
 4, 5, 6 → ADD VITANIN B-12

1645 RETURN PERMITS and EXIT PORT

BY

REVIEWED BY

 APEX REPRESENTATIVE

 APEX PROJECT MANAGER

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Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-19
FIELD REPORT NUMBER _____
PAGE 1 OF _____
DATE 8/30/16

PROJECT	<u>Nustar Vancouver</u>	ARRIVAL TIME	<u>0645</u>
LOCATION	<u>Vancouver, WA</u>	DEPARTURE TIME	_____
CLIENT	<u>Nustar</u>	WEATHER	<u>Overcast</u>
PURPOSE OF OBSERVATIONS	<u>Injection Onsite</u>		
APEX REPRESENTATIVE	<u>Jim Jim</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>CTS</u>	PERMIT NO.	<u>246203</u>
CONTRACTOR REP.	<u>Kevin King</u>	H&S REVIEW	<u>✓</u>

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0650 - Onsite
0700 - safety meeting / get permit
0730 - mob to work area, delineate site / CTS works to clear more holes along the river, and remove tooling from yesterday's injection points. Work to set up on additional points for the Day.
0900 - Begin Injections @ #34, #33, #35, and #36. Additional CTS staff work to clear holes along the river down to 5'
1000 - Continue injections and work to clear more Inj. location
1100 - No sign of EOS in River
1200 - Continue injections / Air Knifing
1300 - Conduct O&M on North & South systems
1400 - complete O&M, Injections continue / 4 new holes along River cleared to 5' bgs
1530 complete Injections @ 34, 33, 35 and 36 work to secure site
1700 - offsite

11 Hrs

BY

REVIEWED BY

APEX REPRESENTATIVE

APEX PROJECT MANAGER



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 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER 1126-19
 FIELD REPORT NUMBER -
 PAGE 1 OF
 DATE 8/29/16

PROJECT	<u>Nustar Vancouver Injections</u>	ARRIVAL TIME	<u>0645</u>
LOCATION	<u>Nustar Vancouver / POU</u>	DEPARTURE TIME	<u> </u>
CLIENT	<u>Nustar</u>	WEATHER	<u>Sunny</u>
PURPOSE OF OBSERVATIONS	<u>Injection oversite</u>		
APEX REPRESENTATIVE	<u>Jm</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>CTS</u>	PERMIT NO.	<u>246196</u>
CONTRACTOR REP.	<u>Kyle King</u>	H&S REVIEW	<u>✓</u>

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0645 - Jm, CC, CTS onsite
 0700 - Contractor meeting, get permit, 2 CTS staff sit through Nustar safety orientation. total of 4 CTS staff onsite
 0745 - work to mob injection truck and EOS to begin injections @ locations: 1, 3, and 6 (see figure) all locations located along River.
 0900 - continue setup of injection area (create exclusion zone)
 1000 - CTS works to place rods down to 45' @ Injection locations along the River (Injection Interval will be 45' - 25' Sgs) confirm down wells @ immediate vicinity to be ~ 29' Sgs currently unable to vac/air knife New Locations due to dead battery on vac truck, CTS works to fix the problem
 1030 - complete placing injection points @ Location #3, work to place injection point @ Location #1
 1046 - CC offsite, due to no air knife operation activities - hit refusal @ 8' @ injection #1, and refusal @ 17.5' @ Location #6, work to set injection points @ locations #5, and location immediately NW of Injection #1,
 1230 - all Injection points (NW of #1, #5, and #3) have injection screen placed down to 45'. Work to setup Injection truck and begin injections
 1330 - begin injection @ locations: 1, 8, and 12 (see field figure) (all locations along River) Department of Ecology Enroute
 1400 - other 3 Drillers work to air knife locations in alley between buildings

BY

REVIEWED BY

 APEX REPRESENTATIVE

 APEX PROJECT MANAGER



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PROJECT NUMBER 1126-19
FIELD REPORT NUMBER _____
PAGE 2 OF 2
DATE 8/29/10

1400 - Craig w/ Ecology onsite / safety briefing, site walk
1500 - Craig offsite
1600 - continue injections, No Eos observed in river
1700 - continue pumping @ final interval to complete injections
1, 8, 12 No visible EOS in river.
1730 - offsite

BY

REVIEWED BY

APEX REPRESENTATIVE

APEX PROJECT MANAGER



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 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER 1126-18
 FIELD REPORT NUMBER _____
 PAGE 1 OF _____
 DATE 8/19/16

PROJECT	<u>Nustar Vancouver Inj</u>	ARRIVAL TIME	<u>0645</u>
LOCATION	<u>Nustar Vancouver</u>	DEPARTURE TIME	_____
CLIENT	<u>Nustar</u>	WEATHER	<u>Hot ~101°F</u>
PURPOSE OF OBSERVATIONS	<u>Inj boring clearing/air kerite</u>		
APEX REPRESENTATIVE	<u>Jm</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>CTS</u>	PERMIT NO.	<u>2461060</u>
CONTRACTOR REP.	<u>kyca</u>	H&S REVIEW	_____

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0645 - onsite
 0700 - H&S meeting
 0730 - get permit
 0800 - begin working to clear holes @ Inj locations
 1020 - clear 4 locations, walk to clear a second location
 1130 - clear second location, lunch break @ 1145
 1200 - work to clear 3rd location
 1300 - complete clearing @ Injection location #1, begin working to move H₂O / soil drums (12) to IOW storage area under overpass entrance into port as requested by Matt Graves (POV ENV Manager)

Complete clearing to 5' @ injection locations: #5, 3, 4, and 1
 turn in Nustar permit, sign out, begin moving drums @ 1315
 - A total of 12 55 gal drums to be moved to storage area
 * 6 drums of Decon H₂O (IOW)
 * 6 drums of soil from clearing holes down to 5'

1400 - work to offload drum @ storage area.
 1430 - complete offloading drums, secure work area
 1500 - offsite

BY

REVIEWED BY

 APEX REPRESENTATIVE

 APEX PROJECT MANAGER



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PROJECT NUMBER 1126-18
 FIELD REPORT NUMBER _____
 PAGE 1 OF _____
 DATE 8/18/16

PROJECT	<u>Nustar Injections</u>	ARRIVAL TIME	<u>0645</u>
LOCATION	<u>POV @ Nustar Van terminal</u>	DEPARTURE TIME	_____
CLIENT	<u>Nustar</u>	WEATHER	<u>Hot ~ 100°F</u>
PURPOSE OF OBSERVATIONS	<u>Injection Oversight</u>		
APEX REPRESENTATIVE	<u>Jim</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>CTS</u>	PERMIT NO.	<u>246164</u>
CONTRACTOR REP.	<u>Kyle</u>	H&S REVIEW	<u>✓</u>

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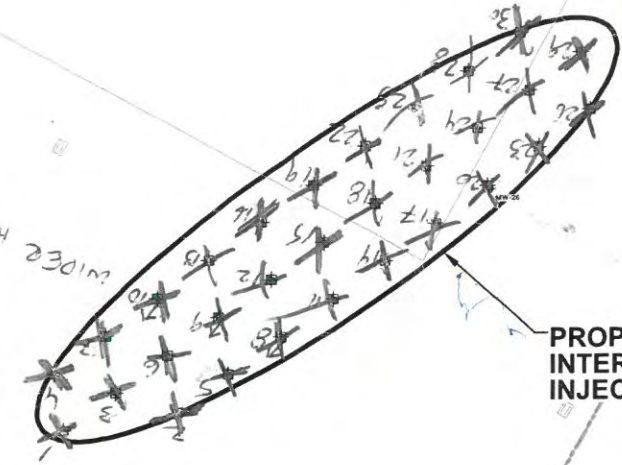
0645 - Onsite
 0700 - Contractor orientation meeting / Nustar safety training
 0800 - Work to sort out paper work between CTS and Nustar
 1000 - Drop box for soil drives onsite, Place Drop box outside building warehouse, under awning as instructed by Tom (Nustar maintenance tech)
 1030 - get permit(s) work to mob equip for air-knife / clearing over to Nustar from POV warehouse
 1100 - Jim collects soil sample for profiling from T&W onsite * 12 drums total onsite ready for pickup (all labeled)
 1120 - Mob drill rig for coring @ W. end of injection area, work to delineate site and begin coring of asphalt, 1130 - begin clearing locations on West end of site, continue working to clear locations
 1500 - first location clear, large cobbles / rip-rap down hole / concrete fill material, very hard to clear
 1600 - offsite / one hole cleared

BY _____ REVIEWED BY _____
 APEX REPRESENTATIVE APEX PROJECT MANAGER

DO NOT LOOSE!

X = Air Knives
O = Completed

WIDE PASS 150'±



PROPOSED INTERIM ACTION INJECTION AREA

1st Injection Round

PROPOSED INTERIM ACTION INJECTION AREA

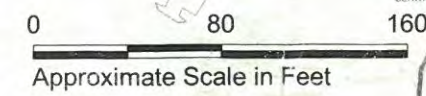
2008 GROUNDWATER INTERIM ACTION AREA

8-13, 22-24-25, 28, 30
7/29/16

14, 17-21, 23, 26-27, 29
7/28/16

15-16, 17, 21
7/27/16

- 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.
 4. LOCATIONS 1 THROUGH 6 DEPICT THE ORDER OF THE FIRST 6 BIOINJECTIONS. SEE SECTION 3.0 OF TEXT FOR ADDITIONAL INFORMATION.



360-942-1120

LEGEND:

- PROPOSED ENHANCED BIOREMEDIATION INJECTION POINT
- INJECTION #1 INITIAL INJECTION ORDER (SEE NOTE 4)
- 2011 INTERIM ACTION STANDARD OIL SUBSTRATE INJECTION POINT
- 2011 INTERIM ACTION 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

Enhanced Bioremediation Design
2015 Interim Action Work Plan
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1126-17	Figure	10
	September 2015			

CONCRETE SEWAGE

Refusal @ 13

Refusal @ 17

Refusal @ 22

INJECTION #6

Refusal @ 22



3015 SW First Avenue
 Portland, Oregon 97201-4707
 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER 11200-18
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 9/30/10

PROJECT	<u>3rd Q GWM</u>	ARRIVAL TIME	<u>0650</u>
LOCATION	<u>Vancouver, wa</u>	DEPARTURE TIME	<u>1550</u>
CLIENT	<u>Nustar Van</u>	WEATHER	<u>Fog</u>
PURPOSE OF OBSERVATIONS	<u>Gwm</u>		
APEX REPRESENTATIVE	<u>Kyle Kline</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>—</u>	PERMIT NO.	<u>246380</u>
CONTRACTOR REP.	<u>—</u>	H&S REVIEW	<u>yes</u>

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0650	- On site, sign in, safety meeting, get permit, H&S review
0720	- Prep truck for sampling, cal YSI
0735	- set up on MW-3
0754	- sample MW-3
0833	sample MW-15
1015	sample MW-24d
1112	sample MGMS2-60
1143	sample MGMS1-40
1215	sample MGMS1-60
1245	sample MGMS1-132
1325	sample MGMS3-40
1354	sample MGMS3-60
1425	sample MGMS3-110
1445	sample MGMS3-132
1515	- Empty purge Buckets Drum 100% Full
1525	- Equipment Blank Field Blank
1548	- Sign out turn in permit
1550	OFF site

BY _____ REVIEWED BY _____
 APEX REPRESENTATIVE APEX PROJECT MANAGER

WELL MONITORING DATA SHEET



Well I.D.	MGMS3-132	Job Number:	1126-18
Client:	Nustar Van	Date:	9/30/16
Project:	3rd @ GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	28.90	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump	Pump Intake Depth:	ms	Comments
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1435	—	—	29.21	0.20	7.46	18.98	179	2.43	140.7	—	C
1438	—	—	29.23		7.03	17.83	179	1.16	152.7	—	C
1441	—	—	29.23		7.00	17.76	178	0.92	155.4	—	C
1443	—	—	29.21	↓	6.98	17.71	177	0.85	158.6	—	C


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-132	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace
Sample Time:	1445	Final Depth to Water:	28.82	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40ml	HCl	HUOC	yes no	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MGMS 3-110	Job Number:	1126-18
	Client:	Nustar Van	Date:	9/30/16
	Project:	3rd Q GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	28.92	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B Pump LF		Pump Intake Depth:		ms		Comments			
Sampling Method:		LF		Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1413	—	—	28.95	0.15	7.32	21.89	175	1.86	156.1	—	C
1416	—	—	28.96		7.33	21.40	157	1.13	154.1	—	C
1419	—	—	28.93		7.31	21.38	156	1.06	155.4	—	C
1422	—	—	28.91	↓	7.29	21.39	158	0.95	155.9	—	C


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS 3-110	Sampling Flow Rate	0.15	Analytical Laboratory:	POCC	
Sample Time:	1425	Final Depth to Water:	28.92	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	HVOC	yes <u>no</u>			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MGMS3-60	Job Number:	1126-18
	Client:	Nustar Van	Date:	9/30/16
	Project:	3rd @ GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	28.91	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments		
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria	
1342	—	—	29.00	0.20	7.61	19.99	129	1.71	142.4	—	C	
1345	—	—	28.98	↓	7.27	19.64	112	1.69	154.2	—	C	
1348	—	—	28.97	↓	7.25	19.53	112	1.65	160.2	—	C	
1351	—	—	28.97	↓	7.23	19.41	111	1.64	163.6	—	C	

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-60	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1354	Final Depth to Water:	28.96	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MGMS3-40	Job Number:	1126-18
Client:	Nustar Van	Date:	9/30/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height:	—
Depth to Water:	28.20	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	-- Stabilization Criteria
1313	—	—	28.20	0.20	7.16	19.16	440	2.83	168.9	—	C
1316	—	—	28.22	↓	7.10	17.74	433	2.78	169.0	—	C
1319	—	—	28.21	↓	7.05	17.68	428	2.72	167.3	—	C
1322	—	—	28.22	↓	7.03	17.52	427	2.70	165.3	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-40	Sampling Flow Rate:	0.20	Analytical Laboratory:	Face	
Sample Time:	1325	Final Depth to Water:	28.18	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 x 40 ml	HCl	HUOC	yes (no)	—	—	MGMS3-40 Dup
3 x 40 ml	HCl	Ethane, Ethene	yes (no)	—	—	—
1 x 250	H2SO4	TOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	M6MS1-132	Job Number:	1126-18
Client:	MuStar Van	Date:	9/30/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	29.75	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump		Pump Intake Depth:		MS		Comments			
Sampling Method:		LP		Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1232	—	—	30.16	0.20	7.58	20.71	155	3.21	142.5	—	C
1235	—	—	30.06		7.36	20.52	147	1.37	159.6	—	C
1238	—	—	30.11		7.33	20.36	145	1.28	162.0	—	C
1241	—	—	30.10	✓	7.33	20.27	143	1.22	166.7	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	M6MS1-132	Sampling Flow Rate:	0.20	Analytical Laboratory:	Price	
Sample Time:	1245	Final Depth to Water:	29.78	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCl	HVOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MGM51-60	Job Number:	1126-18
Client:	NuStar Van	Date:	9/30/16
Project:	3rd & GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height:	—
Depth to Water:	29.64	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:	R Pump	Pump Intake Depth:	MS	Comments:	
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1204	—	—	29.60	0.20	7.95	19.60	203	4.12	141.0	—	C
1207	—	—	29.69		7.65	19.39	186	1.70	152.2	—	C
1210	—	—	29.70		7.63	19.46	184	1.67	154.5	—	C
1213	—	—	29.70	✓	7.62	19.53	183	1.68	155.3	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGM51-60	Sampling Flow Rate:	0.20	Analytical Laboratory:	PACE
Sample Time:	1215	Final Depth to Water:	29.68	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 X 40 ml	HCl	HVOC	yes no	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MGMS 1-40	Job Number:	1126-18
Client:	Nustar Van	Date:	9/30/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	28.50	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump			Pump Intake Depth:	MS					Comments	
Sampling Method:	LF			Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1130	—	—	28.78	0.25	6.41	17.84	2128	4.58	191.6	—	C
1133	—	—	28.64	↓	6.83	17.31	2058	4.95	187.4	—	C
1136	—	—	28.81	↓	6.86	17.19	2255	4.99	185.4	—	C
1139	—	—	28.88	↓	6.90	17.12	2255	5.09	184.2	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS1-40	Sampling Flow Rate:	0.25	Analytical Laboratory:	Pace	
Sample Time:	1143	Final Depth to Water:	28.50	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—	—
3 x 40 ml	HCl	Ethane, Ethene	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—	—
1 x 250	H ₂ SO ₄	TOC	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—	—
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.:	MGMS2-60	Job Number:	1126-18
Client:	Nustar Van	Date:	9/30/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	28.90	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1100	—	—	28.95	0.15	6.95	16.78	144	2.64	127.7	—	C
1103	—	—	28.96		6.91	16.89	148	1.61	130.9	—	C
1106	—	—	28.99		6.89	16.91	149	1.47	131.6	—	C
1109	—	—	28.99	∇	6.86	16.93	149	1.37	133.0	—	C


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-60	Sampling Flow Rate:	0.15	Analytical Laboratory:	Pace	
Sample Time:	11/2	Final Depth to Water:	29.01	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-24d	Job Number:	1126-18
	Client:	Nustar van	Date:	9/30/16
	Project:	3rd @ Gum	Sampler:	KK
	Weather:	Fog	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.34	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:		B. Pump		Pump Intake Depth:		MS		Comments			
Sampling Method:		LF		Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1000	—	—	30.31	0.20	6.98	14.16	235	5.89	134.9	—	C
1003	—	—	30.28	↓	7.23	14.39	233	2.46	130.2	—	C
1006	—	—	30.29	↓	7.22	14.28	232	1.18	122.4	—	C
1009	—	—	30.29	↓	7.18	14.04	232	1.07	121.3	—	C
1012	—	—	30.30	↓	7.16	13.92	235		122.5	—	C


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-24d	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1015	Final Depth to Water:	30.00	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-15	Job Number:	1126-18
	Client:	NuStar Van	Date:	9/30/16
	Project:	3rd @ GWH	Sampler:	KK
	Weather:	Fog	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	33.91	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
0820	—	—	34.20	0.20	7.19	13.22	458	4.13	148.8	—	C
0823	—	—	34.63	↓	6.81	13.55	467	1.98	151.2	—	C
0826	—	—	35.03	↓	6.78	13.53	467	1.96	153.2	—	C
0829	—	—	35.42	↓	6.76	13.45	466	1.89	154.7	—	C


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-15	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace
Sample Time:	0833	Final Depth to Water:	35.85	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40ml	HCl	HVOC	yes <u>no</u>	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-3	Job Number:	1126-18
	Client:	Nustar van	Date:	9/30/16
	Project:	3rd Q GWM	Sampler:	KK
	Weather:	Fog	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.90	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0742	—	—	30.36	0.20	7.25	13.81	546	3.23	156.0	—	C
0745	—	—	30.52	↓	6.84	13.68	490	1.62	160.3	—	C
0748	—	—	30.76	↓	6.81	13.64	488	1.42	164.8	—	C
0751	—	—	30.90	↓	6.79	13.63	485	1.31	167.1	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-3	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	0754	Final Depth to Water:	31.06	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS



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PROJECT NUMBER 1126-18
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 9/29/16

PROJECT	<u>3rd Q Gwm</u>	ARRIVAL TIME	<u>0650</u>
LOCATION	<u>vanouver, wa</u>	DEPARTURE TIME	_____
CLIENT	<u>Nustar vanouver</u>	WEATHER	<u>Sunny</u>
PURPOSE OF OBSERVATIONS	<u>Gwm</u>		
APEX REPRESENTATIVE	<u>KK</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	<u>—</u>	PERMIT NO.	<u>246376</u>
CONTRACTOR REP.	<u>—</u>	H&S REVIEW	<u>yes</u>


Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0650	On site, sign in, Safety meeting get permit, H+S Review, sign HASP
0700	Organize Truck for sampling, call YSI
0740	Set up on MW-25:
0800	Sample MW-25:
0905	Sample MW-2
0955	Sample EW-1
1126	Sample MW-5
1210	Sample MW-7
1258	Sample MW-9
1315	Try to open well covers in railroad
1345	Start monthly O+M
1525	Sample MGMS2-40
1607	Sample MGMS2-110
1625	Sample MGMS2-130
1645	Empty purge buckets
1650	Sign out, turn in permit OFF SITE

BY _____
 APEX REPRESENTATIVE

REVIEWED BY _____
 APEX PROJECT MANAGER

WELL MONITORING DATA SHEET

	Well I.D.	M6MS2-132	Job Number:	1126-18
	Client:	Mustar Van	Date:	9/29/16
	Project:	3rd Q GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height:	—
Depth to Water:	28.31	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B Pump		Pump Intake Depth:				ms		Comments	
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1616	—	—	28.21	0.20	6.67	19.84	184	3.84	158	—	C		
1619	—	—	28.38	↓	6.65	19.63	181	0.94	163.0	—	C		
1622	—	—	28.30	↓	6.64	19.43	180	0.76	165.1	—	C		
1625	—	—	28.20	↓	6.62	19.31	178	0.63	167.0	—	C		

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	M6MS2-132	Sampling Flow Rate:	0.20	Analytical Laboratory:	Page	
Sample Time:	1625	Final Depth to Water:	28.18	Did Well Dewater?:	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCL	HUOC	yes (no)	—	—	—
			yes	no		
			yes	no		
			yes	no		
			yes	no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MGMSD-110	Job Number:	1126-18
Client:	Nustor Van	Date:	9/29/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	28.44	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B. Pump		Pump Intake Depth:				MS		Comments	
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1556	—	—	28.61	0.20	7.16	19.45	260	2.44	170.5	—	C		
1559	—	—	28.31		7.13	18.30	173	1.69	168.5	—	C		
1602	—	—	28.48		7.08	17.95	171	1.89	175.5	—	C		
1605	—	—	28.35	∇	7.04	17.88	168	2.01	176.8	—	C		


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMSD-110	Sampling Flow Rate	0.20	Analytical Laboratory:	Face	
Sample Time:	1607	Final Depth to Water:	28.31	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	M6MSD-40	Job Number:	1126-18
	Client:	Nustar van	Date:	9/29/16
	Project:	3rd @ GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	28.12	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1515	—	—	27.65	0.20	6.94	19.66	1637	4.64	192.3	—	C
1518	—	—	27.52	↓	6.97	18.86	1619	5.07	193.2	—	C
1521	—	—	27.32	↓	6.94	18.60	1608	5.11	194.2	—	C
1524	—	—	27.61	↓	6.96	18.48	1595	5.16	194.5	—	C


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	M6MSD-40	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace
Sample Time:	1525	Final Depth to Water:	28.00	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3x40ml	HCl	HVOC	yes no		
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-5	Job Number:	1126-18
	Client:	Mustar van	Date:	9/29/16
	Project:	3rd Q GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.41	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump				Pump Intake Depth:	ms				Comments	
Sampling Method:	LF				Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1115	—	—	29.46	0.20	6.91	17.92	761	3.52	166.3	—	C
1118	—	—	29.48	↓	6.73	17.56	800	1.64	168.4	—	C
1121	—	—	29.49	↓	6.70	17.42	800	1.49	169.7	—	C
1124	—	—	29.50	↓	6.68	17.37	802	1.33	170.4	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	0.20	Analytical Laboratory:	Page	
Sample Time:	1126	Final Depth to Water:	29.52	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	H00C	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-2	Job Number:	1126-18
Client:	Nustar Van.	Date:	9/29/16
Project:	3rd @ GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.28	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B. Pump		Pump Intake Depth:				MS		Comments
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria	
0852	—	—	29.38	0.2	6.55	15.23	563	3.73	140.3	—	C	
0855	—	—	29.64		6.17	14.66	575	2.04	158.2	—	C	
0858	—	—	29.78		6.14	14.61	577	1.92	159.8	—	C	
0901	—	—	29.91	↓	6.12	14.58	577	1.86	160.1	—	C	


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-2	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	0905	Final Depth to Water:	30.06	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40m	HCl	HVOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.: <u>MW-25i</u>	Job Number: <u>1126-18</u>
	Client: <u>Nustar Van.</u>	Date: <u>9/29/16</u>
	Project: <u>3rd Q Gwm</u>	Sampler: <u>KK</u>
	Weather: <u>Sunny</u>	Time In/Out: _____

WELL DATA

Well Depth: _____	Well Diameter: <u>2"</u>	Water Height: _____
Depth to Water: <u>29.14</u>	Screened Interval: _____	x Multiplier: _____
Water Column Length: _____	Depth to Free Product: _____	x Casing Volumes: _____
Purge Volume: _____	Free Product Thickness: _____	= Purge Volume: _____
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>B. Pump</u>				Pump Intake Depth: <u>MS</u>				Comments			
Sampling Method: <u>LF</u>				Tubing Type: <u>Dedicated</u>							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
<u>0747</u>	<u>—</u>	<u>—</u>	<u>29.09</u>	<u>0.20</u>	<u>7.90</u>	<u>14.76</u>	<u>148</u>	<u>4.50</u>	<u>146.1</u>	<u>—</u>	<u>SC</u>
<u>0750</u>	<u>—</u>	<u>—</u>	<u>29.09</u>	<u> </u>	<u>7.04</u>	<u>14.71</u>	<u>174</u>	<u>2.05</u>	<u>158.4</u>	<u>—</u>	<u>SC</u>
<u>0753</u>	<u>—</u>	<u>—</u>	<u>29.09</u>	<u> </u>	<u>7.05</u>	<u>14.72</u>	<u>176</u>	<u>1.94</u>	<u>164.2</u>	<u>—</u>	<u>SC</u>
<u>0756</u>	<u>—</u>	<u>—</u>	<u>29.09</u>	<u>↓</u>	<u>7.</u>	<u>14.76</u>	<u>177</u>	<u>1.86</u>	<u>168.2</u>	<u>—</u>	<u>SC</u>

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: <u>MW-25i</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>Pace</u>	
Sample Time: <u>0800</u>	Final Depth to Water: <u>29.21</u>	Did Well Dewater? <u>NO</u>	
# Containers/Type	Preservative	Analysis/Method	Field Filtered
<u>3 x 40 ml</u>	<u>HCl</u>	<u>HVOC</u>	yes <u>no</u>
			yes no
			yes no
			yes no
			yes no
			yes no

COMMENTS



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 (503) 943-6357 Fax

PROJECT NUMBER _____
 FIELD REPORT NUMBER _____
 PAGE 1 OF _____
 DATE 9/28/16

PROJECT	<u>3rd Q Gwm</u>	ARRIVAL TIME	<u>0650</u>
LOCATION	<u>Vancouver WA</u>	DEPARTURE TIME	_____
CLIENT	<u>Nustar Vancouver</u>	WEATHER	<u>Sunny</u>
PURPOSE OF OBSERVATIONS	<u>Gwm</u>	APEX PROJECT MANAGER	<u>J. Salisbury</u>
APEX REPRESENTATIVE	<u>KK</u>	PERMIT NO.	<u>246350</u>
CONTRACTOR	<u>_____</u>	H&S REVIEW	<u>yes</u>
CONTRACTOR REP.	<u>_____</u>		

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0650 - on site, sign in, Safety Meeting, Get permit, H&S Review
 0725 - organize Truck for sampling, call USI
 0810 - Set up on MW-13
 0833 - sample MW-13
 0930 - sample EX-1
 1030 - sample MP-1
 1115 - sample MW-24;
 1210 - sample MW-22.
 1250 - sample MW-16
 1330 - sample MW-18;
 1438 - sample MW-20.
 1518 - sample MW-19;
 1608 - sample MW-6
 1620 - Empty buckets into Drum
 1635 - sign out Turn in Permit
 1640 - OFF site

BY _____ REVIEWED BY _____
 APEX REPRESENTATIVE _____ APEX PROJECT MANAGER _____

WELL MONITORING DATA SHEET



Well I.D.	MW-6	Job Number:	1126-18
Client:	Nustar van	Date:	9/28/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	SUNNY	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	28.35	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B, Pump	Pump Intake Depth:	ms	Comments
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1552	—	—	28.42	0.20	6.98	19.12	519	3.33	124.6	—	
1555	—	—	28.52	↓	6.35	16.92	480	1.52	136.2	—	
1558	—	—	28.56	↓	6.05	16.20	440	0.96	137.2	—	
1601	—	—	28.61	↓	6.04	16.18	436	0.87	134.1	—	
1604	—	—	28.59	↓	6.03	16.12	428	0.72	132.1	—	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-6	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace
Sample Time:	1608	Final Depth to Water:	28.38	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 X 40 ml	HCl	HVOC	yes (no)	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.:	MW-19i	Job Number:	1126-18
Client:	Nustar Van	Date:	9/28/10
Project:	3rd Q Gwm	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height:	—
Depth to Water:	29.85	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B. Pump		Pump Intake Depth:				MS		Comments
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<< Stabilization Criteria	
1502	—	—	29.84	0.20	7.06	19.87	180	2.21	112.4	—	C	
1505	—	—	29.81	↓	6.48	19.61	180	1.95	133.7	—	C	
1508	—	—	29.81	↓	6.27	19.27	181	1.51	140.9	—	C	
1511	—	—	29.80	↓	6.24	19.21	181	1.42	141.6	—	C	
1514	—	—	29.80	↓	6.21	19.15	181	1.34	142.9	—	C	


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19i	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1518	Final Depth to Water:	29.75	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	HVOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-20i	Job Number:	1126-18
	Client:	NuStar van	Date:	9/28/16
	Project:	3rd @ GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.66	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				B. Pump				Pump Intake Depth:				MS				Comments			
Sampling Method:				LF				Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color Other Remarks								
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria								
1426	—	—	29.65	0.20	7.11	19.23	133	2.68	99.8	—	C								
1429	—	—	29.65	↓	6.08	16.53	130	2.12	145.2	—	C								
1432	—	—	29.65	↓	6.05	16.42	128	2.10	147.3	—	C								
1435	—	—	29.65	↓	6.03	16.25	129	2.11	147.9	—	C								

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-20i	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace		
Sample Time:	1438	Final Depth to Water:	29.65	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3 x 40 ml	HCl	HVOC	yes <input checked="" type="radio"/>	—	—	—	
			yes no				
			yes no				
			yes no				
			yes no				

COMMENTS

--

WELL MONITORING DATA SHEET

	Well I.D.	MW-18i	Job Number:	1126-18
	Client:	Nuster van	Date:	9/28/16
	Project:	3rd Q GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	30.06	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1317	—	—	30.08	0.20	6.94	18.76	119	3.25	101.8	—	C
1320	—	—	30.08		6.48	17.81	116	2.77	124.6	—	C
1323	—	—	30.10		6.35	16.84	112	2.45	137.1	—	C
1326	—	—	30.08		6.33	16.74	110	2.40	139.0	—	C
1329	—	—	30.08	√	6.31	16.60	110	2.35	140.2	—	C


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-18i	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1330	Final Depth to Water:	30.08	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)	—	—	—
			yes	no		
			yes	no		
			yes	no		
			yes	no		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.: <u>MW-16</u>	Job Number: <u>1126-18</u>
	Client: <u>Mustar Van</u>	Date: <u>9/28/16</u>
	Project: <u>3rd Q GWM</u>	Sampler: <u>KK</u>
	Weather: <u>Sunny</u>	Time In/Out: _____

WELL DATA

Well Depth: <u>—</u>	Well Diameter: <u>4"</u>	Water Height: <u>—</u>
Depth to Water: <u>29.24</u>	Screened Interval: <u>—</u>	x Multiplier: <u>—</u>
Water Column Length: <u>—</u>	Depth to Free Product: <u>—</u>	x Casing Volumes: <u>—</u>
Purge Volume: <u>—</u>	Free Product Thickness: <u>—</u>	= Purge Volume: <u>—</u>
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>B. Pump</u>	Pump Intake Depth: <u>m5</u>	Comments: _____
Sampling Method: <u>LF</u>	Tubing Type: <u>Dedicated</u>	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
1239	—	—	29.37	0.20	7.05	17.64	304	3.48	116.5	—	AC
1242	—	—	29.50	↓	6.46	15.88	293	2.11	129.9	—	AC
1245	—	—	29.50	↓	6.45	15.85	291	2.01	131.6	—	AC
1248	—	—	29.51	↓	6.42	15.80	288	1.92	131.9	—	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: <u>MW-16</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>Pace</u>
Sample Time: <u>1250</u>	Final Depth to Water: <u>29.45</u>	Did Well Dewater?: <u>NO</u>
# Containers/Type: <u>3 x 40 ml</u>	Preservative: <u>HCl</u>	Analysis/Method: <u>HVOC</u>
		Field Filtered: <u>yes</u> <u>no</u>
		Filter Size: <u>—</u>
		MS/MSD: <u>—</u>
		Duplicate ID: <u>—</u>
		yes no
		yes no
		yes no
		yes no
		yes no

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.:	mw-22i	Job Number:	1126-18
	Client:	Nustar van	Date:	7/28/16
	Project:	3rd @ GWM	Sampler:	KK
	Weather:		Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	30.92	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B Pump	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1156	—	—	30.98	0.20	7.15	17.60	288	3.33	114.2	—	AC
1159	—	—	30.96	↓	6.66	16.42	294	1.37	128.2	—	AC
1202	—	—	30.95	↓	6.62	16.48	291	1.19	128.6	—	AC
1205	—	—	30.96	↓	6.60	16.56	289	1.04	129.4	—	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	mw-22i	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace
Sample Time:	1210	Final Depth to Water:	30.97	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40 ml	HCl	HVOC	yes no	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-24i	Job Number:	1126-18
Client:	Nustar Van.	Date:	9/28/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.91	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<< Stabilization Criteria
1103	—	—	29.90	0.20	7.64	16.22	134	4.64	114.6	—	SC
1106	—	—	29.90	↓	7.29	15.72	127	2.78	116.9	—	SC
1109	—	—	29.90	↓	7.27	15.61	125	2.64	121.9	—	SC
1112	—	—	29.91	↓	7.24	15.54	122	2.58	123.9	—	SC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-24i	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1115	Final Depth to Water:	29.94	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCl	HVOC	yes (no)	—	—	—
3 X 40 ml	HCl	Ethene, Ethane	yes (no)	—	—	—
1 X 250	H2SO4	TOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MP-1	Job Number:	1126-18
	Client:	Nustar Van	Date:	9/28/16
	Project:	3rd Q Gwm	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.44	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1013	—	—	29.57	0.20	6.67	15.68	609	5.23	126.2	—	SC
1016	—	—	29.61	↓	6.57	15.25	595	2.60	133.3	—	SC
1019	—	—	29.62	↓	6.55	15.05	578	1.31	136.2	—	SC
1022	—	—	29.62	↓	6.58	15.04	574	1.34	136.0	—	SC
1025	—	—	29.63	↓	6.60	15.04	571	1.32	135.2	—	SC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MP-1	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1030	Final Depth to Water:	29.45	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)	—	—	—
3 x 40 ml	HCl	Ethane, Ethene	yes (no)	—	—	—
1 x 250	H ₂ SO ₄	TOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	EX-1	Job Number:	1126-18
Client:	Nuster Van	Date:	9/28/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height:	—
Depth to Water:	29.23	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B Pump	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
0919	—	—	29.41	0.20	5.76	16.76	922	4.28	142.2	—	SC
0922	—	—	29.53	↓	5.94	16.74	924	1.74	140.2	—	SC
0925	—	—	29.68	↓	5.96	16.71	928	1.68	139.0	—	SC
0928	—	—	29.74	↓	5.97	16.72	930	1.61	138.1	—	SC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	EX-1	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace
Sample Time:	0930	Final Depth to Water:	29.68	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40 ml	HCl	HUOC	yes (no)	—	—
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-13	Job Number:	1126-18
	Client:	Nustar Van.	Date:	9/28/16
	Project:	3rd Q OWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	28.90	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B, Pump	Pump Intake Depth:	ms	Comments	
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<small>* -- Stabilization Criteria</small>
0820	—	—	29.00	0.20	4.66	17.80	591	4.81	166.7	—	VC
0823	—	—	29.14		4.65	16.83	455	2.63	160.1	—	VC
0826	—	—	29.28		4.61	16.90	451	2.66	159.1	—	VC
0829	—	—	29.45	√	4.60	16.92	448	2.71	158.7	—	VC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-13	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace
Sample Time:	0833	Final Depth to Water:	29.49	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
6 x 40ml	HCl	HVOC	yes (no)	—	— MW-13 DUP
3 x 40ml	HCl	Ethane, Ethene	yes (no)	—	—
1 x 250	H2SO4	TOC	yes (no)	—	—
			yes no		
			yes no		
			yes no		

COMMENTS

* white water



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PROJECT NUMBER 1126-18
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 9/27/16

PROJECT	<u>3rd Quarter GWM</u>	ARRIVAL TIME	<u>0650</u>
LOCATION	<u>Vancouver WA</u>	DEPARTURE TIME	_____
CLIENT	<u>NuStar</u>	WEATHER	<u>overcast</u>
PURPOSE OF OBSERVATIONS	<u>GWM</u>		
APEX REPRESENTATIVE	<u>KK</u>	APEX PROJECT MANAGER	<u>Stephanie Salisbury</u>
CONTRACTOR	_____	PERMIT NO.	<u>246347</u>
CONTRACTOR REP.	_____	H&S REVIEW	<u>YES</u>

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0650 - On site, sign in, get permit, H+S Review
 0725 - organize truck for sampling, cal yst.
 0750 - Setup on MW-14. Issues with bladder pump, have to figure out problem
 0900 - sample MW-14
 1008 - sample MW-23i
 1050 - sample MW-17
 1150 - sample S-1
 1240 - sample MW-26
 1330 - sample MW-10
 1415 - sample MW-1
 1500 - sample MW-12
 1530 - Empty purge buckets and start a new purge drum
 1625 - sample MW-8
 1645 - sign out, turn in Permit
 1650 OFF site

BY _____

REVIEWED BY _____

 APEX REPRESENTATIVE

 APEX PROJECT MANAGER

WELL MONITORING DATA SHEET



Well I.D.	MW-8	Job Number:	1126-18
Client:	Nustar Van.	Date:	9/27/16
Project:	3rd Q GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	28.60	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B Pump		Pump Intake Depth:				MS		Comments	
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1611	—	—	28.65	0.20	5.78	19.75	1183	4.92	213.7	—		C	
1614	—	—	28.69		4.86	19.11	1104	1.84	208.1	—		C	
1617	—	—	28.72		4.84	19.08	1100	1.76	203.4	—		C	
1620	—	—	28.75	↓	4.82	19.01	1101	1.71	202.7	—		C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-8	Sampling Flow Rate:	0.2	Analytical Laboratory:	Pace	
Sample Time:	1625	Final Depth to Water:	28.80	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-12	Job Number:	1126-18
Client:	Nustar Vancouver	Date:	9/27/16
Project:	3rd & Gwm	Sampler:	KK
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height:	—
Depth to Water:	27.28	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump			Pump Intake Depth:	ms			Comments			
Sampling Method:	LF			Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1442	—	—	27.55	0.20	5.26	19.56	1264	6.30	240.2	—	VC
1445	—	—	27.75	1	5.13	19.23	1256	2.64	256.3	—	VC
1448	—	—	27.82	1	3.60	19.17	1253	1.32	255.7	—	VC
1451	—	—	27.95	1	3.56	19.15	1253	1.22	254.5	—	VC
1454	—	—	28.00	1	3.53	19.16	1250	0.98	253.5	—	VC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-12	Sampling Flow Rate:	0.20	Analytical Laboratory:	PACE	
Sample Time:	1500	Final Depth to Water:	28.19	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 x 40 ml	HCl	HVOC	yes (no)	—	—	MW-12 Duf
3 x 40 ml	HCl	Ethane, Ethene	yes (no)			
1 x 250	H2SO4	TOC	yes (no)			
3 x 40 ml	HCl		yes (no)		X	
			yes no			
			yes no			

COMMENTS

* White water

WELL MONITORING DATA SHEET

	Well I.D.	MW-1	Job Number:	1126-18
	Client:	Nustar Vancouver	Date:	9/27/16
	Project:	3rd Qrt. GWM	Sampler:	KK
	Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	28.69	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				B. Pump		Pump Intake Depth:				MS		Comments	
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1401	—	—	28.69	0.20	6.64	19.79	360	1.71	221.2	—	C		
1404	—	—	28.68	↓	6.23	18.61	333	1.02	234.0	—	C		
1407	—	—	28.68	↓	6.18	18.53	330	0.98	237.1	—	C		
1410	—	—	28.67	↓	6.16	18.45	326	0.96	237.7	—	C		

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-1	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1415	Final Depth to Water:	28.64	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	HVOC	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—	—
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			

COMMENTS

--

WELL MONITORING DATA SHEET

	Well I.D.:	MW-26	Job Number:	1126-18
	Client:	Nustar Vancouver	Date:	9/27/16
	Project:	3rd Qrt Gwm	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.21	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments		
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria	
1228	—	—	29.21	0.20	6.68	18.64	3307	1.42	224.3	—	C	
1231	—	—	29.21	↓	6.38	17.67	3305	1.53	239.9	—	C	
1234	—	—	29.21	↓	6.35	17.65	3201	1.61	237.0	—	C	
1237	—	—	29.20	↓	6.33	17.58	3208	1.64	236.7	—	C	

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-26	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace
Sample Time:	1240	Final Depth to Water:	29.19	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40 ml	HCl	HVOC	yes <u>no</u>	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	S-1	Job Number:	1126-18
Client:	NuStar van	Date:	9/27/19
Project:	3rd Ort Gwm	Sampler:	KK
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height:	—
Depth to Water:	29.92	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B Pump			Pump Intake Depth:		MS			Comments		
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria	
1134	—	—	29.80	0.20	7.45	18.18	175	2.09	200.3	—	C	
1137	—	—	29.74		7.29	17.64	164	1.58	205.6	—	C	
1140	—	—	29.72		7.11	17.04	153	1.26	215.5	—	C	
1143	—	—	29.72		7.07	16.98	151	1.24	218.3	—	C	
1146	—	—	29.72	✓	7.04	16.94	151	1.20	219.1	—	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-1	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1150	Final Depth to Water:	29.81	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.:	MW-23	Job Number:	1126-18
Client:	Nustar Vancouver	Date:	9/27/16
Project:	3rd Qrt. GWM	Sampler:	KK
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height:	—
Depth to Water:	30.10	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				B. Pump		Pump Intake Depth:			MS		Comments	
Sampling Method:				LF		Tubing Type:			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)	Turbidity (NTUs)	Clarity/Color	Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria	
0955	—	—	29.70	0.20	8.05	18.26	228	5.64	179.5	—	AC	
0958	—	—	29.75	↓	7.51	16.29	121	4.21	200.4	—	AC	
1001	—	—	29.80	↓	7.49	16.38	119	4.10	207.7	—	AC	
1004	—	—	29.86	↓	7.46	16.44	116	3.92	212.2	—	AC	


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-23	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1008	Final Depth to Water:	30.10	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	HVOC	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—	—
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-14	Job Number:	1126-18
	Client:	Nustar	Date:	9/27/16
	Project:	3rd Quarter GWM	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	29.30	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0848	—	—	29.35	0.20	7.21	18.18	2764	8.57	220.1	—	AC
0851	—	—	29.37		7.21	16.79	2749	8.83	220.1	—	AC
0854	—	—	29.41		7.22	16.62	2761	8.11	220.7	—	AC
0857	—	—	29.43	✓	7.22	16.57	2770	8.08	221.2	—	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-14	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	0900	Final Depth to Water:	29.30	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <input checked="" type="radio"/> no	—	—	—
3 x 40 ml	HCl	Ethanol, Ethene	yes <input checked="" type="radio"/> no	—	—	—
1 x 250	H ₂ SO ₄	TOC	yes <input checked="" type="radio"/> no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS



3015 SW First Avenue
 Portland, Oregon 97201-4707
 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER _____
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 9/26/16

PROJECT	<u>Quarterly GWM</u>	ARRIVAL TIME	<u>0720</u>
LOCATION	<u>Vancouver WA</u>	DEPARTURE TIME	_____
CLIENT	<u>NuStar</u>	WEATHER	<u>Sunny</u>
PURPOSE OF OBSERVATIONS	<u>Gauging + GWM</u>		
APEX REPRESENTATIVE	<u>KK/JM</u>	APEX PROJECT MANAGER	_____
CONTRACTOR	_____	PERMIT NO.	<u>246345</u>
CONTRACTOR REP.	_____	H&S REVIEW	_____

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0720 - on site, sign in, Get permit, H + S Review
 0740 - Start to pop well caps
 0907 - Finish popping well caps and finding ones in construction site
 0908 - start gauging wells
 1219 - Finish gauging wells
 1225 - Get gear organized to sample wells
 1326 - Sample S-2
 1358 - Sample mw-21-105
 1422 - Sample mw-21-40
 1523 - Sample mw-19
 1530 - Turn in permit, sign out
 1540 OFF site

BY _____

REVIEWED BY _____

 APEX REPRESENTATIVE

 APEX PROJECT MANAGER

WELL MONITORING DATA SHEET



Well I.D.	MW-19	Job Number:	
Client:	NuStar	Date:	9/26/16
Project:	Quarterly GWM	Sampler:	KK/JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height:	—
Depth to Water:	29.01	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. pump				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1511	—	—	29.15	0.20	7.65	20.85	2154	5.32	171.5	—	C
1514	—	—	29.21	↓	7.36	20.21	1731	3.54	173.6	—	C
1517	—	—	29.21	↓	7.33	20.14	1721	3.31	174.6	—	C
1520	—	—	29.22	↓	7.30	20.08	1704	3.27	174.4	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1523	Final Depth to Water:	29.18	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCl	HVOC	yes (no)	—	—	—
3 X 40 ml	HCl	Ethene, Ethane	yes (no)	—	—	—
1 X 250	H2SO4	TOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.:	MW-21;-40	Job Number:	1128-18
Client:	NuStar	Date:	9/26/16
Project:	Quarterly GWM	Sampler:	KK/JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height:	—
Depth to Water:	30.30	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump	Pump Intake Depth:	115	Comments:	
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<< Stabilization Criteria
1404	.6	0.60	30.30	0.20	7.37	17.72	197	2.80	152.7	—	Clear
1407	1.2	0.60	30.33	.20	7.38	17.30	197	1.45	153.6	—	Clear
1410	1.8	0.60	30.33	.20	7.35	17.26	197	1.35	157.5	—	clear
1413	2.4	0.60	30.33	.20	7.13	16.99	196	.92	159.8	—	clear
1416	3.0	.60	30.33	.20	7.10	16.95	195	.85	160.1	—	clear
1419	3.6	.60	30.33	.20	7.09	16.94	195	0.80	160.6	—	clear
1422	4.2	.60	30.33	S A M P L E							

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21;-40	Sampling Flow Rate:	0.20	Analytical Laboratory:	Trace
Sample Time:	1422	Final Depth to Water:	30.33	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)	—	—
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	S-2	Job Number:	1126-18
Client:	Mustart	Date:	9/26/16
Project:	Quarterly GWM	Sampler:	KK/JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	30.1	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1311	.6	30.20	.20	8.47	20.56	1702	6.00	138.9	-	-	Clear
1314	.6	30.23	.20	7.35	18.82	1632	4.46	158.5	-	-	Clear
1317	.6	30.23	.20	7.20	18.59	1620	4.61	160.3	-	-	Clear
1320	.6	30.23	.20	7.15	18.50	1621	4.68	165.1	-	-	Clear
1323	.6	30.23	.20	7.15	18.48	1619	4.75	164.0	-	-	Clear
1326	.6			SAMPLE							

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-2	Sampling Flow Rate:	.20	Analytical Laboratory:	Pace	
Sample Time:	1326	Final Depth to Water:	30.20	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HLL	HVOC	yes no	—	—	—
			yes	no		
			yes	no		
			yes	no		
			yes	no		
			yes	no		

COMMENTS

WELL GAGING DATA SHEET



Client:	NuStar	Job Number:	1126-18
Project:	Quartermaster Gwm	Date:	9/26/16
Weather:	Sunny	Sampler:	KK/JM
		Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-12	0908	-	27.34	-	-	-	milky water 0/3
MW-19	0911	-	29.18	-	-	-	3/3
EX-1	0913	-	29.16	-	-	-	0/3
MP-4	0915	-	29.29	-	-	-	milky water 0/3
MW-24i	1124	-	30.68	-	-	-	0/3
MP-3	0923	-	29.29	-	-	-	3/3
MW-24d	0926	-	30.58	-	-	-	0/3
MP-2	0928	-	29.46	-	-	-	milky chunks 0/3
MP-1	0930	-	29.40	-	-	-	0/3
MW-7	0932	-	29.20	-	-	-	0/3
MW-5	0934	-	29.50	-	-	-	2/3
MW-9	0939	-	29.27	-	-	-	3/3
MW-13	0945	-	28.74	-	-	-	milky water 1/3
S-2	0949	-	29.59	-	-	-	0/3
MW-14	0953	-	29.27	-	-	-	0/3
MW-17	0955	-	28.35	-	-	-	0/3
MW-26	0958	-	29.15	-	-	-	3/3
MW-10	1003	-	29.01	-	-	-	0
MW-8	1006	-	28.54	-	-	-	2/3
MW-22i	1013	-	31.28	-	-	-	0/2
MW-32S	1016	-	30.35	-	-	-	3/3
MW-32i	1019	-	31.28	-	-	-	2/3
MW-31i	1024	-	31.36	-	-	-	2/2
MW-E	1031	-	26.89	-	-	-	0/3
MW-18i	1037	-	30.34	-	-	-	2/2
MW-16	1040	-	29.60	-	-	-	0/3
MW-20i	1043	-	30.13	-	-	-	0/2
MW-19i	1047	-	30.65	-	-	-	1/2
W-15	1049	-	34.20	-	-	-	-
MW-F	1052	-	31.02	-	-	-	3/3
MW-6	1057	-	29.37	-	-	-	3/3
MW-30i	1101	-	26.74	-	-	-	0/3



3015 SW First Avenue
 Portland, Oregon 97201-4707
 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER 1126-18
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 12-18-16 → 12-16-16

PROJECT	<u>MUSTAK Vancouver</u>	ARRIVAL TIME	<u>0700</u>
LOCATION	<u>Vancouver</u>	DEPARTURE TIME	_____
CLIENT	<u>MUSTAK</u>	WEATHER	_____
PURPOSE OF OBSERVATIONS	<u>GW M</u>		
APEX REPRESENTATIVE	<u>Jake Munsey</u>	APEX PROJECT MANAGER	<u>Stephanie S.</u>
CONTRACTOR	_____	PERMIT NO.	<u>X</u>
CONTRACTOR REP.	_____	H&S REVIEW	<u>X</u>

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

* MON → Gauge all wells with Chris
 EXCEPT; (MW-16 under truck)
 (MW-325 & MW 32i under low rider)
 MW-E Missing/paved over when
 shop was constructed. Gauged EXCLUDED
 wells later. Sampled 4 wells

TUES → Sampled 10 wells, Brought New IDW
 Drum & Label

Wed → Sampled 10 wells

Thursday → NO site visit, SNOW DAY

FRIDAY → Sampled 9 wells

MGM52-40 & 60 DO NOT WORK WELL

1 IDW DRUM LEFT on site 9/10 Full
 in Hazardous waste storage & in waste house

BY


 APEX REPRESENTATIVE

REVIEWED BY


 APEX PROJECT MANAGER

WELL GAGING DATA SHEET

APEX		Job Number: 1126					
		Client: Mustek Vanc					
		Date: 12-12-16					
		Project: GWM					
		Sampler: JGM					
		Weather: Rainy					
		Time In/Out: 0700					
WATER LEVEL DATA							
Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-1	1010	—	24.68	—	—	—	Chris & JM
MW-12	1015	—	23.44	—	—	—	
MW-19	1016	—	25.91	—	—	—	
EX-1	1018	—	26.01	—	—	—	
MP-4	1019	—	26.61	—	—	—	
MP-3	1022	—	25.42	—	—	—	
MW-24i	1024	—	26.12	—	—	—	
MW-24n	1025	—	26.04	—	—	—	
MP-2	1026	—	26.34	—	—	—	
MP-1	1027	—	26.26	—	—	—	
MW-7	1028	—	26.04	—	—	—	
MW-9	1030	—	26.21	—	—	—	
MW-13	1032	—	25.38	—	—	—	
S-1	1033	—	25.52	—	—	—	
S-2	1034	—	25.44	—	—	—	
MW-14	1036	—	26.15	—	—	—	Broken magnet
MW-23i	1038	—	26.17	—	—	—	
MW-17	1040	—	24.76	—	—	—	
MW-26	1042	—	26.22	—	—	—	
MW-25i	1044	—	25.92	—	—	—	
MW-10	1046	—	26.75	—	—	—	
MW-22i	1048	—	26.69	—	—	—	
MW-8	1049	—	26.00	—	—	—	
MW-21i-105	1050	—	26.31	—	—	—	
MW-21i-40	1050	—	26.44	—	—	—	
MW-31i	1056	—	26.84	—	—	—	
MW-32s	—	—	—	—	—	—	COULD NOT GAUGE DUE TO VEHICLE PACKED.
MW-32i	—	—	—	—	—	—	
MW-18i	1105	—	25.71	—	—	—	
MW-20i	1110	—	25.50	—	—	—	
MW-19i	1112	—	25.99	—	—	—	Beclonite in Well magnet
MW-15	1114	—	31.75	—	—	—	

JGM


WELL GAGING DATA SHEET

	Client:	Mustaf van	Job Number:	1126
	Project:	607	Date:	12-12-16
	Weather:	Rain	Sampler:	567
			Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-6	1116	~	24.77	~	~		
MW-30i	1118	~	22.13	~	~		Missing Bolts
MW-F	1120	~	26.43	~	~		
MW-2	1127	~	26.37	~	~		26.34 sensitivity adjust
MW-5	1130	~	25.99	~	~		
MW-6	1138	~	24.65	~	~		
EW-1	1139	~	23.40	~	~		
MW-3	1144	~	26.48	~	~		
M6751-40	1155	~	22.96	~	~		
M6751-60	1156	~	23.23	~	~		
M6751-132	1157	~	23.12	~	~		
M6752-40	1200	~	24.36	~	~		
M6752-60	1201	~	24.91	~	~		
M6752-110	1202	~	24.71	~	~		
M6752-132	1203	~	24.91	~	~		
M6753-40	1205	~	24.06	~	~		
M6753-60	1206	~	23.93	~	~		
M6753-110	1207	~	24.05	~	~		
M6753-132	1208	~	24.11	~	~		
MW-16							Under Trucks/under asphalt
MW-E							
Data for MW 16, 32S, 32i							
is ok GWM sheets							

WELL MONITORING DATA SHEET

	Well I.D.: <u>MP-1</u>	Job Number: <u>1126</u>
	Client: <u>Muskrat Valley</u>	Date: <u>12-13-16</u>
	Project: <u>GWM</u>	Sampler: <u>56m</u>
	Weather: <u>Fog</u>	Time In/Out: _____

WELL DATA

Well Depth: _____	Well Diameter: <u>2"</u>	Water Height: _____
Depth to Water: <u>26.12</u>	Screened Interval: _____	x Multiplier: _____
Water Column Length: _____	Depth to Free Product: _____	x Casing Volumes: _____
Purge Volume: _____	Free Product Thickness: _____	= Purge Volume: _____

Water Height Multipliers (gal) 1-inch = 0.041 2-inch = 0.162 4-inch = 0.653 1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>BP</u>	Pump Intake Depth: <u>MS</u>	Comments: _____
Sampling Method: <u>LF</u>	Tubing Type: <u>HDPE</u>	_____

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
<u>0805</u>			<u>26.12</u>	<u>.20</u>	<u>8.68</u>	<u>13.46</u>	<u>294</u>	<u>6.60</u>	<u>79.2</u>	<u>-</u>	<u>Clear</u>
<u>0808</u>			<u>26.12</u>	<u>.20</u>	<u>8.53</u>	<u>15.05</u>	<u>338</u>	<u>3.26</u>	<u>26.1</u>	<u>-</u>	<u>Clear</u>
<u>0811</u>			<u>26.12</u>	<u>.20</u>	<u>8.50</u>	<u>15.13</u>	<u>345</u>	<u>3.38</u>	<u>16.6</u>	<u>-</u>	<u>Clear</u>
<u>0814</u>			<u>26.12</u>	<u>.20</u>	<u>8.45</u>	<u>15.13</u>	<u>348</u>	<u>3.57</u>	<u>12.1</u>	<u>-</u>	<u>Clear</u>

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: <u>MP-1</u>	Sampling Flow Rate: <u>.20</u>	Analytical Laboratory: <u>Pale</u>				
Sample Time: <u>0814</u>	Final Depth to Water: <u>26.12</u>	Did Well Dewater? <u>no</u>				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
<u>3x 40ml</u>	<u>HCl</u>	<u>HVOC</u>	yes <u>no</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>2x 40ml</u>	<u>H2SO4</u>	<u>TOC</u>	yes <u>no</u>			
<u>2x 40 ml</u>	<u>none</u>	<u>Methane/Ethane</u>	yes <u>no</u>			
		<u>Ethane</u>	yes <u>no</u>			
			yes <u>no</u>			
			yes <u>no</u>			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	MW-26	Job Number:	1126
	Client:	MUSTAR vabc	Date:	12-13-16
	Project:	6wm	Sampler:	JGM
	Weather:	Partly Sunny ^{cold}	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	26.10	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:		BP		Pump Intake Depth:		MS		Comments			
Sampling Method:		LF		Tubing Type:		HDPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1155			26.10	.25	7.08	12.59	2511	6.40	114.8	—	Clear
1158			26.00	.25	7.16	12.66	2589	6.30	110.4	—	Clear
1201			25.90	.25	7.55	13.81	3041	1.26	108.5	—	Clear
1204			26.00	.25	7.58	13.95	3079	0.90	104.2	—	Clear
1207			25.90	.25	7.60	14.02	3087	0.88	102.4	—	Clear
			? ↑								

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-26	Sampling Flow Rate:	.25	Analytical Laboratory:	Pate	
Sample Time:	1207	Final Depth to Water:	25.90	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 mL	HCL	HVOL	yes no	—	—	—
2x 40 mL	H2SO4	TOC	yes no	—	—	—
2x 40 mL	none	Methane	yes no	—	—	—
		Ethane	yes no			
		Ethene	yes no			
			yes no			

COMMENTS

* water level came up during monitoring

WELL MONITORING DATA SHEET

	Well I.D.	MW-251'	Job Number:	1126
	Client:	MUSTAK	Date:	12-13-16
	Project:	GWM	Sampler:	J6M
	Weather:	Partly Sunny cold	Time In/Out:	

WELL DATA

Well Depth:	~	Well Diameter:	2"	Water Height	~
Depth to Water:	25.69	Screened Interval:	~	x Multiplier	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes	~
Purge Volume:	~	Free Product Thickness:	~	= Purge Volume	~
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				BP				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			HDPE			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1245			25.69	.25	9.33	10.14	212	8.79	51.4	-	Clear			
1248			25.47	.25	9.20	11.98	151	2.06	53.6	-	Clear			
1251			25.36	.25	9.17	12.14	149	1.78	55.1	-	Clear			
1254			25.35	.25	9.15	12.22	146	1.72	57.3	-	Clear			

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-251	Sampling Flow Rate:	.25	Analytical Laboratory:	Paci		
Sample Time:	1254	Final Depth to Water:	25.35	Did Well Dewater?	no		
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
3x40 ML	HCL	HVOC	yes	no	~	~	~
			yes	no			
			yes	no			
			yes	no			
			yes	no			
			yes	no			

COMMENTS

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WELL MONITORING DATA SHEET

Well I.D.	MW 24 D	Job Number:	1126
Client:	MUSTAR JARL	Date:	12-12-16
Project:	BWM	Sampler:	JGM
Weather:	PARTLY SUNNY	Time In/Out:	-

WELL DATA

Well Depth:	~	Well Diameter:	2"	Water Height	~
Depth to Water:	25.17	Screened Interval:	~	x Multiplier	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes	~
Purge Volume:	-	Free Product Thickness:	~	= Purge Volume	~
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		BP		Pump Intake Depth:		MS		Comments			
Sampling Method:		LE		Tubing Type:		HDPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1537			25.17	.25	7.78	13.28	207	11.53	43.8	-	clear
1540			25.60	.25	8.12	13.71	212	1.98	16.7	-	clear
1543			25.60	.25	8.18	14.00	214	.99	1.01	-	clear
1546			25.60	.25	8.23	14.15	215	.94	-10.3	-	clear
1549			25.60	.25	8.25	14.25	217	0.85	-15.9	-	clear


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW 24 D	Sampling Flow Rate:	.25	Analytical Laboratory:	Pace	
Sample Time:	1549	Final Depth to Water:	25.60	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	VQA	HVOC	yes no	-	-	-
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	W16MS3-40	Job Number:	1126
	Client:	Next of Vale	Date:	12-16-16
	Project:	60M	Sampler:	J6m
	Weather:	Sunny, cold	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height:	—
Depth to Water:	23.25	Screened Interval:	40'	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BP			Pump Intake Depth:	MS			Comments			
Sampling Method:	LF			Tubing Type:	HDPE						
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1010			23.25	.20	7.02	14.21	531	6.32	11.8	—	clear
1013			23.29	.20	7.29	14.28	536	6.20	-1.0	—	clear
1016			23.32	.20	7.31	14.43	538	6.10	-4.1	—	clear
1019			23.35	.20	7.33	14.56	542	5.95	-9.2	—	clear

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	W16MS3-40	Sampling Flow Rate:	.20	Analytical Laboratory:	Pace		
Sample Time:	1019	Final Depth to Water:	23.35	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3 X 40ml	HCL	HVOC	yes no	—	—	—	
2 X 40ml	H2SO4	TOC	yes no	—	—	—	
2 X 40ml	none	Methane	yes no	—	—	—	
		Ethane	yes no				
		Ethanol	yes no				

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	M6MS3-60	Job Number:	1126
Client:	MUSTAR VANCOUVER	Date:	12-16-16
Project:	GM	Sampler:	JGM
Weather:	Partly Sunny, cold	Time In/Out:	

WELL DATA

Well Depth:	~	Well Diameter:	—	Water Height:	—
Depth to Water:	23.38	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	~	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				Pump Intake Depth:				Comments			
BP				MS							
Sampling Method:				Tubing Type:							
IF				HDPE							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (bt)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1035			23.38	.20	7.61	11.11	105	6.00	48.2	—	clear
1038			23.41	.20	7.82	12.01	91	4.80	46.1	—	clear
1041			23.42	.20	7.83	12.26	90	4.63	43.9	—	clear
1044			23.43	.20	7.84	12.48	87	4.41	42.7	—	clear

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	M6MS3-60	Sampling Flow Rate:	.20	Analytical Laboratory:	pac	
Sample Time:	1044	Final Depth to Water:	23.43	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	M6MS1-60	Job Number:	1126
Client:	MUSTAR	Date:	12-26-16
Project:	GWM	Sampler:	JGM
Weather:	Sunny,	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	24.90	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BP			Pump Intake Depth:	MS			Comments			
Sampling Method:	LF			Tubing Type:	HDPE						
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1210			24.90	.20	9.39	15.21	111	5.57	-0.3	—	clear
1213			24.91	.20	8.83	15.22	96	6.48	16.1	—	clear
1216			24.91	.20	8.80	15.23	95	6.65	20.2	—	clear
1219			24.93	.20	8.79	15.24	92	6.78	28.9	—	clear

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	M6MS1-60	Sampling Flow Rate:	.20	Analytical Laboratory:	Pace	
Sample Time:	1219	Final Depth to Water:	24.93	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 ML	HCL	HVOC	yes no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Gauged @ Inflection

Well I.D.: <i>MW-325</i>	Job Number: <i>1126</i>
Client: <i>MUSTAR VANCOUVER</i>	Date: <i>12-14-16</i>
Project: <i>BWM</i>	Sampler: <i>JGM</i>
Weather: <i>Cloudy, Cold</i>	Time In/Out:

WELL DATA

Well Depth: <i>—</i>	Well Diameter: <i>2"</i>	Water Height: <i>—</i>
Depth to Water: <i>26.18</i>	Screened Interval: <i>—</i>	x Multiplier: <i>—</i>
Water Column Length: <i>—</i>	Depth to Free Product: <i>—</i>	x Casing Volumes: <i>—</i>
Purge Volume: <i>—</i>	Free Product Thickness: <i>—</i>	= Purge Volume: <i>—</i>
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method: <i>BP</i>	Pump Intake Depth: <i>MS Dedicated</i>	Comments:									
Sampling Method: <i>IT</i>	Tubing Type: <i>HDPE Dedicated</i>										
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	←- Stabilization Criteria
<i>1159</i>			<i>26.18</i>	<i>0.2</i>	<i>8.05</i>	<i>14.01</i>	<i>257</i>	<i>4.76</i>	<i>65.2</i>	<i>—</i>	<i>clear</i>
<i>1202</i>			<i>26.63</i>	<i>0.20</i>	<i>8.06</i>	<i>14.38</i>	<i>168</i>	<i>1.55</i>	<i>58.6</i>	<i>—</i>	<i>clear</i>
<i>1205</i>			<i>27.04</i>	<i>0.20</i>	<i>7.91</i>	<i>14.50</i>	<i>149</i>	<i>1.49</i>	<i>54.4</i>	<i>—</i>	<i>clear</i>
<i>1208</i>			<i>27.04</i>	<i>.20</i>	<i>7.88</i>	<i>14.51</i>	<i>143</i>	<i>1.41</i>	<i>54.3</i>	<i>—</i>	<i>clear</i>
<i>1211</i>			<i>27.04</i>	<i>.20</i>	<i>7.88</i>	<i>14.52</i>	<i>143</i>	<i>1.39</i>	<i>54.4</i>	<i>—</i>	<i>clear</i>

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: <i>MW-325</i>	Sampling Flow Rate: <i>0.20</i>	Analytical Laboratory: <i>Pace</i>				
Sample Time: <i>1211</i>	Final Depth to Water: <i>27.04</i>	Did Well Dewater?: <i>NC</i>				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
<i>3 X 40 ml</i>	<i>HCL</i>	<i>4 VOL</i>	yes no	<i>—</i>	<i>—</i>	<i>—</i>
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

*26.50 = MW 32 i @ 1214
Gauged @ Inflection for
Representative data*

WELL MONITORING DATA SHEET



Well I.D.	MW-19	Job Number:	1126
Client:	Nustar Vancouver	Date:	12-12-16
Project:	6WM	Sampler:	JGM
Weather:	Rainy	Time In/Out:	

WELL DATA

Well Depth:	~	Well Diameter:	2 1/2	Water Height:	~
Depth to Water:	25.94	Screened Interval:	~	x Multiplier:	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes:	~
Purge Volume:	~	Free Product Thickness:	~	= Purge Volume:	~
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BF			Pump Intake Depth:	MS			Comments			
Sampling Method:	LF			Tubing Type:	HDPE						
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1305			25.94	.25	7.48	14.44	1818	8.49	179.5	-	clear
1308			25.94	.25	7.74	14.52	1834	9.06	176.8	-	clear
1311			25.94	.25	7.74	14.48	1838	9.07	176.8	-	clear
1314			25.94	.25	7.83	14.39	1826	9.22	175.2	-	clear
1317	SAMPLE										

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate:	.25	Analytical Laboratory:	Pace	
Sample Time:	1317	Final Depth to Water:	25.94	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCL	HVOC	yes no	~	-	-
2 x 40 ml	H2SO4	TOC	yes no			
3 x 40 ml	HCL	HVOC	yes no			DUP
2 x 40 ml	none	Methoxyethanol	yes no			
			yes no			

COMMENTS



WELL MONITORING DATA SHEET

Well I.D.:	MW-21i-105	Job Number:	1126
Client:	MUSTAK VAPOR	Date:	12-13-16
Project:	6UM	Sampler:	J6M
Weather:	partly sunny, cold	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	25.76	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				BP				Pump Intake Depth:			MS		Comments
Sampling Method:				ZF				Tubing Type:			HDPE		
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1440			25.76	.25	8.21	10.63	115	5.22	40.1	—	clear		
1443			25.55	.25	8.23	11.23	89	1.16	40.1	—	clear		
1446			25.59	.25	8.25	11.44	89	1.07	42.3	—	clear		
1449			25.63	.25	8.27	11.68	88	1.00	41.5	—	clear		

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21i-105	Sampling Flow Rate:	0.25	Analytical Laboratory:	PACC		
Sample Time:	1449	Final Depth to Water:	25.63	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
			yes	no			
3x40mL	HCL	HVOL	yes	no			
			yes	no			
			yes	no			
			yes	no			
			yes	no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-221	Job Number:	1126
Client:	MUSTAR VANCOUVER	Date:	12-13-16
Project:	GUM	Sampler:	J6m
Weather:	Partly Sunny, cold	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	26.40	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BP			Pump Intake Depth:	MS			Comments			
Sampling Method:	IF			Tubing Type:	HDPE						
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1335			26.40	.25	8.43	10.39	185	5.87	75.8	—	clear
1338			25.52	.25	8.43	13.04	275	1.05	-19.0	—	clear
1341			26.01	.25	8.28	13.09	260	0.89	-23.6	—	clear
1344			26.12	.25	8.24	13.13	253	0.61	-29.9	—	clear
1347			26.30	.25	8.21	13.18	244	0.44	-31.8	—	clear

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-221	Sampling Flow Rate:	.25	Analytical Laboratory:	Pace	
Sample Time:	1347	Final Depth to Water:	26.30	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCL	H VOC	yes no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-191	Job Number:	1126
Client:	Mustar Vancouver	Date:	12-14-16
Project:	Gwyn	Sampler:	J6m
Weather:	Cloudy, cold	Time In/Out:	

WELL DATA

Well Depth:	~	Well Diameter:	2"	Water Height:	~
Depth to Water:	25.61	Screened Interval:	~	x Multiplier:	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes:	~
Purge Volume:	~	Free Product Thickness:	~	= Purge Volume:	~
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:	RP	Pump Intake Depth:	MS	Comments:	
Sampling Method:	LF	Tubing Type:	HDPE		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1120			25.61	.20	7.94	8.63	107	7.28	87.6	-	clear
1123			2520	.20	8.03	12.21	150	1.82	85.6	-	clear
1126			2530	.20	8.06	12.33	153	1.79	75.9	-	clear
1129			2536	.20	8.10	12.38	156	1.77	67.7	-	clear

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-191	Sampling Flow Rate:	.20	Analytical Laboratory:	Pace	
Sample Time:	1129	Final Depth to Water:	25.36	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCL	HVOC	yes no	-	-	-
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

* water level came up during monitoring.

WELL MONITORING DATA SHEET



Well I.D.	MW-181	Job Number:	1721
Client:	Mustar Vancouver	Date:	12-14-16
Project:	GWM	Sampler:	JGM
Weather:	Cloudy 31°	Time In/Out:	

WELL DATA

Well Depth:	~	Well Diameter:	2"	Water Height	~
Depth to Water:	25.12	Screened Interval:	~	x Multiplier	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes	~
Purge Volume:	~	Free Product Thickness:	~	= Purge Volume	~
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	HOPE		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0935		25.12	.25	8.55	8.59	81	9.35	99.4	-	clear	
0938		25.12	.25	8.61	9.01	86	4.63	90.6	-	clear	
0941		25.13	.25	8.65	12.35	87	4.67	84.1	-	clear	
0944		25.14	.25	8.67	12.80	88	4.70	80.5	-	clear	
0947		25.15	.25	8.72	12.82	89	4.72	78.0	-	clear	


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-181	Sampling Flow Rate:	.25	Analytical Laboratory:	Pacc	
Sample Time:	0947	Final Depth to Water:	25.15	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 mL	HCL	HVOC	yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-7	Job Number:	1126
	Client:	MUSTAR Vancouver	Date:	12-14-16
	Project:	GWM	Sampler:	J6M
	Weather:	SNOW, cold	Time In/Out:	

WELL DATA					
Well Depth:	~	Well Diameter:	4"	Water Height	~
Depth to Water:	25.60	Screened Interval:	~	x Multiplier	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes	~
Purge Volume:	~	Free Product Thickness:	~	= Purge Volume	~
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA												
Purge Method:		BP			Pump Intake Depth:		MS			Comments		
Sampling Method:		LF			Tubing Type:		HDPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria	
1325			25.60	.20	7.01	12.84	77	2.54	53.5	-		clear
1328			26.11	.20	7.05	13.99	73	1.30	34.5	-		clear
1331			26.14	.20	7.03	14.23	70	1.26	21.2	-		clear
1334			26.17	.20	7.02	14.46	68	1.20	14.0	-		clear
1337			26.20	.20	7.02	14.63	67	1.13	5.6	-		clear


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA							
Sample ID:	MW-7	Sampling Flow Rate	.20	Analytical Laboratory:	Pace		
Sample Time:	1337	Final Depth to Water:	26.20	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3 x 40 mL	HCL	HVOC	yes no	~	-		
3 x 40 mL	HCL	HVOC	yes no	~	-		MW-7 DUP
			yes no				
			yes no				
			yes no				

COMMENTS

* Maggots in well OK: small white
 x sulfur smell crawling bugs

WELL MONITORING DATA SHEET

	Well I.D.: <u>MU-14</u>	Job Number: <u>1126</u>
	Client: <u>MUSTAR VAPL</u>	Date: <u>12-13-16</u>
	Project: <u>GWM</u>	Sampler: <u>SBM</u>
	Weather: <u>Partly Sunny</u>	Time In/Out: _____

WELL DATA

Well Depth: <u>—</u>	Well Diameter: <u>4"</u>	Water Height: <u>—</u>
Depth to Water: <u>25.99</u>	Screened Interval: <u>—</u>	x Multiplier: <u>—</u>
Water Column Length: <u>—</u>	Depth to Free Product: <u>—</u>	x Casing Volumes: <u>—</u>
Purge Volume: <u>—</u>	Free Product Thickness: <u>—</u>	= Purge Volume: <u>—</u>
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>BP</u>	Pump Intake Depth: <u>MS</u>	Comments
Sampling Method: <u>ZF</u>	Tubing Type: <u>HDPE</u>	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1050			25.99	.20	8.50	11.38	231	5.16	72.3	—	cloud
1053			26.09	.20	8.51	12.58	45	3.49	61.0	—	cloud
1056			26.18	.20	8.50	12.63	33	3.40	58.6	—	clear
1059			26.19	.20	8.48	12.70	32	3.29	56.8	—	clear
1102			26.19	.20	8.45	12.85	31	3.10	55.0	—	clear

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: <u>MU-14</u>	Sampling Flow Rate: <u>.20</u>	Analytical Laboratory: <u>PACC</u>				
Sample Time: <u>1102</u>	Final Depth to Water: <u>26.19</u>	Did Well Dewater? <u>no</u>				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCl	HVOC	yes	no	—	—
2x40 mL	H2SO4	TOC	yes	no	—	—
2x40 mL	none	Methane	yes	no	—	—
		Ethane	yes	no		
		Ethene	yes	no		
			yes	no		

COMMENTS

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WELL MONITORING DATA SHEET



Well I.D.	MW-13	Job Number:	1126
Client:	MUSTAF VANCOUVER	Date:	12/16/16
Project:	GUM	Sampler:	JGM
Weather:	partly sunny, cold	Time In/Out:	-

WELL DATA

Well Depth:	~	Well Diameter:	2 1/4"	Water Height	~
Depth to Water:	27.61	Screened Interval:	~	x Multiplier	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes	~
Purge Volume:	~	Free Product Thickness:	~	= Purge Volume	~
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		BP		Pump Intake Depth:		MS		Comments			
Sampling Method:		IF		Tubing Type:		HOPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0835			24.41	.20	6.56	13.68	695	7.04	-92.1	-	white milky
0838			25.36	.20	6.57	14.08	512	1.08	-99.1	-	white milky
0841			25.65	.20	6.57	14.39	508	.83	-105.0	-	white milky
0844			25.65	.20	6.58	14.56	504	.66	-111.4	-	white milky

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-13	Sampling Flow Rate	.20	Analytical Laboratory:	9acc	
Sample Time:	0844	Final Depth to Water:	25.65	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40ml	HCL	HVOL	yes no	-	-	-
2x40ml	H2SO4	TOC	yes no	-	-	-
2x40ml	non-	Methane	yes no	-	-	-
		Ethanol	yes no			
		Ethene	yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-12	Job Number:	1126
Client:	MUSTAK	Date:	12-14-16
Project:	GWM	Sampler:	JG
Weather:	SPAWY	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	22.91	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	M5	Comments							
Sampling Method:	LF	Tubing Type:	HDPE								
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1500			22.91	.25	5.77	12.78	940	5.48	-20.9	—	white / milky
1503			23.26	.25	5.86	15.97	1114	.83	-56.0	—	milky
1506			23.78	.25	5.86	16.22	1123	.61	-74.6	—	milky
1509			23.84	.25	5.86	16.38	1131	.57	-88.1	—	milky
1512			24.93	.25	5.87	16.55	1136	.46	-91.3	—	milky

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-12	Sampling Flow Rate	.25	Analytical Laboratory:	Pace	
Sample Time:	1512	Final Depth to Water:	25.31	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40ml	HVOC	HVOC	yes no	—	—	
3x40ml	HVOC	HVOC	yes no	—	—	MW-120V P
2x40ml	H2SO4	TOC	yes no	—	—	
2x40ml	none	Methane	yes no	—	—	
		Ethane	yes no			
		Ethane	yes no			

COMMENTS

* Odor white purging

WELL MONITORING DATA SHEET



Well I.D.	MW-8	Job Number:	1126
Client:	Mustar Vancouver	Date:	12-14-16
Project:	Gwm	Sampler:	J67
Weather:	cloudy COLD	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2" 4"	Water Height	—
Depth to Water:	25.90	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		RP		Pump Intake Depth:		MS		Comments			
Sampling Method:		LF		Tubing Type:		HDPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0815			25.90	.20	9.96	8.31	836	7.30	123.4	—	clear
0818			25.99	.20	9.54	12.99	945	2.29	106.9	—	clear
0821			26.05	.20	8.81	13.35	944	1.50	103.5	—	clear
0824			26.11	.20	8.76	13.61	944	1.31	99.1	—	clear
0827			26.20	.20	8.74	13.84	943	1.04	97.9	—	clear

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-8	Sampling Flow Rate:	.20	Analytical Laboratory:	PACC	
Sample Time:	0827	Final Depth to Water:	26.20	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40ml	HCL	VOL	yes no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-9	Job Number:	1126
Client:	Mustar Vancouver	Date:	12-14-16
Project:	6000	Sampler:	JGM
Weather:	Snow	Time In/Out:	~

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	25.87	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	~	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				BP				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			HDPE			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1415			25.87	.20	6.17	10.00	928	7.25	85.7	—	clear			
1418			25.87	.20	6.74	12.63	874	3.49	72.0	—	clear			
1421			25.87	.20	6.59	12.71	761	4.08	79.3	—	clear			
1424			25.87	.20	6.53	12.80	758	4.29	82.1	—	clear			
1427			25.87	.20	6.52	12.88	756	4.53	85.9	—	clear			

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-9	Sampling Flow Rate	.20	Analytical Laboratory:	Pace	
Sample Time:	1427	Final Depth to Water:	25.87	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40ML	HCL	HVOC	yes no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Label came off bag

WELL MONITORING DATA SHEET



Well I.D.	MW-1	Job Number:	1126
Client:	Mustar vape	Date:	12-16-16
Project:	Gum	Sampler:	JGM
Weather:	Partly Sunny, cold	Time In/Out:	~

WELL DATA

Well Depth:	~	Well Diameter:	2"	Water Height	~
Depth to Water:	24.18	Screened Interval:	~	x Multiplier	~
Water Column Length:	~	Depth to Free Product:	~	x Casing Volumes	~
Purge Volume:	~	Free Product Thickness:	~	= Purge Volume	~
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	~

PURGING DATA

Purge Method:	BP			Pump Intake Depth:	MS			Comments			
Sampling Method:	LF			Tubing Type:	HDPE						
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0935			24.18	.20	5.96	10.51	275	7.43	56.0	-	clear
0938			24.18	.20	6.66	13.35	280	1.61	50.0	-	clear
0941			24.18	.20	6.69	13.51	291	1.52	38.0	-	clear
0944			24.18	.20	6.71	13.62	300	1.40	29.4	-	clear

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-1	Sampling Flow Rate	.20	Analytical Laboratory:	Pace	
Sample Time:	0944	Final Depth to Water:	24.18	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCL	HVOL	yes no	~	~	~
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Vancouver (Nuster Trj)

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)
# 1	Jm	7/29/16	1330		45-40	6.0	6:1	30.1	180.5	-	1.20	
					40-35	5.8		30.1	180.5	-	1.20	
					35-30	7.0		30.1	180.5	-	1.20	
					30-25	4.8		30.1	180.5	-	1.20	
# 8	Jm	8/29/16	1330		45-40	6.0	6:1	30.1	180.5	-	1.20	
					40-35	4.9		30.1	180.5	-	1.20	
					35-30	6.6		30.1	180.5	-	1.20	
					30-25	4.7		30.1	180.5	-	1.20	
# 12	Jm	8/29/16	1330		45-40	6.6	6:1	30.1	180.5	-	1.20	
					40-35	5.3		30.1	180.5	-	1.20	
					35-30	6.4		30.1	180.5	-	1.20	
					30-25	5.0		30.1	180.5	-	1.20	
# 34	Jm	8/30/16	1030		45-40	6.6	10:1	30.1	300.8	-	1.2	
					40-35	6.0		30.1	300.8	-	1.2	
					35-30	5.5		30.1	300.8	-	1.2	
					30-25	4.9		30.1	300.8	-	1.2	
# 53	Jm	8/30/16	1030		45-40	6.2	10:1	30.1	300.8	-	1.2	
					40-35	6.0		30.1	300.8	-	1.2	
					35-30	5.1		30.1	300.8	-	1.2	
					30-25	5.0		30.1	300.8	-	1.2	
# 35	Jm	8/30/16	1030		45-40	6.3	10:1	30.1	300.8	-	1.2	
					40-35	6.0		30.1	300.8	-	1.2	
					35-30	5.8		30.1	300.8	-	1.2	
					30-25	4.9		30.1	300.8	-	1.2	
# 36	Jm	8/30/16	1030		45-40	6.6	10:1	30.1	300.8	-	1.2	
					40-35	6.0		30.1	300.8	-	1.2	
					35-30	5.3		30.1	300.8	-	1.2	
					30-25	5.3		30.1	300.8	-	1.2	

→ ~7.6g per 1,000 gal H₂O

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)
4	JGn	6/3/16	1259	1333	45-40	6.8	6:1	30.1	180.5	1/4 teaspoon	1.2	
			1333	1407	40-35	6.2		30.1	180.5	wl.	1.2	
			1411	1445	35-30	6.2		30.1	180.5	20 g	1.2	
			1445	1516	30-25	6.2		30.1	180.5	chase H ₂ O	1.2	
.5	JGn	6/3/16	1259	1337	45-40	5.5	6:1	30.1	180.5	1/4 wl.	1.2	
			1337	1414	40-35	5.7		30.1	180.5	20g	1.2	
			1419	1453	35-30	6.2		30.1	180.5	chase	1.2	
			1453	1525	30-25	6.6		30.1	180.5	H ₂ O	1.2	
6	JGn	6/3/16	1259	1341	45-40	5.0	6:1	30.1	180.5	1/4 wl.	1.2	
			1341	1426	40-35	4.7		30.1	180.5	20 gal	1.2	
			1429	1502	35-30	6.4		30.1	180.5	chase	1.2	
			1502	1555	30-25	6.4		30.1	180.5	H ₂ O	1.2	

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)
3	JGn	9/1/16	1055	1158	45-40	3.4	6:1	30.1	180.5	1/4 TSP	1.2	
			1157	1239	40-35	5.0	↓	30.1	180.5	with	1.2	
			1243	1322	35-30	5.4	↓	30.1	180.5	20 gal	1.2	
			1322	1358	30-25	5.8	↓	30.1	180.5	H ₂ O	1.2	
9	JGn	9/1/16	1056	1151	45-40	3.8	6:1	30.1	180.5	1/4 TSP	1.2	
			1151	1231	40-35	5.3	↓	30.1	180.5	with	1.2	
			1236	1317	35-30	5.1	↓	30.1	180.5	20 gal	1.2	
			1317	1353	30-25	5.8	↓	30.1	180.5	H ₂ O	1.2	
16	JGn	9/1/16	1057	1140	45-40	4.9	6:1	30.1	180.5	1/4 TSP	1.2	
			1140	1224	40-35	4.8	↓	30.1	180.5	with	1.2	
			1229	1313	35-30	4.8	↓	30.1	180.5	20 gal	1.2	
			1313	1349	35-25	5.4	↓	30.1	180.5	H ₂ O	1.2	
17	JGn	9/1/16	1057	1134	45-40	5.7	6:1	30.1	180.5	1/4 TSP	1.2	
			1134	1215	40-35	5.1	↓	30.1	180.5	with	1.2	
			1214	1302	35-30	4.8	↓	30.1	180.5	20 gal	1.2	
			1307	1345	30-25	5.5	↓	30.1	180.5	H ₂ O	1.2	

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)
18	JGM	9-2-16	1100	1142	45-40	5.0	6:1	30.1	180.5	1/4 TSP	1.2	* Relocated INJECTIONS ~ 20' TO THE N TO AVOID FOOTING OF CABRI LEVER WALL
↓	↓	↓	1142	1218	40-35	5.8	↓	30.1	180.5	With	1.2	
↓	↓	↓	1223	1257	35-30	6.2	↓	30.1	180.5	20 gal	1.2	
↓	↓	↓	1257	1326	30-25	7.3	↓	30.1	180.5	H ₂ O	1.2	
20	JGM	9-2-16	1026	1119	45-40	4.0	6:1	30.1	180.5	1/4 TSP	1.2	TO AVOID FOOTING OF CABRI LEVER WALL
↓	↓	↓	1119	1208	40-35	4.3	↓	30.1	180.5	With	1.2	
↓	↓	↓	1210	1246	35-30	5.8	↓	30.1	180.5	20 gal	1.2	
↓	↓	↓	1246	1322	30-25	5.8	↓	30.1	180.5	H ₂ O	1.2	
21	JGM	9-2-16	1026	1108	45-40	5.0	6:1	30.1	180.5	1/4 TSP	1.2	
↓	↓	↓	1108	1200	40-35	4.0	↓	30.1	180.5	With	1.2	
↓	↓	↓	1203	1240	35-30	5.7	↓	30.1	180.5	20 gal	1.2	
↓	↓	↓	1240	1319	30-25	5.9	↓	30.1	180.5	H ₂ O	1.2	
22	JGM	9-2-16	1026	1059	45-40	6.4	6:1	30.1	180.5	1/4 TSP	1.2	
↓	↓	↓	1059	1145	40-35	4.6	↓	30.1	180.5	With	1.2	
↓	↓	↓	1151	1235	35-30	4.8	↓	30.1	180.5	20 gal	1.2	
↓	↓	↓	1235	1312	30-25	6.2	↓	30.1	180.5	H ₂ O	1.2	

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)	
13	JGM	9/6/16	1538	1610	25-30	6.6	6:1	30.1	180.5	1/4 tsp	1.2		
			↓	1503	1538	30-35	6.0	6:1	30.1	180.5	with	1.2	
			↓	1424	1501	35-40	5.7	6:1	30.1	180.5	20 gal	1.2	
			↓	1354	1424	40-45	7.0	6:1	30.1	180.5	H ₂ O	1.2	
10	JGM	9/6/16	1524	1601	25-30	5.7	6:1	30.1	180.5	1/4 tsp	1.2		
			↓	1445	1524	30-35	5.4	6:1	30.1	180.5	with	1.2	
			↓	1407	1443	35-40	5.8	6:1	30.1	180.5	20 gal	1.2	
			↓	1335	1407	40-45	6.6	6:1	30.1	180.5	H ₂ O	1.2	
7	JGM	9/6/16	1531	1607	25-30	5.8	6:1	30.1	180.5	1/4 tsp	1.2		
			↓	1453	1531	30-35	5.5	6:1	30.1	180.5	with	1.2	
			↓	1415	1451	35-40	5.8	6:1	30.1	180.5	20 gal	1.2	
			↓	1335	1415	40-45	5.3	6:1	30.1	180.5	H ₂ O	1.2	
2	JGM	9/6/16	1535	1610	25-30	6.0	6:1	30.1	180.5	1/4 tsp	1.2		
			↓	1457	1535	30-35	5.5	6:1	30.1	180.5	with	1.2	
			↓	1416	1455	35-40	5.4	6:1	30.1	180.5	20 gal	1.2	
			↓	1335	1416	40-45	5.1	6:1	30.1	180.5	H ₂ O	1.2	

* Will get Rates & Times from Cascade on 9/12/16

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)	
40	J6n	9/9/16	1414	1513	25-30	5.9	10:1	30.1	300.8	1/4 TSP	1.2		
			↓	1313	1414	30-35	5.4	↓	30.1	300.8	with	1.2	
			↓	1206	1311	35-40	5.1	↓	30.1	300.8	20gal	1.2	
			↓	1049	1206	40-45	4.3	↓	30.1	300.8	chase	1.2	
39	J6n	9/9/16	1412	1512	25-30	5.8	10:1	30.1	300.8	1/4 TSP	1.2		
			↓	1308	1412	30-35	5.2	↓	30.1	300.8	with	1.2	
			↓	1202	1307	35-40	5.1	↓	30.1	300.8	chase H ₂ O	1.2	
			↓	1049	1202	40-45	4.5	↓	30.1	300.8		1.2	
38	J6n	9/9/16	1409	1511	25-30	5.7	10:1	30.1	300.8	1/4 TSP	1.2		
			↓	1303	1409	30-35	5.0	↓	30.1	300.8	with	1.2	
			↓	1157	1301	35-40	5.2	↓	30.1	300.4	chase	1.2	
			↓	1049	1157	40-45	4.9	↓	30.1	300.4	H ₂ O	1.2	
37	J6n	9/9/16	1403	1504	25-30	5.8	10:1	30.1	300.8	1/4 TSP	1.2		
			↓	1300	1403	30-35	5.3	↓	30.1	300.8	with	1.2	
			↓	1154	1258	35-40	5.2	↓	30.1	300.8	chase	1.2	
			↓	1049	1154	40-45	5.1	↓	30.1	300.8	H ₂ O	1.2	
11	J6n	9/9/16	1400	1458	25-30	5.7	10:1	30.1	300.8	1/4 TSP	1.2		
			↓	1256	1400	30-35	5.2	↓	30.1	300.8	with	1.2	
			↓	1150	1252	35-40	5.3	↓	30.1	300.8	chase	1.2	
			↓	1049	1150	40-45	5.4	↓	30.1	300.8	H ₂ O	1.2	

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)
41	JGM	9/12/16	1319		25-30		10:1	30.1	180.5			
	↓	↓	1220	1319	30-35	5.6	↓					
	↓	↓	1109	1218	35-40	4.8	↓					
	↓	↓	0948	1109	40-45	4.1	↓					
42	JGM	9/12/16	1312		25-30		10:1					
	↓	↓	1208	1312	30-35	5.2	↓					
	↓	↓	1103	1206	35-40	5.3	↓					
	↓	↓	0948	1103	40-45	4.4	↓					
43	JGM	9/12/16	1310		25-30		10:1					
	↓	↓	1203	1310	30-35	4.9	↓					
	↓	↓	1058	1201	35-40	5.3	↓					
	↓	↓	0948	1058	40-45	4.7	↓					
44	JGM	9/12/16	1308		25-30		10:1					
	↓	↓	1159	1308	30-35	4.8	↓					
	↓	↓	1052	1157	35-40	5.1	↓					
	↓	↓	0948	1052	40-45	5.2	↓					

mm

* CHRIS, Lab
 Down #5
 For me?

you write
 from 9/13/16
 got busy helping cascade

They
 only
 had
 two
 on site

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)
29	Jgn	9/13/16	1514	1600	25-30	6.3	10:1	30.1	300.8	1/4 TSP	1.2	
			1416	1514	30-35	6.1	" "	" "	" "	per SS	1.2	
			1328	1418	35-40	5.8				9 gal EOS	1.2	
			1207	1323	40-45	4.7				w/ chas	1.2	
				1323						H2O		
30	Jgn	9/13/16	1510	1606	25-30	6.3	10:1	30.1	300.8	1/4 TSP	1.2	
			1416	1510	30-35	6.2	" "	" "	" "	per SS	1.2	
			1318	1415	35-40	6.0				9 gal EOS	1.2	
			1207	1318	40-45	4.4					1.2	
31	Jgn	9/13/16	1509	1405	25-30	6.3	10:1	30.1	300.8	1/4 TSP	1.2	
			1414	1509	30-35	6.0	" "	" "	" "	per SS	1.2	
			1316	1412	35-40	5.9				9 gal EOS	1.2	
			1207	1316	40-45	4.8					1.2	
32	Jgn	9/13/16	1503	1557	25-30	6.5	10:1	30.1	300.8	1/4 TSP	1.2	
			1409	1503	30-35	6.1	" "	" "	" "	per SS	1.2	
			1308	1408	35-40	5.5				9 gal	1.2	
			1207	1308	40-45	5.4				EOS	1.2	
33	Jgn	9/13/16	1454	1550	25-30	6.3	10:1	30.1	300.8	1/4 TSP	1.2	
			1402	1454	30-35	6.4	" "	" "	" "	per SS	1.2	
			1307	1400	35-40	6.2				9 gal	1.2	
			1207	1307	40-45	5.5				EOS	1.2	

Boring #	Logger initials	Date	Start Time	End Time	Injection Interval (ft)	Injection Rate (gallon/min)	Water/EOS ratio	Gallons EOS	Gallons water	Vitamins Added (teaspoon)	Dechlorinator added (grams)	Additional Notes: (Notes: use as many rows as needed for each borehole. Note change in injection rates with depth, if applicable.)
52	CC	9/14/16	1303	1405	25 to 30	5.7	10:1	30.1	300.8	2.2	2.5	
52	CC	↓	1206	1303	30 to 35	5.8	10:1	30.1	300.8	0	2.5	
52	CC	↓	1103	1200	35 to 40		10:1	30.1	300.8	0	2.5	
52	CC	↓	1009	1103	40 to 45	6.1	10:1	30.1	300.8	0	2.5	
54	CC	9/14/16	1313	1414	25-30	5.4	10:1	30.1	300.8	2.2	2.5	
54	CC	↓	1213	1313	30-35	5.5	↓	↓	↓	0	2.5	
54	CC	↓	1107	1205	35-40	5.7	↓	↓	↓	0	2.5	
54	CC	↓	1009	1107	40-45	5.7	↓	↓	↓	0	2.5	
55	CC	9/14/16	1318	1420	25-30	5.3	10:1	30.1	300.8	2.2	2.5	
55	CC	↓	1220	1318	30-35	5.7	↓	↓	↓	0	2.5	
55	CC	↓	1114	1206	35-40	6.4	↓	↓	↓	0	2.5	
55	CC	↓	1009	1114	40-45	5.1	↓	↓	↓	0	2.5	
56	CC	9/14/16	1324	1424	25-30	5.5	10:1	30.1	300.8	2.2	2.5	
56	CC	↓	1222	1324	30-35	5.3	↓	↓	↓	0	2.5	
56	CC	↓	1116	1213	35-40	5.8	↓	↓	↓	0	2.5	
56	CC	↓	1009	1116	40-45	4.9	↓	↓	↓	0	2.5	
65	CC	9/14/16	1328	1432	25-30	5.5	10:1	30.1	300.8	2.2	2.5	
65	CC	↓	1225	1328	30-35	5.3	↓	↓	↓	0	2.5	
65	CC	↓	1121	1215	35-40	6.1	↓	↓	↓	0	2.5	
65	CC	↓	1009	1121	40-45	4.6	↓	↓	↓	0	2.5	

Both Pages Use 1

8/22/18

MUSTAR Sediment

Sampling

Vessel @ Dock

0920 Deploy 7' - 1

0932 Deploy 14' - 2

19' - 3

0937 Deploy 19' - 3

0942 Deploy 13' - 4

* Ballard Personnel

* No OTISOT required

* No OTISOT required

* No OTISOT required

* No OTISOT required

8-22-16 Mouser Sediment
Sampling

at 10:05

Room ↓ Depth to Mud Time

SED-2-1 20' 5" 1014

SED-2-2 20.6 1031

20.6 @ head 1034

Maver 4' Penetration

5.5' @ 1036

Sample Name Time

SED-2-A 1036

20L-M LCK 20

Penetration/sec 1.5/3.5

STD-2-B (Keefer)

UL-M LCK 17.6' @ 1102

121 OT 1501 TO EAST

Penetration/sec 1.9/2.5

1125 MOB TO SED

Scale: 1 square =

Penetration Water checks
3'

Mouser TO EAST 21.2 @ 1027

Scale: 1 square =

Site in the Room.

Location: glocation
SED-3A-1-Attempt Example

8/22/16 MUSTAR

Sediment Sampling

Name Time (Keep)

SED-3A-1 1154

W-MICK 13.6 @ 1153 Sed

Penol/sec 6.8/4.25

Scale: 1 square = _____

Ballard Manibg

SED-3 Attempt 1

Scale: 1 square = _____

8-22-16 MUSTAR

SEDIMENT SAMPLING

MOB TO SED 4

Name Tinge (KeeP)

SED-4-A-1 1242 @ 1240

WL-MICK 14.9' @ 1240

Penet/rec 7/6.75'

5.75' when cut

Scale: 1 square = _____

Scale: 1 square = _____

Return to the Room

8-22-16 MUSTAR
Sediment Sampling
1305 M06 TO SED-5

Name (Keep)
Time

SED-5A-1 1318
UL-M1 15.5' 1312

Penet/Rec 6/3.85'

Scale: 1 square = _____

Hand-drawn grid for sediment sampling data on page 11.

Scale: 1 square = _____

Hand-drawn grid for sediment sampling data on page 12.

Plot on the Reverse

8-22-16 DUSTAR
 Sediment Sampling
 1341 MOB TO
 SED-6

Name Time
 SED-6-A-1
 WL-M1 CK 1358

Penetration/Recovery 0%
 * EX Tremly Hard
 Offsets to south

* Riprap will
 require 3 attempts
 To SED 10 for
 core collection
 * His late in day
 4410

Scale: 1 square = _____

8-22-16 DUSTAR
 Sediment Sampling

Name Time
 SED-10-A-1 1423

WL-M1 CK 33' @ 1422 moved
 WL-M1 CK 31' @ 1425
 Penet/Rec * 3 1/2'

Scale: 1 square = _____

Return on Rain

8/23/16 MUSTAR

Sediment Sampling

Name Time

SED-10-B

WL ML CK 32.9 @ 0848

Penet/Recovery 4/5

S' EAST SOUTH EAST OFFSITE

Name Time

SED-10-C

WL ML CK 30.1 @ 0913

Pen/Rec 3/1.5

S NORTH OFFSITE

Name Time

SED-10-D (KEEP) 0933

WL ML CK 29.9 @ 0931

Pen/Rec 3.9 / 2.51

Scale: 1 square = 10' ~~East~~ NORTH EAST

Scale: 1 square =

Keep on the Run

8/23/16 MUSTAR
VAN COUVEE SEDIMENT
SAMPLING

NAME TIME KEEP
SFQ-6-B 1013

WL MILLER 18.8 @ 1009

PEN/REC 25/1.5

Scale: 1 square = _____

Scale: 1 square = _____

Return to the Rain

8/23/16 Mustang
Vahcover seedling
Sampling

Name Time

SED-7-A 1045

WL ML CK 17.1 @ 1043

Pen/Rec 0/0

Name Time

SED-7-B 1053

WL ML CK 19.0 @ 1054

Pen/Rec 3.5/4.0

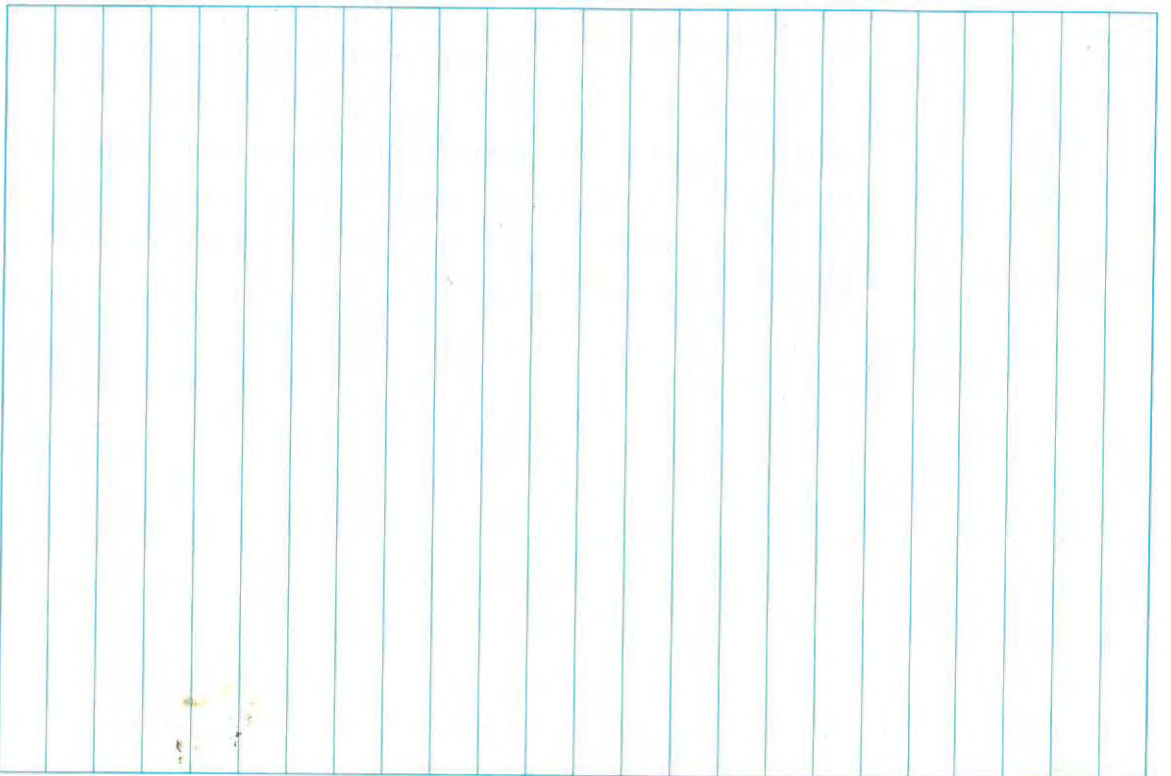
Name Time

SED-7-C 1111 (Beer)

WL ML CK 18.1 @ 1108

Pen/Rec 3.1/1.5

Scale: 1 square = _____



Scale: 1 square = _____

Rec'd in the Rain.

8/23/16 Mustang
VABCOVER Sediment
Sampling.

Name Time

SED-11-A 1158

WL MLCR 26.1 @ 1153

PCH/Rec 4.1/2.5

Scale: 1 square = _____

Scale: 1 square = _____

Return to the River

8/23/16 Mustar
Vancouver Sediment
Sampling

Name	Time
SED-8-A	1312
WL-MLK	15.0' @ 1309
Pen/Rec	5.8/1.2

Name	Time
SED-8-B	
WL-MLK	14.4' @ 1329
Pen/Rec	6.5/2.1
Set/Ret	10 Fast

Name	Time
SED-8-C	1410
WL-MLK	16.7' @ 1406
Pen/Rec	3.0/2.25'

Scale: 1 square = _____

8/24/2016 Mustar Vancouver
Sediment Sampling

Name	Time
SED-9-A	0850 Kece
WL-MLK	8.3' @ 0847
Pen/Rec	4/2.6'

Name	Time
SED-9-B	0918
WL-MLK	8.5' @ 0912
Pen/Rec	6.5/2.9'

Name	Time
SED-9-C	
WL-MLK	

Scale: 1 square = _____

Red on the Return

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-1
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 5'
 Core Recovery (feet) 4'

Date 8/24/2016
 Core Pushed By Ballard
 Core Logged By JGM
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth ()	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.5		0-0.5	VOL	0. - 0.25 Silty SAND, medium to dark brown ssa/4ssa, Loose
		6.1	TOC	
		15.4 PPM	dry	
		0.5-1.5	wieght	.25 - .5 Fine SAND with silt 8ssa/1ssa, med brown to dark gray, Loose
1.0				
1.5				.5 - 2.0 Fine SAND, Medium brown, Loose, poorly graded, Trace silt.
2.0				
2.5		15.4 PPM		2.0 - 4.0 SILT with Large gravel, Medium brown, 65%/35%, Very stiff, well rounded gravels.
		2.5-4.2		
3.0				
3.5				Becomes gray @ 3.7'
4.0		16.5 PPM		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. 1
 Core No. SED-2
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 4.7
 Core Recovery (feet) 4.25

Date 8/22/16
 Core Pushed By Justin Seiwert
 Core Logged By CS/JM
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = (80%) Dense

Theoretical Depth in () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0 - .5	0 - .5	VOL% FOC	Fine SAND with silt, 60%/40% Dark gray, low plasticity
.5 - 1	.5 - 2.5		0.5 - 1 SILT; Dark gray, low plasticity, Trace woody debris 1 - 1.5 SAA
1 - 1.5			1.5 - 2 SAND with silt, 60%/40% Dark gray, Trace woody debris
1.5 - 2			2 - 3 SILT with some sand, Dark gray 70%/30%
2 - 2.5	2.5 - 4.25		3 - 4.25 Fine SAND with silt and gravel, Dark gray some dark brown 80%/10%/10%, well rounded gravels, sub angular sand with frequent mica.

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SEN-3
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 6.8'
 Core Recovery (feet) 4.25

Date 8/22/16
 Core Pushed By JUSTIN SCIMETT
 Core Logged By JGM
 Type of Core Shelby Piston Core Other vibracore
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = 60%

Theoretical Depth in () Core Sections	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.0		0.0-0.5	VOL TOC	0-0.5 SILT WITH sand, 80%/20% VERY LIGHT brown
0.5	7.7 ppm	0.5-2.5	dry weight	0.5-2.0 COARSE SAND with gravel, Trace silt, Medium brown, sub- angular sand, well rounded cobbles, frequent mica
1.0				
1.5				
2.0				2.0 silt lens 2.0-4.25 Fine SAND with silt lenses, medium brown, poorly graded, sub angular sand.
2.5	20.1 ppm	2.5-4.25		
3.0				
3.5				
4.0				
4.25	20.1 ppm			

Figure D-1
Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SEN-4
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 7'
 Core Recovery (feet) 5.75

Date 8/22/16
 Core Pushed By Ballard
 Core Logged By JGM
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = 6.75 TO 5.75 aerial

Theoretical Depth () Core Sections	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
		0-0.5	VOE	<p>5-2.5 Fine SAND with SILT, Dark brown, sub angular sand 65% / 35%</p>
		6.1 PPA	TOL	
		1.5-2.5	DRY weight analysis	
	Sheen	6.3 PPA		
		2.5-4.5		<p>SAND grades TO fine sand, poorly graded, subangular SILT lenses.</p>
		12.4 PPA		
	Sheen	4.5-5.75		
		2.17 PPA		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-5
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 6'
 Core Recovery (feet) 3.85

Date 8/22/16
 Core Pushed By Ballard
 Core Logged By JGM
 Type of Core Shelby Piston Core Other VIBRA CORE
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth in () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0-0.5			0-3.85 SAND with silt lenses fine to medium grained, sub angular, dark brown, trace well rounded gravels.
0.5-2.5	9.2 ppm		
2.5-3.85	14.7 ppm	SAA	
3.85	24.0 ppm	SAA	

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SFD-7
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 3.0
 Core Recovery (feet) 1.5

Date 6/23/2016
 Core Pushed By Ballard
 Core Logged By Jbn
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth in () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.5	0-0.5 <u>11.89%</u>	vol TUC dry	0-0.25 Fine silty SAND, Medium brown, 65% / 35%, Loose
1.0	0.5-1.5 <u>18.69%</u>	wieght	0.25-0.5 Fine SAND with silt, Medium brown, 85% / 15%, Loose
1.5			0.5-1.5 Medium to coarse Gravelly SAND, 55% / 45%, Medium brown well rounded gravels, well rounded to sub angular sand, trace brick fragments
2.0			
2.5			

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-9
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 4.6
 Core Recovery (feet) 2.7

Date 8/24/16
 Core Pushed By Ballant
 Core Logged By JGM
 Type of Core Shelby Piston Core Other VIBRA COR
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth in () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.5	0-0.5 19.100 0.5-2.6	VOL % DRY WEIGHT	0-1 SILTY SAND, Dark brown SS ₆₀ /45 ₄₀ , Loose 1-2.7' FINE SAND, Med brown, sub angular, frequent Mica, poorly graded.
1.0			
1.5			
2.0			
2.5			
	21.7		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-10
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 3.9'
 Core Recovery (feet) 2.5'

Date 8/23/16
 Core Pushed By _____
 Core Logged By 260
 Type of Core Shelby Piston Core Other u. core
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth in () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
			Core Sections
0 - .5	0-0.5 16.5 ppm	VOG TOL DRY weight	0-.25 Fine SILTY SAND, Light brown 750°/250°, Loose, angular to sub angular, frequent mica .25 grades into fine sand Then coarse SAND with gravel .5-2.5 Coarse gravel sand 500°/500°, well round gravel, rounded to sub angular sand
0 - 2.66	0-2.66		
2.5 - 3.0	2.5-3.0 9.1 ppm		

Figure D-1
Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-11
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 4.1
 Core Recovery (feet) 2.5

Date 8/23/16
 Core Pushed By Ballard
 Core Logged By JG
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5" dia
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth ()	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
				Core Sections
0.5		0.0-0.5	VOC TOC DTY Weight	0-.25 silty sand, medium brown 55% ₁₀₀ / 45% ₁₀₀ 90% ₁₀₀
1.0		0.5-2.5		.25-.5 SAND with silt, medium brown 85% ₁₀₀ / 15% ₁₀₀ , Loose
1.5				0.5-2.5 coarse GRAVELLY SAND, medium brown. 65% ₁₀₀ / 35% ₁₀₀ , well rounded gravels, well rounded to subangular sand, Loose, Nails at 2.0', Brick fragments.
2.5				

Figure D-1
 Subsurface Core Log Form

8/24/16 Mustar
 Karcover SEDiment
 Sampling

Nate Tiger (Beep)
 SED-1-A 1020
 WLG 20.3 @ 1015
 Pen/Rec 5/4

8/24/16
 Surface water sample
 Pickup

SURF 1 1057 8/24/16
 SURF 2 1114 8/24/16
 SURF 3 1126 8/24/16
 SURF 4 1133 8/24/16



3015 SW First Avenue
 Portland, Oregon 97201-4707
 (503) 924-4704 Phone
 (503) 943-6357 Fax

PROJECT NUMBER 1126-20
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 3/27/17

PROJECT <u>Mustar Van GWM</u>	ARRIVAL TIME <u>0650</u>
LOCATION <u>Mustar Vancouver</u>	DEPARTURE TIME <u>1600</u>
CLIENT <u>Mustar Vancouver</u>	WEATHER <u>Rain</u>
PURPOSE OF OBSERVATIONS _____	
APEX REPRESENTATIVE <u>K.K. MM</u>	APEX PROJECT MANAGER <u>S. Satisbury</u>
CONTRACTOR _____	PERMIT NO. <u>245259</u>
CONTRACTOR REP. _____	H&S REVIEW <u>yes</u>

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0650 - On site, sign in, safety meeting, safety training
 Get permit
 0800 - start to pop well caps for gauging
 0940 - start gauging wells
 1250 - Finish gauging wells
 1331 - At well 2SI, a sharpie fell out of my pocket and went down the hole. The lid was on.
 1240 - start setting up to sample wells, cal 4SI
 1325 - start sampling first well
 1530 - Finish sampling last well of the day.
 1550 - dump purge water into Drum
 1600 - sign out turn in permit OFF site

BY _____
 APEX REPRESENTATIVE

REVIEWED BY _____
 APEX PROJECT MANAGER

WELL GAGING DATA SHEET




Client:	Mustar Van	Job Number:	1126-20
Project:	10-2017 GWM	Date:	3/27/17
Weather:	Rain	Sampler:	PK, MM
		Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-2	0940	—	16.04	—	—	—	
MW-9	0950	—	18.25	—	—	—	
MW-7	0954	—	16.93	—	—	—	
MW-5	0956	—	16.94	—	—	—	
MP-1	1000	—	16.89	—	—	—	
MP-2	1002	—	16.90	—	—	—	
MW-2AD	1005	—	15.53	—	—	—	
MP-3	1005	—	16.60	—	—	—	
MP-4	1006	—	16.35	—	—	—	
EX	1009	—	16.26	—	—	+	
MW-19	1011	—	15.98	—	—	—	
MW-13	1016	—	14.99	—	—	—	
S-2	1019	—	14.76	—	—	—	
S-1	1218	—	14.81	—	—	—	
MW-14	1023	—	17.14	—	—	—	
MW-17	1025	—	14.72	—	—	—	
MW-26	1030	—	17.76	—	—	—	
MW-10	1032	—	19.44	—	—	—	
MW-8	1035	—	17.60	—	—	—	
MW-32S	1039	—	23.45	—	—	—	
MW-E	1044	—	14.39	—	—	—	NO cover
MW-16	1050	—	14.95	—	—	—	
MW-15	1054	—	22.50	—	—	—	
MW-F	1057	—	15.65	—	—	—	
MW-G	1100	—	13.92	—	—	—	
MW-6	1102	—	15.16	—	—	—	
EW-1	1105	—	12.64	—	—	—	
MW-1	1107	—	14.17	—	—	—	
MW-12	1109	—	13.05	—	—	—	
M6MS1-43	1120	—	15.04	—	—	—	
M6MS2-60	1121	—	14.41	—	—	—	
M6MS1-132	1122	—	14.38	—	—	—	

WELL MONITORING DATA SHEET

	Well I.D.:	MW-23i	Job Number:	1126-20
	Client:	Mustar Van	Date:	3/27/17
	Project:	19207 GWM	Sampler:	KK, mm
	Weather:	Rain, overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	15.36	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				B. Pump				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			Skip Ded.			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1514	—	—	14.96	0.20	7.46	15.11	133	6.87	51.4	—	C			
1517	—	—	15.00	↓	7.24	15.32	133	6.95	55.7	—	C			
1520	—	—	15.03	↓	7.22	15.12	131	7.05	58.6	—	C			
1523	—	—	15.05	✓	7.21	15.02	130	7.12	61.8	—	C			

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-23i	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace
Sample Time:	1525	Final Depth to Water:	15.02	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD
3 x 40ml	HCl	HVOC	yes <u>no</u>	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS



3015 SW First Avenue
 Portland, Oregon 97201-4707
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PROJECT NUMBER 1126-20
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 3/28/17

PROJECT	<u>1Q2017 GWM</u>	ARRIVAL TIME	<u>0650</u>
LOCATION	<u>Nustar Vancouver</u>	DEPARTURE TIME	<u>1645</u>
CLIENT	<u>Nustar</u>	WEATHER	<u>overcast</u>
PURPOSE OF OBSERVATIONS	<u>Groundwater monitoring</u>		
APEX REPRESENTATIVE	<u>KK, MM</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	_____	PERMIT NO.	_____
CONTRACTOR REP.	_____	H&S REVIEW	<u>yes</u>

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0650 - on site, sign in, safety meeting, get permit
 0725 - start to set up for sampling, cal 45L, clean bladders
 0810 - start sampling wells.
 1200 - Empty purge buckets into new Drum.
 1220 - start o+m south system valve stuck down, high pressures.
 1330 - move on to MGMS3 and sample
 1620 Finish sampling last well of the day
 1630 - clean up, dump purge water in Drum
 1645 - off site

BY [Signature]
 APEX REPRESENTATIVE

REVIEWED BY _____
 APEX PROJECT MANAGER

WELL MONITORING DATA SHEET



Well I.D.:	EX	Job Number:	1126-20
Client:	Nustar Van	Date:	3/28/17
Project:	1Q2017 GWM	Sampler:	VK/MM
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height:	
Depth to Water:	15.95	Screened Interval:		x Multiplier:	
Water Column Length:		Depth to Free Product:		x Casing Volumes:	
Purge Volume:		Free Product Thickness:		= Purge Volume:	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	B. Pump				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1600	—	—	16.21	0.20	7.33	15.83	861	4.63	85.8	—	C
1603	—	—	16.18		7.21	16.30	874	1.52	90.0	—	C
1606	—	—	16.24		7.20	16.31	875	1.52	90.3	—	C
1609	—	—	16.18		7.21	16.31	877	1.50	89.9	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	1126	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1612	Final Depth to Water:	16.21	Did Well Dewater?:	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCl	HVOC	yes (no)	—	—	—
2 X 40 ml	—	RSK 175	yes (no)	—	—	—
2 X 40 ml	H2SO4	TOL	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-19	Job Number:	1126-20
Client:	Mustar VAN	Date:	3/28/17
Project:	1Q2017 GWM	Sampler:	KK/MM
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	15.80	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump			Pump Intake Depth:	MS			Comments			
Sampling Method:	LF			Tubing Type:	Dedicated skip						
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1530	—	—	14.15	0.20	6.96	14.45	2099	4.48	117.4	—	C
1533	—	—	14.03	—	7.17	15.02	2464	2.48	105.6	—	C
1536	—	—	14.18	—	7.37	15.38	2240	1.56	88.5	—	C
1539	—	—	14.18	—	7.39	15.40	2230	1.48	84.1	—	C
1542	—	—	14.16	—	7.41	15.49	2189	1.26	82.7	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1545	Final Depth to Water:	15.05	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCl	HUOC	yes (no)	—	—	MW-19 Dup
2 X 40 ml	—	RSK 175	yes	no		
2 X 40 ml	H2SO4	TBC	yes	no		
			yes	no		
			yes	no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MGMS3-132	Job Number:	1126-20
Client:	Mustar Van	Date:	3/28/17
Project:	1Q 2017 GWM	Sampler:	KK/mm
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	13.08	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B. Pump				Pump Intake Depth:			—		Comments	
Sampling Method:				LF				Tubing Type:			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)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1452	—	—	13.02	0.15	8.32	10.18	178	2.91	32.0	—	C			
1455	—	—	13.03		8.37	10.05	177	0.86	31.2	—	C			
1458	—	—	13.03		8.40	10.01	176	0.59	30.1	—	C			
1501	—	—	13.08	✓	8.43	10.11	176	0.50	28.1	—	C			


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-132	Sampling Flow Rate	0.15	Analytical Laboratory:	Pace	
Sample Time:	1505	Final Depth to Water:	13.10	Did Well Dewater?	NO	
# Containers/Type	3 X 40	Preservative	HCl	Analysis/Method	HVOC	
				Field Filtered	yes	no
					yes	no
					yes	no
					yes	no
					yes	no
					yes	no

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MGMS3-110	Job Number:	1126-20
	Client:	Nustar VAN	Date:	3/28/17
	Project:	1Q 2017 GWM	Sampler:	KK/MM
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	13.00	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B. Pump				Pump Intake Depth:			—		Comments	
Sampling Method:				LF				Tubing Type:			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)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1433	—	—	13.01	0.15	7.86	10.97	144	6.74	35.8	—	C			
1436	—	—	13.07		7.89	10.84	156	1.48	36.6	—	C			
1439	—	—	13.02		7.93	10.85	160	1.29	36.0	—	C			
1442	—	—	13.05		7.96	10.78	161	1.12	35.4	—	C			


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-110	Sampling Flow Rate:	0.15	Analytical Laboratory:	Pace	
Sample Time:	1445	Final Depth to Water:	13.10	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MGMS3-40	Job Number:	1126-20
	Client:	Nustar Van	Date:	3/28/17
	Project:	1Q 2017 GWM	Sampler:	KK/MM
	Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	12.98 13.02	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B Pump	Pump Intake Depth:	—	Comments
Sampling Method:	LF	Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color	Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria	
13AA	—	—	13.05	0.20	8.71	11.25	589	6.28	-58.0	—	C	
13A7	—	—	13.05	0.20	9.36	11.44	530	3.69	-98.9	—	C	
1350	—	—	13.08	0.20	9.38	11.61	502	2.24	-115.2	—	C	
1353	—	—	13.11	0.20	9.37	11.60	499	1.98	-120.1	—	C	
1356	—	—	13.12	0.20	9.36	11.66	501	1.62	-123.9	—	C	
1359	—	—	13.12	0.20	9.34	11.77	504	1.57	-125.8	—	C	
1A03			SAMPLE									

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MGMS3-40	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace
Sample Time:	1A03	Final Depth to Water:	13.03	Did Well Dewater?	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40	HCl	HDOC	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—
2 x 40	—	Ethene, Ethane	yes <input type="radio"/> no <input checked="" type="radio"/>	—	MGMS3-40 Dup
2 x 40	H2SO4	TOC	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—
			yes <input type="radio"/> no <input type="radio"/>		
			yes <input type="radio"/> no <input type="radio"/>		
			yes <input type="radio"/> no <input type="radio"/>		

COMMENTS

--

WELL MONITORING DATA SHEET

	Well I.D.	MW-2	Job Number:	1126-20
	Client:	Mustar Van	Date:	3/28/17
	Project:	12 2017 GWM	Sampler:	RK/MM
	Weather:	overcast	Time In/Out:	—

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	15.26	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	Ded. Skid		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1040	—	—	—	0.20	7.26	12.89	25	9.85	96.6	—	C
1043	—	—	—	0.20	6.40	13.16	16	7.31	132.8	—	C
1046	—	—	—	0.20	6.42	13.21	88	3.26	130.0	—	C
1049	—	—	—	0.20	7.15	13.19	187	1.58	64	—	C
1052	—	—	—	0.20	7.75	13.19	250	1.40	-13.0	—	C
1055	—	—	—	0.20	7.93	13.18	294	1.29	-43.2	—	C
1058	—	—	—	0.20	8.08	13.17	360	1.13	-64.2	—	C
1101	—	—	—	0.20	8.36	13.20	488	1.00	-99.6	—	C
1104	—	—	—	0.20	8.48	13.16	558	0.91	-114.3	—	C
1107	—	—	—	0.20	8.48	13.16	571	0.84	-117.4	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-2	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace
Sample Time:	1110	Final Depth to Water:	22.85	Did Well Dewater?	N
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40 ml	HCl	HVOC	yes <input checked="" type="radio"/> no	—	—
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

* Parameters would not stabilize, took sample after 10 readings. During testing could not get DTW, water level gauge wouldn't work

WELL MONITORING DATA SHEET

	Well I.D.:	MW-15	Job Number:	1126-20
	Client:	Mustar Van	Date:	3/28/17
	Project:	1Q 2017 GWM	Sampler:	KK/MM
	Weather:	overcast	Time In/Out:	—

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height:	—
Depth to Water:	21.90	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	✓

PURGING DATA

Purge Method:	B. Pump				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	Ded. Skip				—	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1000	—	—	—	0.20	7.16	12.59	438	4.96	56.0	—	C
1003	—	—	—		6.91	13.46	454	1.84	74.1	—	C
1006	—	—	—		6.89	13.45	454	1.73	77.4	—	C
1009	—	—	—		6.87	13.47	453	1.46	82.4	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-15	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1010	Final Depth to Water:	23.26	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

well on other side of wall so didn't get DTW every 3 mins.



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PROJECT NUMBER 1126-20
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 3/29/17

PROJECT	<u>1Q2017 GWM</u>	ARRIVAL TIME	<u>0652</u>
LOCATION	<u>Vancouver, WA</u>	DEPARTURE TIME	<u>1600</u>
CLIENT	<u>Mustar Vancouver</u>	WEATHER	<u>Rain</u>
PURPOSE OF OBSERVATIONS	<u>Groundwater sampling</u>		
APEX REPRESENTATIVE	<u>KK</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	_____	PERMIT NO.	<u>245266</u>
CONTRACTOR REP.	_____	H&S REVIEW	<u>yes</u>


Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0652 - On site, sign in, safety meeting, get permit
 0730 - Set up for day, cal YSI
 0820 - Start sampling 1st well of the day.
 1530 - Finish sampling last well of the day.
 1540 - Clean up van, put away gear, dump purge water into Drum.
 1600 Sign out, turn in permit, OFF site

BY _____
 APEX REPRESENTATIVE

REVIEWED BY _____
 APEX PROJECT MANAGER

WELL MONITORING DATA SHEET

	Well I.D.: <u>MW-18i</u>	Job Number: <u>1126-20</u>
	Client: <u>Mustar Van</u>	Date: <u>3/29/17</u>
	Project: <u>1Q 2017 GWM</u>	Sampler: <u>KK</u>
	Weather: <u>Rain</u>	Time In/Out: _____

WELL DATA

Well Depth: _____	Well Diameter: <u>2"</u>	Water Height: _____
Depth to Water: <u>15.00</u>	Screened Interval: _____	x Multiplier: _____
Water Column Length: _____	Depth to Free Product: _____	x Casing Volumes: _____
Purge Volume: _____	Free Product Thickness: _____	= Purge Volume: _____
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>B. Pump</u>				Pump Intake Depth: <u>ms</u>				Comments: _____			
Sampling Method: <u>LF</u>				Tubing Type: <u>ded. sk:p</u>				_____			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1426	—	—	15.01	0.20	7.90	14.08	119	6.48	64.6	—	C
1429	—	—	15.00		7.84	14.32	109	4.18	74.6	—	C
1432	—	—	15.00		7.82	14.38	110	4.02	74.5	—	C
1435	—	—	15.01		7.82	14.39	110	3.87	75.3	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: <u>MW-18i</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>Pace</u>
Sample Time: <u>1437</u>	Final Depth to Water: <u>15.00</u>	Did Well Dewater? <u>no</u>
# Containers/Type: <u>3 X 40 ml</u>	Preservative: <u>HCl</u>	Analysis/Method: <u>HVOC</u>
	Field Filtered: <u>yes</u> <u>(no)</u>	Filter Size: _____
	yes no	MS/MSD: _____
	yes no	Duplicate ID: _____
	yes no	
	yes no	
	yes no	

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-21i-40	Job Number:	1126-20
Client:	Mustar van	Date:	3/29/17
Project:	1Q 2017 GWM	Sampler:	KK
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	15.73	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:				B. Pump		Pump Intake Depth:				MS		Comments	
Sampling Method:				LF		Tubing Type:				Ded. skip			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1150	—	—	15.45	0.15	7.66	14.90	189	3.73	55.1	—	C		
1153	—	—	15.53	↓	7.62	15.01	192	0.86	54.0	—	C		
1156	—	—	15.55	↓	7.62	14.99	193	0.64	52.6	—	C		
1159	—	—	15.56	↓	7.64	14.97	193	0.52	51.7	—	C		

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21i-40	Sampling Flow Rate:	0.15	Analytical Laboratory:	Pace	
Sample Time:	1200	Final Depth to Water:	15.73	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3X 40 ml	HCl	HVOC	yes (no)	—	—	—
			yes	no		
			yes	no		
			yes	no		
			yes	no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-22i	Job Number:	1126-20
Client:	Nustar van	Date:	3/29/17
Project:	1Q 2017 GUM	Sampler:	KK
Weather:	Rain	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	15.97	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump			Pump Intake Depth:	MS			Comments			
Sampling Method:	LF			Tubing Type:	Dedicated skip			—			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1024	—	—	15.75	0.20	7.01	13.94	259	3.44	106.4	—	SC
1027	—	—	15.72		7.60	14.23	341	1.32	34.6	—	SC
1030	—	—	15.75		7.86	14.21	351	0.60	-35.1	—	SC
1033	—	—	15.74		7.90	14.23	353	0.53	-41.3	—	SC
1036	—	—	15.73		7.92	14.24	354	0.48	-43.7	—	SC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-22i	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace	
Sample Time:	1038	Final Depth to Water:	15.81	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-25i	Job Number:	1126-20
	Client:	Nustar Van	Date:	3/29/17
	Project:	1Q 2017 GWM	Sampler:	KK
	Weather:	Rain	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	15.20	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		Ded. Skip				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0948	—	—	15.20	0.20	7.59	12.01	282	7.55	106.3	—	C
0951	—	—	15.20	1	7.62	12.93	155	3.23	94.7	—	C
0954	—	—	15.20	1	7.59	13.02	152	3.08	95.3	—	C
0957	—	—	15.19	1	7.56	12.97	151	2.91	94.3	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-25i	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1000	Final Depth to Water:	15.20	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS



3015 SW First Avenue
 Portland, Oregon 97201-4707
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 (503) 943-6357 Fax

PROJECT NUMBER 1126-20
 FIELD REPORT NUMBER _____
 PAGE 1 OF 1
 DATE 3/30/17

PROJECT	<u>1Q 2017 GWM</u>	ARRIVAL TIME	<u>0656</u>
LOCATION	<u>Vancouver WA</u>	DEPARTURE TIME	<u>1610</u>
CLIENT	<u>Nustar Vancouver</u>	WEATHER	_____
PURPOSE OF OBSERVATIONS	<u>Ground water sampling</u>		
APEX REPRESENTATIVE	<u>KK</u>	APEX PROJECT MANAGER	<u>S. Salisbury</u>
CONTRACTOR	_____	PERMIT NO.	<u>245268</u>
CONTRACTOR REP.	_____	H&S REVIEW	<u>yes</u>


Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this 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 included in a preliminary report.

0656 - on site, sign in, safety meeting, set permit
 0730 - setup for sampling, cal YSI
 0810 - start sampling first well of day
 1530 - finish sampling
 1540 - clean up van, dump purge water into drum
 1610 - OFF site, sign out, turn in permit

BY
 APEX REPRESENTATIVE

REVIEWED BY _____
 APEX PROJECT MANAGER

WELL MONITORING DATA SHEET

	Well I.D.	MW-20i	Job Number:	1126-20
	Client:	Nustar Van	Date:	3/30/17
	Project:	1 Q 2017 GWM	Sampler:	KK
	Weather:	Rain	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	14.65	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				B. Pump				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			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)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1149	—	—	14.67	0.20	8.10	14.05	126	7.35	52.6	—	C			
1152	—	—	14.67		7.86	14.39	122	5.55	53.1	—	C			
1155	—	—	14.66		7.84	14.37	120	5.39	53.6	—	C			
1158	—	—	14.66		7.83	14.35	121	5.34	54.0	—	C			

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-20i	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace		
Sample Time:	1200	Final Depth to Water:	14.65	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3 X 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—	
			yes no				
			yes no				
			yes no				
			yes no				

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.:	MW-10	Job Number:	1126-20
	Client:	Nustar Van	Date:	3/30/17
	Project:	19207 Gwm	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	18.50	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B Pump			Pump Intake Depth:	MS			Comments			
Sampling Method:	LF			Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1116	—	—	18.75	0.20	6.75	14.19	1227	3.75	97.4	—	C
1119	—	—	18.92		6.60	14.39	1274	1.29	99.3	—	C
1122	—	—	19.04		6.58	14.42	1278	1.16	101.3	—	C
1125	—	—	19.15		6.60	14.43	1274	1.08	103.3	—	C


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-10	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1127	Final Depth to Water:	19.04	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40m	HCl	HVOC	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-1	Job Number:	1126-20
	Client:	Nustar Van	Date:	3/30/17
	Project:	1Q 2017 GWM	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	14.01	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B. Pump				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			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)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1041	—	—	14.05	0.20	7.74	10.33	144	4.51	52.8	—	C			
1044	—	—	14.08		7.73	9.39	112	1.37	53.4	—	C			
1047	—	—	14.07		7.75	9.31	112	1.18	52.6	—	C			
1050	—	—	14.05		7.77	9.30	111	1.03	50.8	—	C			


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	mw-1	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace		
Sample Time:	1052	Final Depth to Water:	14.02	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3 x 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—	—
			yes no				
			yes no				
			yes no				
			yes no				
			yes no				

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-6	Job Number:	1126-20
	Client:	Mustar van	Date:	3/30/17
	Project:	1Q 2017 GWM	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	14.82	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B Pump		Pump Intake Depth:				MS		Comments	
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
817	—	—	14.88	0.20	7.59	13.42	153	5.42	-8.4	—	C		
820	—	—	14.90		7.91	14.18	157	3.78	-29.5	—	C		
823	—	—	14.90		7.93	14.22	159	3.56	-33.5	—	C		
826	—	—	14.91		7.96	14.25	160	3.42	-35.7	—	C		


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-6	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	0828	Final Depth to Water:	14.82	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.:	MW-12	Job Number:	1126-20
	Client:	Nustar van	Date:	3/30/17
	Project:	1Q 2017 G60m	Sampler:	KK
	Weather:	Rain	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	12.63	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	B. Pump				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0915	—	—	13.30	0.25	7.14	11.31	1148	6.82	4.1	—	SC
0918	—	—	13.48		7.36	11.10	1211	3.64	-12.7	—	SC
0921	—	—	13.65		7.43	11.03	1214	3.12	-15.0	—	SC
0924	—	—	13.88		7.44	11.08	1217	3.00	-16.6	—	SC
0927	—	—	14.13		7.42	11.14	1219	2.92	-17.9	—	SC


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-12	Sampling Flow Rate:	0.25	Analytical Laboratory:	Pace	
Sample Time:	0930	Final Depth to Water:	14.57	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 x 40 ml	HCl	HVOC	yes (no)	—	—	MW-12 Dup
2 x 40 ml	—	RSK 175	yes (no)	—	—	—
2 x 40 ml	H ₂ SO ₄	TOC	yes (no)	—	—	—
6 x 40 ml	HCl	HVOC	yes (no)	—	MS/MSD	—
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	M6MS2-40	Job Number:	1126-20
	Client:	Nustar Van	Date:	3/31/17
	Project:	1Q 2017 GWM	Sampler:	KK
	Weather:	Part sun	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	14.48	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:					Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1130	—	—	14.80	0.15	7.46	14.63	1519	3.11	122.8	—	C
1133	—	—	14.81		8.42	15.08	1590	1.08	-54.2	—	C
1136	—	—	14.80		8.64	15.18	1601	0.90	-87.8	—	C
1139	—	—	14.80		8.68	15.34	1611	0.78	-90.6	—	C
1142	—	—	14.81		8.72	15.41	1618	0.68	-92.2	—	C


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	M6MS2-40	Sampling Flow Rate	0.15	Analytical Laboratory:	Pace	
Sample Time:	1144	Final Depth to Water:	14.52	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	H VOC	yes <input checked="" type="radio"/> no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.:	MGMSD-60	Job Number:	1106-20
	Client:	NuStar Van	Date:	3/31/17
	Project:	1Q 2017 GWM	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height:	—
Depth to Water:	13.97	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:		B. Pump		Pump Intake Depth:		—		Comments			
Sampling Method:		LF		Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1106	—	—	13.97	0.15	7.48	13.96	120	4.40	49.8	—	C
1109	—	—	13.92		8.04	13.53	120	4.48	43.8	—	C
1112	—	—	13.94		8.01	13.55	120	4.53	45.3	—	C
1115	—	—	13.93		8.03	13.58	119	4.64	45.8	—	C


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMSD-60	Sampling Flow Rate:	0.15	Analytical Laboratory:	Pace	
Sample Time:	1117	Final Depth to Water:	13.91	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <u>no</u>	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MGMSD-132	Job Number:	1126-20
	Client:	Nustar van	Date:	3/31/17
	Project:	102017 GWM	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height:	—
Depth to Water:	13.85	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:				B. Pump		Pump Intake Depth:				—		Comments	
Sampling Method:				LF		Tubing Type:				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)	Turbidity (NTUs)	Clarity/Color	Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1016	—	—	14.00	0.15	7.37	13.42	172	3.37	62.6	—	C		
1019	—	—	14.04		7.94	13.63	175	0.99	56.1	—	C		
1022	—	—	14.05		7.97	13.67	175	0.78	53.2	—	C		
1025	—	—	14.05		8.00	13.67	175	0.60	48.6	—			

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMSD-132	Sampling Flow Rate:	0.15	Analytical Laboratory:	Pace		
Sample Time:	1027	Final Depth to Water:	13.95	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3 x 40 ml	HCl	HVOC	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—	—	
			yes <input type="radio"/> no <input type="radio"/>				
			yes <input type="radio"/> no <input type="radio"/>				
			yes <input type="radio"/> no <input type="radio"/>				
			yes <input type="radio"/> no <input type="radio"/>				

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MGMS1-43	Job Number:	1126-20
Client:	Nustar Van	Date:	3/31/17
Project:	1Q2017 GWM	Sampler:	KK
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	14.71	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		B. Pump			Pump Intake Depth:		ms			Comments	
Sampling Method:		LF			Tubing Type:		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)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
818	—	—	14.85	0.20	6.92	10.54	1555	5.53	85.4	—	C
821	—	—	14.78		7.73	10.94	1425	3.31	-24.3	—	C
824	—	—	14.78		7.78	11.03	1421	3.19	-34.4	—	C
827	—	—	14.79		7.81	11.09	1424	3.02	-40.7	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS1-	Sampling Flow Rate:	0.20	Analytical Laboratory:	Pace
Sample Time:	0830	Final Depth to Water:	14.70	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3 x 40ml	HCl	HVOC	yes (no)	—	—
2 x 40ml	—	RSK 175	yes (no)	—	—
2 x 40ml	H ₂ SO ₄	TOC	yes (no)	—	—
			yes no		
			yes no		

COMMENTS

8/24/16 Mustar
 Karcover SEDiment
 Sampling

Nate Tiger (Beep)
 SED-1-A 1020
 WLG 20.3 @ 1015
 Pen/Rec 5/4

8/24/16
 Surface water sample
 Pickup

SURF 1 1057 8/24/16
 SURF 2 1114 8/24/16
 SURF 3 1126 8/24/16
 SURF 4 1133 8/24/16

8/22/18

MUSTAR Sediment

Sampling

Vessel @ Dock

0920 Deploy 7' - 1

0932 Deploy 14' - 2

19' - 3

0937 Deploy 19' - 3

0942 Deploy 13' - 4

Both Pages Used

* Ballard Personnel

* No OTISOT Required

* No OTISOT Required

* No OTISOT Required

* No OTISOT Required

8-22-16 Mouser Sediment
Sampling

at 10:00 AM

Room ↓ Depth to Mud Time

SED-2-1 20' 5" 1014

SED-2-2 20.6 1031

20.6 @ head 1034

Maver 4' Penetration

5.5' @ 1036

Sample Name Time

SED-2-A 1036

20L-M LCK 20

Penetration/sec 1.5/3.5

STD-2-B (Keefer)

UL-M LCK 17.6' @ 1102

121 OT 1501 TO EAST

Penetration/sec 1.9/2.5

1125 MOB TO SED

Scale: 1 square =

Penetration Water checks
3'

Mouser TO EAST 21.2 @ 1027

Scale: 1 square =

Site in the Room.

Location: glocation
SED-3A-1-1-ATENT Example

8/22/16 MUSTAR

Sediment Sampling

Name Time (Keep)

SED-3A-1 1154

W-MICK 13.6 @ 1153 Sed

Penol/sec 6.8/4.25

Scale: 1 square = _____

Ballard Manibg

SED-3 Attempt 1

Scale: 1 square = _____

8-22-16 MUSTAR

SEDIMENT SAMPLING

MOB TO SED 4

Name Tinge (KeeP)

SED-4-A-1 1242 @ 1240

WL-MICK 14.9' @ 1240

Penet/rec 7/6.75'

5.75' when cut

Scale: 1 square = _____

Scale: 1 square = _____

Return to the Room

8-22-16 MUSTAR
Sediment Sampling
1305 M06 TO SED-5
(Keep)

Name Time

SED-5A-1 1318

UL-M1 15.5' 1312

Penet/Rec 6/3.85'

Scale: 1 square = _____

Scale: 1 square = _____

Plot on the Reverse

8-22-16 DUSTAR
 Sediment Sampling
 1341 MOB TO
 SED-6

Name Time
 SED-6-A-1
 WL-M1 CK 1358

Penetration/Recovery 0%
 * EX Tremly Hard
 Offsets to south

* Riprap will
 require 3 attempts
 To SED 10 for
 core collection
 * His late in day
 4410

Scale: 1 square = _____

8-22-16 DUSTAR
 Sediment Sampling

Name Time
 SED-10-A-1 1423

WL-M1 CK 33' @ 1422 moved
 WL-M1 CK 31' @ 1425
 Penet/Rec * 3 1/2'

Scale: 1 square = _____

Return on Rain

8/23/16 MUSTAR
VAN COUVEE SEDIMENT
SAMPLING

NAME TIME KEEP
SFQ-6-B 1013

WL MILLER 18.8 @ 1009

PEN/REC 25/1.5

Scale: 1 square = _____

Scale: 1 square = _____

Return to the Rain

8/23/16 Mustang
Vahcover seedling
Sampling

Name Time

SED-7-A 1045

WL ML CK 17.1 @ 1043

Pen/Rec 0/0

Name Time

SED-7-B 1053

WL ML CK 19.0 @ 1054

Pen/Rec 3.5/4.0

Name Time

SED-7-C 1111 (Beer)

WL ML CK 18.1 @ 1108

Pen/Rec 3.1/1.5

Scale: 1 square = _____

Blank lined area for notes or data on page 19.

Scale: 1 square = _____

Rec'd in the Rain.

8/23/16 Mustang
VABCOVER Sediment
Sampling.

Name Time

SEB-11-A 1158

WL MLCR 26.1 @ 1153

PCH/Rec 4.1/2.5

Scale: 1 square = _____

Scale: 1 square = _____

Return to the River

8/23/16 Mustar
VANCOUVER Sediment
SAMPLING

Name	Time
SED-8-A	1312
WL-MLK	15.0' @ 1309
Pen/Rec	5.8/1.2

Name	Time
SED-8-B	
WL-MLK	14.4' @ 1329
Pen/Rec	6.5/2.1
SET	150T TO EAST

Name	Time
SED-8-C	1410
WL-MLK	16.7' @ 1406
Pen/Rec	3.0/2.25'

Scale: 1 square = _____

8/24/2016 Mustar Vancouver
SEDIMENT SAMPLING

Name	Time
SED-9-A	0850 Kece
WL-MLK	8.3' @ 0847
Pen/Rec	4.2/2.6'

Name	Time
SED-9-B	0918
WL-MLK	8.5' @ 0912
Pen/Rec	6.5/2.9'

Name	Time
SED-9-C	
WL-MLK	

Scale: 1 square = _____

Red on the Return

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-1
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 5'
 Core Recovery (feet) 4'

Date 8/24/2016
 Core Pushed By Ballard
 Core Logged By JGM
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth in ()	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.0		0-0.5	VOL	0. - 0.25 Silty SAND, medium to Dark brown ssa/4sa, Loose
0.5		6.1 15.4 PPH 0.5-1.5	TOC dry weight	
1.0				.25 - .5 Fine SAND with silt 8sa/1sa, med brown to dark gray, Loose
1.5				.5 - 2.0 Fine SAND, Medium brown, Loose, poorly graded, Trace silt.
2.0				2.0 - 4.0 SILT with Large gravel, Medium brown, 65%/35%, Very stiff, well rounded gravels.
2.5		15.4 PPH 2.5-4.2		
3.0				Becomes gray @ 3.7'
3.5				
4.0		16.5 PPH		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. 1
 Core No. SED-2
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 4.7
 Core Recovery (feet) 4.25

Date 8/22/16
 Core Pushed By Justin Seiwert
 Core Logged By CS/JM
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = (80%) Dense

Theoretical Depth in () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0 - .5	0-.5	VOL% FOC	Fine SAND with silt, 60%/40% Dark gray, low plasticity
.5 - 1	.5-2.5		0.5-1 SILT; Dark gray, low plasticity, Trace woody debris 1-1.5 SAA
1 - 1.5			1.5-2 SAND with silt, 60%/40% Dark gray, Trace woody debris
1.5 - 2.0			2-3 SILT with some sand, Dark gray 70%/30%
2.0 - 2.5			
2.5 - 3.0	2.5-4.25		3-4.25 Fine SAND with silt and gravel, Dark gray some dark brown 80%/10%/10%, well rounded gravels, sub angular sand with frequent mica.
3.0 - 3.5			
3.5 - 4			
4 - 4.5			

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SEN-3
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 6.8'
 Core Recovery (feet) 4.25

Date 8/22/16
 Core Pushed By JUSTIN SCIMETT
 Core Logged By JGM
 Type of Core Shelby Piston Core Other vibracore
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = 60%

Theoretical Depth in () Core Sections	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.0		0.0-0.5	VOL TOC	0-0.5 SILT WITH sand, 80%/20% VERY LIGHT brown
0.5	7.7 ppm	0.5-2.5	dry weight	0.5-2.0 COARSE SAND with gravel, Trace silt, Medium brown, sub- angular sand, well rounded cobbles, frequent mica
1.0				
1.5				
2.0				2.0 silt lens 2.0-4.25 Fine SAND with silt lenses, medium brown, poorly graded, sub angular sand.
2.5	20.1 ppm	2.5-4.25		
3.0				
3.5				
4.0				
4.25	20.1 ppm			

Figure D-1
Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SEN-4
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 7'
 Core Recovery (feet) 5.75

Date 8/22/16
 Core Pushed By Ballard
 Core Logged By JGM
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = 6.75 TO 5.75 aerial

Theoretical Depth in () Core Sections	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
		0-0.5	VOI	<p>5-2.5 Fine SAND with SILT, Dark brown, sub angular sand 65% / 35%</p>
		6.1 PPA	TOC	
		1.5-2.5	DRY weight analysis	
		6.3 PPA		
		2.5-4.5		<p>SAND grades TO fine sand, poorly graded, subangular SILT lenses.</p>
		12.4 PPA		
		4.5-5.75		
		2.17 PPA		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-5
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 6'
 Core Recovery (feet) 3.85

Date 8/22/16
 Core Pushed By Ballard
 Core Logged By JGM
 Type of Core Shelby Piston Core Other VIBRA CORE
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth ()	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0	0-0.5			0-3.85 SAND with silt lenses fine to medium grained, sub angular, dark brown, trace well rounded gravels.
0.5	9.2 ppm 0.5-2.5			
1				SAA
1.5				
2.0				SAA
2.5	14.7 ppm 2.5-3.85			
3.0				SAA
3.85	24.0 ppm			

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SFD-6
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 2.5
 Core Recovery (feet) 1.5

Date _____
 Core Pushed By Bellard
 Core Logged By JG
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth () Core Sections	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.5		0-0.5 <u>14.7 pen</u> 0.5-2.5		0-1.0 Fine SAND with silt 45% / 15%, Dark brown, Fresh water clam @ .75'
1.0				1.0-1.5 coarse gravelly SAND Medium brown, Loose, well rounded gravels, subangular sand.
1.5				
2.0				
2.5		<u>20.0 pen</u>		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SFD-7
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 3.0
 Core Recovery (feet) 1.5

Date 6/23/2016
 Core Pushed By Ballard
 Core Logged By Jbn
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.5	0-0.5 <u>11.89%</u>	vol TUC dry	0-0.25 Fine silty SAND, Medium brown, 65% / 35%, Loose
1.0	0.5-1.5 <u>18.69%</u>	wieght	0.25-0.5 Fine SAND with silt, Medium brown, 85% / 15%, Loose
1.5			0.5-1.5 Medium to coarse Gravelly SAND, 55% / 45%, Medium brown well rounded gravels, well rounded TO sub angular sand, trace brick fragments
2.0			
2.5			

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-8
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 3.0'
 Core Recovery (feet) 2.25

Date 8/23/16
 Core Pushed By Jen Ballard
 Core Logged By Jen
 Type of Core Shelby Piston Core Other vibracore
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical	Depth in ()	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
Core Sections	0.5		0-0.5	VOC TOC DTY	0-0.25 Silty SAND, Medium TO Dark Brown, 55d ^o /45d ^o , Loose
			22.7 ppm	DTY	0.25-0.5 SAND with silt, Medium brown, 85d ^o /15d ^o , Loose, Large 3" gray Brick fragments. Jen
			0.5-2.25	Weight analysis	0.5-2.5 Medium to coarse Gravelly SAND 60d ^o /40d ^o , Medium to Dark brown, Large 3" gray Brick fragments.
			13.6		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-9
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 4.6
 Core Recovery (feet) 2.7

Date 8/24/16
 Core Pushed By Ballant
 Core Logged By JGM
 Type of Core Shelby Piston Core Other VIBRA COR
 Diameter of Core (inches) 3.5"
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth () Core Sections	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
0.5		0-0.5	VOL % 19.1% DRY WEIGHT	0-1 SILTY SAND, Dark brown SS ₆₀ /45 ₆₀ , Loose
1.0		0.5-2.6		1-2.7' FINE SAND, Med brown, sub angular, frequent mica, poorly graded.
1.5				
2.0				
2.5				
		2.7		

Figure D-1
 Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-10
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 3.9'
 Core Recovery (feet) 2.5'

Date 8/23/16
 Core Pushed By _____
 Core Logged By JG
 Type of Core Shelby Piston Core Other u. core
 Diameter of Core (inches) 3.5
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth in () Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
			Core Sections
0 - .5	0-0.5 16.5 ppm	VOG TOL DRY weight	0-.25 Fine SILTY SAND, Light brown 750°/250°, Loose, angular to sub angular, frequent mica .25 grades into fine sand Then coarse SAND with gravel
0.5 - 2.5	0-2.66 9.1 ppm		.5-2.5 Coarse gravel sand 500°/500°, well round gravel, rounded to sub angular sand

Figure D-1
Subsurface Core Log Form

Visual Classification of Subsurface Core

Job _____
 Job No. _____
 Exploration No. _____
 Core No. SED-11
 Water Depth/Elevation of Core _____
 Cored Length (feet; from log) 4.1
 Core Recovery (feet) 2.5

Date 8/23/16
 Core Pushed By Ballard
 Core Logged By JG
 Type of Core Shelby Piston Core Other Vibracore
 Diameter of Core (inches) 3.5" dia
 Core Quality Good Fair Poor Disturbed
 Average % Compaction = _____

Theoretical Depth ()	Actual	Sample Interval	Sample Analytes	Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
				Core Sections
0.5		0.0-0.5	VOC TOC DTY Weight	0-.25 silty sand, medium brown 55% ₁₀₀ / 45% ₁₀₀ 90% ₁₀₀
1.0		0.5-2.5		.25-.5 SAND with silt, medium brown 85% ₁₀₀ / 15% ₁₀₀ , Loose
1.5				0.5-2.5 coarse GRAVELLY SAND, medium brown. 65% ₁₀₀ / 35% ₁₀₀ , well rounded gravels, well rounded to subangular sand, Loose, Nails at 2.0', Brick fragments.
2.5				

Figure D-1
 Subsurface Core Log Form

Appendix C

**March 2017 Laboratory Analytical Reports
and Data Quality Review (on CD)**

Appendix C – Laboratory Analytical Reports and Data Quality Review

1.0 Introduction

This appendix documents the results of a quality assurance/quality control (QA/QC) review of the analytical data for groundwater samples collected during the March and June 2017 groundwater sampling events and air samples collected during the January through June 2017 soil vapor extraction (SVE) effluent sampling events for the NuStar Terminals Services, Inc. (NuStar) Vancouver Facility (Facility) in Vancouver, Washington. TestAmerica Laboratories in West Sacramento, California and Pace Analytical (Pace) in Davis, California performed the analyses. A copy of each analytical laboratory report is included in this appendix.

Report	Report Date	Sampling Event
1285102	April 4, 2017	First Quarter Groundwater Monitoring
320-25383-1	February 7, 2017	January SVE Monitoring
320-26384-1	March 17, 2017	February SVE Monitoring
320-27201-1	April 19, 2017	March SVE Monitoring
320-27847-1	May 11, 2017	April SVE Monitoring

2.0 Data Validation

The QA review outlines the applicable quality control 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
- Field duplicates to assess sampling and laboratory precision

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

Appendix C – Laboratory Analytical Reports and Data Quality Review

3.0 Analytical Methods

Chemical analyses on collected water samples consisted of volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B. Select groundwater samples were also analyzed for TOC by EPA Method 5310D and ethene by EPA Method RSK-175M. SVE effluent vapor samples were analyzed for VOCs using EPA Method TO15.

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.

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 MW-14 and MGMS3-40 from the March 2017 sampling event were insufficiently acid preserved for VOC analysis. There is potential that these results are biased low since MW-14 and MGMS3-40 were analyzed outside of 7-days.

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 groundwater or air analyses.

Appendix C – Laboratory Analytical Reports and Data Quality Review

Laboratory Control Samples and Laboratory Control Sample Duplicate. Laboratory Control Samples (LCS) were also analyzed by the laboratories to assess the accuracy of the analytical equipment. 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 percent recovery was within control limits for the water samples. The LCSD recovery associated with the air samples collected during the January 2017 SVE monitoring event was outside control limits for benzyl chloride. This analyte was biased high in the LCSD but because the analyte was not detected in the associated project samples, no data were flagged. The LCSD recovery for vinyl acetate was below the lower control limit for air samples collected during the March 2017 air samples. This analyte is biased low in the LCSD but because the analyte is not part of the monitoring program analytes, no data was flagged in the data table.

In addition, a second laboratory control sample (the Laboratory Control Sample Duplicate [LCSD]) is prepared as above and analyzed. This is compared to the initial laboratory control sample to assess the precision of the analytical method (RPD). The RPD between LCS and LCSDs was within the control limit.

Matrix Spike Analyses. Matrix Spike (MS) analyses are performed on samples submitted to the laboratory that are of the same matrix as the actual sample. The MS is spiked with known levels of the COI. These analyses are used to assess the potential for matrix interference with recovery or detection of the COI and the accuracy of the determination. The spiked sample results are compared to the expected result (i.e., sample concentration plus spike amount) and reported as percent recovery.

Several MS and MS duplicates (MSD) were analyzed during the batch analyses for both groundwater monitoring events. Percent recoveries and RPD values were within control limits for quality control samples associated with samples collected during the January and March 2017 events.

The MS/MSD RPD's were within control limits.

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 spiked into environmental and batch quality control 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 is analyzed and compared to the primary sample analysis to assess

Appendix C – Laboratory Analytical Reports and Data Quality Review

the precision of the analytical method. This comparison can be expressed by the RPD between the original and duplicate samples. RPD values were outside of the control limit methane and ethene for batch 467360. The higher of the two results for ethene were included in the data table.

Field Duplicate. A field duplicate is a second field sample collected from a selected monitoring well. 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 second sample to assess the precision of the analytical method. This comparison can be expressed by the RPD between the original and duplicate samples. The analytes were below the RPD limit of +/-30 percent. Field duplicates were not collected for air samples.

Field Blank. A field blank is a sample of analyte-free water poured into a clean sample container in the field, preserved, and shipped to the laboratory with field samples. Field blanks assess the potential for contamination from field conditions during sampling. No analytes were identified in the field blanks collected during the first and second quarter 2017 monitoring events.

Equipment Blank. An equipment blank is a sample of analyte-free water poured over or through decontaminated field sampling equipment during a sampling event. Equipment blanks assess the potential for contamination from the total sampling, sample preparation, and measurement process when decontaminated sampling equipment is used to collect samples. No analytes were identified in the equipment blanks collected during the first and second quarter 2017 monitoring events.

Trip Blank. A trip blank is a clean sample of a matrix that is taken from the laboratory to the sampling site and transported back to the laboratory without having been exposed to sampling procedures. Trip blanks assess contamination introduced during shipping and field-handling activities. A trip blank was not analyzed for the first quarter 2017 monitoring event.

Conclusion. In conclusion, the overall QA objectives have been met, and the data are of adequate quality for use in this project.

Appendix C – Laboratory Analytical Reports and Data Quality Review

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 2016 groundwater sampling events and air samples collected during the July, August, September, October, November, and December 2016 soil vapor extraction (SVE) effluent sampling events for the NuStar Terminals Services, Inc. (NuStar) Vancouver Facility (Facility) in Vancouver, Washington. TestAmerica Laboratories in Los Angeles, California and Pace Analytical (Pace) in Davis, California performed the analyses. A copy of each analytical laboratory report is included in this appendix.

The QA review included examination and validation of the laboratory summary report, including:

- Analytical methods;
- Detection limits;
- Sample holding times;
- Custody records;
- Surrogates, spikes, and blanks; and
- Duplicates.

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

Analytical Methods

Chemical analyses on collected water samples consisted of volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B. Select groundwater samples were also analyzed for TOC by EPA Method 5310D and ethene by EPA Method RSK-175M. SVE effluent vapor samples were analyzed for VOCs using EPA Method TO15.

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.

Appendix C – Laboratory Analytical Reports and Data Quality Review

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.

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 holding times specified for the VOC analyses. The hold time for the RSK 175 analysis associated with the following samples collected during the December 2016 event (MW-19 and MW-24i) was outside of acceptable limits (of 14 days) by one day. There is the potential that these results could be biased low.

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 groundwater or air analyses.

Laboratory Control Samples and Laboratory Control Sample Duplicate. Laboratory Control Samples (LCS) were also analyzed by the laboratories to assess the accuracy of the analytical equipment. 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 percent recovery was within control limits for the water samples. The LCS recovery associated with the air samples collected during the December 2016 SVE monitoring event was outside control limits for carbon tetrachloride. This analyte was biased high in the LCS but because the analyte was not detected in the associated project samples, no data were flagged.

In addition, a second laboratory control sample (the Laboratory Control Sample Duplicate [LCSD]) is prepared as above and analyzed. This is compared to the initial laboratory control sample to assess the precision of the analytical method (RPD). The RPD between the LCS and one of the LCSD samples associated with the September 2016 sample batch, was above the acceptable limit. A second LCSD was analyzed and was well within control limits; therefore, no data were flagged.

Appendix C – Laboratory Analytical Reports and Data Quality Review

Matrix Spike Analyses. Matrix Spike (MS) analyses are performed on samples submitted to the laboratory that are of the same matrix as the actual sample. The MS is spiked with known levels of the COI. These analyses are used to assess the potential for matrix interference with recovery or detection of the COI and the accuracy of the determination. The spiked sample results are compared to the expected result (i.e., sample concentration plus spike amount) and reported as percent recovery.

Several MS and MS duplicates (MSD) were analyzed during the batch analyses for both groundwater monitoring events. During the December 2016 monitoring event, recoveries for some Matrix Spike/ Matrix Spike Duplicate analytes were above control limits. This may indicate a bias for the samples that were spiked. Since the LCS recoveries were within control limits, no data were considered acceptable and no data were flagged.

The MS/MSD RPD's were within control limits.

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 spiked into environmental and batch quality control 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.

Field Duplicate. A field duplicate is a second field sample collected from a selected monitoring well. 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 second sample to assess the precision of the analytical method. This comparison can be expressed by the RPD between the original and duplicate samples. With the exception of cis-DCE in MW-12 during the September and December 2016 monitoring events and PCE, TCE, and 1,1-dichloroethane in MW-12 during the September 2016 monitoring event, the analytes were below the RPD limit of +/-30 percent. The samples with analytes outside of the acceptable range are flagged with a D qualifier on the associated data tables. Field duplicates were not collected for air samples.

Field Blank. A field blank is a sample of analyte-free water poured into a clean sample container in the field, preserved, and shipped to the laboratory with field samples. Field blanks assess the potential for contamination from field conditions during sampling. No analytes were identified in the field blanks collected during the third and fourth quarter 2016 monitoring events.

Appendix C – Laboratory Analytical Reports and Data Quality Review

Equipment Blank. An equipment blank is a sample of analyte-free water poured over or through decontaminated field sampling equipment during a sampling event. Equipment blanks assess the potential for contamination from the total sampling, sample preparation, and measurement process when decontaminated sampling equipment is used to collect samples. No analytes were identified in the equipment blanks collected during the third and fourth quarter 2016 monitoring events.

Trip Blank. A trip blank is a clean sample of a matrix that is taken from the laboratory to the sampling site and transported back to the laboratory without having been exposed to sampling procedures. Trip blanks assess contamination introduced during shipping and field-handling activities. No analytes were identified in the trip blanks collected during the third and fourth quarter 2016 monitoring events.

Conclusion. In conclusion, the overall QA objectives have been met, and the data are of adequate quality for use in this project.

June 06, 2017

Stephanie Bosze-Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

RE: Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Dear Stephanie Bosze-Salisbury:

Enclosed are the analytical results for sample(s) received by the laboratory on August 30, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott M Forbes
scott.forbes@pacelabs.com
(530) 297-4800
Project Manager

Enclosures

cc: Kelsi Evans, Apex Companies, LLC



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Davis Certification IDs

2795 Second Street Suite 300 Davis, CA 95618

North Dakota Certification #: R-214

Oregon Certification #: CA300002

Washington Certification #: C926-15a

California Certification #: 08263CA

Minnesota Department of Health Certification #: 006-999-465

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

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SAMPLE SUMMARY

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1273712001	SED-5 2.5-3.85	Solid	08/22/16 13:18	08/30/16 09:30
1273712002	SED-2 0.5-2.5	Solid	08/22/16 11:02	08/30/16 09:30
1273712003	SED-5 0.5-2.5	Solid	08/22/16 13:18	08/30/16 09:30
1273712004	SED-4 4.5-4.75	Solid	08/22/16 12:42	08/30/16 09:30
1273712005	SED-4 2.5-4.5	Solid	08/22/16 12:42	08/30/16 09:30
1273712006	SED-4 0.5-2.5	Solid	08/22/16 12:42	08/30/16 09:30
1273712007	SED-4 0.0-0.5	Solid	08/22/16 12:42	08/30/16 09:30
1273712008	SED-2 0.0 - 0.5	Solid	08/22/16 11:02	08/30/16 09:30
1273712009	SED-5 0.0 - 0.5	Solid	08/22/16 13:18	08/30/16 09:30
1273712010	SED-2 2.5-4.25	Solid	08/22/16 11:02	08/30/16 09:30
1273712011	SED-3 0.0-0.5	Solid	08/22/16 11:53	08/30/16 09:30
1273712012	SED-3 2.5-4.25	Solid	08/22/16 11:53	08/30/16 09:30
1273712013	SED-3 0.5-2.5	Solid	08/22/16 11:53	08/30/16 09:30
1273712014	SED-11 0.5-2.5	Solid	08/23/16 11:58	08/30/16 09:30
1273712015	SED-8 0.0-0.5	Solid	08/23/16 14:10	08/30/16 09:30
1273712016	SED-9 0.5-2.7	Solid	08/23/16 08:50	08/30/16 09:30
1273712017	SED-11 0.0-0.5 DUP	Solid	08/23/16 11:55	08/30/16 09:30
1273712018	SED-7 0.5-1.5	Solid	08/23/16 11:08	08/30/16 09:30
1273712019	SED-6 0.0-0.5	Solid	08/23/16 10:13	08/30/16 09:30
1273712020	SED-7 0.0-0.5	Solid	08/23/16 11:08	08/30/16 09:30
1273712021	SED-6 0.5-1.5 Dup	Solid	08/23/16 10:13	08/30/16 09:30
1273712022	SED-1 0.0-0.5	Solid	08/24/16 10:20	08/30/16 09:30
1273712023	SED-11 0.5-2.5 Dup	Solid	08/23/16 11:58	08/30/16 09:30
1273712024	SED-1 2.5-4.2	Solid	08/24/16 10:20	08/30/16 09:30
1273712025	SED-9 0.0-0.5	Solid	08/23/16 08:50	08/30/16 09:30
1273712026	SED-1 0.5-2.5	Solid	08/24/16 10:20	08/30/16 09:30
1273712027	SED-11 0.0-0.5	Solid	08/23/16 11:58	08/30/16 09:30
1273712028	SED-8 0.5-2.25	Solid	08/23/16 14:10	08/30/16 09:30
1273712029	SED-6 0.5-1.5	Solid	08/23/16 10:13	08/30/16 09:30
1273712030	SED-6 0.0-0.5 DUP	Solid	08/23/16 10:13	08/30/16 09:30
1273712031	SED-10 0.0-0.5	Solid	08/23/16 09:33	08/30/16 09:30
1273712032	SED-10 0.5-2.66	Solid	08/23/16 09:33	08/30/16 09:30
1273712033	Surf 4	Water	08/24/16 00:00	08/30/16 09:30
1273712034	Surf 2 DUP	Water	08/24/16 00:00	08/30/16 09:30
1273712035	Surf 2	Water	08/24/16 00:00	08/30/16 09:30
1273712036	Surf 1	Water	08/24/16 00:00	08/30/16 09:30
1273712037	Surf 3	Water	08/24/16 00:00	08/30/16 09:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1273712038	Trip Blank	Water	08/24/16 00:00	08/30/16 09:30

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1273712001	SED-5 2.5-3.85	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712002	SED-2 0.5-2.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712003	SED-5 0.5-2.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712004	SED-4 4.5-4.75	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712005	SED-4 2.5-4.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712006	SED-4 0.5-2.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712007	SED-4 0.0-0.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712008	SED-2 0.0 - 0.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712009	SED-5 0.0 - 0.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712010	SED-2 2.5-4.25	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712011	SED-3 0.0-0.5	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712012	SED-3 2.5-4.25	EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
1273712013	SED-3 0.5-2.5	EPA 8260B	JCP	68	PASI-DAV

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1273712014	SED-11 0.5-2.5	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712015	SED-8 0.0-0.5	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712016	SED-9 0.5-2.7	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712017	SED-11 0.0-0.5 DUP	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712018	SED-7 0.5-1.5	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712019	SED-6 0.0-0.5	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712020	SED-7 0.0-0.5	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712021	SED-6 0.5-1.5 Dup	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712022	SED-1 0.0-0.5	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712023	SED-11 0.5-2.5 Dup	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712024	SED-1 2.5-4.2	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
1273712025	SED-9 0.0-0.5	ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
		EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1273712026	SED-1 0.5-2.5	EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
1273712027	SED-11 0.0-0.5	EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
1273712028	SED-8 0.5-2.25	EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
1273712029	SED-6 0.5-1.5	EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
1273712030	SED-6 0.0-0.5 DUP	EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
1273712031	SED-10 0.0-0.5	EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
1273712032	SED-10 0.5-2.66	EPA 9060 Modified	TJJ	4	PASI-G
		EPA 8260B	JCP	68	PASI-DAV
		ASTM D 2974-13 (2013)	SJ1	1	PASI-DAV
1273712033	Surf 4	EPA 9060 Modified	TJJ	4	PASI-G
1273712033	Surf 4	EPA 8260B	JCP	67	PASI-DAV
1273712034	Surf 2 DUP	EPA 8260B	JCP	67	PASI-DAV
1273712035	Surf 2	EPA 8260B	JCP	67	PASI-DAV
1273712036	Surf 1	EPA 8260B	JCP	67	PASI-DAV
1273712037	Surf 3	EPA 8260B	JCP	67	PASI-DAV

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-5 2.5-3.85** Lab ID: **1273712001** Collected: 08/22/16 13:18 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	71-43-2	
Bromobenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	108-86-1	
Bromochloromethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	74-97-5	
Bromodichloromethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-27-4	
Bromoform	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-25-2	
Bromomethane	ND	ug/kg	26.3	1	08/31/16 10:22	08/31/16 11:38	74-83-9	
n-Butylbenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	56-23-5	
Chlorobenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	108-90-7	
Chloroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-00-3	
Chloroform	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	67-66-3	
Chloromethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	96-12-8	
Dibromochloromethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	106-93-4	
Dibromomethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-35-4	
cis-1,2-Dichloroethene	105	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	156-59-2	M1
trans-1,2-Dichloroethene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	10061-02-6	
Ethylbenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	87-68-3	
n-Hexane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	110-54-3	M1
Isopropylbenzene (Cumene)	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	99-87-6	
Methylene Chloride	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	1634-04-4	
Naphthalene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	91-20-3	
n-Propylbenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	103-65-1	
Styrene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	100-42-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-5 2.5-3.85 **Lab ID: 1273712001** Collected: 08/22/16 13:18 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	79-34-5	
Tetrachloroethene	214	ug/kg	55.8	1	09/02/16 09:58	09/02/16 13:00	127-18-4	
Toluene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	79-00-5	
Trichloroethene	241	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	79-01-6	M1
Trichlorofluoromethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	540-84-1	M1
Vinyl chloride	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	75-01-4	
Xylene (Total)	ND	ug/kg	13.2	1	08/31/16 10:22	08/31/16 11:38	1330-20-7	
m&p-Xylene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	179601-23-1	
o-Xylene	ND	ug/kg	6.6	1	08/31/16 10:22	08/31/16 11:38	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	118	%	70-130	1	08/31/16 10:22	08/31/16 11:38	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 11:38	2037-26-5	
4-Bromofluorobenzene (S)	82	%	70-130	1	08/31/16 10:22	08/31/16 11:38	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	24.0	%	0.10	1		08/31/16 15:22		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	26.0	%	0.10	1		09/07/16 11:34		
Total Organic Carbon	3060	mg/kg	879	1		09/07/16 11:34	7440-44-0	
Total Organic Carbon	2350	mg/kg	880	1		09/07/16 11:39	7440-44-0	
Mean Total Organic Carbon	2710	mg/kg	880	1		09/07/16 11:34	7440-44-0	

Sample: SED-2 0.5-2.5 **Lab ID: 1273712002** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	71-43-2	
Bromobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	108-86-1	
Bromochloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	74-97-5	
Bromodichloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-27-4	
Bromoform	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-25-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-2 0.5-2.5 **Lab ID: 1273712002** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Bromomethane	ND	ug/kg	30.2	1	08/31/16 10:22	08/31/16 13:18	74-83-9	
n-Butylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	56-23-5	
Chlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	108-90-7	
Chloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-00-3	
Chloroform	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	67-66-3	
Chloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	96-12-8	
Dibromochloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	106-93-4	
Dibromomethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	10061-02-6	
Ethylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	87-68-3	
n-Hexane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	99-87-6	
Methylene Chloride	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	1634-04-4	
Naphthalene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	91-20-3	
n-Propylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	103-65-1	
Styrene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	630-20-6	
1,1,1,2,2-Tetrachloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	79-34-5	
Tetrachloroethene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	127-18-4	
Toluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	87-61-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-2 0.5-2.5 **Lab ID: 1273712002** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,2,4-Trichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	79-00-5	
Trichloroethene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	540-84-1	
Vinyl chloride	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	75-01-4	
Xylene (Total)	ND	ug/kg	15.1	1	08/31/16 10:22	08/31/16 13:18	1330-20-7	
m&p-Xylene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	179601-23-1	
o-Xylene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:18	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%	70-130	1	08/31/16 10:22	08/31/16 13:18	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 13:18	2037-26-5	
4-Bromofluorobenzene (S)	83	%	70-130	1	08/31/16 10:22	08/31/16 13:18	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	34.8	%	0.10	1		08/31/16 15:22		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	7.4	%	0.10	1		09/07/16 07:51		
Total Organic Carbon	18700	mg/kg	2590	1		09/07/16 07:51	7440-44-0	
Total Organic Carbon	20200	mg/kg	2590	1		09/07/16 07:57	7440-44-0	
Mean Total Organic Carbon	19500	mg/kg	2590	1		09/07/16 07:51	7440-44-0	

Sample: SED-5 0.5-2.5 **Lab ID: 1273712003** Collected: 08/22/16 13:18 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	71-43-2	
Bromobenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	108-86-1	
Bromochloromethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	74-97-5	
Bromodichloromethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-27-4	
Bromoform	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-25-2	
Bromomethane	ND	ug/kg	25.3	1	08/31/16 10:22	08/31/16 13:38	74-83-9	
n-Butylbenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	56-23-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-5 0.5-2.5** Lab ID: **1273712003** Collected: 08/22/16 13:18 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Chlorobenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	108-90-7	
Chloroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-00-3	
Chloroform	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	67-66-3	
Chloromethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	96-12-8	
Dibromochloromethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	106-93-4	
Dibromomethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-35-4	
cis-1,2-Dichloroethene	31.2	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	10061-02-6	
Ethylbenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	87-68-3	
n-Hexane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	99-87-6	
Methylene Chloride	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	1634-04-4	
Naphthalene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	91-20-3	
n-Propylbenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	103-65-1	
Styrene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	79-34-5	
Tetrachloroethene	114	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	127-18-4	
Toluene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	79-00-5	
Trichloroethene	26.3	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-69-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-5 0.5-2.5 **Lab ID: 1273712003** Collected: 08/22/16 13:18 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2,3-Trichloropropane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	540-84-1	
Vinyl chloride	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	75-01-4	
Xylene (Total)	ND	ug/kg	12.6	1	08/31/16 10:22	08/31/16 13:38	1330-20-7	
m&p-Xylene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	179601-23-1	
o-Xylene	ND	ug/kg	6.3	1	08/31/16 10:22	08/31/16 13:38	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	114	%	70-130	1	08/31/16 10:22	08/31/16 13:38	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 13:38	2037-26-5	
4-Bromofluorobenzene (S)	84	%	70-130	1	08/31/16 10:22	08/31/16 13:38	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	22.2	%	0.10	1		08/31/16 15:24		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	6.5	%	0.10	1		09/07/16 08:03		
Total Organic Carbon	1500	mg/kg	852	1		09/07/16 08:03	7440-44-0	
Total Organic Carbon	1600	mg/kg	863	1		09/07/16 08:10	7440-44-0	
Mean Total Organic Carbon	1550	mg/kg	857	1		09/07/16 08:03	7440-44-0	

Sample: SED-4 4.5-4.75 **Lab ID: 1273712004** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	71-43-2	
Bromobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	108-86-1	
Bromochloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	74-97-5	
Bromodichloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-27-4	
Bromoform	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-25-2	
Bromomethane	ND	ug/kg	30.3	1	08/31/16 10:22	08/31/16 13:58	74-83-9	
n-Butylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	56-23-5	
Chlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	108-90-7	
Chloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-00-3	
Chloroform	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	67-66-3	
Chloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	95-49-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-4 4.5-4.75** Lab ID: **1273712004** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
4-Chlorotoluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	96-12-8	
Dibromochloromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	106-93-4	
Dibromomethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-35-4	
cis-1,2-Dichloroethene	38.8	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	10061-02-6	
Ethylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	87-68-3	
n-Hexane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	99-87-6	
Methylene Chloride	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	1634-04-4	
Naphthalene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	91-20-3	
n-Propylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	103-65-1	
Styrene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	79-34-5	
Tetrachloroethene	218	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	127-18-4	
Toluene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	79-00-5	
Trichloroethene	132	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	540-84-1	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Project No.: 1273712

Sample: SED-4 4.5-4.75 **Lab ID: 1273712004** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Vinyl chloride	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	75-01-4	
Xylene (Total)	ND	ug/kg	15.2	1	08/31/16 10:22	08/31/16 13:58	1330-20-7	
m&p-Xylene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	179601-23-1	
o-Xylene	ND	ug/kg	7.6	1	08/31/16 10:22	08/31/16 13:58	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	113	%	70-130	1	08/31/16 10:22	08/31/16 13:58	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 13:58	2037-26-5	
4-Bromofluorobenzene (S)	86	%	70-130	1	08/31/16 10:22	08/31/16 13:58	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	34.4	%	0.10	1		08/31/16 15:24		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	22.8	%	0.10	1		09/07/16 08:15		
Total Organic Carbon	5570	mg/kg	1020	1		09/07/16 08:15	7440-44-0	
Total Organic Carbon	4430	mg/kg	1010	1		09/07/16 08:22	7440-44-0	
Mean Total Organic Carbon	5000	mg/kg	1020	1		09/07/16 08:15	7440-44-0	

Sample: SED-4 2.5-4.5 **Lab ID: 1273712005** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	71-43-2	
Bromobenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	108-86-1	
Bromochloromethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	74-97-5	
Bromodichloromethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-27-4	
Bromoform	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-25-2	
Bromomethane	ND	ug/kg	26.8	1	08/31/16 10:22	08/31/16 14:18	74-83-9	
n-Butylbenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	56-23-5	
Chlorobenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	108-90-7	
Chloroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-00-3	
Chloroform	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	67-66-3	
Chloromethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	96-12-8	
Dibromochloromethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	106-93-4	
Dibromomethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	74-95-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Sample Project No.: 1273712

Sample: **SED-4 2.5-4.5** Lab ID: **1273712005** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2-Dichlorobenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-35-4	
cis-1,2-Dichloroethene	58.8	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	10061-02-6	
Ethylbenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	87-68-3	
n-Hexane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	99-87-6	
Methylene Chloride	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	1634-04-4	
Naphthalene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	91-20-3	
n-Propylbenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	103-65-1	
Styrene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	79-34-5	
Tetrachloroethene	645	ug/kg	64.5	1	09/02/16 09:58	09/02/16 13:20	127-18-4	
Toluene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	79-00-5	
Trichloroethene	156	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	540-84-1	
Vinyl chloride	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	75-01-4	
Xylene (Total)	ND	ug/kg	13.4	1	08/31/16 10:22	08/31/16 14:18	1330-20-7	
m&p-Xylene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	179601-23-1	
o-Xylene	ND	ug/kg	6.7	1	08/31/16 10:22	08/31/16 14:18	95-47-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-4 2.5-4.5 **Lab ID: 1273712005** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Surrogates								
1,2-Dichloroethane-d4 (S)	113	%	70-130	1	08/31/16 10:22	08/31/16 14:18	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 14:18	2037-26-5	
4-Bromofluorobenzene (S)	85	%	70-130	1	08/31/16 10:22	08/31/16 14:18	460-00-4	
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	28.2	%	0.10	1		08/31/16 15:25		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	4.2	%	0.10	1		09/07/16 08:28		
Total Organic Carbon	12400	mg/kg	4100	1		09/07/16 08:28	7440-44-0	
Total Organic Carbon	12900	mg/kg	4220	1		09/07/16 08:35	7440-44-0	
Mean Total Organic Carbon	12700	mg/kg	4160	1		09/07/16 08:28	7440-44-0	

Sample: SED-4 0.5-2.5 **Lab ID: 1273712006** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	71-43-2	
Bromobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	108-86-1	
Bromochloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	74-97-5	
Bromodichloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-27-4	
Bromoform	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-25-2	
Bromomethane	ND	ug/kg	25.7	1	08/31/16 10:22	08/31/16 14:38	74-83-9	
n-Butylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	56-23-5	
Chlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	108-90-7	
Chloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-00-3	
Chloroform	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	67-66-3	
Chloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	96-12-8	
Dibromochloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	106-93-4	
Dibromomethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-71-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Project No.: 1273712

Sample: **SED-4 0.5-2.5** Lab ID: **1273712006** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,1-Dichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	10061-02-6	
Ethylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	87-68-3	
n-Hexane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	99-87-6	
Methylene Chloride	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	1634-04-4	
Naphthalene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	91-20-3	
n-Propylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	103-65-1	
Styrene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	79-34-5	
Tetrachloroethene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	127-18-4	
Toluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	79-00-5	
Trichloroethene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	540-84-1	
Vinyl chloride	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	75-01-4	
Xylene (Total)	ND	ug/kg	12.9	1	08/31/16 10:22	08/31/16 14:38	1330-20-7	
m&p-Xylene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	179601-23-1	
o-Xylene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 14:38	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%.	70-130	1	08/31/16 10:22	08/31/16 14:38	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1	08/31/16 10:22	08/31/16 14:38	2037-26-5	
4-Bromofluorobenzene (S)	87	%.	70-130	1	08/31/16 10:22	08/31/16 14:38	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-4 0.5-2.5 **Lab ID: 1273712006** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	24.1	%	0.10	1		08/31/16 15:26		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	2.2	%	0.10	1		09/07/16 08:40		
Total Organic Carbon	10400	mg/kg	1840	1		09/07/16 08:40	7440-44-0	
Total Organic Carbon	10100	mg/kg	1870	1		09/07/16 08:46	7440-44-0	
Mean Total Organic Carbon	10300	mg/kg	1850	1		09/07/16 08:40	7440-44-0	

Sample: SED-4 0.0-0.5 **Lab ID: 1273712007** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	71-43-2	
Bromobenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	108-86-1	
Bromochloromethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	74-97-5	
Bromodichloromethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-27-4	
Bromoform	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-25-2	
Bromomethane	ND	ug/kg	32.0	1	08/31/16 10:22	08/31/16 14:58	74-83-9	
n-Butylbenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	104-51-8	
sec-Butylbenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	98-06-6	
Carbon tetrachloride	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	56-23-5	
Chlorobenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	108-90-7	
Chloroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-00-3	
Chloroform	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	67-66-3	
Chloromethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	95-49-8	
4-Chlorotoluene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	96-12-8	
Dibromochloromethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	106-93-4	
Dibromomethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	156-60-5	
Dichlorofluoromethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-43-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Project No.: 1273712

Sample: **SED-4 0.0-0.5** Lab ID: **1273712007** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2-Dichloropropane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	10061-02-6	
Ethylbenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	87-68-3	
n-Hexane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	99-87-6	
Methylene Chloride	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	1634-04-4	
Naphthalene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	91-20-3	
n-Propylbenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	103-65-1	
Styrene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	630-20-6	
1,1,1,2,2-Tetrachloroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	79-34-5	
Tetrachloroethene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	127-18-4	
Toluene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	79-00-5	
Trichloroethene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	79-01-6	
Trichlorofluoromethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	540-84-1	
Vinyl chloride	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	75-01-4	
Xylene (Total)	ND	ug/kg	16.0	1	08/31/16 10:22	08/31/16 14:58	1330-20-7	
m&p-Xylene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	179601-23-1	
o-Xylene	ND	ug/kg	8.0	1	08/31/16 10:22	08/31/16 14:58	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%	70-130	1	08/31/16 10:22	08/31/16 14:58	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	08/31/16 10:22	08/31/16 14:58	2037-26-5	
4-Bromofluorobenzene (S)	86	%	70-130	1	08/31/16 10:22	08/31/16 14:58	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture **37.5** % 0.10 1 08/31/16 15:27

Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD% **4.1** % 0.10 1 09/07/16 08:51

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Sample Project No.: 1273712

Sample: SED-4 0.0-0.5 **Lab ID: 1273712007** Collected: 08/22/16 12:42 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Total Organic Carbon	8910	mg/kg	2370	1		09/07/16 08:51	7440-44-0	
Total Organic Carbon	8550	mg/kg	2350	1		09/07/16 08:56	7440-44-0	
Mean Total Organic Carbon	8730	mg/kg	2360	1		09/07/16 08:51	7440-44-0	

Sample: SED-2 0.0 - 0.5 **Lab ID: 1273712008** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	71-43-2	
Bromobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	108-86-1	
Bromochloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	74-97-5	
Bromodichloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-27-4	
Bromoform	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-25-2	
Bromomethane	ND	ug/kg	30.2	1	08/31/16 10:22	08/31/16 15:18	74-83-9	
n-Butylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	56-23-5	
Chlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	108-90-7	
Chloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-00-3	
Chloroform	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	67-66-3	
Chloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	96-12-8	
Dibromochloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	106-93-4	
Dibromomethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	10061-01-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-2 0.0 - 0.5 **Lab ID: 1273712008** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
trans-1,3-Dichloropropene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	10061-02-6	
Ethylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	87-68-3	
n-Hexane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	99-87-6	
Methylene Chloride	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	1634-04-4	
Naphthalene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	91-20-3	
n-Propylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	103-65-1	
Styrene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	79-34-5	
Tetrachloroethene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	127-18-4	
Toluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	79-00-5	
Trichloroethene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	540-84-1	
Vinyl chloride	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	75-01-4	
Xylene (Total)	ND	ug/kg	15.1	1	08/31/16 10:22	08/31/16 15:18	1330-20-7	
m&p-Xylene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	179601-23-1	
o-Xylene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 15:18	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	1	08/31/16 10:22	08/31/16 15:18	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 15:18	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	08/31/16 10:22	08/31/16 15:18	460-00-4	
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	35.1	%	0.10	1		08/31/16 15:27		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	4.2	%	0.10	1		09/07/16 09:03		
Total Organic Carbon	22700	mg/kg	2670	1		09/07/16 09:03	7440-44-0	
Total Organic Carbon	21800	mg/kg	2680	1		09/07/16 09:08	7440-44-0	
Mean Total Organic Carbon	22300	mg/kg	2680	1		09/07/16 09:03	7440-44-0	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-5 0.0 - 0.5** Lab ID: **1273712009** Collected: 08/22/16 13:18 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	71-43-2	
Bromobenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	108-86-1	
Bromochloromethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	74-97-5	
Bromodichloromethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-27-4	
Bromoform	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-25-2	
Bromomethane	ND	ug/kg	36.8	1	08/31/16 10:22	08/31/16 15:38	74-83-9	
n-Butylbenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	104-51-8	
sec-Butylbenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	135-98-8	
tert-Butylbenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	98-06-6	
Carbon tetrachloride	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	56-23-5	
Chlorobenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	108-90-7	
Chloroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-00-3	
Chloroform	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	67-66-3	
Chloromethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	74-87-3	
2-Chlorotoluene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	95-49-8	
4-Chlorotoluene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	96-12-8	
Dibromochloromethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	106-93-4	
Dibromomethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-71-8	
1,1-Dichloroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-34-3	
1,2-Dichloroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	107-06-2	
1,1-Dichloroethene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-35-4	
cis-1,2-Dichloroethene	89.2	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	156-60-5	
Dichlorofluoromethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-43-4	
1,2-Dichloropropane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	78-87-5	
1,3-Dichloropropane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	142-28-9	
2,2-Dichloropropane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	594-20-7	
1,1-Dichloropropene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	10061-02-6	
Ethylbenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	87-68-3	
n-Hexane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	98-82-8	
p-Isopropyltoluene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	99-87-6	
Methylene Chloride	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	1634-04-4	
Naphthalene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	91-20-3	
n-Propylbenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	103-65-1	
Styrene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	100-42-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-5 0.0 - 0.5 **Lab ID: 1273712009** Collected: 08/22/16 13:18 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,1,1,2-Tetrachloroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	79-34-5	
Tetrachloroethene	196	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	127-18-4	
Toluene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	79-00-5	
Trichloroethene	60.9	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	79-01-6	
Trichlorofluoromethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	540-84-1	
Vinyl chloride	9.7	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	75-01-4	
Xylene (Total)	ND	ug/kg	18.4	1	08/31/16 10:22	08/31/16 15:38	1330-20-7	
m&p-Xylene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	179601-23-1	
o-Xylene	ND	ug/kg	9.2	1	08/31/16 10:22	08/31/16 15:38	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%	70-130	1	08/31/16 10:22	08/31/16 15:38	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 15:38	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	08/31/16 10:22	08/31/16 15:38	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	46.2	%	0.10	1	08/31/16 15:29			
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	7.4	%	0.10	1	09/07/16 09:14			
Total Organic Carbon	19600	mg/kg	2700	1	09/07/16 09:14	7440-44-0		
Total Organic Carbon	21100	mg/kg	2660	1	09/07/16 09:19	7440-44-0		
Mean Total Organic Carbon	20300	mg/kg	2680	1	09/07/16 09:14	7440-44-0		

Sample: SED-2 2.5-4.25 **Lab ID: 1273712010** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	71-43-2	
Bromobenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	108-86-1	
Bromochloromethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	74-97-5	
Bromodichloromethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-27-4	
Bromoform	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-25-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-2 2.5-4.25 **Lab ID: 1273712010** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Bromomethane	ND	ug/kg	30.6	1	08/31/16 10:22	08/31/16 15:58	74-83-9	
n-Butylbenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	56-23-5	
Chlorobenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	108-90-7	
Chloroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-00-3	
Chloroform	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	67-66-3	
Chloromethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	96-12-8	
Dibromochloromethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	106-93-4	
Dibromomethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	10061-02-6	
Ethylbenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	87-68-3	
n-Hexane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	99-87-6	
Methylene Chloride	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	1634-04-4	
Naphthalene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	91-20-3	
n-Propylbenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	103-65-1	
Styrene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	630-20-6	
1,1,1,2,2-Tetrachloroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	79-34-5	
Tetrachloroethene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	127-18-4	
Toluene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-2 2.5-4.25 **Lab ID: 1273712010** Collected: 08/22/16 11:02 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,2,4-Trichlorobenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	79-00-5	
Trichloroethene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	540-84-1	
Vinyl chloride	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	75-01-4	
Xylene (Total)	ND	ug/kg	15.3	1	08/31/16 10:22	08/31/16 15:58	1330-20-7	
m&p-Xylene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	179601-23-1	
o-Xylene	ND	ug/kg	7.7	1	08/31/16 10:22	08/31/16 15:58	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%	70-130	1	08/31/16 10:22	08/31/16 15:58	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	08/31/16 10:22	08/31/16 15:58	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	08/31/16 10:22	08/31/16 15:58	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	35.8	%	0.10	1		08/31/16 15:29		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	4.8	%	0.10	1		09/07/16 09:36		
Total Organic Carbon	20100	mg/kg	3450	1		09/07/16 09:36	7440-44-0	
Total Organic Carbon	19200	mg/kg	3390	1		09/07/16 09:41	7440-44-0	
Mean Total Organic Carbon	19600	mg/kg	3420	1		09/07/16 09:36	7440-44-0	

Sample: SED-3 0.0-0.5 **Lab ID: 1273712011** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	71-43-2	
Bromobenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	108-86-1	
Bromochloromethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	74-97-5	
Bromodichloromethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-27-4	
Bromoform	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-25-2	
Bromomethane	ND	ug/kg	26.2	1	08/31/16 10:22	08/31/16 18:43	74-83-9	
n-Butylbenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	56-23-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: **SED-3 0.0-0.5** Lab ID: **1273712011** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Chlorobenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	108-90-7	
Chloroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-00-3	
Chloroform	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	67-66-3	
Chloromethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	96-12-8	
Dibromochloromethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	106-93-4	
Dibromomethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	10061-02-6	
Ethylbenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	87-68-3	
n-Hexane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	99-87-6	
Methylene Chloride	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	1634-04-4	
Naphthalene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	91-20-3	
n-Propylbenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	103-65-1	
Styrene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	79-34-5	
Tetrachloroethene	25.1	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	127-18-4	
Toluene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	79-00-5	
Trichloroethene	10.4	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-69-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-3 0.0-0.5 **Lab ID: 1273712011** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,2,3-Trichloropropane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	540-84-1	
Vinyl chloride	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	75-01-4	
Xylene (Total)	ND	ug/kg	13.1	1	08/31/16 10:22	08/31/16 18:43	1330-20-7	
m&p-Xylene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	179601-23-1	
o-Xylene	ND	ug/kg	6.5	1	08/31/16 10:22	08/31/16 18:43	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1	08/31/16 10:22	08/31/16 18:43	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	08/31/16 10:22	08/31/16 18:43	2037-26-5	
4-Bromofluorobenzene (S)	88	%	70-130	1	08/31/16 10:22	08/31/16 18:43	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	24.7	%	0.10	1		08/31/16 15:30		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	0.60	%	0.10	1		09/07/16 09:47		
Total Organic Carbon	2550	mg/kg	884	1		09/07/16 09:47	7440-44-0	
Total Organic Carbon	2530	mg/kg	890	1		09/07/16 09:52	7440-44-0	
Mean Total Organic Carbon	2540	mg/kg	887	1		09/07/16 09:47	7440-44-0	

Sample: SED-3 2.5-4.25 **Lab ID: 1273712012** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	71-43-2	
Bromobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	108-86-1	
Bromochloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	74-97-5	
Bromodichloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-27-4	
Bromoform	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-25-2	
Bromomethane	ND	ug/kg	25.7	1	08/31/16 10:22	08/31/16 19:03	74-83-9	
n-Butylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	56-23-5	
Chlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	108-90-7	
Chloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-00-3	
Chloroform	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	67-66-3	
Chloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	95-49-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Sample Project No.: 1273712

Sample: **SED-3 2.5-4.25** Lab ID: **1273712012** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
4-Chlorotoluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	96-12-8	
Dibromochloromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	106-93-4	
Dibromomethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-35-4	
cis-1,2-Dichloroethene	9.2	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	10061-02-6	
Ethylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	87-68-3	
n-Hexane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	99-87-6	
Methylene Chloride	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	1634-04-4	
Naphthalene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	91-20-3	
n-Propylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	103-65-1	
Styrene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	79-34-5	
Tetrachloroethene	1340	ug/kg	66.1	1	09/02/16 09:58	09/02/16 13:40	127-18-4	
Toluene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	79-00-5	
Trichloroethene	113	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	540-84-1	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-3 2.5-4.25 **Lab ID: 1273712012** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Vinyl chloride	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	75-01-4	
Xylene (Total)	ND	ug/kg	12.9	1	08/31/16 10:22	08/31/16 19:03	1330-20-7	
m&p-Xylene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	179601-23-1	
o-Xylene	ND	ug/kg	6.4	1	08/31/16 10:22	08/31/16 19:03	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	1	08/31/16 10:22	08/31/16 19:03	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	08/31/16 10:22	08/31/16 19:03	2037-26-5	
4-Bromofluorobenzene (S)	90	%	70-130	1	08/31/16 10:22	08/31/16 19:03	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	24.4	%	0.10	1		08/31/16 15:30		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	0.46	%	0.10	1		09/07/16 09:58		
Total Organic Carbon	2880	mg/kg	1010	1		09/07/16 09:58	7440-44-0	
Total Organic Carbon	2870	mg/kg	1010	1		09/07/16 10:04	7440-44-0	
Mean Total Organic Carbon	2870	mg/kg	1010	1		09/07/16 09:58	7440-44-0	

Sample: SED-3 0.5-2.5 **Lab ID: 1273712013** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	71-43-2	
Bromobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	108-86-1	
Bromochloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	74-97-5	
Bromodichloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-27-4	
Bromoform	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-25-2	
Bromomethane	ND	ug/kg	24.3	1	08/31/16 10:22	08/31/16 19:23	74-83-9	
n-Butylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	56-23-5	
Chlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	108-90-7	
Chloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-00-3	
Chloroform	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	67-66-3	
Chloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	96-12-8	
Dibromochloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	106-93-4	
Dibromomethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	74-95-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: **SED-3 0.5-2.5** Lab ID: **1273712013** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2-Dichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	10061-02-6	
Ethylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	87-68-3	
n-Hexane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	99-87-6	
Methylene Chloride	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	1634-04-4	
Naphthalene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	91-20-3	
n-Propylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	103-65-1	
Styrene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	79-34-5	
Tetrachloroethene	96.6	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	127-18-4	
Toluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	79-00-5	
Trichloroethene	16.2	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	540-84-1	
Vinyl chloride	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	75-01-4	
Xylene (Total)	ND	ug/kg	12.2	1	08/31/16 10:22	08/31/16 19:23	1330-20-7	
m&p-Xylene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	179601-23-1	
o-Xylene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:23	95-47-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-3 0.5-2.5 **Lab ID: 1273712013** Collected: 08/22/16 11:53 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	08/31/16 10:22	08/31/16 19:23	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1	08/31/16 10:22	08/31/16 19:23	2037-26-5	
4-Bromofluorobenzene (S)	87	%	70-130	1	08/31/16 10:22	08/31/16 19:23	460-00-4	
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	20.1	%	0.10	1		08/31/16 15:31		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	0.78	%	0.10	1		09/07/16 10:09		
Total Organic Carbon	8550	mg/kg	844	1		09/07/16 10:09	7440-44-0	
Total Organic Carbon	8490	mg/kg	834	1		09/07/16 10:15	7440-44-0	
Mean Total Organic Carbon	8520	mg/kg	839	1		09/07/16 10:09	7440-44-0	

Sample: SED-11 0.5-2.5 **Lab ID: 1273712014** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	71-43-2	
Bromobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	108-86-1	
Bromochloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	74-97-5	
Bromodichloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-27-4	
Bromoform	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-25-2	
Bromomethane	ND	ug/kg	24.3	1	08/31/16 10:22	08/31/16 19:43	74-83-9	
n-Butylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	56-23-5	
Chlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	108-90-7	
Chloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-00-3	
Chloroform	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	67-66-3	
Chloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	96-12-8	
Dibromochloromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	106-93-4	
Dibromomethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-71-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-11 0.5-2.5** Lab ID: **1273712014** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil								
Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,1-Dichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-35-4	
cis-1,2-Dichloroethene	27.8	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	10061-02-6	
Ethylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	87-68-3	
n-Hexane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	99-87-6	
Methylene Chloride	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	1634-04-4	
Naphthalene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	91-20-3	
n-Propylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	103-65-1	
Styrene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	79-34-5	
Tetrachloroethene	190	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	127-18-4	
Toluene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	79-00-5	
Trichloroethene	31.2	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	540-84-1	
Vinyl chloride	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	75-01-4	
Xylene (Total)	ND	ug/kg	12.1	1	08/31/16 10:22	08/31/16 19:43	1330-20-7	
m&p-Xylene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	179601-23-1	
o-Xylene	ND	ug/kg	6.1	1	08/31/16 10:22	08/31/16 19:43	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%.	70-130	1	08/31/16 10:22	08/31/16 19:43	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1	08/31/16 10:22	08/31/16 19:43	2037-26-5	
4-Bromofluorobenzene (S)	88	%.	70-130	1	08/31/16 10:22	08/31/16 19:43	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Project No.: 1273712

Sample: SED-11 0.5-2.5 **Lab ID: 1273712014** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	19.1	%	0.10	1		08/31/16 15:32		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	24.0	%	0.10	1		09/07/16 11:45		
Total Organic Carbon	3920	mg/kg	820	1		09/07/16 11:45	7440-44-0	
Total Organic Carbon	4990	mg/kg	832	1		09/07/16 11:51	7440-44-0	
Mean Total Organic Carbon	4450	mg/kg	826	1		09/07/16 11:45	7440-44-0	

Sample: SED-8 0.0-0.5 **Lab ID: 1273712015** Collected: 08/23/16 14:10 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	71-43-2	
Bromobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	108-86-1	
Bromochloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	74-97-5	
Bromodichloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-27-4	
Bromoform	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-25-2	
Bromomethane	ND	ug/kg	29.9	1	08/31/16 10:22	08/31/16 20:03	74-83-9	
n-Butylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	56-23-5	
Chlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	108-90-7	
Chloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-00-3	
Chloroform	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	67-66-3	
Chloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	96-12-8	
Dibromochloromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	106-93-4	
Dibromomethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-35-4	
cis-1,2-Dichloroethene	137	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-43-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-8 0.0-0.5 **Lab ID: 1273712015** Collected: 08/23/16 14:10 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2-Dichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	10061-02-6	
Ethylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	87-68-3	
n-Hexane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	99-87-6	
Methylene Chloride	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	1634-04-4	
Naphthalene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	91-20-3	
n-Propylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	103-65-1	
Styrene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	79-34-5	
Tetrachloroethene	4100	ug/kg	68.4	1	09/02/16 09:58	09/02/16 14:00	127-18-4	E
Toluene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	108-88-3	
Toluene	ND	ug/kg	68.4	1	09/02/16 09:58	09/02/16 14:00	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	79-00-5	
Trichloroethene	137	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	540-84-1	
Vinyl chloride	21.8	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	75-01-4	
Xylene (Total)	ND	ug/kg	15.0	1	08/31/16 10:22	08/31/16 20:03	1330-20-7	
m&p-Xylene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	179601-23-1	
o-Xylene	ND	ug/kg	7.5	1	08/31/16 10:22	08/31/16 20:03	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%	70-130	1	08/31/16 10:22	08/31/16 20:03	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1	08/31/16 10:22	08/31/16 20:03	2037-26-5	
4-Bromofluorobenzene (S)	92	%	70-130	1	08/31/16 10:22	08/31/16 20:03	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	34.8	%	0.10	1	08/31/16 15:32
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-8 0.0-0.5 Lab ID: 1273712015 Collected: 08/23/16 14:10 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	0.44	%	0.10	1		09/07/16 12:00		
Total Organic Carbon	14700	mg/kg	1020	1		09/07/16 12:00	7440-44-0	
Total Organic Carbon	14800	mg/kg	1030	1		09/07/16 12:06	7440-44-0	
Mean Total Organic Carbon	14700	mg/kg	1020	1		09/07/16 12:00	7440-44-0	

Sample: SED-9 0.5-2.7 Lab ID: 1273712016 Collected: 08/23/16 08:50 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	71-43-2	
Bromobenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	108-86-1	
Bromochloromethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	74-97-5	
Bromodichloromethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-27-4	
Bromoform	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-25-2	
Bromomethane	ND	ug/kg	23.9	1	08/31/16 10:22	08/31/16 20:23	74-83-9	
n-Butylbenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	56-23-5	
Chlorobenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	108-90-7	
Chloroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-00-3	
Chloroform	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	67-66-3	
Chloromethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	96-12-8	
Dibromochloromethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	106-93-4	
Dibromomethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	594-20-7	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
 Pace Project No.: 1273712

Sample: **SED-9 0.5-2.7** Lab ID: **1273712016** Collected: 08/23/16 08:50 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,1-Dichloropropene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	10061-02-6	
Ethylbenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	87-68-3	
n-Hexane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	99-87-6	
Methylene Chloride	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	1634-04-4	
Naphthalene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	91-20-3	
n-Propylbenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	103-65-1	
Styrene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	79-34-5	
Tetrachloroethene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	127-18-4	
Toluene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	79-00-5	
Trichloroethene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	540-84-1	
Vinyl chloride	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	75-01-4	
Xylene (Total)	ND	ug/kg	12.0	1	08/31/16 10:22	08/31/16 20:23	1330-20-7	
m&p-Xylene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	179601-23-1	
o-Xylene	ND	ug/kg	6.0	1	08/31/16 10:22	08/31/16 20:23	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	08/31/16 10:22	08/31/16 20:23	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	08/31/16 10:22	08/31/16 20:23	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	08/31/16 10:22	08/31/16 20:23	460-00-4	
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	18.2	%	0.10	1		08/31/16 15:33		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	9.9	%	0.10	1		09/08/16 05:40		
Total Organic Carbon	1080	mg/kg	816	1		09/08/16 05:40	7440-44-0	
Total Organic Carbon	982	mg/kg	815	1		09/08/16 05:45	7440-44-0	
Mean Total Organic Carbon	1030	mg/kg	816	1		09/08/16 05:40	7440-44-0	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-11 0.0-0.5 DUP** Lab ID: **1273712017** Collected: 08/23/16 11:55 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	71-43-2	
Bromobenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	108-86-1	
Bromochloromethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	74-97-5	
Bromodichloromethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-27-4	
Bromoform	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-25-2	
Bromomethane	ND	ug/kg	277	1	09/02/16 09:58	09/02/16 14:20	74-83-9	
n-Butylbenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	104-51-8	
sec-Butylbenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	135-98-8	
tert-Butylbenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	98-06-6	
Carbon tetrachloride	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	56-23-5	
Chlorobenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	108-90-7	
Chloroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-00-3	
Chloroform	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	67-66-3	
Chloromethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	74-87-3	
2-Chlorotoluene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	95-49-8	
4-Chlorotoluene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	96-12-8	
Dibromochloromethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	106-93-4	
Dibromomethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-71-8	
1,1-Dichloroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-34-3	
1,2-Dichloroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	107-06-2	
1,1-Dichloroethene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-35-4	
cis-1,2-Dichloroethene	232	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	156-60-5	
Dichlorofluoromethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-43-4	
1,2-Dichloropropane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	78-87-5	
1,3-Dichloropropane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	142-28-9	
2,2-Dichloropropane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	594-20-7	
1,1-Dichloropropene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	10061-02-6	
Ethylbenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	87-68-3	
n-Hexane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	98-82-8	
p-Isopropyltoluene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	99-87-6	
Methylene Chloride	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	1634-04-4	
Naphthalene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	91-20-3	
n-Propylbenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	103-65-1	
Styrene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	100-42-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-11 0.0-0.5 DUP **Lab ID: 1273712017** Collected: 08/23/16 11:55 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,1,1,2-Tetrachloroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	79-34-5	
Tetrachloroethene	1780	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	127-18-4	
Toluene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	79-00-5	
Trichloroethene	231	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	79-01-6	
Trichlorofluoromethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	540-84-1	
Vinyl chloride	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	75-01-4	
Xylene (Total)	ND	ug/kg	139	1	09/02/16 09:58	09/02/16 14:20	1330-20-7	
m&p-Xylene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	179601-23-1	
o-Xylene	ND	ug/kg	69.3	1	09/02/16 09:58	09/02/16 14:20	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	09/02/16 09:58	09/02/16 14:20	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/02/16 09:58	09/02/16 14:20	2037-26-5	
4-Bromofluorobenzene (S)	87	%	70-130	1	09/02/16 09:58	09/02/16 14:20	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture **34.4** % 0.10 1 08/31/16 15:33

Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	25.4	%	0.10	1	09/08/16 10:50			
Total Organic Carbon	4150	mg/kg	1020	1	09/08/16 10:50	7440-44-0		
Total Organic Carbon	5350	mg/kg	1020	1	09/08/16 10:56	7440-44-0		
Mean Total Organic Carbon	4750	mg/kg	1020	1	09/08/16 10:50	7440-44-0		

Sample: SED-7 0.5-1.5 **Lab ID: 1273712018** Collected: 08/23/16 11:08 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	71-43-2	
Bromobenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	108-86-1	
Bromochloromethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	74-97-5	
Bromodichloromethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-27-4	
Bromoform	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-25-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-7 0.5-1.5** Lab ID: **1273712018** Collected: 08/23/16 11:08 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Bromomethane	ND	ug/kg	246	1	09/02/16 09:58	09/02/16 14:40	74-83-9	
n-Butylbenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	104-51-8	
sec-Butylbenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	135-98-8	
tert-Butylbenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	98-06-6	
Carbon tetrachloride	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	56-23-5	
Chlorobenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	108-90-7	
Chloroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-00-3	
Chloroform	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	67-66-3	
Chloromethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	74-87-3	
2-Chlorotoluene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	95-49-8	
4-Chlorotoluene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	96-12-8	
Dibromochloromethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	106-93-4	
Dibromomethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-71-8	
1,1-Dichloroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-34-3	
1,2-Dichloroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	107-06-2	
1,1-Dichloroethene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	156-60-5	
Dichlorofluoromethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-43-4	
1,2-Dichloropropane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	78-87-5	
1,3-Dichloropropane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	142-28-9	
2,2-Dichloropropane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	594-20-7	
1,1-Dichloropropene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	10061-02-6	
Ethylbenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	87-68-3	
n-Hexane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	98-82-8	
p-Isopropyltoluene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	99-87-6	
Methylene Chloride	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	1634-04-4	
Naphthalene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	91-20-3	
n-Propylbenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	103-65-1	
Styrene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	79-34-5	
Tetrachloroethene	564	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	127-18-4	
Toluene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-7 0.5-1.5 **Lab ID: 1273712018** Collected: 08/23/16 11:08 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,2,4-Trichlorobenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	79-00-5	
Trichloroethene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	79-01-6	
Trichlorofluoromethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	540-84-1	
Vinyl chloride	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	75-01-4	
Xylene (Total)	ND	ug/kg	123	1	09/02/16 09:58	09/02/16 14:40	1330-20-7	
m&p-Xylene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	179601-23-1	
o-Xylene	ND	ug/kg	61.4	1	09/02/16 09:58	09/02/16 14:40	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	70-130	1	09/02/16 09:58	09/02/16 14:40	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/02/16 09:58	09/02/16 14:40	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	09/02/16 09:58	09/02/16 14:40	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	18.5	%	0.10	1		08/31/16 15:35		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	17.8	%	0.10	1		09/08/16 06:52		
Total Organic Carbon	2790	mg/kg	821	1		09/08/16 06:52	7440-44-0	
Total Organic Carbon	3340	mg/kg	814	1		09/08/16 06:58	7440-44-0	
Mean Total Organic Carbon	3070	mg/kg	817	1		09/08/16 06:52	7440-44-0	

Sample: SED-6 0.0-0.5 **Lab ID: 1273712019** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Soil Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Benzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	71-43-2	M1
Bromobenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	108-86-1	M1
Bromochloromethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	74-97-5	M1
Bromodichloromethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-27-4	M1
Bromoform	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-25-2	M1
Bromomethane	ND	ug/kg	1550	1	09/02/16 12:59	09/02/16 16:41	74-83-9	
n-Butylbenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	135-98-8	M1
tert-Butylbenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	98-06-6	M1
Carbon tetrachloride	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	56-23-5	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: **SED-6 0.0-0.5** Lab ID: **1273712019** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Chlorobenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	108-90-7	M1
Chloroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-00-3	
Chloroform	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	67-66-3	
Chloromethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	95-49-8	M1
4-Chlorotoluene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	106-43-4	M1
1,2-Dibromo-3-chloropropane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	96-12-8	
Dibromochloromethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	106-93-4	M1
Dibromomethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	74-95-3	M1
1,2-Dichlorobenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	95-50-1	M1
1,3-Dichlorobenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	541-73-1	M1
1,4-Dichlorobenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	106-46-7	M1
Dichlorodifluoromethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-71-8	M1
1,1-Dichloroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	107-06-2	M1
1,1-Dichloroethene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-35-4	M1
cis-1,2-Dichloroethene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	156-59-2	M1
trans-1,2-Dichloroethene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	156-60-5	M1
Dichlorofluoromethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-43-4	M1
1,2-Dichloropropane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	142-28-9	M1
2,2-Dichloropropane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	594-20-7	M1
1,1-Dichloropropene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	563-58-6	M1
cis-1,3-Dichloropropene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	10061-02-6	
Ethylbenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	100-41-4	M1
Hexachloro-1,3-butadiene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	87-68-3	M1
n-Hexane	ND	ug/kg	194	1	09/02/16 12:59	09/02/16 16:41	110-54-3	M1
Isopropylbenzene (Cumene)	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	98-82-8	M1
p-Isopropyltoluene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	99-87-6	M1
Methylene Chloride	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-09-2	M1
Methyl-tert-butyl ether	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	1634-04-4	
Naphthalene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	91-20-3	
n-Propylbenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	103-65-1	
Styrene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	100-42-5	M1
1,1,1,2-Tetrachloroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	630-20-6	M1
1,1,2,2-Tetrachloroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	79-34-5	
Tetrachloroethene	5020	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	127-18-4	
Toluene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	108-88-3	M1
1,2,3-Trichlorobenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	87-61-6	M1
1,2,4-Trichlorobenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	120-82-1	M1
1,1,1-Trichloroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	71-55-6	M1
1,1,2-Trichloroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	79-00-5	
Trichloroethene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	79-01-6	M1
Trichlorofluoromethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-69-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-6 0.0-0.5 **Lab ID: 1273712019** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Soil								
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
1,2,3-Trichloropropane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	76-13-1	M1
1,2,4-Trimethylbenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	108-67-8	M1
2,2,4-Trimethylpentane	ND	ug/kg	155	1	09/02/16 12:59	09/02/16 16:41	540-84-1	M1
Vinyl chloride	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	75-01-4	M1
Xylene (Total)	ND	ug/kg	775	1	09/02/16 12:59	09/02/16 16:41	1330-20-7	MS
m&p-Xylene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	179601-23-1	
o-Xylene	ND	ug/kg	387	1	09/02/16 12:59	09/02/16 16:41	95-47-6	M1
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	09/02/16 12:59	09/02/16 16:41	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1	09/02/16 12:59	09/02/16 16:41	2037-26-5	
4-Bromofluorobenzene (S)	87	%	70-130	1	09/02/16 12:59	09/02/16 16:41	460-00-4	

Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low

Benzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	71-43-2	
Bromobenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	108-86-1	
Bromochloromethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	74-97-5	
Bromodichloromethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-27-4	
Bromoform	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-25-2	
Bromomethane	ND	ug/kg	31.2	1	09/01/16 06:56	09/01/16 10:20	74-83-9	
n-Butylbenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	56-23-5	
Chlorobenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	108-90-7	
Chloroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-00-3	
Chloroform	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	67-66-3	
Chloromethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	96-12-8	
Dibromochloromethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	106-93-4	
Dibromomethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-35-4	
cis-1,2-Dichloroethene	24.4	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	78-87-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-6 0.0-0.5 **Lab ID: 1273712019** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,3-Dichloropropane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	10061-02-6	
Ethylbenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	87-68-3	
n-Hexane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	99-87-6	
Methylene Chloride	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	1634-04-4	
Naphthalene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	91-20-3	
n-Propylbenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	103-65-1	
Styrene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	79-34-5	
Toluene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	79-00-5	
Trichloroethene	77.9	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	540-84-1	
Vinyl chloride	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	75-01-4	
Xylene (Total)	ND	ug/kg	15.6	1	09/01/16 06:56	09/01/16 10:20	1330-20-7	
m&p-Xylene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	179601-23-1	
o-Xylene	ND	ug/kg	7.8	1	09/01/16 06:56	09/01/16 10:20	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	70-130	1	09/01/16 06:56	09/01/16 10:20	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/01/16 06:56	09/01/16 10:20	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	09/01/16 06:56	09/01/16 10:20	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture **38.0** % 0.10 1 08/31/16 17:44

Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD% **2.7** % 0.10 1 09/08/16 07:04
 Total Organic Carbon **5920** mg/kg 1080 1 09/08/16 07:04 7440-44-0
 Total Organic Carbon **5760** mg/kg 1080 1 09/08/16 07:10 7440-44-0

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-6 0.0-0.5 **Lab ID: 1273712019** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Mean Total Organic Carbon	5840	mg/kg	1080	1		09/08/16 07:04	7440-44-0	

Sample: SED-7 0.0-0.5 **Lab ID: 1273712020** Collected: 08/23/16 11:08 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	71-43-2	
Bromobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	108-86-1	
Bromochloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	74-97-5	
Bromodichloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-27-4	
Bromoform	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-25-2	
Bromomethane	ND	ug/kg	28.0	1	09/01/16 06:56	09/01/16 10:40	74-83-9	
n-Butylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	56-23-5	
Chlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	108-90-7	
Chloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-00-3	
Chloroform	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	67-66-3	
Chloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	96-12-8	
Dibromochloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	106-93-4	
Dibromomethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	10061-02-6	
Ethylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	100-41-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-7 0.0-0.5** Lab ID: **1273712020** Collected: 08/23/16 11:08 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Hexachloro-1,3-butadiene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	87-68-3	
n-Hexane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	99-87-6	
Methylene Chloride	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	1634-04-4	
Naphthalene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	91-20-3	
n-Propylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	103-65-1	
Styrene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	79-34-5	
Tetrachloroethene	47.8	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	127-18-4	
Toluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	79-00-5	
Trichloroethene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	540-84-1	
Vinyl chloride	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	75-01-4	
Xylene (Total)	ND	ug/kg	14.0	1	09/01/16 06:56	09/01/16 10:40	1330-20-7	
m&p-Xylene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	179601-23-1	
o-Xylene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 10:40	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	09/01/16 06:56	09/01/16 10:40	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/01/16 06:56	09/01/16 10:40	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	09/01/16 06:56	09/01/16 10:40	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	28.7	%	0.10	1	08/31/16 17:45
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	ND	%	0.10	1	09/08/16 11:54
Total Organic Carbon	2060	mg/kg	947	1	09/08/16 11:54 7440-44-0
Total Organic Carbon	2060	mg/kg	935	1	09/08/16 11:59 7440-44-0
Mean Total Organic Carbon	2060	mg/kg	941	1	09/08/16 11:54 7440-44-0

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-6 0.5-1.5 Dup **Lab ID: 1273712021** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	71-43-2	
Bromobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	108-86-1	
Bromochloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	74-97-5	
Bromodichloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-27-4	
Bromoform	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-25-2	
Bromomethane	ND	ug/kg	21.9	1	09/01/16 06:56	09/01/16 11:00	74-83-9	
n-Butylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	98-06-6	
Carbon tetrachloride	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	56-23-5	
Chlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	108-90-7	
Chloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-00-3	
Chloroform	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	67-66-3	
Chloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	96-12-8	
Dibromochloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	106-93-4	
Dibromomethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	156-60-5	
Dichlorofluoromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-43-4	
1,2-Dichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	10061-02-6	
Ethylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	87-68-3	
n-Hexane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	99-87-6	
Methylene Chloride	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	1634-04-4	
Naphthalene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	91-20-3	
n-Propylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	103-65-1	
Styrene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	100-42-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-6 0.5-1.5 Dup **Lab ID: 1273712021** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	79-34-5	
Tetrachloroethene	193	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	127-18-4	
Toluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	79-00-5	
Trichloroethene	6.4	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	540-84-1	
Vinyl chloride	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	75-01-4	
Xylene (Total)	ND	ug/kg	11.0	1	09/01/16 06:56	09/01/16 11:00	1330-20-7	
m&p-Xylene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	179601-23-1	
o-Xylene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 11:00	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	1	09/01/16 06:56	09/01/16 11:00	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/01/16 06:56	09/01/16 11:00	2037-26-5	
4-Bromofluorobenzene (S)	87	%	70-130	1	09/01/16 06:56	09/01/16 11:00	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture **10.1** % 0.10 1 08/31/16 17:46

Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	33.7	%	0.10	1	09/08/16 08:09			
Total Organic Carbon	7470	mg/kg	742	1	09/08/16 08:09	7440-44-0		
Total Organic Carbon	5310	mg/kg	738	1	09/08/16 08:18	7440-44-0		
Mean Total Organic Carbon	6390	mg/kg	740	1	09/08/16 08:09	7440-44-0		

Sample: SED-1 0.0-0.5 **Lab ID: 1273712022** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	71-43-2	
Bromobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	108-86-1	
Bromochloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	74-97-5	
Bromodichloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-27-4	
Bromoform	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-25-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: **SED-1 0.0-0.5** Lab ID: **1273712022** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Bromomethane	ND	ug/kg	27.9	1	09/01/16 06:56	09/01/16 11:20	74-83-9	
n-Butylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	56-23-5	
Chlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	108-90-7	
Chloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-00-3	
Chloroform	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	67-66-3	
Chloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	96-12-8	
Dibromochloromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	106-93-4	
Dibromomethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-71-8	
1,1-Dichloroethane	8.4	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-35-4	
cis-1,2-Dichloroethene	35.2	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	10061-02-6	
Ethylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	87-68-3	
n-Hexane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	99-87-6	
Methylene Chloride	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	1634-04-4	
Naphthalene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	91-20-3	
n-Propylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	103-65-1	
Styrene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	79-34-5	
Tetrachloroethene	37.2	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	127-18-4	
Toluene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-1 0.0-0.5 **Lab ID: 1273712022** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,2,4-Trichlorobenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	79-00-5	
Trichloroethene	131	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	540-84-1	
Vinyl chloride	23.9	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	75-01-4	
Xylene (Total)	ND	ug/kg	14.0	1	09/01/16 06:56	09/01/16 11:20	1330-20-7	
m&p-Xylene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	179601-23-1	
o-Xylene	ND	ug/kg	7.0	1	09/01/16 06:56	09/01/16 11:20	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%	70-130	1	09/01/16 06:56	09/01/16 11:20	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/01/16 06:56	09/01/16 11:20	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1	09/01/16 06:56	09/01/16 11:20	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	30.2	%	0.10	1		08/31/16 17:47		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	19.2	%	0.10	1		09/08/16 08:30		
Total Organic Carbon	5100	mg/kg	961	1		09/08/16 08:30	7440-44-0	
Total Organic Carbon	6180	mg/kg	959	1		09/08/16 08:35	7440-44-0	
Mean Total Organic Carbon	5640	mg/kg	960	1		09/08/16 08:30	7440-44-0	

Sample: SED-11 0.5-2.5 Dup **Lab ID: 1273712023** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	71-43-2	
Bromobenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	108-86-1	
Bromochloromethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	74-97-5	
Bromodichloromethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-27-4	
Bromoform	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-25-2	
Bromomethane	ND	ug/kg	204	1	09/02/16 09:58	09/02/16 15:01	74-83-9	
n-Butylbenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	104-51-8	
sec-Butylbenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	135-98-8	
tert-Butylbenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	98-06-6	
Carbon tetrachloride	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	56-23-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-11 0.5-2.5 Dup **Lab ID: 1273712023** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Chlorobenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	108-90-7	
Chloroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-00-3	
Chloroform	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	67-66-3	
Chloromethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	74-87-3	
2-Chlorotoluene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	95-49-8	
4-Chlorotoluene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	96-12-8	
Dibromochloromethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	106-93-4	
Dibromomethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-71-8	
1,1-Dichloroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-34-3	
1,2-Dichloroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	107-06-2	
1,1-Dichloroethene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	156-60-5	
Dichlorofluoromethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-43-4	
1,2-Dichloropropane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	78-87-5	
1,3-Dichloropropane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	142-28-9	
2,2-Dichloropropane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	594-20-7	
1,1-Dichloropropene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	10061-02-6	
Ethylbenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	87-68-3	
n-Hexane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	98-82-8	
p-Isopropyltoluene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	99-87-6	
Methylene Chloride	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	1634-04-4	
Naphthalene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	91-20-3	
n-Propylbenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	103-65-1	
Styrene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	79-34-5	
Tetrachloroethene	419	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	127-18-4	
Toluene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	79-00-5	
Trichloroethene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	79-01-6	
Trichlorofluoromethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-69-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-11 0.5-2.5 Dup **Lab ID: 1273712023** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,2,3-Trichloropropane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	540-84-1	
Vinyl chloride	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	75-01-4	
Xylene (Total)	ND	ug/kg	102	1	09/02/16 09:58	09/02/16 15:01	1330-20-7	
m&p-Xylene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	179601-23-1	
o-Xylene	ND	ug/kg	51.0	1	09/02/16 09:58	09/02/16 15:01	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	09/02/16 09:58	09/02/16 15:01	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/02/16 09:58	09/02/16 15:01	2037-26-5	
4-Bromofluorobenzene (S)	89	%	70-130	1	09/02/16 09:58	09/02/16 15:01	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	12.4	%	0.10	1		08/31/16 17:47		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	14.4	%	0.10	1		09/08/16 08:41		
Total Organic Carbon	8050	mg/kg	769	1		09/08/16 08:41	7440-44-0	
Total Organic Carbon	9290	mg/kg	763	1		09/08/16 08:47	7440-44-0	
Mean Total Organic Carbon	8670	mg/kg	766	1		09/08/16 08:41	7440-44-0	

Sample: SED-1 2.5-4.2 **Lab ID: 1273712024** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	71-43-2	
Bromobenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	108-86-1	
Bromochloromethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	74-97-5	
Bromodichloromethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-27-4	
Bromoform	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-25-2	
Bromomethane	ND	ug/kg	24.4	1	09/01/16 06:56	09/01/16 12:00	74-83-9	
n-Butylbenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	56-23-5	
Chlorobenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	108-90-7	
Chloroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-00-3	
Chloroform	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	67-66-3	
Chloromethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	95-49-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Project No.: 1273712

Sample: **SED-1 2.5-4.2** Lab ID: **1273712024** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
4-Chlorotoluene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	96-12-8	
Dibromochloromethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	106-93-4	
Dibromomethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-35-4	
cis-1,2-Dichloroethene	32.1	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	10061-02-6	
Ethylbenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	87-68-3	
n-Hexane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	99-87-6	
Methylene Chloride	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	1634-04-4	
Naphthalene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	91-20-3	
n-Propylbenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	103-65-1	
Styrene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	79-34-5	
Tetrachloroethene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	127-18-4	
Toluene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	79-00-5	
Trichloroethene	14.9	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	540-84-1	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-1 2.5-4.2 **Lab ID: 1273712024** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Vinyl chloride	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	75-01-4	
Xylene (Total)	ND	ug/kg	12.2	1	09/01/16 06:56	09/01/16 12:00	1330-20-7	
m&p-Xylene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	179601-23-1	
o-Xylene	ND	ug/kg	6.1	1	09/01/16 06:56	09/01/16 12:00	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	1	09/01/16 06:56	09/01/16 12:00	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/01/16 06:56	09/01/16 12:00	2037-26-5	
4-Bromofluorobenzene (S)	86	%	70-130	1	09/01/16 06:56	09/01/16 12:00	460-00-4	
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	20.3	%	0.10	1		08/31/16 17:48		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	8.7	%	0.10	1		09/08/16 08:53		
Total Organic Carbon	3760	mg/kg	835	1		09/08/16 08:53	7440-44-0	
Total Organic Carbon	3450	mg/kg	846	1		09/08/16 08:59	7440-44-0	
Mean Total Organic Carbon	3600	mg/kg	841	1		09/08/16 08:53	7440-44-0	

Sample: SED-9 0.0-0.5 **Lab ID: 1273712025** Collected: 08/23/16 08:50 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	71-43-2	
Bromobenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	108-86-1	
Bromochloromethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	74-97-5	
Bromodichloromethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-27-4	
Bromoform	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-25-2	
Bromomethane	ND	ug/kg	28.4	1	09/01/16 06:56	09/01/16 12:20	74-83-9	
n-Butylbenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	104-51-8	
sec-Butylbenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	135-98-8	
tert-Butylbenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	98-06-6	
Carbon tetrachloride	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	56-23-5	
Chlorobenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	108-90-7	
Chloroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-00-3	
Chloroform	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	67-66-3	
Chloromethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	74-87-3	
2-Chlorotoluene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	95-49-8	
4-Chlorotoluene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	96-12-8	
Dibromochloromethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	106-93-4	
Dibromomethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	74-95-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-9 0.0-0.5** Lab ID: **1273712025** Collected: 08/23/16 08:50 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2-Dichlorobenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-71-8	
1,1-Dichloroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-34-3	
1,2-Dichloroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	107-06-2	
1,1-Dichloroethene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-35-4	
cis-1,2-Dichloroethene	66.6	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	156-60-5	
Dichlorofluoromethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-43-4	
1,2-Dichloropropane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	78-87-5	
1,3-Dichloropropane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	142-28-9	
2,2-Dichloropropane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	594-20-7	
1,1-Dichloropropene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	10061-02-6	
Ethylbenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	87-68-3	
n-Hexane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	98-82-8	
p-Isopropyltoluene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	99-87-6	
Methylene Chloride	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	1634-04-4	
Naphthalene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	91-20-3	
n-Propylbenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	103-65-1	
Styrene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	79-34-5	
Tetrachloroethene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	127-18-4	
Toluene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	79-00-5	
Trichloroethene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	79-01-6	
Trichlorofluoromethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	540-84-1	
Vinyl chloride	12.5	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	75-01-4	
Xylene (Total)	ND	ug/kg	14.2	1	09/01/16 06:56	09/01/16 12:20	1330-20-7	
m&p-Xylene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	179601-23-1	
o-Xylene	ND	ug/kg	7.1	1	09/01/16 06:56	09/01/16 12:20	95-47-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-9 0.0-0.5 **Lab ID: 1273712025** Collected: 08/23/16 08:50 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%	70-130	1	09/01/16 06:56	09/01/16 12:20	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/01/16 06:56	09/01/16 12:20	2037-26-5	
4-Bromofluorobenzene (S)	86	%	70-130	1	09/01/16 06:56	09/01/16 12:20	460-00-4	
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	30.8	%	0.10	1		08/31/16 17:48		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	23.0	%	0.10	1		09/08/16 09:04		
Total Organic Carbon	6530	mg/kg	1420	1		09/08/16 09:04	7440-44-0	
Total Organic Carbon	5180	mg/kg	1410	1		09/08/16 09:10	7440-44-0	
Mean Total Organic Carbon	5850	mg/kg	1410	1		09/08/16 09:04	7440-44-0	

Sample: SED-1 0.5-2.5 **Lab ID: 1273712026** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	71-43-2	
Bromobenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	108-86-1	
Bromochloromethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	74-97-5	
Bromodichloromethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-27-4	
Bromoform	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-25-2	
Bromomethane	ND	ug/kg	24.6	1	09/02/16 09:58	09/02/16 11:00	74-83-9	
n-Butylbenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	56-23-5	
Chlorobenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	108-90-7	
Chloroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-00-3	
Chloroform	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	67-66-3	
Chloromethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	96-12-8	
Dibromochloromethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	106-93-4	
Dibromomethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-71-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-1 0.5-2.5** Lab ID: **1273712026** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,1-Dichloroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-35-4	
cis-1,2-Dichloroethene	11.0	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	10061-02-6	
Ethylbenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	87-68-3	
n-Hexane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	110-54-3	M1
Isopropylbenzene (Cumene)	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	99-87-6	
Methylene Chloride	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	1634-04-4	
Naphthalene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	91-20-3	
n-Propylbenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	103-65-1	
Styrene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	79-34-5	
Tetrachloroethene	25.9	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	127-18-4	
Toluene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	79-00-5	
Trichloroethene	54.9	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	540-84-1	M1
Vinyl chloride	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	75-01-4	
Xylene (Total)	ND	ug/kg	12.3	1	09/02/16 09:58	09/02/16 11:00	1330-20-7	
m&p-Xylene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	179601-23-1	
o-Xylene	ND	ug/kg	6.2	1	09/02/16 09:58	09/02/16 11:00	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%.	70-130	1	09/02/16 09:58	09/02/16 11:00	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1	09/02/16 09:58	09/02/16 11:00	2037-26-5	
4-Bromofluorobenzene (S)	89	%.	70-130	1	09/02/16 09:58	09/02/16 11:00	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-1 0.5-2.5 **Lab ID: 1273712026** Collected: 08/24/16 10:20 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	22.0	%	0.10	1		08/31/16 17:49		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	0.60	%	0.10	1		09/08/16 09:17		
Total Organic Carbon	4850	mg/kg	1200	1		09/08/16 09:17	7440-44-0	
Total Organic Carbon	4880	mg/kg	1210	1		09/08/16 09:23	7440-44-0	
Mean Total Organic Carbon	4860	mg/kg	1210	1		09/08/16 09:17	7440-44-0	

Sample: SED-11 0.0-0.5 **Lab ID: 1273712027** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	71-43-2	
Bromobenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	108-86-1	
Bromochloromethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	74-97-5	
Bromodichloromethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-27-4	
Bromoform	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-25-2	
Bromomethane	ND	ug/kg	266	1	09/02/16 09:58	09/02/16 15:21	74-83-9	
n-Butylbenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	104-51-8	
sec-Butylbenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	135-98-8	
tert-Butylbenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	98-06-6	
Carbon tetrachloride	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	56-23-5	
Chlorobenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	108-90-7	
Chloroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-00-3	
Chloroform	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	67-66-3	
Chloromethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	74-87-3	
2-Chlorotoluene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	95-49-8	
4-Chlorotoluene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	96-12-8	
Dibromochloromethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	106-93-4	
Dibromomethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-71-8	
1,1-Dichloroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-34-3	
1,2-Dichloroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	107-06-2	
1,1-Dichloroethene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-35-4	
cis-1,2-Dichloroethene	125	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	156-60-5	
Dichlorofluoromethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-43-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-11 0.0-0.5** Lab ID: **1273712027** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2-Dichloropropane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	78-87-5	
1,3-Dichloropropane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	142-28-9	
2,2-Dichloropropane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	594-20-7	
1,1-Dichloropropene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	10061-02-6	
Ethylbenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	87-68-3	
n-Hexane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	98-82-8	
p-Isopropyltoluene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	99-87-6	
Methylene Chloride	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	1634-04-4	
Naphthalene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	91-20-3	
n-Propylbenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	103-65-1	
Styrene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	79-34-5	
Tetrachloroethene	852	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	127-18-4	
Toluene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	79-00-5	
Trichloroethene	133	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	79-01-6	
Trichlorofluoromethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	540-84-1	
Vinyl chloride	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	75-01-4	
Xylene (Total)	ND	ug/kg	133	1	09/02/16 09:58	09/02/16 15:21	1330-20-7	
m&p-Xylene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	179601-23-1	
o-Xylene	ND	ug/kg	66.5	1	09/02/16 09:58	09/02/16 15:21	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	1	09/02/16 09:58	09/02/16 15:21	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/02/16 09:58	09/02/16 15:21	2037-26-5	
4-Bromofluorobenzene (S)	87	%	70-130	1	09/02/16 09:58	09/02/16 15:21	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	30.4	%	0.10	1	08/31/16 17:49
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	33.2	%	0.10	1	09/08/16 11:15
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-11 0.0-0.5 **Lab ID: 1273712027** Collected: 08/23/16 11:58 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Total Organic Carbon	3870	mg/kg	966	1		09/08/16 11:15	7440-44-0	
Total Organic Carbon	2770	mg/kg	967	1		09/08/16 11:22	7440-44-0	
Mean Total Organic Carbon	3320	mg/kg	967	1		09/08/16 11:15	7440-44-0	

Sample: SED-8 0.5-2.25 **Lab ID: 1273712028** Collected: 08/23/16 14:10 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Benzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	71-43-2	
Bromobenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	108-86-1	
Bromochloromethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	74-97-5	
Bromodichloromethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-27-4	
Bromoform	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-25-2	
Bromomethane	ND	ug/kg	238	1	09/02/16 09:58	09/02/16 15:41	74-83-9	
n-Butylbenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	56-23-5	
Chlorobenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	108-90-7	
Chloroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-00-3	
Chloroform	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	67-66-3	
Chloromethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	96-12-8	
Dibromochloromethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	106-93-4	
Dibromomethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-71-8	
1,1-Dichloroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	107-06-2	
1,1-Dichloroethene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-35-4	
cis-1,2-Dichloroethene	87.8	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	10061-01-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-8 0.5-2.25** Lab ID: **1273712028** Collected: 08/23/16 14:10 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
trans-1,3-Dichloropropene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	10061-02-6	
Ethylbenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	87-68-3	
n-Hexane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	99-87-6	
Methylene Chloride	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	1634-04-4	
Naphthalene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	91-20-3	
n-Propylbenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	103-65-1	
Styrene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	79-34-5	
Tetrachloroethene	1640	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	127-18-4	
Toluene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	79-00-5	
Trichloroethene	240	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	79-01-6	
Trichlorofluoromethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	540-84-1	
Vinyl chloride	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	75-01-4	
Xylene (Total)	ND	ug/kg	119	1	09/02/16 09:58	09/02/16 15:41	1330-20-7	
m&p-Xylene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	179601-23-1	
o-Xylene	ND	ug/kg	59.4	1	09/02/16 09:58	09/02/16 15:41	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%	70-130	1	09/02/16 09:58	09/02/16 15:41	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/02/16 09:58	09/02/16 15:41	2037-26-5	
4-Bromofluorobenzene (S)	88	%	70-130	1	09/02/16 09:58	09/02/16 15:41	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture **15.8** % 0.10 1 08/31/16 17:50

Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	8.4	%	0.10	1	09/08/16 11:27			
Total Organic Carbon	4090	mg/kg	802	1	09/08/16 11:27	7440-44-0		
Total Organic Carbon	3760	mg/kg	788	1	09/08/16 11:33	7440-44-0		
Mean Total Organic Carbon	3930	mg/kg	795	1	09/08/16 11:27	7440-44-0		

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-6 0.5-1.5 **Lab ID: 1273712029** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Benzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	71-43-2	
Bromobenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	108-86-1	
Bromochloromethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	74-97-5	
Bromodichloromethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-27-4	
Bromoform	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-25-2	
Bromomethane	ND	ug/kg	1090	1	09/02/16 12:59	09/02/16 18:21	74-83-9	
n-Butylbenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	104-51-8	
sec-Butylbenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	135-98-8	
tert-Butylbenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	98-06-6	
Carbon tetrachloride	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	56-23-5	
Chlorobenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	108-90-7	
Chloroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-00-3	
Chloroform	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	67-66-3	
Chloromethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	74-87-3	
2-Chlorotoluene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	95-49-8	
4-Chlorotoluene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	96-12-8	
Dibromochloromethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	106-93-4	
Dibromomethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-71-8	
1,1-Dichloroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-34-3	
1,2-Dichloroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	107-06-2	
1,1-Dichloroethene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	156-60-5	
Dichlorofluoromethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-43-4	
1,2-Dichloropropane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	78-87-5	
1,3-Dichloropropane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	142-28-9	
2,2-Dichloropropane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	594-20-7	
1,1-Dichloropropene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	10061-02-6	
Ethylbenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	87-68-3	
n-Hexane	ND	ug/kg	137	1	09/02/16 12:59	09/02/16 18:21	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	98-82-8	
p-Isopropyltoluene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	99-87-6	
Methylene Chloride	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	1634-04-4	
Naphthalene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	91-20-3	
n-Propylbenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	103-65-1	
Styrene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	100-42-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-6 0.5-1.5** Lab ID: **1273712029** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Soil								
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	79-34-5	
Tetrachloroethene	2400	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	127-18-4	
Toluene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	79-00-5	
Trichloroethene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	79-01-6	
Trichlorofluoromethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	109	1	09/02/16 12:59	09/02/16 18:21	540-84-1	
Vinyl chloride	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	75-01-4	
Xylene (Total)	ND	ug/kg	546	1	09/02/16 12:59	09/02/16 18:21	1330-20-7	
m&p-Xylene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	179601-23-1	
o-Xylene	ND	ug/kg	273	1	09/02/16 12:59	09/02/16 18:21	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	09/02/16 12:59	09/02/16 18:21	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1	09/02/16 12:59	09/02/16 18:21	2037-26-5	
4-Bromofluorobenzene (S)	88	%	70-130	1	09/02/16 12:59	09/02/16 18:21	460-00-4	

Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low

Benzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	71-43-2	
Bromobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	108-86-1	
Bromochloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	74-97-5	
Bromodichloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-27-4	
Bromoform	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-25-2	
Bromomethane	ND	ug/kg	22.0	1	09/01/16 06:56	09/01/16 13:41	74-83-9	
n-Butylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	56-23-5	
Chlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	108-90-7	
Chloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-00-3	
Chloroform	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	67-66-3	
Chloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	96-12-8	
Dibromochloromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	106-93-4	
Dibromomethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	95-50-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: **SED-6 0.5-1.5** Lab ID: **1273712029** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,3-Dichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-35-4	
cis-1,2-Dichloroethene	10.8	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	10061-02-6	
Ethylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	87-68-3	
n-Hexane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	99-87-6	
Methylene Chloride	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	1634-04-4	
Naphthalene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	91-20-3	
n-Propylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	103-65-1	
Styrene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	79-34-5	
Toluene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	79-00-5	
Trichloroethene	47.1	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	540-84-1	
Vinyl chloride	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	75-01-4	
Xylene (Total)	ND	ug/kg	11.0	1	09/01/16 06:56	09/01/16 13:41	1330-20-7	
m&p-Xylene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	179601-23-1	
o-Xylene	ND	ug/kg	5.5	1	09/01/16 06:56	09/01/16 13:41	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%.	70-130	1	09/01/16 06:56	09/01/16 13:41	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1	09/01/16 06:56	09/01/16 13:41	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-6 0.5-1.5 **Lab ID: 1273712029** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low

Surrogates

4-Bromofluorobenzene (S)	84	%	70-130	1	09/01/16 06:56	09/01/16 13:41	460-00-4	
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Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	12.0	%	0.10	1	08/31/16 17:50			
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	29.6	%	0.10	1	09/08/16 09:53			
Total Organic Carbon	4630	mg/kg	756	1	09/08/16 09:53	7440-44-0		
Total Organic Carbon	3440	mg/kg	763	1	09/08/16 09:59	7440-44-0		
Mean Total Organic Carbon	4030	mg/kg	759	1	09/08/16 09:53	7440-44-0		

Sample: SED-6 0.0-0.5 DUP **Lab ID: 1273712030** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8260 MSV Med Soil

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Benzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	71-43-2	
Bromobenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	108-86-1	
Bromochloromethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	74-97-5	
Bromodichloromethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-27-4	
Bromoform	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-25-2	
Bromomethane	ND	ug/kg	2250	1	09/02/16 12:59	09/02/16 18:41	74-83-9	
n-Butylbenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	56-23-5	
Chlorobenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	108-90-7	
Chloroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-00-3	
Chloroform	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	67-66-3	
Chloromethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	96-12-8	
Dibromochloromethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	106-93-4	
Dibromomethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-71-8	
1,1-Dichloroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	107-06-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: **SED-6 0.0-0.5 DUP** Lab ID: **1273712030** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	10061-02-6	
Ethylbenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	87-68-3	
n-Hexane	ND	ug/kg	281	1	09/02/16 12:59	09/02/16 18:41	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	99-87-6	
Methylene Chloride	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	1634-04-4	
Naphthalene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	91-20-3	
n-Propylbenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	103-65-1	
Styrene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	79-34-5	
Tetrachloroethene	5490	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	127-18-4	
Toluene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	79-00-5	
Trichloroethene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	79-01-6	
Trichlorofluoromethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	225	1	09/02/16 12:59	09/02/16 18:41	540-84-1	
Vinyl chloride	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	75-01-4	
Xylene (Total)	ND	ug/kg	1120	1	09/02/16 12:59	09/02/16 18:41	1330-20-7	
m&p-Xylene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	179601-23-1	
o-Xylene	ND	ug/kg	561	1	09/02/16 12:59	09/02/16 18:41	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1	09/02/16 12:59	09/02/16 18:41	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1	09/02/16 12:59	09/02/16 18:41	2037-26-5	
4-Bromofluorobenzene (S)	88	%	70-130	1	09/02/16 12:59	09/02/16 18:41	460-00-4	

Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low

Benzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	71-43-2	
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: **SED-6 0.0-0.5 DUP** Lab ID: **1273712030** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Bromobenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	108-86-1	
Bromochloromethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	74-97-5	
Bromodichloromethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-27-4	
Bromoform	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-25-2	
Bromomethane	ND	ug/kg	46.1	1	09/01/16 06:56	09/01/16 14:00	74-83-9	
n-Butylbenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	104-51-8	
sec-Butylbenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	135-98-8	
tert-Butylbenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	98-06-6	
Carbon tetrachloride	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	56-23-5	
Chlorobenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	108-90-7	
Chloroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-00-3	
Chloroform	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	67-66-3	
Chloromethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	74-87-3	
2-Chlorotoluene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	95-49-8	
4-Chlorotoluene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	96-12-8	
Dibromochloromethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	106-93-4	
Dibromomethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-71-8	
1,1-Dichloroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-34-3	
1,2-Dichloroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	107-06-2	
1,1-Dichloroethene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-35-4	
cis-1,2-Dichloroethene	36.6	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	156-60-5	
Dichlorofluoromethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-43-4	
1,2-Dichloropropane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	78-87-5	
1,3-Dichloropropane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	142-28-9	
2,2-Dichloropropane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	594-20-7	
1,1-Dichloropropene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	10061-02-6	
Ethylbenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	87-68-3	
n-Hexane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	98-82-8	
p-Isopropyltoluene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	99-87-6	
Methylene Chloride	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	1634-04-4	
Naphthalene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	91-20-3	
n-Propylbenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	103-65-1	
Styrene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	630-20-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-6 0.0-0.5 DUP **Lab ID: 1273712030** Collected: 08/23/16 10:13 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low

1,1,2,2-Tetrachloroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	79-34-5	
Toluene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	79-00-5	
Trichloroethene	80.4	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	79-01-6	
Trichlorofluoromethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	540-84-1	
Vinyl chloride	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	75-01-4	
Xylene (Total)	ND	ug/kg	23.0	1	09/01/16 06:56	09/01/16 14:00	1330-20-7	
m&p-Xylene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	179601-23-1	
o-Xylene	ND	ug/kg	11.5	1	09/01/16 06:56	09/01/16 14:00	95-47-6	

Surrogates

1,2-Dichloroethane-d4 (S)	106	%	70-130	1	09/01/16 06:56	09/01/16 14:00	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1	09/01/16 06:56	09/01/16 14:00	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1	09/01/16 06:56	09/01/16 14:00	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	56.7	%	0.10	1	08/31/16 17:51			
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	10.5	%	0.10	1	09/08/16 11:38			
Total Organic Carbon	24500	mg/kg	1920	1	09/08/16 11:38	7440-44-0		
Total Organic Carbon	22100	mg/kg	1920	1	09/08/16 11:48	7440-44-0		
Mean Total Organic Carbon	23300	mg/kg	1920	1	09/08/16 11:38	7440-44-0		

Sample: SED-10 0.0-0.5 **Lab ID: 1273712031** Collected: 08/23/16 09:33 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8260 MSV Low Soil

Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low

Benzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	71-43-2	
Bromobenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	108-86-1	
Bromochloromethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	74-97-5	
Bromodichloromethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-27-4	
Bromoform	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-25-2	
Bromomethane	ND	ug/kg	27.2	1	09/01/16 06:56	09/01/16 14:20	74-83-9	
n-Butylbenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-10 0.0-0.5 **Lab ID: 1273712031** Collected: 08/23/16 09:33 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
sec-Butylbenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	56-23-5	
Chlorobenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	108-90-7	
Chloroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-00-3	
Chloroform	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	67-66-3	
Chloromethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	96-12-8	
Dibromochloromethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	106-93-4	
Dibromomethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	10061-02-6	
Ethylbenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	87-68-3	
n-Hexane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	99-87-6	
Methylene Chloride	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	1634-04-4	
Naphthalene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	91-20-3	
n-Propylbenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	103-65-1	
Styrene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	79-34-5	
Tetrachloroethene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	127-18-4	
Toluene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	71-55-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-10 0.0-0.5 **Lab ID: 1273712031** Collected: 08/23/16 09:33 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
1,1,2-Trichloroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	79-00-5	
Trichloroethene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	540-84-1	
Vinyl chloride	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	75-01-4	
Xylene (Total)	ND	ug/kg	13.6	1	09/01/16 06:56	09/01/16 14:20	1330-20-7	
m&p-Xylene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	179601-23-1	
o-Xylene	ND	ug/kg	6.8	1	09/01/16 06:56	09/01/16 14:20	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%	70-130	1	09/01/16 06:56	09/01/16 14:20	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1	09/01/16 06:56	09/01/16 14:20	2037-26-5	
4-Bromofluorobenzene (S)	86	%	70-130	1	09/01/16 06:56	09/01/16 14:20	460-00-4	

Dry Weight, Davis

Analytical Method: ASTM D 2974-13 (2013)

Percent Moisture	28.4	%	0.10	1		08/31/16 17:51		
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Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	13.3	%	0.10	1		09/08/16 10:28		
Total Organic Carbon	1180	mg/kg	934	1		09/08/16 10:28	7440-44-0	
Total Organic Carbon	1030	mg/kg	927	1		09/08/16 10:34	7440-44-0	
Mean Total Organic Carbon	1110	mg/kg	931	1		09/08/16 10:28	7440-44-0	

Sample: SED-10 0.5-2.66 **Lab ID: 1273712032** Collected: 08/23/16 09:33 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low								
Benzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	71-43-2	
Bromobenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	108-86-1	
Bromochloromethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	74-97-5	
Bromodichloromethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-27-4	
Bromoform	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-25-2	
Bromomethane	ND	ug/kg	24.0	1	09/01/16 06:56	09/01/16 14:41	74-83-9	
n-Butylbenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	56-23-5	
Chlorobenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	108-90-7	
Chloroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-00-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: SED-10 0.5-2.66 **Lab ID: 1273712032** Collected: 08/23/16 09:33 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
Chloroform	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	67-66-3	
Chloromethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	96-12-8	
Dibromochloromethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	106-93-4	
Dibromomethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	10061-02-6	
Ethylbenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	87-68-3	
n-Hexane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	99-87-6	
Methylene Chloride	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-09-2	
Methyl-tert-butyl ether	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	1634-04-4	
Naphthalene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	91-20-3	
n-Propylbenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	103-65-1	
Styrene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	79-34-5	
Tetrachloroethene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	127-18-4	
Toluene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	79-00-5	
Trichloroethene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	76-13-1	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: SED-10 0.5-2.66 **Lab ID: 1273712032** Collected: 08/23/16 09:33 Received: 08/30/16 09:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Soil		Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low						
1,2,4-Trimethylbenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	108-67-8	
2,2,4-Trimethylpentane	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	540-84-1	
Vinyl chloride	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	75-01-4	
Xylene (Total)	ND	ug/kg	12.0	1	09/01/16 06:56	09/01/16 14:41	1330-20-7	
m&p-Xylene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	179601-23-1	
o-Xylene	ND	ug/kg	6.0	1	09/01/16 06:56	09/01/16 14:41	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%	70-130	1	09/01/16 06:56	09/01/16 14:41	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1	09/01/16 06:56	09/01/16 14:41	2037-26-5	
4-Bromofluorobenzene (S)	84	%	70-130	1	09/01/16 06:56	09/01/16 14:41	460-00-4	
Dry Weight, Davis		Analytical Method: ASTM D 2974-13 (2013)						
Percent Moisture	17.7	%	0.10	1		08/31/16 17:52		
Total Organic Carbon		Analytical Method: EPA 9060 Modified						
Surrogates								
RPD%	5.4	%	0.10	1		09/08/16 10:39		
Total Organic Carbon	1210	mg/kg	808	1		09/08/16 10:39	7440-44-0	
Total Organic Carbon	1150	mg/kg	814	1		09/08/16 10:45	7440-44-0	
Mean Total Organic Carbon	1180	mg/kg	811	1		09/08/16 10:39	7440-44-0	

Sample: Surf 4 **Lab ID: 1273712033** Collected: 08/24/16 00:00 Received: 08/30/16 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Benzene	ND	ug/L	0.50	1		08/31/16 18:28	71-43-2	
Bromobenzene	ND	ug/L	0.50	1		08/31/16 18:28	108-86-1	
Bromochloromethane	ND	ug/L	0.50	1		08/31/16 18:28	74-97-5	
Bromodichloromethane	ND	ug/L	0.50	1		08/31/16 18:28	75-27-4	
Bromoform	ND	ug/L	0.50	1		08/31/16 18:28	75-25-2	
Bromomethane	ND	ug/L	20.0	1		08/31/16 18:28	74-83-9	
n-Butylbenzene	ND	ug/L	0.50	1		08/31/16 18:28	104-51-8	
sec-Butylbenzene	ND	ug/L	0.50	1		08/31/16 18:28	135-98-8	
tert-Butylbenzene	ND	ug/L	0.50	1		08/31/16 18:28	98-06-6	
Carbon tetrachloride	ND	ug/L	0.50	1		08/31/16 18:28	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		08/31/16 18:28	108-90-7	
Chloroethane	ND	ug/L	2.0	1		08/31/16 18:28	75-00-3	
Chloroform	ND	ug/L	0.50	1		08/31/16 18:28	67-66-3	
Chloromethane	ND	ug/L	0.50	1		08/31/16 18:28	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 18:28	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 18:28	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/31/16 18:28	96-12-8	
Dibromochloromethane	ND	ug/L	0.50	1		08/31/16 18:28	124-48-1	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: Surf 4	Lab ID: 1273712033	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		08/31/16 18:28	106-93-4	
Dibromomethane	ND	ug/L	0.50	1		08/31/16 18:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:28	106-46-7	
Dichlorodifluoromethane	ND	ug/L	0.50	1		08/31/16 18:28	75-71-8	
1,1-Dichloroethane	ND	ug/L	0.50	1		08/31/16 18:28	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		08/31/16 18:28	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		08/31/16 18:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 18:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 18:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		08/31/16 18:28	78-87-5	
1,3-Dichloropropane	ND	ug/L	0.50	1		08/31/16 18:28	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	1		08/31/16 18:28	594-20-7	
1,1-Dichloropropene	ND	ug/L	0.50	1		08/31/16 18:28	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 18:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 18:28	10061-02-6	
Ethylbenzene	ND	ug/L	0.50	1		08/31/16 18:28	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	0.50	1		08/31/16 18:28	87-68-3	
n-Hexane	ND	ug/L	10.0	1		08/31/16 18:28	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/L	0.50	1		08/31/16 18:28	98-82-8	
p-Isopropyltoluene	ND	ug/L	0.50	1		08/31/16 18:28	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/31/16 18:28	75-09-2	
Methyl-tert-butyl ether	ND	ug/L	0.50	1		08/31/16 18:28	1634-04-4	
Naphthalene	ND	ug/L	0.50	1		08/31/16 18:28	91-20-3	
n-Propylbenzene	ND	ug/L	0.50	1		08/31/16 18:28	103-65-1	
Styrene	ND	ug/L	0.50	1		08/31/16 18:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 18:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 18:28	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		08/31/16 18:28	127-18-4	
Toluene	ND	ug/L	0.50	1		08/31/16 18:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		08/31/16 18:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		08/31/16 18:28	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		08/31/16 18:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		08/31/16 18:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	0.50	1		08/31/16 18:28	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	0.50	1		08/31/16 18:28	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 18:28	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 18:28	108-67-8	
2,2,4-Trimethylpentane	ND	ug/L	4.0	1		08/31/16 18:28	540-84-1	
Vinyl chloride	ND	ug/L	0.50	1		08/31/16 18:28	75-01-4	
Xylene (Total)	ND	ug/L	1.5	1		08/31/16 18:28	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/31/16 18:28	179601-23-1	
o-Xylene	ND	ug/L	0.50	1		08/31/16 18:28	95-47-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: Surf 4		Lab ID: 1273712033	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		08/31/16 18:28	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		08/31/16 18:28	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		08/31/16 18:28	460-00-4	

Sample: Surf 2 DUP		Lab ID: 1273712034	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Benzene	ND	ug/L	0.50	1		08/31/16 18:47	71-43-2	
Bromobenzene	ND	ug/L	0.50	1		08/31/16 18:47	108-86-1	
Bromochloromethane	ND	ug/L	0.50	1		08/31/16 18:47	74-97-5	
Bromodichloromethane	ND	ug/L	0.50	1		08/31/16 18:47	75-27-4	
Bromoform	ND	ug/L	0.50	1		08/31/16 18:47	75-25-2	
Bromomethane	ND	ug/L	20.0	1		08/31/16 18:47	74-83-9	
n-Butylbenzene	ND	ug/L	0.50	1		08/31/16 18:47	104-51-8	
sec-Butylbenzene	ND	ug/L	0.50	1		08/31/16 18:47	135-98-8	
tert-Butylbenzene	ND	ug/L	0.50	1		08/31/16 18:47	98-06-6	
Carbon tetrachloride	ND	ug/L	0.50	1		08/31/16 18:47	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		08/31/16 18:47	108-90-7	
Chloroethane	ND	ug/L	2.0	1		08/31/16 18:47	75-00-3	
Chloroform	ND	ug/L	0.50	1		08/31/16 18:47	67-66-3	
Chloromethane	ND	ug/L	0.50	1		08/31/16 18:47	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 18:47	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 18:47	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/31/16 18:47	96-12-8	
Dibromochloromethane	ND	ug/L	0.50	1		08/31/16 18:47	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		08/31/16 18:47	106-93-4	
Dibromomethane	ND	ug/L	0.50	1		08/31/16 18:47	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:47	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:47	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:47	106-46-7	
Dichlorodifluoromethane	ND	ug/L	0.50	1		08/31/16 18:47	75-71-8	
1,1-Dichloroethane	ND	ug/L	0.50	1		08/31/16 18:47	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		08/31/16 18:47	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		08/31/16 18:47	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 18:47	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 18:47	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		08/31/16 18:47	78-87-5	
1,3-Dichloropropane	ND	ug/L	0.50	1		08/31/16 18:47	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	1		08/31/16 18:47	594-20-7	
1,1-Dichloropropene	ND	ug/L	0.50	1		08/31/16 18:47	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 18:47	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 18:47	10061-02-6	
Ethylbenzene	ND	ug/L	0.50	1		08/31/16 18:47	100-41-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Sample: Surf 2 DUP		Lab ID: 1273712034	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Hexachloro-1,3-butadiene	ND	ug/L	0.50	1		08/31/16 18:47	87-68-3	
n-Hexane	ND	ug/L	10.0	1		08/31/16 18:47	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/L	0.50	1		08/31/16 18:47	98-82-8	
p-Isopropyltoluene	ND	ug/L	0.50	1		08/31/16 18:47	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/31/16 18:47	75-09-2	
Methyl-tert-butyl ether	ND	ug/L	0.50	1		08/31/16 18:47	1634-04-4	
Naphthalene	ND	ug/L	0.50	1		08/31/16 18:47	91-20-3	
n-Propylbenzene	ND	ug/L	0.50	1		08/31/16 18:47	103-65-1	
Styrene	ND	ug/L	0.50	1		08/31/16 18:47	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 18:47	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 18:47	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		08/31/16 18:47	127-18-4	
Toluene	ND	ug/L	0.50	1		08/31/16 18:47	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:47	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 18:47	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		08/31/16 18:47	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		08/31/16 18:47	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		08/31/16 18:47	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		08/31/16 18:47	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	0.50	1		08/31/16 18:47	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	0.50	1		08/31/16 18:47	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 18:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 18:47	108-67-8	
2,2,4-Trimethylpentane	ND	ug/L	4.0	1		08/31/16 18:47	540-84-1	
Vinyl chloride	ND	ug/L	0.50	1		08/31/16 18:47	75-01-4	
Xylene (Total)	ND	ug/L	1.5	1		08/31/16 18:47	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/31/16 18:47	179601-23-1	
o-Xylene	ND	ug/L	0.50	1		08/31/16 18:47	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		08/31/16 18:47	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		08/31/16 18:47	2037-26-5	
4-Bromofluorobenzene (S)	102	%	70-130	1		08/31/16 18:47	460-00-4	

Sample: Surf 2		Lab ID: 1273712035	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Benzene	ND	ug/L	0.50	1		08/31/16 19:06	71-43-2	
Bromobenzene	ND	ug/L	0.50	1		08/31/16 19:06	108-86-1	
Bromochloromethane	ND	ug/L	0.50	1		08/31/16 19:06	74-97-5	
Bromodichloromethane	ND	ug/L	0.50	1		08/31/16 19:06	75-27-4	
Bromoform	ND	ug/L	0.50	1		08/31/16 19:06	75-25-2	
Bromomethane	ND	ug/L	20.0	1		08/31/16 19:06	74-83-9	
n-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:06	104-51-8	
sec-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:06	135-98-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: Surf 2	Lab ID: 1273712035	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
tert-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:06	98-06-6	
Carbon tetrachloride	ND	ug/L	0.50	1		08/31/16 19:06	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		08/31/16 19:06	108-90-7	
Chloroethane	ND	ug/L	2.0	1		08/31/16 19:06	75-00-3	
Chloroform	ND	ug/L	0.50	1		08/31/16 19:06	67-66-3	
Chloromethane	ND	ug/L	0.50	1		08/31/16 19:06	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 19:06	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 19:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/31/16 19:06	96-12-8	
Dibromochloromethane	ND	ug/L	0.50	1		08/31/16 19:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		08/31/16 19:06	106-93-4	
Dibromomethane	ND	ug/L	0.50	1		08/31/16 19:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:06	106-46-7	
Dichlorodifluoromethane	ND	ug/L	0.50	1		08/31/16 19:06	75-71-8	
1,1-Dichloroethane	ND	ug/L	0.50	1		08/31/16 19:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		08/31/16 19:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		08/31/16 19:06	78-87-5	
1,3-Dichloropropane	ND	ug/L	0.50	1		08/31/16 19:06	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	1		08/31/16 19:06	594-20-7	
1,1-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:06	10061-02-6	
Ethylbenzene	ND	ug/L	0.50	1		08/31/16 19:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	0.50	1		08/31/16 19:06	87-68-3	
n-Hexane	ND	ug/L	10.0	1		08/31/16 19:06	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/L	0.50	1		08/31/16 19:06	98-82-8	
p-Isopropyltoluene	ND	ug/L	0.50	1		08/31/16 19:06	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/31/16 19:06	75-09-2	
Methyl-tert-butyl ether	ND	ug/L	0.50	1		08/31/16 19:06	1634-04-4	
Naphthalene	ND	ug/L	0.50	1		08/31/16 19:06	91-20-3	
n-Propylbenzene	ND	ug/L	0.50	1		08/31/16 19:06	103-65-1	
Styrene	ND	ug/L	0.50	1		08/31/16 19:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 19:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 19:06	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		08/31/16 19:06	127-18-4	
Toluene	ND	ug/L	0.50	1		08/31/16 19:06	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:06	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		08/31/16 19:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		08/31/16 19:06	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		08/31/16 19:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		08/31/16 19:06	75-69-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: Surf 2		Lab ID: 1273712035		Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,2,3-Trichloropropane	ND	ug/L	0.50	1		08/31/16 19:06	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	0.50	1		08/31/16 19:06	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 19:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 19:06	108-67-8	
2,2,4-Trimethylpentane	ND	ug/L	4.0	1		08/31/16 19:06	540-84-1	
Vinyl chloride	ND	ug/L	0.50	1		08/31/16 19:06	75-01-4	
Xylene (Total)	ND	ug/L	1.5	1		08/31/16 19:06	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/31/16 19:06	179601-23-1	
o-Xylene	ND	ug/L	0.50	1		08/31/16 19:06	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%.	70-130	1		08/31/16 19:06	17060-07-0	
Toluene-d8 (S)	99	%.	70-130	1		08/31/16 19:06	2037-26-5	
4-Bromofluorobenzene (S)	103	%.	70-130	1		08/31/16 19:06	460-00-4	

Sample: Surf 1		Lab ID: 1273712036		Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Benzene	ND	ug/L	0.50	1		08/31/16 19:25	71-43-2	
Bromobenzene	ND	ug/L	0.50	1		08/31/16 19:25	108-86-1	
Bromochloromethane	ND	ug/L	0.50	1		08/31/16 19:25	74-97-5	
Bromodichloromethane	ND	ug/L	0.50	1		08/31/16 19:25	75-27-4	
Bromoform	ND	ug/L	0.50	1		08/31/16 19:25	75-25-2	
Bromomethane	ND	ug/L	20.0	1		08/31/16 19:25	74-83-9	
n-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:25	104-51-8	
sec-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:25	135-98-8	
tert-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:25	98-06-6	
Carbon tetrachloride	ND	ug/L	0.50	1		08/31/16 19:25	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		08/31/16 19:25	108-90-7	
Chloroethane	ND	ug/L	2.0	1		08/31/16 19:25	75-00-3	
Chloroform	ND	ug/L	0.50	1		08/31/16 19:25	67-66-3	
Chloromethane	ND	ug/L	0.50	1		08/31/16 19:25	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 19:25	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 19:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/31/16 19:25	96-12-8	
Dibromochloromethane	ND	ug/L	0.50	1		08/31/16 19:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		08/31/16 19:25	106-93-4	
Dibromomethane	ND	ug/L	0.50	1		08/31/16 19:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:25	106-46-7	
Dichlorodifluoromethane	ND	ug/L	0.50	1		08/31/16 19:25	75-71-8	
1,1-Dichloroethane	ND	ug/L	0.50	1		08/31/16 19:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		08/31/16 19:25	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:25	75-35-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: Surf 1	Lab ID: 1273712036	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		08/31/16 19:25	78-87-5	
1,3-Dichloropropane	ND	ug/L	0.50	1		08/31/16 19:25	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	1		08/31/16 19:25	594-20-7	
1,1-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:25	10061-02-6	
Ethylbenzene	ND	ug/L	0.50	1		08/31/16 19:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	0.50	1		08/31/16 19:25	87-68-3	
n-Hexane	ND	ug/L	10.0	1		08/31/16 19:25	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/L	0.50	1		08/31/16 19:25	98-82-8	
p-Isopropyltoluene	ND	ug/L	0.50	1		08/31/16 19:25	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/31/16 19:25	75-09-2	
Methyl-tert-butyl ether	ND	ug/L	0.50	1		08/31/16 19:25	1634-04-4	
Naphthalene	ND	ug/L	0.50	1		08/31/16 19:25	91-20-3	
n-Propylbenzene	ND	ug/L	0.50	1		08/31/16 19:25	103-65-1	
Styrene	ND	ug/L	0.50	1		08/31/16 19:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 19:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 19:25	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		08/31/16 19:25	127-18-4	
Toluene	ND	ug/L	0.50	1		08/31/16 19:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		08/31/16 19:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		08/31/16 19:25	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		08/31/16 19:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		08/31/16 19:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	0.50	1		08/31/16 19:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	0.50	1		08/31/16 19:25	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 19:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 19:25	108-67-8	
2,2,4-Trimethylpentane	ND	ug/L	4.0	1		08/31/16 19:25	540-84-1	
Vinyl chloride	ND	ug/L	0.50	1		08/31/16 19:25	75-01-4	
Xylene (Total)	ND	ug/L	1.5	1		08/31/16 19:25	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/31/16 19:25	179601-23-1	
o-Xylene	ND	ug/L	0.50	1		08/31/16 19:25	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		08/31/16 19:25	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		08/31/16 19:25	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		08/31/16 19:25	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: Surf 3	Lab ID: 1273712037	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Benzene	ND	ug/L	0.50	1		08/31/16 19:45	71-43-2	
Bromobenzene	ND	ug/L	0.50	1		08/31/16 19:45	108-86-1	
Bromochloromethane	ND	ug/L	0.50	1		08/31/16 19:45	74-97-5	
Bromodichloromethane	ND	ug/L	0.50	1		08/31/16 19:45	75-27-4	
Bromoform	ND	ug/L	0.50	1		08/31/16 19:45	75-25-2	
Bromomethane	ND	ug/L	20.0	1		08/31/16 19:45	74-83-9	
n-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:45	104-51-8	
sec-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:45	135-98-8	
tert-Butylbenzene	ND	ug/L	0.50	1		08/31/16 19:45	98-06-6	
Carbon tetrachloride	ND	ug/L	0.50	1		08/31/16 19:45	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		08/31/16 19:45	108-90-7	
Chloroethane	ND	ug/L	2.0	1		08/31/16 19:45	75-00-3	
Chloroform	ND	ug/L	0.50	1		08/31/16 19:45	67-66-3	
Chloromethane	ND	ug/L	0.50	1		08/31/16 19:45	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 19:45	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		08/31/16 19:45	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		08/31/16 19:45	96-12-8	
Dibromochloromethane	ND	ug/L	0.50	1		08/31/16 19:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		08/31/16 19:45	106-93-4	
Dibromomethane	ND	ug/L	0.50	1		08/31/16 19:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:45	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:45	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:45	106-46-7	
Dichlorodifluoromethane	ND	ug/L	0.50	1		08/31/16 19:45	75-71-8	
1,1-Dichloroethane	ND	ug/L	0.50	1		08/31/16 19:45	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		08/31/16 19:45	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		08/31/16 19:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		08/31/16 19:45	78-87-5	
1,3-Dichloropropane	ND	ug/L	0.50	1		08/31/16 19:45	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	1		08/31/16 19:45	594-20-7	
1,1-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:45	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		08/31/16 19:45	10061-02-6	
Ethylbenzene	ND	ug/L	0.50	1		08/31/16 19:45	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	0.50	1		08/31/16 19:45	87-68-3	
n-Hexane	ND	ug/L	10.0	1		08/31/16 19:45	110-54-3	
Isopropylbenzene (Cumene)	ND	ug/L	0.50	1		08/31/16 19:45	98-82-8	
p-Isopropyltoluene	ND	ug/L	0.50	1		08/31/16 19:45	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/31/16 19:45	75-09-2	
Methyl-tert-butyl ether	ND	ug/L	0.50	1		08/31/16 19:45	1634-04-4	
Naphthalene	ND	ug/L	0.50	1		08/31/16 19:45	91-20-3	
n-Propylbenzene	ND	ug/L	0.50	1		08/31/16 19:45	103-65-1	
Styrene	ND	ug/L	0.50	1		08/31/16 19:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 19:45	630-20-6	
1,1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		08/31/16 19:45	79-34-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Sample: Surf 3	Lab ID: 1273712037	Collected: 08/24/16 00:00	Received: 08/30/16 09:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Tetrachloroethene	1.1	ug/L	0.50	1		08/31/16 19:45	127-18-4	
Toluene	ND	ug/L	0.50	1		08/31/16 19:45	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:45	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	0.50	1		08/31/16 19:45	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		08/31/16 19:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		08/31/16 19:45	79-00-5	
Trichloroethene	0.65	ug/L	0.50	1		08/31/16 19:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		08/31/16 19:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	0.50	1		08/31/16 19:45	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	0.50	1		08/31/16 19:45	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 19:45	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	0.50	1		08/31/16 19:45	108-67-8	
2,2,4-Trimethylpentane	ND	ug/L	4.0	1		08/31/16 19:45	540-84-1	
Vinyl chloride	ND	ug/L	0.50	1		08/31/16 19:45	75-01-4	
Xylene (Total)	ND	ug/L	1.5	1		08/31/16 19:45	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		08/31/16 19:45	179601-23-1	
o-Xylene	ND	ug/L	0.50	1		08/31/16 19:45	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		08/31/16 19:45	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		08/31/16 19:45	2037-26-5	
4-Bromofluorobenzene (S)	102	%	70-130	1		08/31/16 19:45	460-00-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

QC Batch: 92805 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5030 Low Analysis Description: 8260 MSV Low Soil
 Associated Lab Samples: 1273712001, 1273712002, 1273712003, 1273712004, 1273712005, 1273712006, 1273712007, 1273712008,
 1273712009, 1273712010, 1273712011, 1273712012, 1273712013, 1273712014, 1273712015, 1273712016

METHOD BLANK: 365117 Matrix: Solid
 Associated Lab Samples: 1273712001, 1273712002, 1273712003, 1273712004, 1273712005, 1273712006, 1273712007, 1273712008,
 1273712009, 1273712010, 1273712011, 1273712012, 1273712013, 1273712014, 1273712015, 1273712016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	4.9	08/31/16 11:18	
1,1,1-Trichloroethane	ug/kg	ND	4.9	08/31/16 11:18	
1,1,2,2-Tetrachloroethane	ug/kg	ND	4.9	08/31/16 11:18	
1,1,2-Trichloroethane	ug/kg	ND	4.9	08/31/16 11:18	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	4.9	08/31/16 11:18	
1,1-Dichloroethane	ug/kg	ND	4.9	08/31/16 11:18	
1,1-Dichloroethene	ug/kg	ND	4.9	08/31/16 11:18	
1,1-Dichloropropene	ug/kg	ND	4.9	08/31/16 11:18	
1,2,3-Trichlorobenzene	ug/kg	ND	4.9	08/31/16 11:18	
1,2,3-Trichloropropane	ug/kg	ND	4.9	08/31/16 11:18	
1,2,4-Trichlorobenzene	ug/kg	ND	4.9	08/31/16 11:18	
1,2,4-Trimethylbenzene	ug/kg	ND	4.9	08/31/16 11:18	
1,2-Dibromo-3-chloropropane	ug/kg	ND	4.9	08/31/16 11:18	
1,2-Dibromoethane (EDB)	ug/kg	ND	4.9	08/31/16 11:18	
1,2-Dichlorobenzene	ug/kg	ND	4.9	08/31/16 11:18	
1,2-Dichloroethane	ug/kg	ND	4.9	08/31/16 11:18	
1,2-Dichloropropane	ug/kg	ND	4.9	08/31/16 11:18	
1,3,5-Trimethylbenzene	ug/kg	ND	4.9	08/31/16 11:18	
1,3-Dichlorobenzene	ug/kg	ND	4.9	08/31/16 11:18	
1,3-Dichloropropane	ug/kg	ND	4.9	08/31/16 11:18	
1,4-Dichlorobenzene	ug/kg	ND	4.9	08/31/16 11:18	
2,2,4-Trimethylpentane	ug/kg	ND	4.9	08/31/16 11:18	
2,2-Dichloropropane	ug/kg	ND	4.9	08/31/16 11:18	
2-Chlorotoluene	ug/kg	ND	4.9	08/31/16 11:18	
4-Chlorotoluene	ug/kg	ND	4.9	08/31/16 11:18	
Benzene	ug/kg	ND	4.9	08/31/16 11:18	
Bromobenzene	ug/kg	ND	4.9	08/31/16 11:18	
Bromochloromethane	ug/kg	ND	4.9	08/31/16 11:18	
Bromodichloromethane	ug/kg	ND	4.9	08/31/16 11:18	
Bromoform	ug/kg	ND	4.9	08/31/16 11:18	
Bromomethane	ug/kg	ND	19.7	08/31/16 11:18	
Carbon tetrachloride	ug/kg	ND	4.9	08/31/16 11:18	
Chlorobenzene	ug/kg	ND	4.9	08/31/16 11:18	
Chloroethane	ug/kg	ND	4.9	08/31/16 11:18	
Chloroform	ug/kg	ND	4.9	08/31/16 11:18	
Chloromethane	ug/kg	ND	4.9	08/31/16 11:18	
cis-1,2-Dichloroethene	ug/kg	ND	4.9	08/31/16 11:18	
cis-1,3-Dichloropropene	ug/kg	ND	4.9	08/31/16 11:18	
Dibromochloromethane	ug/kg	ND	4.9	08/31/16 11:18	
Dibromomethane	ug/kg	ND	4.9	08/31/16 11:18	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

METHOD BLANK: 365117 Matrix: Solid
Associated Lab Samples: 1273712001, 1273712002, 1273712003, 1273712004, 1273712005, 1273712006, 1273712007, 1273712008, 1273712009, 1273712010, 1273712011, 1273712012, 1273712013, 1273712014, 1273712015, 1273712016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/kg	ND	4.9	08/31/16 11:18	
Dichlorofluoromethane	ug/kg	ND	4.9	08/31/16 11:18	
Ethylbenzene	ug/kg	ND	4.9	08/31/16 11:18	
Hexachloro-1,3-butadiene	ug/kg	ND	4.9	08/31/16 11:18	
Isopropylbenzene (Cumene)	ug/kg	ND	4.9	08/31/16 11:18	
m&p-Xylene	ug/kg	ND	4.9	08/31/16 11:18	
Methyl-tert-butyl ether	ug/kg	ND	4.9	08/31/16 11:18	
Methylene Chloride	ug/kg	ND	4.9	08/31/16 11:18	
n-Butylbenzene	ug/kg	ND	4.9	08/31/16 11:18	
n-Hexane	ug/kg	ND	4.9	08/31/16 11:18	
n-Propylbenzene	ug/kg	ND	4.9	08/31/16 11:18	
Naphthalene	ug/kg	ND	4.9	08/31/16 11:18	
o-Xylene	ug/kg	ND	4.9	08/31/16 11:18	
p-Isopropyltoluene	ug/kg	ND	4.9	08/31/16 11:18	
sec-Butylbenzene	ug/kg	ND	4.9	08/31/16 11:18	
Styrene	ug/kg	ND	4.9	08/31/16 11:18	
tert-Butylbenzene	ug/kg	ND	4.9	08/31/16 11:18	
Tetrachloroethene	ug/kg	ND	4.9	08/31/16 11:18	
Toluene	ug/kg	ND	4.9	08/31/16 11:18	
trans-1,2-Dichloroethene	ug/kg	ND	4.9	08/31/16 11:18	
trans-1,3-Dichloropropene	ug/kg	ND	4.9	08/31/16 11:18	
Trichloroethene	ug/kg	ND	4.9	08/31/16 11:18	
Trichlorofluoromethane	ug/kg	ND	4.9	08/31/16 11:18	
Vinyl chloride	ug/kg	ND	4.9	08/31/16 11:18	
Xylene (Total)	ug/kg	ND	9.9	08/31/16 11:18	
1,2-Dichloroethane-d4 (S)	%	116	70-130	08/31/16 11:18	
4-Bromofluorobenzene (S)	%	82	70-130	08/31/16 11:18	
Toluene-d8 (S)	%	100	70-130	08/31/16 11:18	

LABORATORY CONTROL SAMPLE: 365118

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	39.1	31.8	81	72-125	
1,1,1-Trichloroethane	ug/kg	39.1	38.3	98	71-125	
1,1,2,2-Tetrachloroethane	ug/kg	39.1	33.3	85	75-125	
1,1,2-Trichloroethane	ug/kg	39.1	37.1	95	74-125	
1,1,2-Trichlorotrifluoroethane	ug/kg	39.1	34.1	87	68-125	
1,1-Dichloroethane	ug/kg	39.1	39.9	102	71-125	
1,1-Dichloroethene	ug/kg	39.1	34.1	87	72-125	
1,1-Dichloropropene	ug/kg	39.1	38.2	98	72-125	
1,2,3-Trichlorobenzene	ug/kg	39.1	30.6	78	69-125	
1,2,3-Trichloropropane	ug/kg	39.1	32.3	83	75-125	
1,2,4-Trichlorobenzene	ug/kg	39.1	30.7	78	66-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 365118

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	39.1	32.1	82	73-125	
1,2-Dibromo-3-chloropropane	ug/kg	97.8	85.2	87	59-138	
1,2-Dibromoethane (EDB)	ug/kg	39.1	34.6	89	73-125	
1,2-Dichlorobenzene	ug/kg	39.1	34.1	87	72-125	
1,2-Dichloroethane	ug/kg	39.1	38.8	99	67-125	
1,2-Dichloropropane	ug/kg	39.1	37.7	96	68-125	
1,3,5-Trimethylbenzene	ug/kg	39.1	32.7	84	74-125	
1,3-Dichlorobenzene	ug/kg	39.1	28.9	74	72-125	
1,3-Dichloropropane	ug/kg	39.1	37.4	96	70-125	
1,4-Dichlorobenzene	ug/kg	39.1	33.3	85	69-125	
2,2,4-Trimethylpentane	ug/kg	39.1	40.2	103	70-130	
2,2-Dichloropropane	ug/kg	39.1	38.9	99	70-125	
2-Chlorotoluene	ug/kg	39.1	30.1	77	74-125	
4-Chlorotoluene	ug/kg	39.1	30.8	79	72-125	
Benzene	ug/kg	39.1	35.6	91	69-125	
Bromobenzene	ug/kg	39.1	28.6	73	73-125	
Bromochloromethane	ug/kg	39.1	31.9	82	73-125	
Bromodichloromethane	ug/kg	39.1	38.7	99	70-125	
Bromoform	ug/kg	39.1	29.2	75	68-125	
Bromomethane	ug/kg	39.1	29.5	75	36-138	
Carbon tetrachloride	ug/kg	39.1	37.1	95	69-126	
Chlorobenzene	ug/kg	39.1	31.5	80	73-125	
Chloroethane	ug/kg	39.1	35.4	91	30-150	
Chloroform	ug/kg	39.1	38.4	98	71-125	
Chloromethane	ug/kg	39.1	38.4	98	53-125	
cis-1,2-Dichloroethene	ug/kg	39.1	34.5	88	72-125	
cis-1,3-Dichloropropene	ug/kg	39.1	39.5	101	71-125	
Dibromochloromethane	ug/kg	39.1	35.1	90	69-125	
Dibromomethane	ug/kg	39.1	29.5	75	72-125	
Dichlorodifluoromethane	ug/kg	39.1	30.8	79	46-125	
Dichlorofluoromethane	ug/kg	39.1	34.8	89	70-130	
Ethylbenzene	ug/kg	39.1	33.4	85	72-125	
Hexachloro-1,3-butadiene	ug/kg	39.1	31.0	79	67-125	
Isopropylbenzene (Cumene)	ug/kg	39.1	32.4	83	75-125	
m&p-Xylene	ug/kg	78.3	62.0	79	71-125	
Methyl-tert-butyl ether	ug/kg	39.1	37.0	95	71-125	
Methylene Chloride	ug/kg	39.1	35.0	90	58-125	
n-Butylbenzene	ug/kg	39.1	39.7	102	67-125	
n-Hexane	ug/kg	97.8	86.6	89	70-130	
n-Propylbenzene	ug/kg	39.1	34.1	87	72-125	
Naphthalene	ug/kg	39.1	32.7	84	64-125	
o-Xylene	ug/kg	39.1	31.2	80	73-125	
p-Isopropyltoluene	ug/kg	39.1	32.2	82	67-125	
sec-Butylbenzene	ug/kg	39.1	32.8	84	74-125	
Styrene	ug/kg	39.1	32.2	82	71-125	
tert-Butylbenzene	ug/kg	39.1	32.7	84	74-125	
Tetrachloroethene	ug/kg	39.1	32.4	83	72-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 365118

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/kg	39.1	36.2	92	70-125	
trans-1,2-Dichloroethene	ug/kg	39.1	35.7	91	72-125	
trans-1,3-Dichloropropene	ug/kg	39.1	39.4	101	68-125	
Trichloroethene	ug/kg	39.1	32.5	83	73-125	
Trichlorofluoromethane	ug/kg	39.1	32.9	84	66-125	
Vinyl chloride	ug/kg	39.1	33.6	86	62-125	
Xylene (Total)	ug/kg	117	93.2	79	72-125	
1,2-Dichloroethane-d4 (S)	%			115	70-130	
4-Bromofluorobenzene (S)	%			86	70-130	
Toluene-d8 (S)	%			103	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 365119 365120

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1273712001 Result	Spike Conc.	Spike Conc.	MS Result						
1,1,1,2-Tetrachloroethane	ug/kg	ND	51.2	51.7	36.4	39.6	71	77	33-133	8	25
1,1,1-Trichloroethane	ug/kg	ND	51.2	51.7	48.6	50.2	92	95	54-126	3	25
1,1,2,2-Tetrachloroethane	ug/kg	ND	51.2	51.7	37.3	38.1	73	74	30-145	2	25
1,1,2-Trichloroethane	ug/kg	ND	51.2	51.7	43.7	46.3	85	89	30-134	6	25
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	51.2	51.7	41.1	41.2	80	80	57-125	0	25
1,1-Dichloroethane	ug/kg	ND	51.2	51.7	53.1	54.6	99	101	51-125	3	25
1,1-Dichloroethene	ug/kg	ND	51.2	51.7	44.5	45.5	85	86	60-125	2	25
1,1-Dichloropropene	ug/kg	ND	51.2	51.7	44.0	44.7	86	86	54-125	2	25
1,2,3-Trichlorobenzene	ug/kg	ND	51.2	51.7	18.4	18.8	36	36	30-125	2	25
1,2,3-Trichloropropane	ug/kg	ND	51.2	51.7	36.6	37.0	71	72	32-125	1	25
1,2,4-Trichlorobenzene	ug/kg	ND	51.2	51.7	18.9	18.7	37	36	30-125	1	25
1,2,4-Trimethylbenzene	ug/kg	ND	51.2	51.7	30.9	31.0	60	60	30-131	1	25
1,2-Dibromo-3-chloropropane	ug/kg	ND	128	129	89.0	89.4	69	69	30-142	1	25
1,2-Dibromoethane (EDB)	ug/kg	ND	51.2	51.7	39.2	41.1	76	79	46-125	5	25
1,2-Dichlorobenzene	ug/kg	ND	51.2	51.7	28.1	29.4	55	57	30-125	5	25
1,2-Dichloroethane	ug/kg	ND	51.2	51.7	47.7	48.8	93	94	46-125	2	25
1,2-Dichloropropane	ug/kg	ND	51.2	51.7	47.1	49.2	92	95	41-125	4	25
1,3,5-Trimethylbenzene	ug/kg	ND	51.2	51.7	31.2	32.3	61	62	30-132	3	25
1,3-Dichlorobenzene	ug/kg	ND	51.2	51.7	24.2	25.3	47	49	30-125	5	25
1,3-Dichloropropane	ug/kg	ND	51.2	51.7	45.5	46.7	89	90	32-125	2	25
1,4-Dichlorobenzene	ug/kg	ND	51.2	51.7	28.1	28.1	55	54	30-125	0	25
2,2,4-Trimethylpentane	ug/kg	ND	51.2	51.7	30.7	27.7	60	54	70-130	10	25 M1
2,2-Dichloropropane	ug/kg	ND	51.2	51.7	49.7	49.7	97	96	52-127	0	25
2-Chlorotoluene	ug/kg	ND	51.2	51.7	28.1	29.1	55	56	30-125	4	25
4-Chlorotoluene	ug/kg	ND	51.2	51.7	28.4	29.1	55	56	30-125	3	25
Benzene	ug/kg	ND	51.2	51.7	43.2	44.4	84	85	56-125	3	25
Bromobenzene	ug/kg	ND	51.2	51.7	27.5	29.1	54	56	30-125	6	25
Bromochloromethane	ug/kg	ND	51.2	51.7	39.1	40.3	76	78	45-125	3	25
Bromodichloromethane	ug/kg	ND	51.2	51.7	46.0	48.5	90	94	31-132	5	25

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 365119 365120												
Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		1273712001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Bromoform	ug/kg	ND	51.2	51.7	33.4	35.4	65	68	30-125	6	25	
Bromomethane	ug/kg	ND	51.2	51.7	43.2	45.4	84	88	30-139	5	25	
Carbon tetrachloride	ug/kg	ND	51.2	51.7	44.0	45.7	86	88	49-130	4	25	
Chlorobenzene	ug/kg	ND	51.2	51.7	33.3	34.7	65	67	33-125	4	25	
Chloroethane	ug/kg	ND	51.2	51.7	51.3	50.1	100	97	30-150	2	25	
Chloroform	ug/kg	ND	51.2	51.7	47.9	49.0	94	95	46-125	2	25	
Chloromethane	ug/kg	ND	51.2	51.7	50.9	51.9	99	100	45-125	2	25	
cis-1,2-Dichloroethene	ug/kg	105	51.2	51.7	213	215	210	212	50-125	1	25	M1
cis-1,3-Dichloropropene	ug/kg	ND	51.2	51.7	45.6	46.8	89	90	35-126	3	25	
Dibromochloromethane	ug/kg	ND	51.2	51.7	41.4	42.7	81	83	30-130	3	25	
Dibromomethane	ug/kg	ND	51.2	51.7	36.2	37.6	71	73	36-127	4	25	
Dichlorodifluoromethane	ug/kg	ND	51.2	51.7	40.4	40.8	79	79	44-125	1	25	
Dichlorofluoromethane	ug/kg	ND	51.2	51.7	47.7	46.2	93	89	70-130	3	25	
Ethylbenzene	ug/kg	ND	51.2	51.7	36.4	37.6	71	73	45-125	3	25	
Hexachloro-1,3-butadiene	ug/kg	ND	51.2	51.7	20.2	17.0	39	33	30-125	17	25	
Isopropylbenzene (Cumene)	ug/kg	ND	51.2	51.7	34.9	34.1	68	66	35-128	2	25	
m&p-Xylene	ug/kg	ND	102	103	65.6	67.9	64	65	40-125	4	25	
Methyl-tert-butyl ether	ug/kg	ND	51.2	51.7	47.4	48.9	93	95	42-125	3	25	
Methylene Chloride	ug/kg	ND	51.2	51.7	43.7	45.6	85	88	42-125	4	25	
n-Butylbenzene	ug/kg	ND	51.2	51.7	32.6	30.1	64	58	30-127	8	25	
n-Hexane	ug/kg	ND	128	129	81.8	77.2	64	60	70-130	6	25	M1
n-Propylbenzene	ug/kg	ND	51.2	51.7	32.2	32.0	63	62	30-136	1	25	
Naphthalene	ug/kg	ND	51.2	51.7	21.4	22.9	42	44	30-127	6	25	
o-Xylene	ug/kg	ND	51.2	51.7	33.8	35.1	66	68	44-125	4	25	
p-Isopropyltoluene	ug/kg	ND	51.2	51.7	28.6	28.3	56	55	30-136	1	25	
sec-Butylbenzene	ug/kg	ND	51.2	51.7	30.0	29.2	59	56	30-133	3	25	
Styrene	ug/kg	ND	51.2	51.7	31.2	33.0	61	64	30-128	6	25	
tert-Butylbenzene	ug/kg	ND	51.2	51.7	31.9	31.5	62	61	30-129	1	25	
Tetrachloroethene	ug/kg	326	51.2	51.7	597	530	530	394	42-125	12	25	E,M1
Toluene	ug/kg	ND	51.2	51.7	40.7	42.0	79	80	50-125	3	25	
trans-1,2-Dichloroethene	ug/kg	ND	51.2	51.7	44.8	46.0	83	85	57-125	3	25	
trans-1,3-Dichloropropene	ug/kg	ND	51.2	51.7	43.0	45.7	84	88	33-125	6	25	
Trichloroethene	ug/kg	241	51.2	51.7	401	394	312	297	51-125	2	25	E,M1
Trichlorofluoromethane	ug/kg	ND	51.2	51.7	42.7	43.8	83	85	54-125	2	25	
Vinyl chloride	ug/kg	ND	51.2	51.7	47.9	49.6	91	94	57-125	3	25	
Xylene (Total)	ug/kg	ND	154	155	99.4	103	65	66	44-125	4	25	
1,2-Dichloroethane-d4 (S)	%						115	114	70-130			
4-Bromofluorobenzene (S)	%						83	87	70-130			
Toluene-d8 (S)	%						102	102	70-130			

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

QC Batch: 92905 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5030 Low Analysis Description: 8260 MSV Low Soil
 Associated Lab Samples: 1273712017, 1273712018, 1273712019, 1273712020, 1273712021, 1273712022, 1273712023, 1273712024,
 1273712025, 1273712026, 1273712027, 1273712028, 1273712029, 1273712030, 1273712031, 1273712032

METHOD BLANK: 365464 Matrix: Solid
 Associated Lab Samples: 1273712017, 1273712018, 1273712019, 1273712020, 1273712021, 1273712022, 1273712023, 1273712024,
 1273712025, 1273712026, 1273712027, 1273712028, 1273712029, 1273712030, 1273712031, 1273712032

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	4.9	09/01/16 08:00	
1,1,1-Trichloroethane	ug/kg	ND	4.9	09/01/16 08:00	
1,1,2,2-Tetrachloroethane	ug/kg	ND	4.9	09/01/16 08:00	
1,1,2-Trichloroethane	ug/kg	ND	4.9	09/01/16 08:00	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	4.9	09/01/16 08:00	
1,1-Dichloroethane	ug/kg	ND	4.9	09/01/16 08:00	
1,1-Dichloroethene	ug/kg	ND	4.9	09/01/16 08:00	
1,1-Dichloropropene	ug/kg	ND	4.9	09/01/16 08:00	
1,2,3-Trichlorobenzene	ug/kg	ND	4.9	09/01/16 08:00	
1,2,3-Trichloropropane	ug/kg	ND	4.9	09/01/16 08:00	
1,2,4-Trichlorobenzene	ug/kg	ND	4.9	09/01/16 08:00	
1,2,4-Trimethylbenzene	ug/kg	ND	4.9	09/01/16 08:00	
1,2-Dibromo-3-chloropropane	ug/kg	ND	4.9	09/01/16 08:00	
1,2-Dibromoethane (EDB)	ug/kg	ND	4.9	09/01/16 08:00	
1,2-Dichlorobenzene	ug/kg	ND	4.9	09/01/16 08:00	
1,2-Dichloroethane	ug/kg	ND	4.9	09/01/16 08:00	
1,2-Dichloropropane	ug/kg	ND	4.9	09/01/16 08:00	
1,3,5-Trimethylbenzene	ug/kg	ND	4.9	09/01/16 08:00	
1,3-Dichlorobenzene	ug/kg	ND	4.9	09/01/16 08:00	
1,3-Dichloropropane	ug/kg	ND	4.9	09/01/16 08:00	
1,4-Dichlorobenzene	ug/kg	ND	4.9	09/01/16 08:00	
2,2,4-Trimethylpentane	ug/kg	ND	4.9	09/01/16 08:00	
2,2-Dichloropropane	ug/kg	ND	4.9	09/01/16 08:00	
2-Chlorotoluene	ug/kg	ND	4.9	09/01/16 08:00	
4-Chlorotoluene	ug/kg	ND	4.9	09/01/16 08:00	
Benzene	ug/kg	ND	4.9	09/01/16 08:00	
Bromobenzene	ug/kg	ND	4.9	09/01/16 08:00	
Bromochloromethane	ug/kg	ND	4.9	09/01/16 08:00	
Bromodichloromethane	ug/kg	ND	4.9	09/01/16 08:00	
Bromoform	ug/kg	ND	4.9	09/01/16 08:00	
Bromomethane	ug/kg	ND	19.5	09/01/16 08:00	
Carbon tetrachloride	ug/kg	ND	4.9	09/01/16 08:00	
Chlorobenzene	ug/kg	ND	4.9	09/01/16 08:00	
Chloroethane	ug/kg	ND	4.9	09/01/16 08:00	
Chloroform	ug/kg	ND	4.9	09/01/16 08:00	
Chloromethane	ug/kg	ND	4.9	09/01/16 08:00	
cis-1,2-Dichloroethene	ug/kg	ND	4.9	09/01/16 08:00	
cis-1,3-Dichloropropene	ug/kg	ND	4.9	09/01/16 08:00	
Dibromochloromethane	ug/kg	ND	4.9	09/01/16 08:00	
Dibromomethane	ug/kg	ND	4.9	09/01/16 08:00	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

METHOD BLANK: 365464

Matrix: Solid

Associated Lab Samples: 1273712017, 1273712018, 1273712019, 1273712020, 1273712021, 1273712022, 1273712023, 1273712024, 1273712025, 1273712026, 1273712027, 1273712028, 1273712029, 1273712030, 1273712031, 1273712032

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/kg	ND	4.9	09/01/16 08:00	
Dichlorofluoromethane	ug/kg	ND	4.9	09/01/16 08:00	
Ethylbenzene	ug/kg	ND	4.9	09/01/16 08:00	
Hexachloro-1,3-butadiene	ug/kg	ND	4.9	09/01/16 08:00	
Isopropylbenzene (Cumene)	ug/kg	ND	4.9	09/01/16 08:00	
m&p-Xylene	ug/kg	ND	4.9	09/01/16 08:00	
Methyl-tert-butyl ether	ug/kg	ND	4.9	09/01/16 08:00	
Methylene Chloride	ug/kg	ND	4.9	09/01/16 08:00	
n-Butylbenzene	ug/kg	ND	4.9	09/01/16 08:00	
n-Hexane	ug/kg	ND	4.9	09/01/16 08:00	
n-Propylbenzene	ug/kg	ND	4.9	09/01/16 08:00	
Naphthalene	ug/kg	ND	4.9	09/01/16 08:00	
o-Xylene	ug/kg	ND	4.9	09/01/16 08:00	
p-Isopropyltoluene	ug/kg	ND	4.9	09/01/16 08:00	
sec-Butylbenzene	ug/kg	ND	4.9	09/01/16 08:00	
Styrene	ug/kg	ND	4.9	09/01/16 08:00	
tert-Butylbenzene	ug/kg	ND	4.9	09/01/16 08:00	
Tetrachloroethene	ug/kg	ND	4.9	09/01/16 08:00	
Toluene	ug/kg	ND	4.9	09/01/16 08:00	
trans-1,2-Dichloroethene	ug/kg	ND	4.9	09/01/16 08:00	
trans-1,3-Dichloropropene	ug/kg	ND	4.9	09/01/16 08:00	
Trichloroethene	ug/kg	ND	4.9	09/01/16 08:00	
Trichlorofluoromethane	ug/kg	ND	4.9	09/01/16 08:00	
Vinyl chloride	ug/kg	ND	4.9	09/01/16 08:00	
Xylene (Total)	ug/kg	ND	9.7	09/01/16 08:00	
1,2-Dichloroethane-d4 (S)	%	111	70-130	09/01/16 08:00	
4-Bromofluorobenzene (S)	%	88	70-130	09/01/16 08:00	
Toluene-d8 (S)	%	102	70-130	09/01/16 08:00	

LABORATORY CONTROL SAMPLE: 365465

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	39	34.0	87	72-125	
1,1,1-Trichloroethane	ug/kg	39	38.6	99	71-125	
1,1,2,2-Tetrachloroethane	ug/kg	39	35.7	92	75-125	
1,1,2-Trichloroethane	ug/kg	39	37.7	97	74-125	
1,1,2-Trichlorotrifluoroethane	ug/kg	39	36.4	93	68-125	
1,1-Dichloroethane	ug/kg	39	39.1	100	71-125	
1,1-Dichloroethene	ug/kg	39	36.6	94	72-125	
1,1-Dichloropropene	ug/kg	39	39.0	100	72-125	
1,2,3-Trichlorobenzene	ug/kg	39	33.2	85	69-125	
1,2,3-Trichloropropane	ug/kg	39	34.3	88	75-125	
1,2,4-Trichlorobenzene	ug/kg	39	33.8	87	66-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 365465

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	39	31.9	82	73-125	
1,2-Dibromo-3-chloropropane	ug/kg	97.5	88.7	91	59-138	
1,2-Dibromoethane (EDB)	ug/kg	39	35.3	91	73-125	
1,2-Dichlorobenzene	ug/kg	39	34.3	88	72-125	
1,2-Dichloroethane	ug/kg	39	37.9	97	67-125	
1,2-Dichloropropane	ug/kg	39	39.2	101	68-125	
1,3,5-Trimethylbenzene	ug/kg	39	34.7	89	74-125	
1,3-Dichlorobenzene	ug/kg	39	31.1	80	72-125	
1,3-Dichloropropane	ug/kg	39	38.0	97	70-125	
1,4-Dichlorobenzene	ug/kg	39	34.8	89	69-125	
2,2,4-Trimethylpentane	ug/kg	39	40.6	104	70-130	
2,2-Dichloropropane	ug/kg	39	39.7	102	70-125	
2-Chlorotoluene	ug/kg	39	32.0	82	74-125	
4-Chlorotoluene	ug/kg	39	32.9	84	72-125	
Benzene	ug/kg	39	36.1	93	69-125	
Bromobenzene	ug/kg	39	31.0	80	73-125	
Bromochloromethane	ug/kg	39	33.9	87	73-125	
Bromodichloromethane	ug/kg	39	38.7	99	70-125	
Bromoform	ug/kg	39	32.5	83	68-125	
Bromomethane	ug/kg	39	33.8	87	36-138	
Carbon tetrachloride	ug/kg	39	38.8	99	69-126	
Chlorobenzene	ug/kg	39	33.6	86	73-125	
Chloroethane	ug/kg	39	40.9	105	30-150	
Chloroform	ug/kg	39	39.5	101	71-125	
Chloromethane	ug/kg	39	37.9	97	53-125	
cis-1,2-Dichloroethene	ug/kg	39	36.0	92	72-125	
cis-1,3-Dichloropropene	ug/kg	39	39.5	101	71-125	
Dibromochloromethane	ug/kg	39	36.9	95	69-125	
Dibromomethane	ug/kg	39	33.1	85	72-125	
Dichlorodifluoromethane	ug/kg	39	30.9	79	46-125	
Dichlorofluoromethane	ug/kg	39	36.3	93	70-130	
Ethylbenzene	ug/kg	39	35.2	90	72-125	
Hexachloro-1,3-butadiene	ug/kg	39	36.4	93	67-125	
Isopropylbenzene (Cumene)	ug/kg	39	35.4	91	75-125	
m&p-Xylene	ug/kg	78	64.8	83	71-125	
Methyl-tert-butyl ether	ug/kg	39	37.3	96	71-125	
Methylene Chloride	ug/kg	39	36.2	93	58-125	
n-Butylbenzene	ug/kg	39	36.0	92	67-125	
n-Hexane	ug/kg	97.5	91.9	94	70-130	
n-Propylbenzene	ug/kg	39	35.8	92	72-125	
Naphthalene	ug/kg	39	34.7	89	64-125	
o-Xylene	ug/kg	39	33.2	85	73-125	
p-Isopropyltoluene	ug/kg	39	33.2	85	67-125	
sec-Butylbenzene	ug/kg	39	32.9	85	74-125	
Styrene	ug/kg	39	34.4	88	71-125	
tert-Butylbenzene	ug/kg	39	34.7	89	74-125	
Tetrachloroethene	ug/kg	39	35.5	91	72-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 365465

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/kg	39	37.2	95	70-125	
trans-1,2-Dichloroethene	ug/kg	39	37.0	95	72-125	
trans-1,3-Dichloropropene	ug/kg	39	39.5	101	68-125	
Trichloroethene	ug/kg	39	35.2	90	73-125	
Trichlorofluoromethane	ug/kg	39	33.9	87	66-125	
Vinyl chloride	ug/kg	39	36.5	94	62-125	
Xylene (Total)	ug/kg	117	98.1	84	72-125	
1,2-Dichloroethane-d4 (S)	%			111	70-130	
4-Bromofluorobenzene (S)	%			90	70-130	
Toluene-d8 (S)	%			102	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 365466 365467

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1273712017 Result	Spike Conc.	Spike Conc.	Result						
1,1,1,2-Tetrachloroethane	ug/kg	ND			47.4	48.7			3	25	
1,1,1-Trichloroethane	ug/kg	ND			58.1	57.7			1	25	
1,1,2,2-Tetrachloroethane	ug/kg	ND			46.9	46.8			0	25	
1,1,2-Trichloroethane	ug/kg	ND			54.9	53.3			3	25	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND			51.0	51.6			1	25	
1,1-Dichloroethane	ug/kg	ND			65.3	64.3			2	25	
1,1-Dichloroethene	ug/kg	ND			54.2	54.4			0	25	
1,1-Dichloropropene	ug/kg	ND			55.0	53.9			2	25	
1,2,3-Trichlorobenzene	ug/kg	ND			21.3	19.6			9	25	
1,2,3-Trichloropropane	ug/kg	ND			45.9	46.1			0	25	
1,2,4-Trichlorobenzene	ug/kg	ND			21.9	19.7			10	25	
1,2,4-Trimethylbenzene	ug/kg	ND			37.2	36.9			1	25	
1,2-Dibromo-3-chloropropane	ug/kg	ND			109	109			1	25	
1,2-Dibromoethane (EDB)	ug/kg	ND			49.9	48.5			3	25	
1,2-Dichlorobenzene	ug/kg	ND			36.3	34.7			4	25	
1,2-Dichloroethane	ug/kg	ND			56.5	55.8			1	25	
1,2-Dichloropropane	ug/kg	ND			57.6	57.2			1	25	
1,3,5-Trimethylbenzene	ug/kg	ND			37.8	38.3			1	25	
1,3-Dichlorobenzene	ug/kg	ND			31.9	31.1			2	25	
1,3-Dichloropropane	ug/kg	ND			55.4	54.3			2	25	
1,4-Dichlorobenzene	ug/kg	ND			35.3	33.5			5	25	
2,2,4-Trimethylpentane	ug/kg	ND			26.6	31.0			15	25	M1
2,2-Dichloropropane	ug/kg	ND			59.4	59.2			0	25	
2-Chlorotoluene	ug/kg	ND			37.1	37.1			0	25	
4-Chlorotoluene	ug/kg	ND			36.5	36.7			1	25	
Benzene	ug/kg	ND			54.0	53.2			1	25	
Bromobenzene	ug/kg	ND			37.7	37.3			1	25	
Bromochloromethane	ug/kg	ND			51.0	49.4			3	25	
Bromodichloromethane	ug/kg	ND			57.4	55.9			3	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		365466			365467							
Parameter	Units	1273712017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromoform	ug/kg	ND			43.9	43.3				1	25	
Bromomethane	ug/kg	ND			52.6	54.6				4	25	
Carbon tetrachloride	ug/kg	ND			55.7	55.3				1	25	
Chlorobenzene	ug/kg	ND			45.1	44.7				1	25	
Chloroethane	ug/kg	ND			60.1	61.5				2	25	
Chloroform	ug/kg	ND			59.1	57.3				3	25	
Chloromethane	ug/kg	ND			58.6	56.8				3	25	
cis-1,2-Dichloroethene	ug/kg	232			131	126				4	25	
cis-1,3-Dichloropropene	ug/kg	ND			56.7	55.7				2	25	
Dibromochloromethane	ug/kg	ND			52.5	51.8				1	25	
Dibromomethane	ug/kg	ND			46.8	47.9				2	25	
Dichlorodifluoromethane	ug/kg	ND			47.0	45.7				3	25	
Dichlorofluoromethane	ug/kg	ND			58.4	54.0				8	25	
Ethylbenzene	ug/kg	ND			45.5	46.5				2	25	
Hexachloro-1,3-butadiene	ug/kg	ND			17.3	19.2				10	25	M1
Isopropylbenzene (Cumene)	ug/kg	ND			41.7	43.0				3	25	
m&p-Xylene	ug/kg	ND			83.4	80.8				3	25	
Methyl-tert-butyl ether	ug/kg	ND			57.2	56.0				2	25	
Methylene Chloride	ug/kg	ND			54.5	53.6				2	25	
n-Butylbenzene	ug/kg	ND			31.1	32.6				5	25	
n-Hexane	ug/kg	ND			89.0	97.3				9	25	M1
n-Propylbenzene	ug/kg	ND			38.5	39.8				3	25	
Naphthalene	ug/kg	ND			29.4	28.0				5	25	
o-Xylene	ug/kg	ND			43.3	42.4				2	25	
p-Isopropyltoluene	ug/kg	ND			31.3	32.8				5	25	
sec-Butylbenzene	ug/kg	ND			31.9	34.1				7	25	
Styrene	ug/kg	ND			43.1	41.7				3	25	
tert-Butylbenzene	ug/kg	ND			36.3	37.5				3	25	
Tetrachloroethene	ug/kg	1780			414	434				5	25	E
Toluene	ug/kg	ND			53.6	53.5				0	25	
trans-1,2-Dichloroethene	ug/kg	ND			55.1	55.2				0	25	
trans-1,3-Dichloropropene	ug/kg	ND			54.7	53.7				2	25	
Trichloroethene	ug/kg	231			107	108				1	25	
Trichlorofluoromethane	ug/kg	ND			54.5	51.5				6	25	
Vinyl chloride	ug/kg	ND			57.2	56.9				0	25	
Xylene (Total)	ug/kg	ND			127	123				3	25	
1,2-Dichloroethane-d4 (S)	%.						109	108	70-130			
4-Bromofluorobenzene (S)	%.						91	90	70-130			
Toluene-d8 (S)	%.						102	102	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

QC Batch: 93102 Analysis Method: EPA 8260B
QC Batch Method: EPA 5030 Low Analysis Description: 8260 MSV Low Soil
Associated Lab Samples: 1273712001, 1273712005, 1273712012, 1273712015, 1273712017, 1273712018, 1273712023, 1273712026, 1273712027, 1273712028

METHOD BLANK: 366226 Matrix: Solid
Associated Lab Samples: 1273712001, 1273712005, 1273712012, 1273712015, 1273712017, 1273712018, 1273712023, 1273712026, 1273712027, 1273712028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	4.8	09/02/16 10:40	
1,1,1-Trichloroethane	ug/kg	ND	4.8	09/02/16 10:40	
1,1,2,2-Tetrachloroethane	ug/kg	ND	4.8	09/02/16 10:40	
1,1,2-Trichloroethane	ug/kg	ND	4.8	09/02/16 10:40	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	4.8	09/02/16 10:40	
1,1-Dichloroethane	ug/kg	ND	4.8	09/02/16 10:40	
1,1-Dichloroethene	ug/kg	ND	4.8	09/02/16 10:40	
1,1-Dichloropropene	ug/kg	ND	4.8	09/02/16 10:40	
1,2,3-Trichlorobenzene	ug/kg	ND	4.8	09/02/16 10:40	
1,2,3-Trichloropropane	ug/kg	ND	4.8	09/02/16 10:40	
1,2,4-Trichlorobenzene	ug/kg	ND	4.8	09/02/16 10:40	
1,2,4-Trimethylbenzene	ug/kg	ND	4.8	09/02/16 10:40	
1,2-Dibromo-3-chloropropane	ug/kg	ND	4.8	09/02/16 10:40	
1,2-Dibromoethane (EDB)	ug/kg	ND	4.8	09/02/16 10:40	
1,2-Dichlorobenzene	ug/kg	ND	4.8	09/02/16 10:40	
1,2-Dichloroethane	ug/kg	ND	4.8	09/02/16 10:40	
1,2-Dichloropropane	ug/kg	ND	4.8	09/02/16 10:40	
1,3,5-Trimethylbenzene	ug/kg	ND	4.8	09/02/16 10:40	
1,3-Dichlorobenzene	ug/kg	ND	4.8	09/02/16 10:40	
1,3-Dichloropropane	ug/kg	ND	4.8	09/02/16 10:40	
1,4-Dichlorobenzene	ug/kg	ND	4.8	09/02/16 10:40	
2,2,4-Trimethylpentane	ug/kg	ND	4.8	09/02/16 10:40	
2,2-Dichloropropane	ug/kg	ND	4.8	09/02/16 10:40	
2-Chlorotoluene	ug/kg	ND	4.8	09/02/16 10:40	
4-Chlorotoluene	ug/kg	ND	4.8	09/02/16 10:40	
Benzene	ug/kg	ND	4.8	09/02/16 10:40	
Bromobenzene	ug/kg	ND	4.8	09/02/16 10:40	
Bromochloromethane	ug/kg	ND	4.8	09/02/16 10:40	
Bromodichloromethane	ug/kg	ND	4.8	09/02/16 10:40	
Bromoform	ug/kg	ND	4.8	09/02/16 10:40	
Bromomethane	ug/kg	ND	19.3	09/02/16 10:40	
Carbon tetrachloride	ug/kg	ND	4.8	09/02/16 10:40	
Chlorobenzene	ug/kg	ND	4.8	09/02/16 10:40	
Chloroethane	ug/kg	ND	4.8	09/02/16 10:40	
Chloroform	ug/kg	ND	4.8	09/02/16 10:40	
Chloromethane	ug/kg	ND	4.8	09/02/16 10:40	
cis-1,2-Dichloroethene	ug/kg	ND	4.8	09/02/16 10:40	
cis-1,3-Dichloropropene	ug/kg	ND	4.8	09/02/16 10:40	
Dibromochloromethane	ug/kg	ND	4.8	09/02/16 10:40	
Dibromomethane	ug/kg	ND	4.8	09/02/16 10:40	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

METHOD BLANK: 366226

Matrix: Solid

Associated Lab Samples: 1273712001, 1273712005, 1273712012, 1273712015, 1273712017, 1273712018, 1273712023, 1273712026, 1273712027, 1273712028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/kg	ND	4.8	09/02/16 10:40	
Dichlorofluoromethane	ug/kg	ND	4.8	09/02/16 10:40	
Ethylbenzene	ug/kg	ND	4.8	09/02/16 10:40	
Hexachloro-1,3-butadiene	ug/kg	ND	4.8	09/02/16 10:40	
Isopropylbenzene (Cumene)	ug/kg	ND	4.8	09/02/16 10:40	
m&p-Xylene	ug/kg	ND	4.8	09/02/16 10:40	
Methyl-tert-butyl ether	ug/kg	ND	4.8	09/02/16 10:40	
Methylene Chloride	ug/kg	ND	4.8	09/02/16 10:40	
n-Butylbenzene	ug/kg	ND	4.8	09/02/16 10:40	
n-Hexane	ug/kg	ND	4.8	09/02/16 10:40	
n-Propylbenzene	ug/kg	ND	4.8	09/02/16 10:40	
Naphthalene	ug/kg	ND	4.8	09/02/16 10:40	
o-Xylene	ug/kg	ND	4.8	09/02/16 10:40	
p-Isopropyltoluene	ug/kg	ND	4.8	09/02/16 10:40	
sec-Butylbenzene	ug/kg	ND	4.8	09/02/16 10:40	
Styrene	ug/kg	ND	4.8	09/02/16 10:40	
tert-Butylbenzene	ug/kg	ND	4.8	09/02/16 10:40	
Tetrachloroethene	ug/kg	ND	4.8	09/02/16 10:40	
Toluene	ug/kg	ND	4.8	09/02/16 10:40	
trans-1,2-Dichloroethene	ug/kg	ND	4.8	09/02/16 10:40	
trans-1,3-Dichloropropene	ug/kg	ND	4.8	09/02/16 10:40	
Trichloroethene	ug/kg	ND	4.8	09/02/16 10:40	
Trichlorofluoromethane	ug/kg	ND	4.8	09/02/16 10:40	
Vinyl chloride	ug/kg	ND	4.8	09/02/16 10:40	
Xylene (Total)	ug/kg	ND	9.7	09/02/16 10:40	
1,2-Dichloroethane-d4 (S)	%	110	70-130	09/02/16 10:40	
4-Bromofluorobenzene (S)	%	99	70-130	09/02/16 10:40	
Toluene-d8 (S)	%	102	70-130	09/02/16 10:40	

LABORATORY CONTROL SAMPLE: 366227

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	39.3	34.4	88	72-125	
1,1,1-Trichloroethane	ug/kg	39.3	37.8	96	71-125	
1,1,2,2-Tetrachloroethane	ug/kg	39.3	32.0	82	75-125	
1,1,2-Trichloroethane	ug/kg	39.3	37.0	94	74-125	
1,1,2-Trichlorotrifluoroethane	ug/kg	39.3	35.6	91	68-125	
1,1-Dichloroethane	ug/kg	39.3	38.7	99	71-125	
1,1-Dichloroethene	ug/kg	39.3	35.5	90	72-125	
1,1-Dichloropropene	ug/kg	39.3	38.3	98	72-125	
1,2,3-Trichlorobenzene	ug/kg	39.3	32.9	84	69-125	
1,2,3-Trichloropropane	ug/kg	39.3	31.7	81	75-125	
1,2,4-Trichlorobenzene	ug/kg	39.3	33.1	84	66-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 366227

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	39.3	32.7	83	73-125	
1,2-Dibromo-3-chloropropane	ug/kg	98.2	86.1	88	59-138	
1,2-Dibromoethane (EDB)	ug/kg	39.3	34.9	89	73-125	
1,2-Dichlorobenzene	ug/kg	39.3	35.0	89	72-125	
1,2-Dichloroethane	ug/kg	39.3	36.7	93	67-125	
1,2-Dichloropropane	ug/kg	39.3	37.0	94	68-125	
1,3,5-Trimethylbenzene	ug/kg	39.3	33.0	84	74-125	
1,3-Dichlorobenzene	ug/kg	39.3	31.8	81	72-125	
1,3-Dichloropropane	ug/kg	39.3	37.1	94	70-125	
1,4-Dichlorobenzene	ug/kg	39.3	34.3	87	69-125	
2,2,4-Trimethylpentane	ug/kg	39.3	39.6	101	70-130	
2,2-Dichloropropane	ug/kg	39.3	38.6	98	70-125	
2-Chlorotoluene	ug/kg	39.3	30.8	78	74-125	
4-Chlorotoluene	ug/kg	39.3	31.6	80	72-125	
Benzene	ug/kg	39.3	36.1	92	69-125	
Bromobenzene	ug/kg	39.3	30.7	78	73-125	
Bromochloromethane	ug/kg	39.3	33.5	85	73-125	
Bromodichloromethane	ug/kg	39.3	38.2	97	70-125	
Bromoform	ug/kg	39.3	31.7	81	68-125	
Bromomethane	ug/kg	39.3	33.5	85	36-138	
Carbon tetrachloride	ug/kg	39.3	38.3	97	69-126	
Chlorobenzene	ug/kg	39.3	33.3	85	73-125	
Chloroethane	ug/kg	39.3	40.0	102	30-150	
Chloroform	ug/kg	39.3	38.5	98	71-125	
Chloromethane	ug/kg	39.3	36.7	93	53-125	
cis-1,2-Dichloroethene	ug/kg	39.3	35.5	90	72-125	
cis-1,3-Dichloropropene	ug/kg	39.3	39.1	100	71-125	
Dibromochloromethane	ug/kg	39.3	36.4	93	69-125	
Dibromomethane	ug/kg	39.3	32.1	82	72-125	
Dichlorodifluoromethane	ug/kg	39.3	29.4	75	46-125	
Dichlorofluoromethane	ug/kg	39.3	37.8	96	70-130	
Ethylbenzene	ug/kg	39.3	35.1	89	72-125	
Hexachloro-1,3-butadiene	ug/kg	39.3	33.9	86	67-125	
Isopropylbenzene (Cumene)	ug/kg	39.3	33.3	85	75-125	
m&p-Xylene	ug/kg	78.6	65.6	84	71-125	
Methyl-tert-butyl ether	ug/kg	39.3	36.5	93	71-125	
Methylene Chloride	ug/kg	39.3	35.6	91	58-125	
n-Butylbenzene	ug/kg	39.3	39.0	99	67-125	
n-Hexane	ug/kg	98.2	89.9	92	70-130	
n-Propylbenzene	ug/kg	39.3	33.2	84	72-125	
Naphthalene	ug/kg	39.3	34.3	87	64-125	
o-Xylene	ug/kg	39.3	33.2	84	73-125	
p-Isopropyltoluene	ug/kg	39.3	34.4	87	67-125	
sec-Butylbenzene	ug/kg	39.3	34.9	89	74-125	
Styrene	ug/kg	39.3	34.3	87	71-125	
tert-Butylbenzene	ug/kg	39.3	33.4	85	74-125	
Tetrachloroethene	ug/kg	39.3	34.8	89	72-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 366227

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/kg	39.3	36.6	93	70-125	
trans-1,2-Dichloroethene	ug/kg	39.3	36.4	93	72-125	
trans-1,3-Dichloropropene	ug/kg	39.3	38.7	99	68-125	
Trichloroethene	ug/kg	39.3	34.5	88	73-125	
Trichlorofluoromethane	ug/kg	39.3	34.1	87	66-125	
Vinyl chloride	ug/kg	39.3	34.6	88	62-125	
Xylene (Total)	ug/kg	118	98.8	84	72-125	
1,2-Dichloroethane-d4 (S)	%			108	70-130	
4-Bromofluorobenzene (S)	%			91	70-130	
Toluene-d8 (S)	%			102	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 366228 366229

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1273712026 Result	Spike Conc.	Spike Conc.	MS Result						
1,1,1,2-Tetrachloroethane	ug/kg	ND	51	49.5	36.6	38.0	72	77	33-133	4	25
1,1,1-Trichloroethane	ug/kg	ND	51	49.5	43.1	46.4	84	93	54-126	7	25
1,1,2,2-Tetrachloroethane	ug/kg	ND	51	49.5	32.8	35.3	64	71	30-145	7	25
1,1,2-Trichloroethane	ug/kg	ND	51	49.5	41.1	41.3	81	84	30-134	1	25
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	51	49.5	39.6	41.3	78	83	57-125	4	25
1,1-Dichloroethane	ug/kg	ND	51	49.5	46.8	49.3	89	96	51-125	5	25
1,1-Dichloroethene	ug/kg	ND	51	49.5	42.2	43.9	82	88	60-125	4	25
1,1-Dichloropropene	ug/kg	ND	51	49.5	42.6	43.8	84	89	54-125	3	25
1,2,3-Trichlorobenzene	ug/kg	ND	51	49.5	17.7	18.8	35	38	30-125	6	25
1,2,3-Trichloropropane	ug/kg	ND	51	49.5	33.0	34.2	65	69	32-125	4	25
1,2,4-Trichlorobenzene	ug/kg	ND	51	49.5	18.8	20.4	37	41	30-125	8	25
1,2,4-Trimethylbenzene	ug/kg	ND	51	49.5	29.9	30.6	59	62	30-131	2	25
1,2-Dibromo-3-chloropropane	ug/kg	ND	127	124	81.9	83.1	64	67	30-142	1	25
1,2-Dibromoethane (EDB)	ug/kg	ND	51	49.5	38.1	38.7	75	78	46-125	2	25
1,2-Dichlorobenzene	ug/kg	ND	51	49.5	28.5	30.6	56	62	30-125	7	25
1,2-Dichloroethane	ug/kg	ND	51	49.5	42.2	42.8	83	86	46-125	1	25
1,2-Dichloropropane	ug/kg	ND	51	49.5	43.4	44.7	85	90	41-125	3	25
1,3,5-Trimethylbenzene	ug/kg	ND	51	49.5	30.2	32.7	59	66	30-132	8	25
1,3-Dichlorobenzene	ug/kg	ND	51	49.5	26.0	27.5	51	56	30-125	6	25
1,3-Dichloropropane	ug/kg	ND	51	49.5	41.7	41.9	82	85	32-125	1	25
1,4-Dichlorobenzene	ug/kg	ND	51	49.5	28.1	29.8	55	60	30-125	6	25
2,2,4-Trimethylpentane	ug/kg	ND	51	49.5	27.2	26.8	53	54	70-130	1	25 M1
2,2-Dichloropropane	ug/kg	ND	51	49.5	45.0	45.9	88	93	52-127	2	25
2-Chlorotoluene	ug/kg	ND	51	49.5	28.4	30.6	56	62	30-125	8	25
4-Chlorotoluene	ug/kg	ND	51	49.5	29.7	31.1	58	63	30-125	5	25
Benzene	ug/kg	ND	51	49.5	40.7	42.0	80	85	56-125	3	25
Bromobenzene	ug/kg	ND	51	49.5	29.3	31.4	58	63	30-125	7	25
Bromochloromethane	ug/kg	ND	51	49.5	39.3	39.6	77	80	45-125	1	25
Bromodichloromethane	ug/kg	ND	51	49.5	42.9	44.7	84	90	31-132	4	25

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		366228		366229									
Parameter	Units	1273712026	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
Bromoform	ug/kg	ND	51	49.5	32.5	33.9	64	69	30-125	4	25		
Bromomethane	ug/kg	ND	51	49.5	38.3	41.1	75	83	30-139	7	25		
Carbon tetrachloride	ug/kg	ND	51	49.5	42.4	43.8	83	89	49-130	3	25		
Chlorobenzene	ug/kg	ND	51	49.5	34.5	36.3	67	73	33-125	5	25		
Chloroethane	ug/kg	ND	51	49.5	46.3	47.7	91	96	30-150	3	25		
Chloroform	ug/kg	ND	51	49.5	44.2	46.0	87	93	46-125	4	25		
Chloromethane	ug/kg	ND	51	49.5	43.1	43.9	85	89	45-125	2	25		
cis-1,2-Dichloroethene	ug/kg	11.0	51	49.5	53.1	56.4	83	92	50-125	6	25		
cis-1,3-Dichloropropene	ug/kg	ND	51	49.5	43.7	44.4	86	90	35-126	2	25		
Dibromochloromethane	ug/kg	ND	51	49.5	39.9	40.3	78	81	30-130	1	25		
Dibromomethane	ug/kg	ND	51	49.5	36.7	36.7	72	74	36-127	0	25		
Dichlorodifluoromethane	ug/kg	ND	51	49.5	33.4	35.4	66	72	44-125	6	25		
Dichlorofluoromethane	ug/kg	ND	51	49.5	44.9	40.9	88	83	70-130	10	25		
Ethylbenzene	ug/kg	ND	51	49.5	36.3	37.7	71	76	45-125	4	25		
Hexachloro-1,3-butadiene	ug/kg	ND	51	49.5	17.4	17.0	34	34	30-125	3	25		
Isopropylbenzene (Cumene)	ug/kg	ND	51	49.5	31.8	35.7	62	72	35-128	11	25		
m&p-Xylene	ug/kg	ND	102	98.9	66.9	71.2	66	72	40-125	6	25		
Methyl-tert-butyl ether	ug/kg	ND	51	49.5	42.2	43.0	83	87	42-125	2	25		
Methylene Chloride	ug/kg	ND	51	49.5	40.9	42.0	80	85	42-125	3	25		
n-Butylbenzene	ug/kg	ND	51	49.5	27.7	28.6	54	58	30-127	3	25		
n-Hexane	ug/kg	ND	127	124	80.6	84.9	63	69	70-130	5	25	M1	
n-Propylbenzene	ug/kg	ND	51	49.5	30.3	33.6	59	68	30-136	10	25		
Naphthalene	ug/kg	ND	51	49.5	22.5	24.4	44	49	30-127	8	25		
o-Xylene	ug/kg	ND	51	49.5	33.6	35.6	66	72	44-125	6	25		
p-Isopropyltoluene	ug/kg	ND	51	49.5	27.4	28.0	54	57	30-136	2	25		
sec-Butylbenzene	ug/kg	ND	51	49.5	27.8	28.2	55	57	30-133	1	25		
Styrene	ug/kg	ND	51	49.5	33.6	35.3	66	71	30-128	5	25		
tert-Butylbenzene	ug/kg	ND	51	49.5	30.2	30.8	59	62	30-129	2	25		
Tetrachloroethene	ug/kg	25.9	51	49.5	65.1	69.0	77	87	42-125	6	25		
Toluene	ug/kg	ND	51	49.5	40.6	41.9	79	84	50-125	3	25		
trans-1,2-Dichloroethene	ug/kg	ND	51	49.5	41.6	42.7	82	86	57-125	2	25		
trans-1,3-Dichloropropene	ug/kg	ND	51	49.5	42.5	42.8	83	86	33-125	1	25		
Trichloroethene	ug/kg	54.9	51	49.5	99.8	112	88	114	51-125	11	25		
Trichlorofluoromethane	ug/kg	ND	51	49.5	41.5	38.7	81	78	54-125	7	25		
Vinyl chloride	ug/kg	ND	51	49.5	42.1	46.2	80	91	57-125	9	25		
Xylene (Total)	ug/kg	ND	152	149	100	107	66	72	44-125	6	25		
1,2-Dichloroethane-d4 (S)	%						106	105	70-130				
4-Bromofluorobenzene (S)	%						89	92	70-130				
Toluene-d8 (S)	%						102	101	70-130				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

QC Batch: 93118 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260 MSV Med Soil
Associated Lab Samples: 1273712019, 1273712029, 1273712030

METHOD BLANK: 366307 Matrix: Solid

Associated Lab Samples: 1273712019, 1273712029, 1273712030

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	246	09/02/16 16:21	
1,1,1-Trichloroethane	ug/kg	ND	246	09/02/16 16:21	
1,1,2,2-Tetrachloroethane	ug/kg	ND	246	09/02/16 16:21	
1,1,2-Trichloroethane	ug/kg	ND	246	09/02/16 16:21	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	246	09/02/16 16:21	
1,1-Dichloroethane	ug/kg	ND	246	09/02/16 16:21	
1,1-Dichloroethene	ug/kg	ND	246	09/02/16 16:21	
1,1-Dichloropropene	ug/kg	ND	246	09/02/16 16:21	
1,2,3-Trichlorobenzene	ug/kg	ND	246	09/02/16 16:21	
1,2,3-Trichloropropane	ug/kg	ND	246	09/02/16 16:21	
1,2,4-Trichlorobenzene	ug/kg	ND	246	09/02/16 16:21	
1,2,4-Trimethylbenzene	ug/kg	ND	246	09/02/16 16:21	
1,2-Dibromo-3-chloropropane	ug/kg	ND	246	09/02/16 16:21	
1,2-Dibromoethane (EDB)	ug/kg	ND	246	09/02/16 16:21	
1,2-Dichlorobenzene	ug/kg	ND	246	09/02/16 16:21	
1,2-Dichloroethane	ug/kg	ND	246	09/02/16 16:21	
1,2-Dichloropropane	ug/kg	ND	246	09/02/16 16:21	
1,3,5-Trimethylbenzene	ug/kg	ND	246	09/02/16 16:21	
1,3-Dichlorobenzene	ug/kg	ND	246	09/02/16 16:21	
1,3-Dichloropropane	ug/kg	ND	246	09/02/16 16:21	
1,4-Dichlorobenzene	ug/kg	ND	246	09/02/16 16:21	
2,2,4-Trimethylpentane	ug/kg	ND	98.4	09/02/16 16:21	
2,2-Dichloropropane	ug/kg	ND	246	09/02/16 16:21	
2-Chlorotoluene	ug/kg	ND	246	09/02/16 16:21	
4-Chlorotoluene	ug/kg	ND	246	09/02/16 16:21	
Benzene	ug/kg	ND	246	09/02/16 16:21	
Bromobenzene	ug/kg	ND	246	09/02/16 16:21	
Bromochloromethane	ug/kg	ND	246	09/02/16 16:21	
Bromodichloromethane	ug/kg	ND	246	09/02/16 16:21	
Bromoform	ug/kg	ND	246	09/02/16 16:21	
Bromomethane	ug/kg	ND	984	09/02/16 16:21	
Carbon tetrachloride	ug/kg	ND	246	09/02/16 16:21	
Chlorobenzene	ug/kg	ND	246	09/02/16 16:21	
Chloroethane	ug/kg	ND	246	09/02/16 16:21	
Chloroform	ug/kg	ND	246	09/02/16 16:21	
Chloromethane	ug/kg	ND	246	09/02/16 16:21	
cis-1,2-Dichloroethene	ug/kg	ND	246	09/02/16 16:21	
cis-1,3-Dichloropropene	ug/kg	ND	246	09/02/16 16:21	
Dibromochloromethane	ug/kg	ND	246	09/02/16 16:21	
Dibromomethane	ug/kg	ND	246	09/02/16 16:21	
Dichlorodifluoromethane	ug/kg	ND	246	09/02/16 16:21	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

METHOD BLANK: 366307

Matrix: Solid

Associated Lab Samples: 1273712019, 1273712029, 1273712030

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorofluoromethane	ug/kg	ND	246	09/02/16 16:21	
Ethylbenzene	ug/kg	ND	246	09/02/16 16:21	
Hexachloro-1,3-butadiene	ug/kg	ND	246	09/02/16 16:21	
Isopropylbenzene (Cumene)	ug/kg	ND	246	09/02/16 16:21	
m&p-Xylene	ug/kg	ND	246	09/02/16 16:21	
Methyl-tert-butyl ether	ug/kg	ND	246	09/02/16 16:21	
Methylene Chloride	ug/kg	ND	246	09/02/16 16:21	
n-Butylbenzene	ug/kg	ND	246	09/02/16 16:21	
n-Hexane	ug/kg	ND	123	09/02/16 16:21	
n-Propylbenzene	ug/kg	ND	246	09/02/16 16:21	
Naphthalene	ug/kg	ND	246	09/02/16 16:21	
o-Xylene	ug/kg	ND	246	09/02/16 16:21	
p-Isopropyltoluene	ug/kg	ND	246	09/02/16 16:21	
sec-Butylbenzene	ug/kg	ND	246	09/02/16 16:21	
Styrene	ug/kg	ND	246	09/02/16 16:21	
tert-Butylbenzene	ug/kg	ND	246	09/02/16 16:21	
Tetrachloroethene	ug/kg	ND	246	09/02/16 16:21	
Toluene	ug/kg	ND	246	09/02/16 16:21	
trans-1,2-Dichloroethene	ug/kg	ND	246	09/02/16 16:21	
trans-1,3-Dichloropropene	ug/kg	ND	246	09/02/16 16:21	
Trichloroethene	ug/kg	ND	246	09/02/16 16:21	
Trichlorofluoromethane	ug/kg	ND	246	09/02/16 16:21	
Vinyl chloride	ug/kg	ND	246	09/02/16 16:21	
Xylene (Total)	ug/kg	ND	492	09/02/16 16:21	
1,2-Dichloroethane-d4 (S)	%	109	70-130	09/02/16 16:21	
4-Bromofluorobenzene (S)	%	87	70-130	09/02/16 16:21	
Toluene-d8 (S)	%	100	70-130	09/02/16 16:21	

LABORATORY CONTROL SAMPLE: 366308

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1980	1900	96	75-125	
1,1,1-Trichloroethane	ug/kg	1980	2020	102	75-126	
1,1,2,2-Tetrachloroethane	ug/kg	1980	2120	107	58-140	
1,1,2-Trichloroethane	ug/kg	1980	2120	107	57-136	
1,1,2-Trichlorotrifluoroethane	ug/kg	1980	1850	93	70-130	
1,1-Dichloroethane	ug/kg	1980	2160	109	75-125	
1,1-Dichloroethene	ug/kg	1980	1780	89	74-125	
1,1-Dichloropropene	ug/kg	1980	2080	105	75-129	
1,2,3-Trichlorobenzene	ug/kg	1980	1990	100	75-134	
1,2,3-Trichloropropane	ug/kg	1980	2100	106	61-131	
1,2,4-Trichlorobenzene	ug/kg	1980	1960	99	75-139	
1,2,4-Trimethylbenzene	ug/kg	1980	1910	96	75-128	
1,2-Dibromo-3-chloropropane	ug/kg	4960	5440	110	62-133	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 366308

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromoethane (EDB)	ug/kg	1980	2050	103	60-138	
1,2-Dichlorobenzene	ug/kg	1980	2020	102	75-125	
1,2-Dichloroethane	ug/kg	1980	2140	108	75-125	
1,2-Dichloropropane	ug/kg	1980	2130	108	75-125	
1,3,5-Trimethylbenzene	ug/kg	1980	1940	98	75-125	
1,3-Dichlorobenzene	ug/kg	1980	1800	91	75-125	
1,3-Dichloropropane	ug/kg	1980	2150	109	60-132	
1,4-Dichlorobenzene	ug/kg	1980	1930	97	75-125	
2,2,4-Trimethylpentane	ug/kg	1980	2270	115	70-130	
2,2-Dichloropropane	ug/kg	1980	2010	101	75-132	
2-Chlorotoluene	ug/kg	1980	1790	90	75-125	
4-Chlorotoluene	ug/kg	1980	1840	93	75-125	
Benzene	ug/kg	1980	1970	99	75-125	
Bromobenzene	ug/kg	1980	1790	90	75-125	
Bromochloromethane	ug/kg	1980	1830	92	75-125	
Bromodichloromethane	ug/kg	1980	2030	103	75-125	
Bromoform	ug/kg	1980	1760	88	61-125	
Bromomethane	ug/kg	1980	1440	72	30-125	
Carbon tetrachloride	ug/kg	1980	1940	98	72-136	
Chlorobenzene	ug/kg	1980	1860	94	75-125	
Chloroethane	ug/kg	1980	2060	104	30-134	
Chloroform	ug/kg	1980	2130	107	75-125	
Chloromethane	ug/kg	1980	2210	111	54-128	
cis-1,2-Dichloroethene	ug/kg	1980	1940	98	75-125	
cis-1,3-Dichloropropene	ug/kg	1980	2180	110	75-132	
Dibromochloromethane	ug/kg	1980	1930	97	47-139	
Dibromomethane	ug/kg	1980	1840	93	75-125	
Dichlorodifluoromethane	ug/kg	1980	1670	84	47-125	
Dichlorofluoromethane	ug/kg	1980	1940	98	70-130	
Ethylbenzene	ug/kg	1980	1940	98	75-128	
Hexachloro-1,3-butadiene	ug/kg	1980	1980	100	75-131	
Isopropylbenzene (Cumene)	ug/kg	1980	1940	98	75-127	
m&p-Xylene	ug/kg	3970	3650	92	75-131	
Methyl-tert-butyl ether	ug/kg	1980	2190	110	75-125	
Methylene Chloride	ug/kg	1980	2070	104	70-133	
n-Butylbenzene	ug/kg	1980	2170	109	75-134	
n-Hexane	ug/kg	4960	4990	101	70-130	
n-Propylbenzene	ug/kg	1980	1960	99	75-125	
Naphthalene	ug/kg	1980	2150	109	75-126	
o-Xylene	ug/kg	1980	1870	94	75-127	
p-Isopropyltoluene	ug/kg	1980	1900	96	75-129	
sec-Butylbenzene	ug/kg	1980	1940	98	75-132	
Styrene	ug/kg	1980	1940	98	75-130	
tert-Butylbenzene	ug/kg	1980	1930	97	75-130	
Tetrachloroethene	ug/kg	1980	1870	94	75-125	
Toluene	ug/kg	1980	2000	101	75-125	
trans-1,2-Dichloroethene	ug/kg	1980	1960	99	75-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 366308

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,3-Dichloropropene	ug/kg	1980	2160	109	60-140	
Trichloroethene	ug/kg	1980	1840	93	75-125	
Trichlorofluoromethane	ug/kg	1980	1900	96	30-135	
Vinyl chloride	ug/kg	1980	2030	102	65-134	
Xylene (Total)	ug/kg	5950	5520	93	75-130	
1,2-Dichloroethane-d4 (S)	%			109	70-130	
4-Bromofluorobenzene (S)	%			92	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 366309 366310

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		1273712019 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/kg	ND	3220	3110	2100	2030	65	65	75-131	4	25	M1
1,1,1-Trichloroethane	ug/kg	ND	3220	3110	2250	2170	70	70	75-125	4	25	M1
1,1,2,2-Tetrachloroethane	ug/kg	ND	3220	3110	2250	2140	70	69	62-142	5	25	
1,1,2-Trichloroethane	ug/kg	ND	3220	3110	2370	2230	74	72	60-150	6	25	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	3220	3110	1630	1590	51	51	70-130	2	25	M1
1,1-Dichloroethane	ug/kg	ND	3220	3110	2450	2330	76	75	75-125	5	25	
1,1-Dichloroethene	ug/kg	ND	3220	3110	1920	1930	60	62	75-125	0	25	M1
1,1-Dichloropropene	ug/kg	ND	3220	3110	2300	2230	71	72	75-125	3	25	M1
1,2,3-Trichlorobenzene	ug/kg	ND	3220	3110	2160	2030	67	65	75-133	7	25	M1
1,2,3-Trichloropropane	ug/kg	ND	3220	3110	2160	2060	67	66	66-138	5	25	
1,2,4-Trichlorobenzene	ug/kg	ND	3220	3110	2080	2030	65	65	75-137	3	25	M1
1,2,4-Trimethylbenzene	ug/kg	ND	3220	3110	2100	2000	65	64	59-138	5	25	
1,2-Dibromo-3-chloropropane	ug/kg	ND	8040	7790	5710	5350	71	69	65-148	7	25	
1,2-Dibromoethane (EDB)	ug/kg	ND	3220	3110	2200	2100	68	68	75-125	4	25	M1
1,2-Dichlorobenzene	ug/kg	ND	3220	3110	2250	2130	70	69	75-125	5	25	M1
1,2-Dichloroethane	ug/kg	ND	3220	3110	2410	2320	74	74	75-125	4	25	M1
1,2-Dichloropropane	ug/kg	ND	3220	3110	2430	2320	76	75	75-125	5	25	
1,3,5-Trimethylbenzene	ug/kg	ND	3220	3110	2150	2030	67	65	71-133	5	25	M1
1,3-Dichlorobenzene	ug/kg	ND	3220	3110	1960	1850	61	60	75-125	5	25	M1
1,3-Dichloropropane	ug/kg	ND	3220	3110	2390	2260	74	73	75-125	6	25	M1
1,4-Dichlorobenzene	ug/kg	ND	3220	3110	2160	2050	67	66	75-125	5	25	M1
2,2,4-Trimethylpentane	ug/kg	ND	3220	3110	1740	1730	54	56	70-130	0	25	M1
2,2-Dichloropropane	ug/kg	ND	3220	3110	2260	2190	70	70	75-125	3	25	M1
2-Chlorotoluene	ug/kg	ND	3220	3110	2000	1890	62	61	75-125	6	25	M1
4-Chlorotoluene	ug/kg	ND	3220	3110	2070	1970	64	63	75-125	5	25	M1
Benzene	ug/kg	ND	3220	3110	2230	2150	69	69	75-125	4	25	M1
Bromobenzene	ug/kg	ND	3220	3110	1990	1900	62	61	75-125	5	25	M1
Bromochloromethane	ug/kg	ND	3220	3110	2060	1980	64	64	75-125	4	25	M1
Bromodichloromethane	ug/kg	ND	3220	3110	2320	2220	72	71	75-125	5	25	M1
Bromoform	ug/kg	ND	3220	3110	1980	1830	62	59	61-133	8	25	M1
Bromomethane	ug/kg	ND	3220	3110	1930	1960	60	63	30-145	2	25	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Parameter	Units	1273712019		366309		366310		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Carbon tetrachloride	ug/kg	ND	3220	3110	2130	2060	66	66	75-125	3	25	M1	
Chlorobenzene	ug/kg	ND	3220	3110	2130	2040	66	65	75-125	4	25	M1	
Chloroethane	ug/kg	ND	3220	3110	2050	2130	64	69	30-138	4	25		
Chloroform	ug/kg	ND	3220	3110	2420	2350	75	76	75-125	3	25		
Chloromethane	ug/kg	ND	3220	3110	2140	2130	67	68	65-126	1	25		
cis-1,2-Dichloroethene	ug/kg	ND	3220	3110	2180	2190	67	70	75-125	0	25	M1	
cis-1,3-Dichloropropene	ug/kg	ND	3220	3110	2440	2320	76	75	75-125	5	25		
Dibromochloromethane	ug/kg	ND	3220	3110	2180	2050	68	66	64-133	6	25		
Dibromomethane	ug/kg	ND	3220	3110	2020	1930	63	62	75-125	5	25	M1	
Dichlorodifluoromethane	ug/kg	ND	3220	3110	751	741	23	24	52-125	1	25	M1	
Dichlorofluoromethane	ug/kg	ND	3220	3110	2000	2030	62	65	70-130	1	25	M1	
Ethylbenzene	ug/kg	ND	3220	3110	2180	2100	68	67	71-135	4	25	M1	
Hexachloro-1,3-butadiene	ug/kg	ND	3220	3110	2090	2020	65	65	75-127	4	25	M1	
Isopropylbenzene (Cumene)	ug/kg	ND	3220	3110	2190	2100	68	68	75-135	4	25	M1	
m&p-Xylene	ug/kg	ND	6430	6220	4110	3940	64	63	63-138	4	25		
Methyl-tert-butyl ether	ug/kg	ND	3220	3110	2490	2360	77	76	75-125	5	25		
Methylene Chloride	ug/kg	ND	3220	3110	2260	2170	70	70	75-130	4	25	M1	
n-Butylbenzene	ug/kg	ND	3220	3110	2360	2290	73	73	58-150	3	25		
n-Hexane	ug/kg	ND	8040	7790	3350	3390	42	44	70-130	1	25	M1	
n-Propylbenzene	ug/kg	ND	3220	3110	2180	2100	68	67	32-150	4	25		
Naphthalene	ug/kg	ND	3220	3110	2280	2180	71	70	56-150	5	25		
o-Xylene	ug/kg	ND	3220	3110	2080	2010	65	65	75-126	3	25	M1	
p-Isopropyltoluene	ug/kg	ND	3220	3110	2070	1980	64	63	71-136	5	25	M1	
sec-Butylbenzene	ug/kg	ND	3220	3110	2120	2040	66	66	74-136	4	25	M1	
Styrene	ug/kg	ND	3220	3110	2160	2070	67	66	75-134	4	25	M1	
tert-Butylbenzene	ug/kg	ND	3220	3110	2140	2040	67	66	75-130	5	25	M1	
Tetrachloroethene	ug/kg	5020	3220	3110	7460	7380	76	76	75-125	1	25		
Toluene	ug/kg	ND	3220	3110	2270	2190	70	70	75-125	4	25	M1	
trans-1,2-Dichloroethene	ug/kg	ND	3220	3110	2140	2080	66	67	75-125	3	25	M1	
trans-1,3-Dichloropropene	ug/kg	ND	3220	3110	2410	2320	75	75	74-135	4	25		
Trichloroethene	ug/kg	ND	3220	3110	2270	2120	66	64	75-125	7	25	M1	
Trichlorofluoromethane	ug/kg	ND	3220	3110	1680	1590	52	51	30-126	6	25		
Vinyl chloride	ug/kg	ND	3220	3110	1800	1780	56	57	75-130	1	25	M1	
Xylene (Total)	ug/kg	ND	9660	9330	6190	5950	64	64	75-130	4	25	MS	
1,2-Dichloroethane-d4 (S)	%.						107	106	70-130				
4-Bromofluorobenzene (S)	%.						91	90	70-130				
Toluene-d8 (S)	%.						101	100	70-130				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

QC Batch: 92887

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV Med Water

Associated Lab Samples: 1273712033, 1273712034, 1273712035, 1273712036, 1273712037

METHOD BLANK: 365400

Matrix: Water

Associated Lab Samples: 1273712033, 1273712034, 1273712035, 1273712036, 1273712037

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	0.50	08/31/16 16:52	
1,1,1-Trichloroethane	ug/L	ND	0.50	08/31/16 16:52	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	08/31/16 16:52	
1,1,2-Trichloroethane	ug/L	ND	0.50	08/31/16 16:52	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	0.50	08/31/16 16:52	
1,1-Dichloroethane	ug/L	ND	0.50	08/31/16 16:52	
1,1-Dichloroethene	ug/L	ND	0.50	08/31/16 16:52	
1,1-Dichloropropene	ug/L	ND	0.50	08/31/16 16:52	
1,2,3-Trichlorobenzene	ug/L	ND	0.50	08/31/16 16:52	
1,2,3-Trichloropropane	ug/L	ND	0.50	08/31/16 16:52	
1,2,4-Trichlorobenzene	ug/L	ND	0.50	08/31/16 16:52	
1,2,4-Trimethylbenzene	ug/L	ND	0.50	08/31/16 16:52	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	08/31/16 16:52	
1,2-Dibromoethane (EDB)	ug/L	ND	0.50	08/31/16 16:52	
1,2-Dichlorobenzene	ug/L	ND	0.50	08/31/16 16:52	
1,2-Dichloroethane	ug/L	ND	0.50	08/31/16 16:52	
1,2-Dichloropropane	ug/L	ND	0.50	08/31/16 16:52	
1,3,5-Trimethylbenzene	ug/L	ND	0.50	08/31/16 16:52	
1,3-Dichlorobenzene	ug/L	ND	0.50	08/31/16 16:52	
1,3-Dichloropropane	ug/L	ND	0.50	08/31/16 16:52	
1,4-Dichlorobenzene	ug/L	ND	0.50	08/31/16 16:52	
2,2,4-Trimethylpentane	ug/L	ND	4.0	08/31/16 16:52	
2,2-Dichloropropane	ug/L	ND	2.0	08/31/16 16:52	
2-Chlorotoluene	ug/L	ND	1.0	08/31/16 16:52	
4-Chlorotoluene	ug/L	ND	1.0	08/31/16 16:52	
Benzene	ug/L	ND	0.50	08/31/16 16:52	
Bromobenzene	ug/L	ND	0.50	08/31/16 16:52	
Bromochloromethane	ug/L	ND	0.50	08/31/16 16:52	
Bromodichloromethane	ug/L	ND	0.50	08/31/16 16:52	
Bromoform	ug/L	ND	0.50	08/31/16 16:52	
Bromomethane	ug/L	ND	20.0	08/31/16 16:52	
Carbon tetrachloride	ug/L	ND	0.50	08/31/16 16:52	
Chlorobenzene	ug/L	ND	0.50	08/31/16 16:52	
Chloroethane	ug/L	ND	2.0	08/31/16 16:52	
Chloroform	ug/L	ND	0.50	08/31/16 16:52	
Chloromethane	ug/L	ND	0.50	08/31/16 16:52	
cis-1,2-Dichloroethene	ug/L	ND	0.50	08/31/16 16:52	
cis-1,3-Dichloropropene	ug/L	ND	0.50	08/31/16 16:52	
Dibromochloromethane	ug/L	ND	0.50	08/31/16 16:52	
Dibromomethane	ug/L	ND	0.50	08/31/16 16:52	
Dichlorodifluoromethane	ug/L	ND	0.50	08/31/16 16:52	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

METHOD BLANK: 365400 Matrix: Water
Associated Lab Samples: 1273712033, 1273712034, 1273712035, 1273712036, 1273712037

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylbenzene	ug/L	ND	0.50	08/31/16 16:52	
Hexachloro-1,3-butadiene	ug/L	ND	0.50	08/31/16 16:52	
Isopropylbenzene (Cumene)	ug/L	ND	0.50	08/31/16 16:52	
m&p-Xylene	ug/L	ND	1.0	08/31/16 16:52	
Methyl-tert-butyl ether	ug/L	ND	0.50	08/31/16 16:52	
Methylene Chloride	ug/L	ND	5.0	08/31/16 16:52	
n-Butylbenzene	ug/L	ND	0.50	08/31/16 16:52	
n-Hexane	ug/L	ND	10.0	08/31/16 16:52	
n-Propylbenzene	ug/L	ND	0.50	08/31/16 16:52	
Naphthalene	ug/L	ND	0.50	08/31/16 16:52	
o-Xylene	ug/L	ND	0.50	08/31/16 16:52	
p-Isopropyltoluene	ug/L	ND	0.50	08/31/16 16:52	
sec-Butylbenzene	ug/L	ND	0.50	08/31/16 16:52	
Styrene	ug/L	ND	0.50	08/31/16 16:52	
tert-Butylbenzene	ug/L	ND	0.50	08/31/16 16:52	
Tetrachloroethene	ug/L	ND	0.50	08/31/16 16:52	
Toluene	ug/L	ND	0.50	08/31/16 16:52	
trans-1,2-Dichloroethene	ug/L	ND	0.50	08/31/16 16:52	
trans-1,3-Dichloropropene	ug/L	ND	0.50	08/31/16 16:52	
Trichloroethene	ug/L	ND	0.50	08/31/16 16:52	
Trichlorofluoromethane	ug/L	ND	0.50	08/31/16 16:52	
Vinyl chloride	ug/L	ND	0.50	08/31/16 16:52	
Xylene (Total)	ug/L	ND	1.5	08/31/16 16:52	
1,2-Dichloroethane-d4 (S)	%	96	70-130	08/31/16 16:52	
4-Bromofluorobenzene (S)	%	102	70-130	08/31/16 16:52	
Toluene-d8 (S)	%	100	70-130	08/31/16 16:52	

LABORATORY CONTROL SAMPLE: 365401

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	40	42.2	105	72-134	
1,1,1-Trichloroethane	ug/L	40	37.1	93	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	39.6	99	75-125	
1,1,2-Trichloroethane	ug/L	40	36.9	92	75-126	
1,1,2-Trichlorotrifluoroethane	ug/L	40	39.1	98	74-127	
1,1-Dichloroethane	ug/L	40	35.1	88	71-131	
1,1-Dichloroethene	ug/L	40	36.0	90	74-126	
1,1-Dichloropropene	ug/L	40	36.5	91	73-126	
1,2,3-Trichlorobenzene	ug/L	40	42.2	106	75-125	
1,2,3-Trichloropropane	ug/L	40	39.4	98	74-126	
1,2,4-Trichlorobenzene	ug/L	40	42.6	107	75-127	
1,2,4-Trimethylbenzene	ug/L	40	39.4	99	75-127	
1,2-Dibromo-3-chloropropane	ug/L	100	102	102	51-150	
1,2-Dibromoethane (EDB)	ug/L	40	37.8	95	74-128	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 365401

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	40.0	100	75-125	
1,2-Dichloroethane	ug/L	40	35.6	89	64-141	
1,2-Dichloropropane	ug/L	40	35.7	89	73-127	
1,3,5-Trimethylbenzene	ug/L	40	39.7	99	75-127	
1,3-Dichlorobenzene	ug/L	40	41.0	102	75-125	
1,3-Dichloropropane	ug/L	40	36.9	92	73-129	
1,4-Dichlorobenzene	ug/L	40	39.8	100	75-125	
2,2,4-Trimethylpentane	ug/L	40	32.3	81	70-130	
2,2-Dichloropropane	ug/L	40	33.4	84	49-150	
2-Chlorotoluene	ug/L	40	40.6	101	75-125	
4-Chlorotoluene	ug/L	40	40.4	101	75-125	
Benzene	ug/L	40	36.1	90	75-125	
Bromobenzene	ug/L	40	42.6	107	75-125	
Bromochloromethane	ug/L	40	39.2	98	75-126	
Bromodichloromethane	ug/L	40	37.1	93	70-134	
Bromoform	ug/L	40	46.2	115	68-130	
Bromomethane	ug/L	40	27.3	68	30-150	
Carbon tetrachloride	ug/L	40	40.7	102	66-135	
Chlorobenzene	ug/L	40	40.6	102	75-125	
Chloroethane	ug/L	40	36.4	91	55-150	
Chloroform	ug/L	40	36.6	91	72-131	
Chloromethane	ug/L	40	26.9	67	54-132	
cis-1,2-Dichloroethene	ug/L	40	36.1	90	75-125	
cis-1,3-Dichloropropene	ug/L	40	36.7	92	74-130	
Dibromochloromethane	ug/L	40	40.7	102	70-132	
Dibromomethane	ug/L	40	39.3	98	72-135	
Dichlorodifluoromethane	ug/L	40	31.7	79	41-150	
Ethylbenzene	ug/L	40	39.0	98	75-125	
Hexachloro-1,3-butadiene	ug/L	40	39.7	99	75-131	
Isopropylbenzene (Cumene)	ug/L	40	39.9	100	75-125	
m&p-Xylene	ug/L	80	79.3	99	75-125	
Methyl-tert-butyl ether	ug/L	40	35.2	88	73-125	
Methylene Chloride	ug/L	40	35.5	89	68-125	
n-Butylbenzene	ug/L	40	37.9	95	68-134	
n-Hexane	ug/L	100	94.2	94	70-130	
n-Propylbenzene	ug/L	40	39.6	99	75-128	
Naphthalene	ug/L	40	38.0	95	69-128	
o-Xylene	ug/L	40	39.8	100	75-125	
p-Isopropyltoluene	ug/L	40	39.3	98	75-130	
sec-Butylbenzene	ug/L	40	39.0	97	75-125	
Styrene	ug/L	40	41.1	103	75-125	
tert-Butylbenzene	ug/L	40	43.8	110	75-129	
Tetrachloroethene	ug/L	40	38.8	97	75-130	
Toluene	ug/L	40	38.1	95	75-125	
trans-1,2-Dichloroethene	ug/L	40	36.2	91	75-125	
trans-1,3-Dichloropropene	ug/L	40	36.3	91	69-137	
Trichloroethene	ug/L	40	37.9	95	75-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

LABORATORY CONTROL SAMPLE: 365401

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Trichlorofluoromethane	ug/L	40	38.2	96	59-140	
Vinyl chloride	ug/L	40	35.5	89	68-132	
Xylene (Total)	ug/L	120	119	99	75-125	
1,2-Dichloroethane-d4 (S)	%			95	70-130	
4-Bromofluorobenzene (S)	%			106	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 365402 365403

Parameter	Units	365402		365403		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		1271967003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	ND	40	40	41.7	39.8	104	100	66-141	4	30	
1,1,1-Trichloroethane	ug/L	ND	40	40	36.8	35.2	92	88	63-142	4	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	37.4	35.5	93	89	75-125	5	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	35.7	33.7	89	84	75-132	6	30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	40	40	38.3	34.4	96	86	67-134	11	30	
1,1-Dichloroethane	ug/L	ND	40	40	35.0	32.8	88	82	75-126	7	30	
1,1-Dichloroethene	ug/L	ND	40	40	35.6	33.3	89	83	75-125	7	30	
1,1-Dichloropropene	ug/L	ND	40	40	36.4	33.9	91	85	69-129	7	30	
1,2,3-Trichlorobenzene	ug/L	ND	40	40	39.0	36.8	98	92	74-125	6	30	
1,2,3-Trichloropropane	ug/L	ND	40	40	37.2	35.7	93	89	74-126	4	30	
1,2,4-Trichlorobenzene	ug/L	ND	40	40	39.6	36.6	99	91	66-131	8	30	
1,2,4-Trimethylbenzene	ug/L	ND	40	40	38.2	35.8	96	90	75-128	6	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	100	100	91.7	88.2	92	88	41-150	4	30	
1,2-Dibromoethane (EDB)	ug/L	ND	40	40	36.7	34.8	92	87	75-126	5	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	38.7	37.1	97	93	75-125	4	30	
1,2-Dichloroethane	ug/L	ND	40	40	35.2	32.8	88	82	75-137	7	30	
1,2-Dichloropropane	ug/L	ND	40	40	35.5	33.5	89	84	74-131	6	30	
1,3,5-Trimethylbenzene	ug/L	ND	40	40	38.4	36.2	96	91	75-129	6	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	40.2	37.8	101	95	75-126	6	30	
1,3-Dichloropropane	ug/L	ND	40	40	36.1	34.2	90	85	71-130	6	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	38.7	36.4	97	91	73-125	6	30	
2,2,4-Trimethylpentane	ug/L	ND	40	40	31.5	24.8	79	62	70-130	24	30	M1
2,2-Dichloropropane	ug/L	ND	40	40	33.2	31.6	83	79	45-151	5	30	
2-Chlorotoluene	ug/L	ND	40	40	39.9	38.0	100	95	75-126	5	30	
4-Chlorotoluene	ug/L	ND	40	40	39.9	37.5	100	94	75-126	6	30	
Benzene	ug/L	ND	40	40	36.0	34.0	90	85	75-125	6	30	
Bromobenzene	ug/L	ND	40	40	42.4	40.5	106	101	75-125	5	30	
Bromochloromethane	ug/L	ND	40	40	39.2	37.0	98	92	75-126	6	30	
Bromodichloromethane	ug/L	ND	40	40	36.5	34.7	91	87	65-137	5	30	
Bromoform	ug/L	ND	40	40	43.8	41.7	110	104	60-147	5	30	
Bromomethane	ug/L	ND	40	40	29.4	32.3	74	81	30-150	9	30	
Carbon tetrachloride	ug/L	ND	40	40	40.0	38.5	100	96	45-150	4	30	
Chlorobenzene	ug/L	ND	40	40	40.7	38.5	102	96	75-125	5	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 365402												365403											
Parameter	Units	1271967003		MS		MSD		MS		MSD		% Rec		Max		Qual							
		Result	Conc.	Spike Conc.	MSD Spike Conc.	Result	MSD Result	% Rec	MSD % Rec	Limits	RPD	RPD											
Chloroethane	ug/L	ND	40	40	40	36.5	33.6	91	84	66-145	8	30											
Chloroform	ug/L	ND	40	40	40	36.4	34.2	91	86	74-128	6	30											
Chloromethane	ug/L	ND	40	40	40	27.3	25.2	68	63	51-150	8	30											
cis-1,2-Dichloroethene	ug/L	ND	40	40	40	36.0	33.8	90	85	75-125	6	30											
cis-1,3-Dichloropropene	ug/L	ND	40	40	40	35.9	34.3	90	86	75-129	4	30											
Dibromochloromethane	ug/L	ND	40	40	40	39.6	37.8	99	95	66-141	5	30											
Dibromomethane	ug/L	ND	40	40	40	39.2	36.2	98	90	73-139	8	30											
Dichlorodifluoromethane	ug/L	ND	40	40	40	31.4	28.0	78	70	36-149	11	30											
Ethylbenzene	ug/L	ND	40	40	40	38.3	36.5	96	91	74-125	5	30											
Hexachloro-1,3-butadiene	ug/L	ND	40	40	40	38.4	32.8	96	82	64-134	16	30											
Isopropylbenzene (Cumene)	ug/L	ND	40	40	40	38.9	37.0	97	92	75-127	5	30											
m&p-Xylene	ug/L	ND	80	80	80	78.1	74.0	98	93	63-130	5	30											
Methyl-tert-butyl ether	ug/L	ND	40	40	40	34.5	32.4	85	80	73-129	6	30											
Methylene Chloride	ug/L	ND	40	40	40	35.7	33.0	89	83	74-125	8	30											
n-Butylbenzene	ug/L	ND	40	40	40	36.6	32.6	91	81	58-132	11	30											
n-Hexane	ug/L	ND	100	100	100	85.8	70.5	86	71	70-130	20	30											
n-Propylbenzene	ug/L	ND	40	40	40	38.6	36.0	97	90	75-128	7	30											
Naphthalene	ug/L	ND	40	40	40	34.9	33.7	87	84	60-133	4	30											
o-Xylene	ug/L	ND	40	40	40	39.6	37.7	99	94	66-129	5	30											
p-Isopropyltoluene	ug/L	ND	40	40	40	38.0	35.1	95	88	70-132	8	30											
sec-Butylbenzene	ug/L	ND	40	40	40	38.1	35.5	95	89	70-130	7	30											
Styrene	ug/L	ND	40	40	40	38.9	37.1	97	93	71-127	5	30											
tert-Butylbenzene	ug/L	ND	40	40	40	38.8	36.8	97	92	75-128	5	30											
Tetrachloroethene	ug/L	ND	40	40	40	37.9	35.3	95	88	75-135	7	30											
Toluene	ug/L	ND	40	40	40	37.9	36.2	95	90	75-125	5	30											
trans-1,2-Dichloroethene	ug/L	ND	40	40	40	36.2	33.4	90	84	75-125	8	30											
trans-1,3-Dichloropropene	ug/L	ND	40	40	40	35.7	34.1	89	85	67-139	5	30											
Trichloroethene	ug/L	ND	40	40	40	38.0	35.6	95	89	75-130	6	30											
Trichlorofluoromethane	ug/L	ND	40	40	40	37.5	35.7	94	89	57-144	5	30											
Vinyl chloride	ug/L	ND	40	40	40	35.7	33.0	89	83	70-136	8	30											
Xylene (Total)	ug/L	ND	120	120	120	118	112	98	93	61-129	5	30											
1,2-Dichloroethane-d4 (S)	%							95	95	70-130													
4-Bromofluorobenzene (S)	%							106	105	70-130													
Toluene-d8 (S)	%							99	99	70-130													

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

QC Batch: 92857 Analysis Method: ASTM D 2974-13 (2013)
 QC Batch Method: ASTM D 2974-13 (2013) Analysis Description: Dry Weight/Percent Moisture
 Associated Lab Samples: 1273712019, 1273712020, 1273712021, 1273712022, 1273712023, 1273712024, 1273712025, 1273712026,
 1273712027, 1273712028, 1273712029, 1273712030, 1273712031, 1273712032

SAMPLE DUPLICATE: 365335

Parameter	Units	1273712019 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	38.0	40.4	6	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

QC Batch: 234074 Analysis Method: EPA 9060 Modified
QC Batch Method: EPA 9060 Modified Analysis Description: 9060 TOC Average
Associated Lab Samples: 1273712001, 1273712002, 1273712003, 1273712004, 1273712005, 1273712006, 1273712007, 1273712008, 1273712009, 1273712010, 1273712011, 1273712012, 1273712013, 1273712014, 1273712015

METHOD BLANK: 1387184 Matrix: Solid
Associated Lab Samples: 1273712001, 1273712002, 1273712003, 1273712004, 1273712005, 1273712006, 1273712007, 1273712008, 1273712009, 1273712010, 1273712011, 1273712012, 1273712013, 1273712014, 1273712015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mean Total Organic Carbon	mg/kg	ND	668	09/07/16 05:18	

LABORATORY CONTROL SAMPLE: 1387185

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mean Total Organic Carbon	mg/kg	120000	123000	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1387186 1387187

Parameter	Units	35262728001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Mean Total Organic Carbon	mg/kg	3750	7660	7680	10300	12400	86	113	50-150	18 30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1387188 1387189

Parameter	Units	1273712001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Mean Total Organic Carbon	mg/kg	2710	7900	7900	13800	11500	140	111	50-150	18 30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

QC Batch: 234225 Analysis Method: EPA 9060 Modified
QC Batch Method: EPA 9060 Modified Analysis Description: 9060 TOC Average
Associated Lab Samples: 1273712016, 1273712017, 1273712018, 1273712019, 1273712020, 1273712021, 1273712022, 1273712023, 1273712024, 1273712025, 1273712026, 1273712027, 1273712028, 1273712029, 1273712030, 1273712031, 1273712032

METHOD BLANK: 1387642 Matrix: Solid
Associated Lab Samples: 1273712016, 1273712017, 1273712018, 1273712019, 1273712020, 1273712021, 1273712022, 1273712023, 1273712024, 1273712025, 1273712026, 1273712027, 1273712028, 1273712029, 1273712030, 1273712031, 1273712032

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mean Total Organic Carbon	mg/kg	ND	668	09/08/16 05:09	

LABORATORY CONTROL SAMPLE: 1387643

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mean Total Organic Carbon	mg/kg	120000	106000	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1387644 1387645

Parameter	Units	1273712016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mean Total Organic Carbon	mg/kg	1030	7300	7310	8050	7720	96	91	50-150	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1387646 1387647

Parameter	Units	1273712017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mean Total Organic Carbon	mg/kg	4750	9140	9140	10600	12000	64	80	50-150	12	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DAV Pace Analytical Services - Davis

PASI-G Pace Analytical Services - Green Bay

BATCH QUALIFIERS

Batch: 92857

[1] The oven temperature at the time drying was completed was below method criteria.

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MS Analyte recovery in the matrix spike was outside QC limits for one or more of the constituent analytes used in the calculated result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1273712001	SED-5 2.5-3.85	EPA 5030 Low	92805	EPA 8260B	92815
1273712001	SED-5 2.5-3.85	EPA 5030 Low	93102	EPA 8260B	93110
1273712002	SED-2 0.5-2.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712003	SED-5 0.5-2.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712004	SED-4 4.5-4.75	EPA 5030 Low	92805	EPA 8260B	92815
1273712005	SED-4 2.5-4.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712005	SED-4 2.5-4.5	EPA 5030 Low	93102	EPA 8260B	93110
1273712006	SED-4 0.5-2.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712007	SED-4 0.0-0.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712008	SED-2 0.0 - 0.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712009	SED-5 0.0 - 0.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712010	SED-2 2.5-4.25	EPA 5030 Low	92805	EPA 8260B	92815
1273712011	SED-3 0.0-0.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712012	SED-3 2.5-4.25	EPA 5030 Low	92805	EPA 8260B	92815
1273712012	SED-3 2.5-4.25	EPA 5030 Low	93102	EPA 8260B	93110
1273712013	SED-3 0.5-2.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712014	SED-11 0.5-2.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712015	SED-8 0.0-0.5	EPA 5030 Low	92805	EPA 8260B	92815
1273712015	SED-8 0.0-0.5	EPA 5030 Low	93102	EPA 8260B	93110
1273712016	SED-9 0.5-2.7	EPA 5030 Low	92805	EPA 8260B	92815
1273712017	SED-11 0.0-0.5 DUP	EPA 5030 Low	92905	EPA 8260B	92914
1273712017	SED-11 0.0-0.5 DUP	EPA 5030 Low	93102	EPA 8260B	93110
1273712018	SED-7 0.5-1.5	EPA 5030 Low	92905	EPA 8260B	92914
1273712018	SED-7 0.5-1.5	EPA 5030 Low	93102	EPA 8260B	93110
1273712020	SED-7 0.0-0.5	EPA 5030 Low	92905	EPA 8260B	92914
1273712021	SED-6 0.5-1.5 Dup	EPA 5030 Low	92905	EPA 8260B	92914
1273712022	SED-1 0.0-0.5	EPA 5030 Low	92905	EPA 8260B	92914
1273712023	SED-11 0.5-2.5 Dup	EPA 5030 Low	92905	EPA 8260B	92914
1273712023	SED-11 0.5-2.5 Dup	EPA 5030 Low	93102	EPA 8260B	93110
1273712024	SED-1 2.5-4.2	EPA 5030 Low	92905	EPA 8260B	92914
1273712025	SED-9 0.0-0.5	EPA 5030 Low	92905	EPA 8260B	92914
1273712026	SED-1 0.5-2.5	EPA 5030 Low	92905	EPA 8260B	92914
1273712026	SED-1 0.5-2.5	EPA 5030 Low	93102	EPA 8260B	93110
1273712027	SED-11 0.0-0.5	EPA 5030 Low	92905	EPA 8260B	92914
1273712027	SED-11 0.0-0.5	EPA 5030 Low	93102	EPA 8260B	93110
1273712028	SED-8 0.5-2.25	EPA 5030 Low	92905	EPA 8260B	92914
1273712028	SED-8 0.5-2.25	EPA 5030 Low	93102	EPA 8260B	93110
1273712031	SED-10 0.0-0.5	EPA 5030 Low	92905	EPA 8260B	92914

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1273712032	SED-10 0.5-2.66	EPA 5030 Low	92905	EPA 8260B	92914
1273712019	SED-6 0.0-0.5	EPA 5035/5030B	93118	EPA 8260B	93157
1273712029	SED-6 0.5-1.5	EPA 5035/5030B	93118	EPA 8260B	93157
1273712030	SED-6 0.0-0.5 DUP	EPA 5035/5030B	93118	EPA 8260B	93157
1273712033	Surf 4	EPA 8260B	92887		
1273712034	Surf 2 DUP	EPA 8260B	92887		
1273712035	Surf 2	EPA 8260B	92887		
1273712036	Surf 1	EPA 8260B	92887		
1273712037	Surf 3	EPA 8260B	92887		
1273712001	SED-5 2.5-3.85	ASTM D 2974-13 (2013)	92854		
1273712002	SED-2 0.5-2.5	ASTM D 2974-13 (2013)	92854		
1273712003	SED-5 0.5-2.5	ASTM D 2974-13 (2013)	92854		
1273712004	SED-4 4.5-4.75	ASTM D 2974-13 (2013)	92854		
1273712005	SED-4 2.5-4.5	ASTM D 2974-13 (2013)	92854		
1273712006	SED-4 0.5-2.5	ASTM D 2974-13 (2013)	92854		
1273712007	SED-4 0.0-0.5	ASTM D 2974-13 (2013)	92854		
1273712008	SED-2 0.0 - 0.5	ASTM D 2974-13 (2013)	92854		
1273712009	SED-5 0.0 - 0.5	ASTM D 2974-13 (2013)	92854		
1273712010	SED-2 2.5-4.25	ASTM D 2974-13 (2013)	92854		
1273712011	SED-3 0.0-0.5	ASTM D 2974-13 (2013)	92854		
1273712012	SED-3 2.5-4.25	ASTM D 2974-13 (2013)	92854		
1273712013	SED-3 0.5-2.5	ASTM D 2974-13 (2013)	92854		
1273712014	SED-11 0.5-2.5	ASTM D 2974-13 (2013)	92854		
1273712015	SED-8 0.0-0.5	ASTM D 2974-13 (2013)	92854		
1273712016	SED-9 0.5-2.7	ASTM D 2974-13 (2013)	92854		
1273712017	SED-11 0.0-0.5 DUP	ASTM D 2974-13 (2013)	92854		
1273712018	SED-7 0.5-1.5	ASTM D 2974-13 (2013)	92854		
1273712019	SED-6 0.0-0.5	ASTM D 2974-13 (2013)	92857		
1273712020	SED-7 0.0-0.5	ASTM D 2974-13 (2013)	92857		
1273712021	SED-6 0.5-1.5 Dup	ASTM D 2974-13 (2013)	92857		
1273712022	SED-1 0.0-0.5	ASTM D 2974-13 (2013)	92857		
1273712023	SED-11 0.5-2.5 Dup	ASTM D 2974-13 (2013)	92857		
1273712024	SED-1 2.5-4.2	ASTM D 2974-13 (2013)	92857		
1273712025	SED-9 0.0-0.5	ASTM D 2974-13 (2013)	92857		
1273712026	SED-1 0.5-2.5	ASTM D 2974-13 (2013)	92857		
1273712027	SED-11 0.0-0.5	ASTM D 2974-13 (2013)	92857		
1273712028	SED-8 0.5-2.25	ASTM D 2974-13 (2013)	92857		
1273712029	SED-6 0.5-1.5	ASTM D 2974-13 (2013)	92857		
1273712030	SED-6 0.0-0.5 DUP	ASTM D 2974-13 (2013)	92857		
1273712031	SED-10 0.0-0.5	ASTM D 2974-13 (2013)	92857		
1273712032	SED-10 0.5-2.66	ASTM D 2974-13 (2013)	92857		
1273712001	SED-5 2.5-3.85	EPA 9060 Modified	234074		
1273712001	SED-5 2.5-3.85	EPA 9060 Modified	234075		
1273712002	SED-2 0.5-2.5	EPA 9060 Modified	234074		
1273712002	SED-2 0.5-2.5	EPA 9060 Modified	234075		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver Sediment Inve
Pace Project No.: 1273712

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1273712003	SED-5 0.5-2.5	EPA 9060 Modified	234074		
1273712003	SED-5 0.5-2.5	EPA 9060 Modified	234075		
1273712004	SED-4 4.5-4.75	EPA 9060 Modified	234074		
1273712004	SED-4 4.5-4.75	EPA 9060 Modified	234075		
1273712005	SED-4 2.5-4.5	EPA 9060 Modified	234074		
1273712005	SED-4 2.5-4.5	EPA 9060 Modified	234075		
1273712006	SED-4 0.5-2.5	EPA 9060 Modified	234074		
1273712006	SED-4 0.5-2.5	EPA 9060 Modified	234075		
1273712007	SED-4 0.0-0.5	EPA 9060 Modified	234074		
1273712007	SED-4 0.0-0.5	EPA 9060 Modified	234075		
1273712008	SED-2 0.0 - 0.5	EPA 9060 Modified	234074		
1273712008	SED-2 0.0 - 0.5	EPA 9060 Modified	234075		
1273712009	SED-5 0.0 - 0.5	EPA 9060 Modified	234074		
1273712009	SED-5 0.0 - 0.5	EPA 9060 Modified	234075		
1273712010	SED-2 2.5-4.25	EPA 9060 Modified	234074		
1273712010	SED-2 2.5-4.25	EPA 9060 Modified	234075		
1273712011	SED-3 0.0-0.5	EPA 9060 Modified	234074		
1273712011	SED-3 0.0-0.5	EPA 9060 Modified	234075		
1273712012	SED-3 2.5-4.25	EPA 9060 Modified	234074		
1273712012	SED-3 2.5-4.25	EPA 9060 Modified	234075		
1273712013	SED-3 0.5-2.5	EPA 9060 Modified	234074		
1273712013	SED-3 0.5-2.5	EPA 9060 Modified	234075		
1273712014	SED-11 0.5-2.5	EPA 9060 Modified	234074		
1273712014	SED-11 0.5-2.5	EPA 9060 Modified	234075		
1273712015	SED-8 0.0-0.5	EPA 9060 Modified	234074		
1273712015	SED-8 0.0-0.5	EPA 9060 Modified	234075		
1273712016	SED-9 0.5-2.7	EPA 9060 Modified	234225		
1273712016	SED-9 0.5-2.7	EPA 9060 Modified	234226		
1273712017	SED-11 0.0-0.5 DUP	EPA 9060 Modified	234225		
1273712017	SED-11 0.0-0.5 DUP	EPA 9060 Modified	234226		
1273712018	SED-7 0.5-1.5	EPA 9060 Modified	234225		
1273712018	SED-7 0.5-1.5	EPA 9060 Modified	234226		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver Sediment Inve

Pace Project No.: 1273712

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1273712019	SED-6 0.0-0.5	EPA 9060 Modified	234225		
1273712019	SED-6 0.0-0.5	EPA 9060 Modified	234226		
1273712020	SED-7 0.0-0.5	EPA 9060 Modified	234225		
1273712020	SED-7 0.0-0.5	EPA 9060 Modified	234226		
1273712021	SED-6 0.5-1.5 Dup	EPA 9060 Modified	234225		
1273712021	SED-6 0.5-1.5 Dup	EPA 9060 Modified	234226		
1273712022	SED-1 0.0-0.5	EPA 9060 Modified	234225		
1273712022	SED-1 0.0-0.5	EPA 9060 Modified	234226		
1273712023	SED-11 0.5-2.5 Dup	EPA 9060 Modified	234225		
1273712023	SED-11 0.5-2.5 Dup	EPA 9060 Modified	234226		
1273712024	SED-1 2.5-4.2	EPA 9060 Modified	234225		
1273712024	SED-1 2.5-4.2	EPA 9060 Modified	234226		
1273712025	SED-9 0.0-0.5	EPA 9060 Modified	234225		
1273712025	SED-9 0.0-0.5	EPA 9060 Modified	234226		
1273712026	SED-1 0.5-2.5	EPA 9060 Modified	234225		
1273712026	SED-1 0.5-2.5	EPA 9060 Modified	234226		
1273712027	SED-11 0.0-0.5	EPA 9060 Modified	234225		
1273712027	SED-11 0.0-0.5	EPA 9060 Modified	234226		
1273712028	SED-8 0.5-2.25	EPA 9060 Modified	234225		
1273712028	SED-8 0.5-2.25	EPA 9060 Modified	234226		
1273712029	SED-6 0.5-1.5	EPA 9060 Modified	234225		
1273712029	SED-6 0.5-1.5	EPA 9060 Modified	234226		
1273712030	SED-6 0.0-0.5 DUP	EPA 9060 Modified	234225		
1273712030	SED-6 0.0-0.5 DUP	EPA 9060 Modified	234226		
1273712031	SED-10 0.0-0.5	EPA 9060 Modified	234225		
1273712031	SED-10 0.0-0.5	EPA 9060 Modified	234226		
1273712032	SED-10 0.5-2.66	EPA 9060 Modified	234225		
1273712032	SED-10 0.5-2.66	EPA 9060 Modified	234226		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:
 Company: ACEX
 Address: 3055 S. 4th Ave
 Email To: William O'Brien
 Phone: 503-250-7345
 Requested Due Date/TAT: _____

Section B Required Project Information:
 Report To: John Murray
 Copy To: _____
 Purchase Order No.: _____
 Project Name: 116-11003
 Project Number: 116-11003

Section C Invoice Information:
 Attention: Skylar
 Company Name: _____
 Address: 505 S. 7th Ave
 Pace Quote Reference: _____
 Pace Project Manager: _____
 Pace Profile #: _____

REGULATORY AGENCY
 NPDES _____ GROUND WATER _____ DRINKING WATER _____
 UST _____ RCRA _____ OTHER _____
 Site Location: WA
 STATE: _____

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL WIP OL WIP WP AIR AR OTHER OT TISSUE TS	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED		# OF CONTAINERS	UNPRESERVED	PRESERVATIVES						ANALYSIS TEST	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					DATE	TIME			H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₅	Methanol			
		SED-5 2.5-3.85			8/20/16	1318	3	X								601	
		SED-2 0.5-2.5			8/20/16	1102	3	X								002	
		SED-5 0.5-2.5			8/20/16	1318	3	X								003	
		SED-4 4.5-4.75			8/20/16	1242	3	X								004	
		SED-4 2.5-4.5			8/20/16	1242	3	X								005	
		SED-4 0.5-2.5			8/20/16	1242	3	X								006	
		SED-4 0.0-0.5			8/20/16	1242	3	X								007	
		SED-2 0.0-0.5			8/20/16	1102	3	X								008	
		SED-5 0.0-0.5			8/20/16	1318	3	X								009	
		SED-2 2.5-4.25			8/20/16	1102	3	X								010	

ADDITIONAL COMMENTS
 * Additional 202.*
 suit for per sample
 include for disk
 incident collected

RELINQUISHED BY / AFFILIATION
 DATE: _____ TIME: _____
 SIGNATURE OF SAMPLER: _____
 SIGNATURE OF SAMPLER: _____

ACCEPTED BY / AFFILIATION
 DATE: _____ TIME: _____
 SIGNATURE OF SAMPLER: John Murray
 DATE SIGNED (MM/DD/YY): _____

SAMPLE CONDITIONS
 Received on Ice (Y/N) _____
 Custody Sealed (Y/N) _____
 Samples Intact (Y/N) _____



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 2 of

Section A
 Required Client Information:
 Company: Apex
 Address: 3015 SW 1st Ave
 Email To: apexlab@apexlab.com
 Phone: 903 8070335
 Requested Due Date/TAT:

Section B
 Required Project Information:
 Report To: Stephanie Salas
 Copy To:
 Purchase Order No.:
 Project Name: 1120-18-003
 Project Number: 1120-18-003

Section C
 Invoice Information:
 Attention: Stephanie Salas
 Company Name: Apex
 Address: 3015 SW 1st Ave
 Pace Quote Reference: 1120-18-003
 Pace Project Manager: Michelle Balling
 Pace Profile #:

REGULATORY AGENCY
 NPDES: _____ GROUND WATER: _____ DRINKING WATER: _____
 UST: _____ RCRA: _____ OTHER: _____
 Site Location STATE: WA

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WATER WW PRODUCT P SOIL/SOLID S OIL SL OIL OL WASTE W AIR AR OTHER OT TISSUE TS	SAMPLE ID (A-Z, 0-9 / -)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		# OF CONTAINERS	UNPRESERVED	PRESERVATIVES										ANALYSIS TEST	Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				DATE	TIME			H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₈	Methanol	Other								
		SED-3-0.0-0.5		8/23/11	153	3	X													011		
		SED-3-2.5-4.25		8/23/11	153	3														012		
		SED-3-0.5-2.5		8/23/11	153	3														013		
		SED-10-0.5-2.5		8/23/11	158	3														014		
		SED-8-0.0-0.5		8/23/11	1410	3														015		
		SED-9-0.5-2.7		8/23/11	115	3														016		
		SED-11-0.0-0.5 D10		8/23/11	1108	3														017		
		SED-7-0.5-1.5		8/23/11	1108	3														018		
		SED-6-0.0-0.5		8/23/11	1018	3														019		
		SED-7-0.0-0.5		8/23/11	1108	3														020		

ADDITIONAL COMMENTS
 * additional 2oz *
 and per per samples
 included for day water analysis

RELINQUISHED BY / AFFILIATION: _____ DATE: _____ TIME: _____
 ACCEPTED BY / AFFILIATION: _____ DATE: _____ TIME: _____

Temp in °C: _____
 Received on Ice (Y/N): _____
 Custody Sealed (Cooler (Y/N): _____
 Samples Intact (Y/N): _____

SAMPLER NAME AND SIGNATURE: _____
 PRINT Name of SAMPLER: _____
 SIGNATURE of SAMPLER: _____
 DATE Signed (MM/DD/YYYY): _____



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: _____ of _____

Section A Required Client Information:
 Company: Open
 Address: 3015 SW 1st Ave
 Email To: Partners OK 94201
 Phone: 305 807 5385
 Requested Date/TAT: _____

Section B Required Project Information:
 Report To: Septimus Seligman
 Copy To: _____
 Purchase Order No.: _____
 Project Name: 1120-18 003
 Project Number: Nistar Vaccines

Section C Invoice Information:
 Attention: Septimus Seligman
 Company Name: Open
 Address: 3015 SW 1st Ave
 Pace Quote Reference: _____
 Pace Project Manager: Nistar billig
 Pace Profile #: _____

ITEM #	Valid Matrix Codes MATRIX CODE DW DRINKING WATER WV WASTE WATER WP WASTE PRODUCT P PRODUCT SL SOIL/SOLID OL OIL WF WASTE FLUID AIR AIR OTHER TS TISSUE	SAMPLE ID (A-Z, 0-9, / -) Sample IDs MUST BE UNIQUE	COLLECTED DATE	COLLECTED TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	UNPRESERVED	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ SO ₄	Methanol	Other	Analysis Test Y/N	Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																DATE	TIME		
		SED-1 0.5-1.8 DW	8/23/10	10:13	3X														02
		SED-1 0.0-0.5	8/24/10	10:20	3														022
		SED-10 0.5-2.5	8/24/10	11:58	3														023
		SED-1 2.5-4.2	8/24/10	10:20	3														024
		SED 9 0.0-0.5	8/24/10	08:50	3														025
		SED 1 0.5-2.5	8/24/10	10:20	3														026
		SED-11 0.0-0.5	8/24/10	11:57	3														027
		SED 8 0.5-2.25	8/24/10	14:10	3														028
		SED 6 0.5-1.5	8/24/10	10:13	3														029
		SED 6 0.0-0.5 DW	8/24/10	10:13	3														030

ADDITIONAL COMMENTS

RELINQUISHED BY / AFFILIATION: _____ DATE: _____ TIME: _____

ACCEPTED BY / AFFILIATION: _____ DATE: _____ TIME: _____

Temp in °C: _____

Received on Ice (Y/N): _____

Custody Sealed (Y/N): _____

Cooler (Y/N): _____

Samples Intact (Y/N): _____

Electronic Data Deliverable (EDD): EQUS Excel WA EIM Other

State Specific: CA EDF (Global ID: _____) CA WriteOn (Site: _____)

Signature of SAMPLER: _____ DATE Signed (MM/DD/YYYY): _____

PRINT Name of SAMPLER: _____

SIGNATURE of SAMPLER: _____

SAMPLER NAME AND SIGNATURE: _____

Sample Condition Upon Receipt

Client Name: Apex LLC Project #: _____

WO#: 1273712


1273712

Courier: Fed Ex UPS USPS Client
 Commercial Pace OnTrac Other: _____
 Tracking Number: 8099 9440 4666 / 7771 0644 5499

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermom. Used: DA1434 DA2285 Type of Ice: Wet Blue Dry Ice None Samples on ice, cooling process has begun

Cooler Temp Read(°C): 4.4/3.6/4.8 Cooler Temp Corrected(°C): 4.9/4.1/5.3 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 4.05 Date and Initials of Person Examining Contents: Aug 30 2016

Question	Yes	No	N/A	Comments
Chain of Custody Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. No coc in two coolers.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. SED-4 4.5 -4.75 not received. However,
Chain of Custody Relinquished?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. SR received 3 containers labeled as
Sampler Name and/or Signature on COC?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. SED-4 4.5 -5.75 that has matching
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. date + time on the COC. SR will log this
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6. in as SED-4 4.5 -4.75 until further
Rush Turn Around Time Requested?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. No TAT clarification.
Sufficient Volume?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Correct Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All SED-9 samples do not have times
-Pace Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	as coc and labels. SR logged in
Containers Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. the date of 8/23/16 until further clarification
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12. (see email with project.)
-Includes Date/Time/ID/Analysis Matrix: <u>WT/SL</u>				Some samples do not have times
All containers needing acid/base preservation have been checked?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample # on the labels.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15. All 40ml voas are HCL preserved.
Pace Trip Blank Lot # (if purchased):				2 were received labeled as Trip blanks and were logged

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: in as on hold; as the last sample.
 Comments/Resolution: _____
 Field Data Required? Yes No

Project Manager Review: Scott Rms Date: 8/31/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

October 12, 2016

Stephanie Bosze-Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

RE: Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Dear Stephanie Bosze-Salisbury:

Enclosed are the analytical results for sample(s) received by the laboratory on October 04, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott M Forbes
scott.forbes@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
Alaska Certification UST-107
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322

Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Davis Certification IDs

2795 Second Street Suite 300 Davis, CA 95618
North Dakota Certification #: R-214
Oregon Certification #: CA300002
Washington Certification #: C926-15a

California Certification #: 08263CA
Minnesota Department of Health Certification #: 006-999-465

New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:
11277CA
Florida Department of Health (NELAC): E87595
Illinois Environmental Protection Agency: 0025721
Kansas Department of Health and Environment (NELAC):
E-10266
Louisiana Dept. of Environmental Quality (NELAC/LELAP):
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202
Texas Commission on Env. Quality (NELAC):
T104704405-09-TX
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119
Commonwealth of Virginia (TNI): 480246

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1276153001	S-2	Water	09/26/16 13:26	10/04/16 10:00
1276153002	MW-21i-105	Water	09/26/16 13:58	10/04/16 10:00
1276153003	MW-21i-40	Water	09/26/16 14:22	10/04/16 10:00
1276153004	MW-19	Water	09/26/16 15:23	10/04/16 10:00
1276153005	MW-14	Water	09/27/16 09:00	10/04/16 10:00
1276153006	MW-23i	Water	09/27/16 10:08	10/04/16 10:00
1276153007	MW-17	Water	09/27/16 10:50	10/04/16 10:00
1276153008	S-1	Water	09/27/16 11:50	10/04/16 10:00
1276153009	MW-26	Water	09/27/16 12:40	10/04/16 10:00
1276153010	MW-10	Water	09/27/16 13:30	10/04/16 10:00
1276153011	MW-1	Water	09/27/16 14:15	10/04/16 10:00
1276153012	MW-12	Water	09/27/16 15:00	10/04/16 10:00
1276153013	MW-12 DUP	Water	09/27/16 15:00	10/04/16 10:00
1276153014	MW-8	Water	09/27/16 16:25	10/04/16 10:00
1276153015	MW-13	Water	09/28/16 08:33	10/04/16 10:00
1276153016	MW-13 DUP	Water	09/28/16 08:33	10/04/16 10:00
1276153017	EX-1	Water	09/28/16 09:30	10/04/16 10:00
1276153018	MP-1	Water	09/28/16 10:30	10/04/16 10:00
1276153019	MW-24i	Water	09/28/16 11:15	10/04/16 10:00
1276153020	MW-22i	Water	09/28/16 12:10	10/04/16 10:00
1276153021	MW-16	Water	09/28/16 12:50	10/04/16 10:00
1276153022	MW-18i	Water	09/28/16 13:30	10/04/16 10:00
1276153023	MW-20i	Water	09/28/16 14:38	10/04/16 10:00
1276153024	MW-19i	Water	09/28/16 15:18	10/04/16 10:00
1276153025	MW-6	Water	09/28/16 16:08	10/04/16 10:00
1276153026	MW-25i	Water	09/29/16 08:00	10/04/16 10:00
1276153027	MW-2	Water	09/29/16 09:05	10/04/16 10:00
1276153028	EW-1	Water	09/29/16 09:55	10/04/16 10:00
1276153029	MW-5	Water	09/29/16 11:26	10/04/16 10:00
1276153030	MW-7	Water	09/29/16 12:10	10/04/16 10:00
1276153031	MW-7 DUP	Water	09/29/16 12:10	10/04/16 10:00
1276153032	MW-9	Water	09/29/16 12:58	10/04/16 10:00
1276153033	MGMS2-40	Water	09/29/16 15:25	10/04/16 10:00
1276153034	MGMS2-110	Water	09/29/16 16:07	10/04/16 10:00
1276153035	MGMS2-132	Water	09/29/16 16:25	10/04/16 10:00
1276153036	MW-3	Water	09/30/16 07:54	10/04/16 10:00
1276153037	MW-15	Water	09/30/16 08:33	10/04/16 10:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1276153038	MW-24d	Water	09/30/16 10:15	10/04/16 10:00
1276153039	Field Blank 1	Water	09/26/16 15:00	10/04/16 10:00
1276153040	Field Blank 2	Water	09/27/16 16:00	10/04/16 10:00
1276153041	Field Blank 3	Water	09/28/16 16:20	10/04/16 10:00
1276153042	Field Blank 4	Water	09/29/16 16:30	10/04/16 10:00
1276153043	Field Blank 5	Water	09/30/16 15:00	10/04/16 10:00
1276153044	Equipment Blank	Water	09/30/16 15:00	10/04/16 10:00
1276153045	Trip Blank	Water	09/30/16 15:00	10/04/16 10:00
1276153046	MGMS2-60	Water	09/30/16 11:12	10/04/16 10:00
1276153047	MGMS1-40	Water	09/30/16 11:43	10/04/16 10:00
1276153048	MGMS1-60	Water	09/30/16 12:15	10/04/16 10:00
1276153049	MGMS1-132	Water	09/30/16 12:45	10/04/16 10:00
1276153050	MGMS3-40	Water	09/30/16 13:25	10/04/16 10:00
1276153051	MGMS3-40 DUP	Water	09/30/16 13:25	10/04/16 10:00
1276153052	MGMS3-60	Water	09/30/16 13:54	10/04/16 10:00
1276153053	MGMS3-110	Water	09/30/16 14:25	10/04/16 10:00
1276153054	MGMS3-132	Water	09/30/16 14:45	10/04/16 10:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1276153001	S-2	EPA 8260B	JCP	31	PASI-DAV
1276153002	MW-21i-105	EPA 8260B	JCP	31	PASI-DAV
1276153003	MW-21i-40	EPA 8260B	JCP	31	PASI-DAV
1276153004	MW-19	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	SMS2	1	PASI-N
1276153005	MW-14	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	SMS2	1	PASI-N
1276153006	MW-23i	EPA 8260B	JCP	31	PASI-DAV
1276153007	MW-17	EPA 8260B	JCP	31	PASI-DAV
1276153008	S-1	EPA 8260B	JCP	31	PASI-DAV
1276153009	MW-26	EPA 8260B	JCP	31	PASI-DAV
1276153010	MW-10	EPA 8260B	JCP	31	PASI-DAV
1276153011	MW-1	EPA 8260B	JCP	31	PASI-DAV
1276153012	MW-12	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	SMS2	1	PASI-N
1276153013	MW-12 DUP	EPA 8260B	JCP	31	PASI-DAV
1276153014	MW-8	EPA 8260B	JCP	31	PASI-DAV
1276153015	MW-13	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1276153016	MW-13 DUP	EPA 8260B	JCP	31	PASI-DAV
1276153017	EX-1	EPA 8260B	JCP	31	PASI-DAV
1276153018	MP-1	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	SMS2	1	PASI-N
1276153019	MW-24i	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	SMS2	1	PASI-N
1276153020	MW-22i	EPA 8260B	JCP	31	PASI-DAV
1276153021	MW-16	EPA 8260B	JCP	31	PASI-DAV
1276153022	MW-18i	EPA 8260B	JCP	31	PASI-DAV
1276153023	MW-20i	EPA 8260B	JCP	31	PASI-DAV
1276153024	MW-19i	EPA 8260B	JCP	31	PASI-DAV
1276153025	MW-6	EPA 8260B	JCP	31	PASI-DAV

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1276153026	MW-25i	EPA 8260B	JCP	31	PASI-DAV
1276153027	MW-2	EPA 8260B	JCP	31	PASI-DAV
1276153028	EW-1	EPA 8260B	JCP	31	PASI-DAV
1276153029	MW-5	EPA 8260B	JCP	31	PASI-DAV
1276153030	MW-7	EPA 8260B	JCP	31	PASI-DAV
1276153031	MW-7 DUP	EPA 8260B	JCP	31	PASI-DAV
1276153032	MW-9	EPA 8260B	JCP	31	PASI-DAV
1276153033	MGMS2-40	EPA 8260B	JCP	31	PASI-DAV
1276153034	MGMS2-110	EPA 8260B	JCP	31	PASI-DAV
1276153035	MGMS2-132	EPA 8260B	JCP	31	PASI-DAV
1276153036	MW-3	EPA 8260B	JCP	31	PASI-DAV
1276153037	MW-15	EPA 8260B	JCP	31	PASI-DAV
1276153038	MW-24d	EPA 8260B	JCP	31	PASI-DAV
1276153039	Field Blank 1	EPA 8260B	JCP	31	PASI-DAV
1276153040	Field Blank 2	EPA 8260B	JCP	31	PASI-DAV
1276153041	Field Blank 3	EPA 8260B	JCP	31	PASI-DAV
1276153042	Field Blank 4	EPA 8260B	JCP	31	PASI-DAV
1276153043	Field Blank 5	EPA 8260B	JCP	31	PASI-DAV
1276153044	Equipment Blank	EPA 8260B	JCP	31	PASI-DAV
1276153045	Trip Blank	EPA 8260B	JCP	31	PASI-DAV
1276153046	MGMS2-60	EPA 8260B	JCP	31	PASI-DAV
1276153047	MGMS1-40	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	SMS2	1	PASI-N
1276153048	MGMS1-60	EPA 8260B	JCP	31	PASI-DAV
1276153049	MGMS1-132	EPA 8260B	JCP	31	PASI-DAV
1276153050	MGMS3-40	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	SMS2	1	PASI-N
1276153051	MGMS3-40 DUP	EPA 8260B	JCP	31	PASI-DAV
1276153052	MGMS3-60	EPA 8260B	JCP	31	PASI-DAV
1276153053	MGMS3-110	EPA 8260B	JCP	31	PASI-DAV
1276153054	MGMS3-132	EPA 8260B	JCP	31	PASI-DAV

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: S-2		Lab ID: 1276153001	Collected: 09/26/16 13:26	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 01:31	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 01:31	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 01:31	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 01:31	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 01:31	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 01:31	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 01:31	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 01:31	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 01:31	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 01:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 01:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 01:31	106-46-7	
1,1-Dichloroethane	6.2	ug/L	0.50	1		10/05/16 01:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 01:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 01:31	75-35-4	
cis-1,2-Dichloroethene	11.0	ug/L	0.50	1		10/05/16 01:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 01:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 01:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 01:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 01:31	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 01:31	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 01:31	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/05/16 01:31	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 01:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 01:31	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/05/16 01:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 01:31	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 01:31	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1		10/05/16 01:31	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/05/16 01:31	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1		10/05/16 01:31	460-00-4	

Sample: MW-21i-105		Lab ID: 1276153002	Collected: 09/26/16 13:58	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 01:51	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 01:51	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 01:51	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 01:51	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 01:51	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 01:51	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 01:51	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 01:51	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-21i-105		Lab ID: 1276153002	Collected: 09/26/16 13:58	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 01:51	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 01:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 01:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 01:51	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 01:51	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 01:51	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 01:51	75-35-4	
cis-1,2-Dichloroethene	11.7	ug/L	0.50	1		10/05/16 01:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 01:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 01:51	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 01:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 01:51	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 01:51	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 01:51	79-34-5	
Tetrachloroethene	5.8	ug/L	0.50	1		10/05/16 01:51	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 01:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 01:51	79-00-5	
Trichloroethene	5.1	ug/L	0.50	1		10/05/16 01:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 01:51	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 01:51	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/05/16 01:51	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/05/16 01:51	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1		10/05/16 01:51	460-00-4	

Sample: MW-21i-40		Lab ID: 1276153003	Collected: 09/26/16 14:22	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 02:09	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 02:09	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 02:09	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 02:09	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 02:09	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 02:09	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 02:09	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 02:09	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 02:09	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:09	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:09	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:09	106-46-7	
1,1-Dichloroethane	2.6	ug/L	0.50	1		10/05/16 02:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 02:09	107-06-2	
1,1-Dichloroethene	0.87	ug/L	0.50	1		10/05/16 02:09	75-35-4	
cis-1,2-Dichloroethene	77.2	ug/L	0.50	1		10/05/16 02:09	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-21i-40		Lab ID: 1276153003	Collected: 09/26/16 14:22	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 02:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 02:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 02:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 02:09	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 02:09	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 02:09	79-34-5	
Tetrachloroethene	20.1	ug/L	0.50	1		10/05/16 02:09	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 02:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 02:09	79-00-5	
Trichloroethene	19.8	ug/L	0.50	1		10/05/16 02:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 02:09	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 02:09	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/05/16 02:09	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/05/16 02:09	2037-26-5	
4-Bromofluorobenzene (S)	99	%	70-130	1		10/05/16 02:09	460-00-4	

Sample: MW-19		Lab ID: 1276153004	Collected: 09/26/16 15:23	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		10/10/16 10:34	74-84-0	
Ethene	ND	ug/L	10.0	1		10/10/16 10:34	74-85-1	
Methane	948	ug/L	10.0	1		10/10/16 10:34	74-82-8	
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		10/07/16 22:25	75-27-4	
Bromoform	ND	ug/L	5.0	10		10/07/16 22:25	75-25-2	
Bromomethane	ND	ug/L	200	10		10/07/16 22:25	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		10/07/16 22:25	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		10/07/16 22:25	108-90-7	
Chloroethane	ND	ug/L	20.0	10		10/07/16 22:25	75-00-3	
Chloroform	ND	ug/L	5.0	10		10/07/16 22:25	67-66-3	
Chloromethane	ND	ug/L	5.0	10		10/07/16 22:25	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		10/07/16 22:25	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		10/07/16 22:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		10/07/16 22:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		10/07/16 22:25	106-46-7	
1,1-Dichloroethane	10.4	ug/L	5.0	10		10/07/16 22:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		10/07/16 22:25	107-06-2	
1,1-Dichloroethene	11.0	ug/L	5.0	10		10/07/16 22:25	75-35-4	
cis-1,2-Dichloroethene	235	ug/L	5.0	10		10/07/16 22:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	10		10/07/16 22:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		10/07/16 22:25	78-87-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-19		Lab ID: 1276153004		Collected: 09/26/16 15:23		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		10/07/16 22:25	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		10/07/16 22:25	10061-02-6		
Methylene Chloride	ND	ug/L	50.0	10		10/07/16 22:25	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		10/07/16 22:25	79-34-5		
Tetrachloroethene	1520	ug/L	5.0	10		10/07/16 22:25	127-18-4		
1,1,1-Trichloroethane	14.5	ug/L	5.0	10		10/07/16 22:25	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	5.0	10		10/07/16 22:25	79-00-5		
Trichloroethene	592	ug/L	5.0	10		10/07/16 22:25	79-01-6		
Trichlorofluoromethane	ND	ug/L	5.0	10		10/07/16 22:25	75-69-4		
Vinyl chloride	10.1	ug/L	5.0	10		10/07/16 22:25	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	10		10/07/16 22:25	17060-07-0		
Toluene-d8 (S)	102	%	70-130	10		10/07/16 22:25	2037-26-5		
4-Bromofluorobenzene (S)	98	%	70-130	10		10/07/16 22:25	460-00-4		
5310B TOC		Analytical Method: SM 5310B							
Total Organic Carbon	1.9	mg/L	1.0	1		10/06/16 21:06	7440-44-0		

Sample: MW-14		Lab ID: 1276153005		Collected: 09/27/16 09:00		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		10/10/16 10:50	74-84-0		
Ethene	ND	ug/L	10.0	1		10/10/16 10:50	74-85-1		
Methane	ND	ug/L	10.0	1		10/10/16 10:50	74-82-8		
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 22:58	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/05/16 22:58	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 22:58	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 22:58	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 22:58	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/05/16 22:58	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 22:58	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 22:58	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 22:58	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:58	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:58	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:58	106-46-7		
1,1-Dichloroethane	7.2	ug/L	0.50	1		10/05/16 22:58	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 22:58	107-06-2		
1,1-Dichloroethene	2.1	ug/L	0.50	1		10/05/16 22:58	75-35-4		
cis-1,2-Dichloroethene	61.8	ug/L	0.50	1		10/05/16 22:58	156-59-2		
trans-1,2-Dichloroethene	0.94	ug/L	0.50	1		10/05/16 22:58	156-60-5		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-14	Lab ID: 1276153005	Collected: 09/27/16 09:00	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 22:58	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:58	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 22:58	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 22:58	79-34-5	
Tetrachloroethene	100	ug/L	0.50	1		10/05/16 22:58	127-18-4	
1,1,1-Trichloroethane	1.7	ug/L	0.50	1		10/05/16 22:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 22:58	79-00-5	
Trichloroethene	218	ug/L	2.5	5		10/05/16 03:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 22:58	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 22:58	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/05/16 22:58	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/05/16 22:58	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/05/16 22:58	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	8.8	mg/L	5.0	5		10/06/16 21:25	7440-44-0	

Sample: MW-23i	Lab ID: 1276153006	Collected: 09/27/16 10:08	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 02:29	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 02:29	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 02:29	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 02:29	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 02:29	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 02:29	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 02:29	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 02:29	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 02:29	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:29	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 02:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 02:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 02:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 02:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 02:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 02:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 02:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 02:29	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 02:29	75-09-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-23i		Lab ID: 1276153006		Collected: 09/27/16 10:08		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 02:29	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		10/05/16 02:29	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 02:29	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 02:29	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		10/05/16 02:29	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 02:29	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 02:29	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/05/16 02:29	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		10/05/16 02:29	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	1		10/05/16 02:29	460-00-4		

Sample: MW-17		Lab ID: 1276153007		Collected: 09/27/16 10:50		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 02:48	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/05/16 02:48	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 02:48	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 02:48	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 02:48	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/05/16 02:48	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 02:48	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 02:48	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 02:48	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:48	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:48	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 02:48	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 02:48	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 02:48	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 02:48	75-35-4		
cis-1,2-Dichloroethene	1.5	ug/L	0.50	1		10/05/16 02:48	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 02:48	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 02:48	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 02:48	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 02:48	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 02:48	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 02:48	79-34-5		
Tetrachloroethene	4.2	ug/L	0.50	1		10/05/16 02:48	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 02:48	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 02:48	79-00-5		
Trichloroethene	10.4	ug/L	0.50	1		10/05/16 02:48	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 02:48	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 02:48	75-01-4		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-17	Lab ID: 1276153007	Collected: 09/27/16 10:50	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

8260 MSV Med Water Analytical Method: EPA 8260B

Surrogates

1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		10/05/16 02:48	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/05/16 02:48	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		10/05/16 02:48	460-00-4	

Sample: S-1	Lab ID: 1276153008	Collected: 09/27/16 11:50	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

8260 MSV Med Water Analytical Method: EPA 8260B

Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 15:31	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 15:31	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 15:31	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 15:31	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 15:31	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 15:31	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 15:31	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 15:31	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 15:31	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 15:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 15:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 15:31	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 15:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 15:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 15:31	75-35-4	
cis-1,2-Dichloroethene	1.1	ug/L	0.50	1		10/05/16 15:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 15:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 15:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 15:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 15:31	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 15:31	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 15:31	79-34-5	
Tetrachloroethene	0.73	ug/L	0.50	1		10/05/16 15:31	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 15:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 15:31	79-00-5	
Trichloroethene	3.0	ug/L	0.50	1		10/05/16 15:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 15:31	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 15:31	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1		10/05/16 15:31	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/05/16 15:31	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		10/05/16 15:31	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-26		Lab ID: 1276153009	Collected: 09/27/16 12:40	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/10/16 22:20	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/10/16 22:20	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/10/16 22:20	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/10/16 22:20	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/10/16 22:20	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/10/16 22:20	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/10/16 22:20	67-66-3	
Chloromethane	ND	ug/L	2.0	1		10/10/16 22:20	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/10/16 22:20	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/10/16 22:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/10/16 22:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/10/16 22:20	106-46-7	
1,1-Dichloroethane	3.9	ug/L	0.50	1		10/10/16 22:20	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/10/16 22:20	107-06-2	
1,1-Dichloroethene	1.1	ug/L	0.50	1		10/10/16 22:20	75-35-4	
cis-1,2-Dichloroethene	61.1	ug/L	0.50	1		10/10/16 22:20	156-59-2	
trans-1,2-Dichloroethene	1.6	ug/L	0.50	1		10/10/16 22:20	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/10/16 22:20	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/10/16 22:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/10/16 22:20	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/10/16 22:20	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/10/16 22:20	79-34-5	
Tetrachloroethene	160	ug/L	0.50	1		10/10/16 22:20	127-18-4	
1,1,1-Trichloroethane	2.4	ug/L	0.50	1		10/10/16 22:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/10/16 22:20	79-00-5	
Trichloroethene	288	ug/L	1.7	3.33		10/05/16 16:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/10/16 22:20	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/10/16 22:20	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/10/16 22:20	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		10/10/16 22:20	2037-26-5	
4-Bromofluorobenzene (S)	91	%	70-130	1		10/10/16 22:20	460-00-4	

Sample: MW-10		Lab ID: 1276153010	Collected: 09/27/16 13:30	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 15:51	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 15:51	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 15:51	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 15:51	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 15:51	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 15:51	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 15:51	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 15:51	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-10		Lab ID: 1276153010		Collected: 09/27/16 13:30		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 15:51	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 15:51	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 15:51	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 15:51	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 15:51	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 15:51	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 15:51	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 15:51	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 15:51	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 15:51	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 15:51	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 15:51	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 15:51	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 15:51	79-34-5		
Tetrachloroethene	1.6	ug/L	0.50	1		10/05/16 15:51	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 15:51	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 15:51	79-00-5		
Trichloroethene	1.4	ug/L	0.50	1		10/05/16 15:51	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 15:51	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 15:51	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/05/16 15:51	17060-07-0		
Toluene-d8 (S)	102	%	70-130	1		10/05/16 15:51	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	1		10/05/16 15:51	460-00-4		

Sample: MW-1		Lab ID: 1276153011		Collected: 09/27/16 14:15		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 16:10	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/05/16 16:10	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 16:10	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 16:10	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 16:10	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/05/16 16:10	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 16:10	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 16:10	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 16:10	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 16:10	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 16:10	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 16:10	106-46-7		
1,1-Dichloroethane	8.6	ug/L	0.50	1		10/05/16 16:10	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 16:10	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 16:10	75-35-4		
cis-1,2-Dichloroethene	25.2	ug/L	0.50	1		10/05/16 16:10	156-59-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-1		Lab ID: 1276153011		Collected: 09/27/16 14:15		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 16:10	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 16:10	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 16:10	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 16:10	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 16:10	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 16:10	79-34-5		
Tetrachloroethene	2.3	ug/L	0.50	1		10/05/16 16:10	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 16:10	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 16:10	79-00-5		
Trichloroethene	3.1	ug/L	0.50	1		10/05/16 16:10	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 16:10	75-69-4		
Vinyl chloride	23.9	ug/L	0.50	1		10/05/16 16:10	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/05/16 16:10	17060-07-0		
Toluene-d8 (S)	102	%	70-130	1		10/05/16 16:10	2037-26-5		
4-Bromofluorobenzene (S)	99	%	70-130	1		10/05/16 16:10	460-00-4		

Sample: MW-12		Lab ID: 1276153012		Collected: 09/27/16 15:00		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	31.8	ug/L	10.0	1		10/10/16 10:59	74-84-0		
Ethene	ND	ug/L	10.0	1		10/10/16 10:59	74-85-1		
Methane	898	ug/L	10.0	1		10/10/16 10:59	74-82-8		
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	10.0	20		10/05/16 11:00	75-27-4		
Bromoform	ND	ug/L	10.0	20		10/05/16 11:00	75-25-2		
Bromomethane	ND	ug/L	400	20		10/05/16 11:00	74-83-9		
Carbon tetrachloride	ND	ug/L	10.0	20		10/05/16 11:00	56-23-5		
Chlorobenzene	ND	ug/L	10.0	20		10/05/16 11:00	108-90-7		
Chloroethane	ND	ug/L	40.0	20		10/05/16 11:00	75-00-3		
Chloroform	ND	ug/L	10.0	20		10/05/16 11:00	67-66-3		
Chloromethane	ND	ug/L	10.0	20		10/05/16 11:00	74-87-3		
Dibromochloromethane	ND	ug/L	10.0	20		10/05/16 11:00	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	10.0	20		10/05/16 11:00	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	10.0	20		10/05/16 11:00	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	10.0	20		10/05/16 11:00	106-46-7		
1,1-Dichloroethane	26.0	ug/L	10.0	20		10/05/16 11:00	75-34-3		
1,2-Dichloroethane	ND	ug/L	10.0	20		10/05/16 11:00	107-06-2		
1,1-Dichloroethene	ND	ug/L	10.0	20		10/05/16 11:00	75-35-4		
cis-1,2-Dichloroethene	525	ug/L	10.0	20		10/05/16 11:00	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	10.0	20		10/05/16 11:00	156-60-5		
1,2-Dichloropropane	ND	ug/L	10.0	20		10/05/16 11:00	78-87-5		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-12		Lab ID: 1276153012		Collected: 09/27/16 15:00		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
cis-1,3-Dichloropropene	ND	ug/L	10.0	20		10/05/16 11:00	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	10.0	20		10/05/16 11:00	10061-02-6		
Methylene Chloride	ND	ug/L	100	20		10/05/16 11:00	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	20		10/05/16 11:00	79-34-5		
Tetrachloroethene	67.6	ug/L	10.0	20		10/05/16 11:00	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	10.0	20		10/05/16 11:00	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	10.0	20		10/05/16 11:00	79-00-5		
Trichloroethene	45.4	ug/L	10.0	20		10/05/16 11:00	79-01-6		
Trichlorofluoromethane	ND	ug/L	10.0	20		10/05/16 11:00	75-69-4		
Vinyl chloride	14.8	ug/L	10.0	20		10/05/16 11:00	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	20		10/05/16 11:00	17060-07-0		
Toluene-d8 (S)	101	%	70-130	20		10/05/16 11:00	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	20		10/05/16 11:00	460-00-4		
5310B TOC		Analytical Method: SM 5310B							
Total Organic Carbon	5240	mg/L	100	100		10/06/16 21:44	7440-44-0		

Sample: MW-12 DUP		Lab ID: 1276153013		Collected: 09/27/16 15:00		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	2.5	5		10/10/16 23:00	75-27-4		
Bromoform	ND	ug/L	2.5	5		10/10/16 23:00	75-25-2		
Bromomethane	ND	ug/L	100	5		10/10/16 23:00	74-83-9		
Carbon tetrachloride	ND	ug/L	2.5	5		10/10/16 23:00	56-23-5		
Chlorobenzene	ND	ug/L	2.5	5		10/10/16 23:00	108-90-7		
Chloroethane	ND	ug/L	10.0	5		10/10/16 23:00	75-00-3		
Chloroform	ND	ug/L	2.5	5		10/10/16 23:00	67-66-3		
Chloromethane	ND	ug/L	10.0	5		10/10/16 23:00	74-87-3		
Dibromochloromethane	ND	ug/L	2.5	5		10/10/16 23:00	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	2.5	5		10/10/16 23:00	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	2.5	5		10/10/16 23:00	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	2.5	5		10/10/16 23:00	106-46-7		
1,1-Dichloroethane	44.4	ug/L	2.5	5		10/10/16 23:00	75-34-3		
1,2-Dichloroethane	ND	ug/L	2.5	5		10/10/16 23:00	107-06-2		
1,1-Dichloroethene	11.5	ug/L	2.5	5		10/10/16 23:00	75-35-4		
cis-1,2-Dichloroethene	867	ug/L	2.5	5		10/10/16 23:00	156-59-2		
trans-1,2-Dichloroethene	11.4	ug/L	2.5	5		10/10/16 23:00	156-60-5		
1,2-Dichloropropane	ND	ug/L	2.5	5		10/10/16 23:00	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	2.5	5		10/10/16 23:00	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	2.5	5		10/10/16 23:00	10061-02-6		
Methylene Chloride	ND	ug/L	25.0	5		10/10/16 23:00	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	2.5	5		10/10/16 23:00	79-34-5		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-12 DUP		Lab ID: 1276153013	Collected: 09/27/16 15:00	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Tetrachloroethene	387	ug/L	2.5	5		10/10/16 23:00	127-18-4	
1,1,1-Trichloroethane	3.9	ug/L	2.5	5		10/10/16 23:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.5	5		10/10/16 23:00	79-00-5	
Trichloroethene	163	ug/L	2.5	5		10/10/16 23:00	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.5	5		10/10/16 23:00	75-69-4	
Vinyl chloride	22.6	ug/L	2.5	5		10/10/16 23:00	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	5		10/10/16 23:00	17060-07-0	
Toluene-d8 (S)	93	%	70-130	5		10/10/16 23:00	2037-26-5	
4-Bromofluorobenzene (S)	83	%	70-130	5		10/10/16 23:00	460-00-4	

Sample: MW-8		Lab ID: 1276153014	Collected: 09/27/16 16:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 16:29	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 16:29	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 16:29	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 16:29	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 16:29	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 16:29	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 16:29	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 16:29	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 16:29	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 16:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 16:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 16:29	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 16:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 16:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 16:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 16:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 16:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 16:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 16:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 16:29	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 16:29	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 16:29	79-34-5	
Tetrachloroethene	5.3	ug/L	0.50	1		10/05/16 16:29	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 16:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 16:29	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/05/16 16:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 16:29	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 16:29	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/05/16 16:29	17060-07-0	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-8		Lab ID: 1276153014	Collected: 09/27/16 16:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Surrogates								
Toluene-d8 (S)	101	%.	70-130	1		10/05/16 16:29	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		10/05/16 16:29	460-00-4	

Sample: MW-13		Lab ID: 1276153015	Collected: 09/28/16 08:33	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		10/10/16 11:07	74-84-0	
Ethene	ND	ug/L	10.0	1		10/10/16 11:07	74-85-1	
Methane	ND	ug/L	10.0	1		10/10/16 11:07	74-82-8	

8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	25.0	50		10/11/16 00:39	75-27-4	
Bromoform	ND	ug/L	25.0	50		10/11/16 00:39	75-25-2	
Bromomethane	ND	ug/L	1000	50		10/11/16 00:39	74-83-9	
Carbon tetrachloride	ND	ug/L	25.0	50		10/11/16 00:39	56-23-5	
Chlorobenzene	ND	ug/L	25.0	50		10/11/16 00:39	108-90-7	
Chloroethane	ND	ug/L	100	50		10/11/16 00:39	75-00-3	
Chloroform	ND	ug/L	25.0	50		10/11/16 00:39	67-66-3	
Chloromethane	ND	ug/L	100	50		10/11/16 00:39	74-87-3	
Dibromochloromethane	ND	ug/L	25.0	50		10/11/16 00:39	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	25.0	50		10/11/16 00:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	25.0	50		10/11/16 00:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	25.0	50		10/11/16 00:39	106-46-7	
1,1-Dichloroethane	ND	ug/L	25.0	50		10/11/16 00:39	75-34-3	
1,2-Dichloroethane	ND	ug/L	25.0	50		10/11/16 00:39	107-06-2	
1,1-Dichloroethene	ND	ug/L	25.0	50		10/11/16 00:39	75-35-4	
cis-1,2-Dichloroethene	148	ug/L	25.0	50		10/11/16 00:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	25.0	50		10/11/16 00:39	156-60-5	
1,2-Dichloropropane	ND	ug/L	25.0	50		10/11/16 00:39	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	25.0	50		10/11/16 00:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	25.0	50		10/11/16 00:39	10061-02-6	
Methylene Chloride	ND	ug/L	250	50		10/11/16 00:39	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	25.0	50		10/11/16 00:39	79-34-5	
Tetrachloroethene	4840	ug/L	25.0	50		10/11/16 00:39	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	25.0	50		10/11/16 00:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	25.0	50		10/11/16 00:39	79-00-5	
Trichloroethene	895	ug/L	25.0	50		10/11/16 00:39	79-01-6	
Trichlorofluoromethane	ND	ug/L	25.0	50		10/11/16 00:39	75-69-4	
Vinyl chloride	ND	ug/L	25.0	50		10/11/16 00:39	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	50		10/11/16 00:39	17060-07-0	
Toluene-d8 (S)	94	%.	70-130	50		10/11/16 00:39	2037-26-5	
4-Bromofluorobenzene (S)	83	%.	70-130	50		10/11/16 00:39	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-13		Lab ID: 1276153015	Collected: 09/28/16 08:33	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

5310B TOC

Analytical Method: SM 5310B

Total Organic Carbon	33600	mg/L	1000	1000		10/11/16 10:07	7440-44-0	M6
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Sample: MW-13 DUP

Lab ID: 1276153016

Collected: 09/28/16 08:33

Received: 10/04/16 10:00

Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8260 MSV Med Water

Analytical Method: EPA 8260B

Bromodichloromethane	ND	ug/L	25.0	50		10/11/16 00:19	75-27-4	
Bromoform	ND	ug/L	25.0	50		10/11/16 00:19	75-25-2	
Bromomethane	ND	ug/L	1000	50		10/11/16 00:19	74-83-9	
Carbon tetrachloride	ND	ug/L	25.0	50		10/11/16 00:19	56-23-5	
Chlorobenzene	ND	ug/L	25.0	50		10/11/16 00:19	108-90-7	
Chloroethane	ND	ug/L	100	50		10/11/16 00:19	75-00-3	
Chloroform	ND	ug/L	25.0	50		10/11/16 00:19	67-66-3	
Chloromethane	ND	ug/L	100	50		10/11/16 00:19	74-87-3	
Dibromochloromethane	ND	ug/L	25.0	50		10/11/16 00:19	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	25.0	50		10/11/16 00:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	25.0	50		10/11/16 00:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	25.0	50		10/11/16 00:19	106-46-7	
1,1-Dichloroethane	ND	ug/L	25.0	50		10/11/16 00:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	25.0	50		10/11/16 00:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	25.0	50		10/11/16 00:19	75-35-4	
cis-1,2-Dichloroethene	145	ug/L	25.0	50		10/11/16 00:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	25.0	50		10/11/16 00:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	25.0	50		10/11/16 00:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	25.0	50		10/11/16 00:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	25.0	50		10/11/16 00:19	10061-02-6	
Methylene Chloride	ND	ug/L	250	50		10/11/16 00:19	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	25.0	50		10/11/16 00:19	79-34-5	
Tetrachloroethene	5090	ug/L	25.0	50		10/11/16 00:19	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	25.0	50		10/11/16 00:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	25.0	50		10/11/16 00:19	79-00-5	
Trichloroethene	951	ug/L	25.0	50		10/11/16 00:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	25.0	50		10/11/16 00:19	75-69-4	
Vinyl chloride	ND	ug/L	25.0	50		10/11/16 00:19	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	50		10/11/16 00:19	17060-07-0	
Toluene-d8 (S)	95	%.	70-130	50		10/11/16 00:19	2037-26-5	
4-Bromofluorobenzene (S)	85	%.	70-130	50		10/11/16 00:19	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: EX-1		Lab ID: 1276153017		Collected: 09/28/16 09:30		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	1.7	3.33		10/05/16 17:08	75-27-4		
Bromoform	ND	ug/L	1.7	3.33		10/05/16 17:08	75-25-2		
Bromomethane	ND	ug/L	66.6	3.33		10/05/16 17:08	74-83-9		
Carbon tetrachloride	ND	ug/L	1.7	3.33		10/05/16 17:08	56-23-5		
Chlorobenzene	ND	ug/L	1.7	3.33		10/05/16 17:08	108-90-7		
Chloroethane	ND	ug/L	6.7	3.33		10/05/16 17:08	75-00-3		
Chloroform	ND	ug/L	1.7	3.33		10/05/16 17:08	67-66-3		
Chloromethane	ND	ug/L	1.7	3.33		10/05/16 17:08	74-87-3		
Dibromochloromethane	ND	ug/L	1.7	3.33		10/05/16 17:08	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	1.7	3.33		10/05/16 17:08	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	1.7	3.33		10/05/16 17:08	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	1.7	3.33		10/05/16 17:08	106-46-7		
1,1-Dichloroethane	4.6	ug/L	1.7	3.33		10/05/16 17:08	75-34-3		
1,2-Dichloroethane	ND	ug/L	1.7	3.33		10/05/16 17:08	107-06-2		
1,1-Dichloroethene	3.5	ug/L	1.7	3.33		10/05/16 17:08	75-35-4		
cis-1,2-Dichloroethene	2230	ug/L	12.5	25		10/11/16 00:00	156-59-2		
trans-1,2-Dichloroethene	3.8	ug/L	1.7	3.33		10/05/16 17:08	156-60-5		
1,2-Dichloropropane	ND	ug/L	1.7	3.33		10/05/16 17:08	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	1.7	3.33		10/05/16 17:08	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	1.7	3.33		10/05/16 17:08	10061-02-6		
Methylene Chloride	ND	ug/L	16.6	3.33		10/05/16 17:08	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	1.7	3.33		10/05/16 17:08	79-34-5		
Tetrachloroethene	39.4	ug/L	1.7	3.33		10/05/16 17:08	127-18-4		
1,1,1-Trichloroethane	2.5	ug/L	1.7	3.33		10/05/16 17:08	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	1.7	3.33		10/05/16 17:08	79-00-5		
Trichloroethene	549	ug/L	1.7	3.33		10/05/16 17:08	79-01-6		
Trichlorofluoromethane	ND	ug/L	1.7	3.33		10/05/16 17:08	75-69-4		
Vinyl chloride	128	ug/L	1.7	3.33		10/05/16 17:08	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	3.33		10/05/16 17:08	17060-07-0		
Toluene-d8 (S)	102	%	70-130	3.33		10/05/16 17:08	2037-26-5		
4-Bromofluorobenzene (S)	100	%	70-130	3.33		10/05/16 17:08	460-00-4		

Sample: MP-1		Lab ID: 1276153018		Collected: 09/28/16 10:30		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		10/10/16 11:15	74-84-0		
Ethene	ND	ug/L	10.0	1		10/10/16 11:15	74-85-1		
Methane	4000	ug/L	10.0	1		10/10/16 11:15	74-82-8		
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/11/16 13:54	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/11/16 13:54	75-25-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MP-1	Lab ID: 1276153018	Collected: 09/28/16 10:30	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromomethane	ND	ug/L	20.0	1		10/11/16 13:54	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/11/16 13:54	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/11/16 13:54	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/11/16 13:54	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/11/16 13:54	67-66-3	
Chloromethane	ND	ug/L	2.0	1		10/11/16 13:54	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/11/16 13:54	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:54	106-46-7	
1,1-Dichloroethane	1.3	ug/L	0.50	1		10/11/16 13:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/11/16 13:54	107-06-2	
1,1-Dichloroethene	3.1	ug/L	0.50	1		10/11/16 13:54	75-35-4	
cis-1,2-Dichloroethene	40.5	ug/L	0.50	1		10/11/16 13:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/11/16 13:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/11/16 13:54	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/11/16 13:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/11/16 13:54	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/11/16 13:54	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/11/16 13:54	79-34-5	
Tetrachloroethene	99.4	ug/L	0.50	1		10/11/16 13:54	127-18-4	M1
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/11/16 13:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/11/16 13:54	79-00-5	
Trichloroethene	35.5	ug/L	0.50	1		10/11/16 13:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/11/16 13:54	75-69-4	
Vinyl chloride	3.3	ug/L	0.50	1		10/11/16 13:54	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/11/16 13:54	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		10/11/16 13:54	2037-26-5	
4-Bromofluorobenzene (S)	90	%	70-130	1		10/11/16 13:54	460-00-4	

Sample: 5310B TOC	Lab ID: 1276153018	Collected: 09/28/16 11:15	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Total Organic Carbon	2620	mg/L	250	250		10/07/16 19:26	7440-44-0	

Sample: MW-24i	Lab ID: 1276153019	Collected: 09/28/16 11:15	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		10/10/16 11:23	74-84-0	
Ethene	ND	ug/L	10.0	1		10/10/16 11:23	74-85-1	
Methane	ND	ug/L	10.0	1		10/10/16 11:23	74-82-8	

Sample: 8260 MSV Med Water	Lab ID: 1276153018	Collected: 09/28/16 11:15	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 19:08	75-27-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-24i		Lab ID: 1276153019		Collected: 09/28/16 11:15		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromoform	ND	ug/L	0.50	1		10/05/16 19:08	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 19:08	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 19:08	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 19:08	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/05/16 19:08	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 19:08	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 19:08	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 19:08	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 19:08	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 19:08	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 19:08	106-46-7		
1,1-Dichloroethane	0.53	ug/L	0.50	1		10/05/16 19:08	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 19:08	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 19:08	75-35-4		
cis-1,2-Dichloroethene	5.4	ug/L	0.50	1		10/05/16 19:08	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 19:08	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 19:08	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 19:08	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 19:08	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 19:08	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 19:08	79-34-5		
Tetrachloroethene	5.8	ug/L	0.50	1		10/05/16 19:08	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 19:08	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 19:08	79-00-5		
Trichloroethene	3.1	ug/L	0.50	1		10/05/16 19:08	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 19:08	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 19:08	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/05/16 19:08	17060-07-0		
Toluene-d8 (S)	102	%	70-130	1		10/05/16 19:08	2037-26-5		
4-Bromofluorobenzene (S)	98	%	70-130	1		10/05/16 19:08	460-00-4		
5310B TOC		Analytical Method: SM 5310B							
Total Organic Carbon	5.3	mg/L	1.0	1		10/06/16 22:41	7440-44-0		

Sample: MW-22i		Lab ID: 1276153020		Collected: 09/28/16 12:10		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 20:44	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/05/16 20:44	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 20:44	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 20:44	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 20:44	108-90-7		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-22i		Lab ID: 1276153020		Collected: 09/28/16 12:10		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Chloroethane	ND	ug/L	2.0	1		10/05/16 20:44	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 20:44	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 20:44	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 20:44	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 20:44	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 20:44	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 20:44	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 20:44	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 20:44	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 20:44	75-35-4		
cis-1,2-Dichloroethene	8.1	ug/L	0.50	1		10/05/16 20:44	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 20:44	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 20:44	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 20:44	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 20:44	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 20:44	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 20:44	79-34-5		
Tetrachloroethene	1.3	ug/L	0.50	1		10/05/16 20:44	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 20:44	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 20:44	79-00-5		
Trichloroethene	9.0	ug/L	0.50	1		10/05/16 20:44	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 20:44	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 20:44	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		10/05/16 20:44	17060-07-0		
Toluene-d8 (S)	102	%.	70-130	1		10/05/16 20:44	2037-26-5		
4-Bromofluorobenzene (S)	99	%.	70-130	1		10/05/16 20:44	460-00-4		

Sample: MW-16		Lab ID: 1276153021		Collected: 09/28/16 12:50		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 21:03	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/05/16 21:03	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 21:03	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 21:03	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 21:03	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/05/16 21:03	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 21:03	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 21:03	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 21:03	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:03	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:03	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:03	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 21:03	75-34-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-16		Lab ID: 1276153021	Collected: 09/28/16 12:50	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 21:03	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 21:03	75-35-4	
cis-1,2-Dichloroethene	9.5	ug/L	0.50	1		10/05/16 21:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 21:03	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 21:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 21:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 21:03	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 21:03	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 21:03	79-34-5	
Tetrachloroethene	144	ug/L	0.50	1		10/05/16 21:03	127-18-4	
1,1,1-Trichloroethane	0.66	ug/L	0.50	1		10/05/16 21:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 21:03	79-00-5	
Trichloroethene	35.6	ug/L	0.50	1		10/05/16 21:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 21:03	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 21:03	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/05/16 21:03	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/05/16 21:03	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/05/16 21:03	460-00-4	

Sample: MW-18i		Lab ID: 1276153022	Collected: 09/28/16 13:30	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 21:22	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 21:22	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 21:22	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 21:22	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 21:22	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 21:22	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 21:22	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 21:22	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 21:22	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:22	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 21:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 21:22	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 21:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 21:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 21:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 21:22	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 21:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 21:22	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 21:22	75-09-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-18i		Lab ID: 1276153022	Collected: 09/28/16 13:30	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 21:22	79-34-5	
Tetrachloroethene	1.4	ug/L	0.50	1		10/05/16 21:22	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 21:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 21:22	79-00-5	
Trichloroethene	0.85	ug/L	0.50	1		10/05/16 21:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 21:22	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 21:22	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/05/16 21:22	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/05/16 21:22	2037-26-5	
4-Bromofluorobenzene (S)	99	%	70-130	1		10/05/16 21:22	460-00-4	

Sample: MW-20i		Lab ID: 1276153023	Collected: 09/28/16 14:38	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 21:41	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 21:41	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 21:41	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 21:41	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 21:41	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 21:41	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 21:41	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 21:41	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 21:41	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 21:41	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 21:41	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 21:41	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 21:41	75-35-4	
cis-1,2-Dichloroethene	8.7	ug/L	0.50	1		10/05/16 21:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 21:41	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 21:41	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 21:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 21:41	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 21:41	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 21:41	79-34-5	
Tetrachloroethene	4.0	ug/L	0.50	1		10/05/16 21:41	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 21:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 21:41	79-00-5	
Trichloroethene	2.2	ug/L	0.50	1		10/05/16 21:41	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 21:41	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 21:41	75-01-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-20i		Lab ID: 1276153023		Collected: 09/28/16 14:38	Received: 10/04/16 10:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/05/16 21:41	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/05/16 21:41	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/05/16 21:41	460-00-4	

Sample: MW-19i		Lab ID: 1276153024		Collected: 09/28/16 15:18	Received: 10/04/16 10:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 22:01	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 22:01	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 22:01	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 22:01	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 22:01	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 22:01	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 22:01	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 22:01	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 22:01	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:01	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 22:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 22:01	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 22:01	75-35-4	
cis-1,2-Dichloroethene	5.9	ug/L	0.50	1		10/05/16 22:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 22:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 22:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:01	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 22:01	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 22:01	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/05/16 22:01	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 22:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 22:01	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/05/16 22:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 22:01	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 22:01	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/05/16 22:01	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/05/16 22:01	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/05/16 22:01	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-6		Lab ID: 1276153025		Collected: 09/28/16 16:08		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 22:20	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/05/16 22:20	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 22:20	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 22:20	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 22:20	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/05/16 22:20	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 22:20	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 22:20	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 22:20	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:20	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:20	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:20	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 22:20	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 22:20	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 22:20	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 22:20	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 22:20	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 22:20	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:20	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:20	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 22:20	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 22:20	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		10/05/16 22:20	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 22:20	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 22:20	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		10/05/16 22:20	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 22:20	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 22:20	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/05/16 22:20	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		10/05/16 22:20	2037-26-5		
4-Bromofluorobenzene (S)	98	%	70-130	1		10/05/16 22:20	460-00-4		

Sample: MW-25i		Lab ID: 1276153026		Collected: 09/29/16 08:00		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 22:39	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/05/16 22:39	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/05/16 22:39	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 22:39	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 22:39	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/05/16 22:39	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/05/16 22:39	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/05/16 22:39	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-25i	Lab ID: 1276153026	Collected: 09/29/16 08:00	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 22:39	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 22:39	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 22:39	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 22:39	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 22:39	75-35-4	
cis-1,2-Dichloroethene	0.81	ug/L	0.50	1		10/05/16 22:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 22:39	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 22:39	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 22:39	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 22:39	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 22:39	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/05/16 22:39	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 22:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 22:39	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/05/16 22:39	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 22:39	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 22:39	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		10/05/16 22:39	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		10/05/16 22:39	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		10/05/16 22:39	460-00-4	

Sample: MW-2	Lab ID: 1276153027	Collected: 09/29/16 09:05	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 10:35	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 10:35	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 10:35	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 10:35	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 10:35	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 10:35	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 10:35	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 10:35	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 10:35	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 10:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 10:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 10:35	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 10:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 10:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 10:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 10:35	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-2		Lab ID: 1276153027		Collected: 09/29/16 09:05		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 10:35	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 10:35	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 10:35	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 10:35	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 10:35	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 10:35	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 10:35	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 10:35	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 10:35	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		10/06/16 10:35	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 10:35	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 10:35	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/06/16 10:35	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		10/06/16 10:35	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	1		10/06/16 10:35	460-00-4		

Sample: EW-1		Lab ID: 1276153028		Collected: 09/29/16 09:55		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 14:07	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/06/16 14:07	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/06/16 14:07	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 14:07	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 14:07	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/06/16 14:07	75-00-3		
Chloroform	1.1	ug/L	0.50	1		10/06/16 14:07	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/06/16 14:07	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 14:07	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:07	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:07	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:07	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 14:07	75-34-3		
1,2-Dichloroethane	1.5	ug/L	0.50	1		10/06/16 14:07	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 14:07	75-35-4		
cis-1,2-Dichloroethene	5.4	ug/L	0.50	1		10/06/16 14:07	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 14:07	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 14:07	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 14:07	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 14:07	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 14:07	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 14:07	79-34-5		
Tetrachloroethene	38.6	ug/L	0.50	1		10/06/16 14:07	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 14:07	71-55-6		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: EW-1		Lab ID: 1276153028	Collected: 09/29/16 09:55	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 14:07	79-00-5	
Trichloroethene	10.5	ug/L	0.50	1		10/06/16 14:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 14:07	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 14:07	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/06/16 14:07	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/06/16 14:07	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1		10/06/16 14:07	460-00-4	

Sample: MW-5		Lab ID: 1276153029	Collected: 09/29/16 11:26	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		10/06/16 16:22	75-27-4	
Bromoform	ND	ug/L	5.0	10		10/06/16 16:22	75-25-2	
Bromomethane	ND	ug/L	200	10		10/06/16 16:22	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		10/06/16 16:22	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		10/06/16 16:22	108-90-7	
Chloroethane	ND	ug/L	20.0	10		10/06/16 16:22	75-00-3	
Chloroform	ND	ug/L	5.0	10		10/06/16 16:22	67-66-3	
Chloromethane	ND	ug/L	5.0	10		10/06/16 16:22	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		10/06/16 16:22	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		10/06/16 16:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		10/06/16 16:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		10/06/16 16:22	106-46-7	
1,1-Dichloroethane	ND	ug/L	5.0	10		10/06/16 16:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		10/06/16 16:22	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	10		10/06/16 16:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	10		10/06/16 16:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	10		10/06/16 16:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		10/06/16 16:22	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		10/06/16 16:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		10/06/16 16:22	10061-02-6	
Methylene Chloride	ND	ug/L	50.0	10		10/06/16 16:22	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		10/06/16 16:22	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	10		10/06/16 16:22	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	5.0	10		10/06/16 16:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	10		10/06/16 16:22	79-00-5	
Trichloroethene	ND	ug/L	5.0	10		10/06/16 16:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	10		10/06/16 16:22	75-69-4	
Vinyl chloride	ND	ug/L	5.0	10		10/06/16 16:22	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	10		10/06/16 16:22	17060-07-0	
Toluene-d8 (S)	102	%	70-130	10		10/06/16 16:22	2037-26-5	
4-Bromofluorobenzene (S)	99	%	70-130	10		10/06/16 16:22	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-7		Lab ID: 1276153030		Collected: 09/29/16 12:10		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 14:26	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/06/16 14:26	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/06/16 14:26	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 14:26	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 14:26	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/06/16 14:26	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/06/16 14:26	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/06/16 14:26	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 14:26	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:26	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:26	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:26	106-46-7		
1,1-Dichloroethane	1.1	ug/L	0.50	1		10/06/16 14:26	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 14:26	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 14:26	75-35-4		
cis-1,2-Dichloroethene	10.9	ug/L	0.50	1		10/06/16 14:26	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 14:26	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 14:26	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 14:26	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 14:26	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 14:26	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 14:26	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 14:26	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 14:26	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 14:26	79-00-5		
Trichloroethene	5.5	ug/L	0.50	1		10/06/16 14:26	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 14:26	75-69-4		
Vinyl chloride	5.5	ug/L	0.50	1		10/06/16 14:26	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/06/16 14:26	17060-07-0		
Toluene-d8 (S)	102	%	70-130	1		10/06/16 14:26	2037-26-5		
4-Bromofluorobenzene (S)	98	%	70-130	1		10/06/16 14:26	460-00-4		

Sample: MW-7 DUP		Lab ID: 1276153031		Collected: 09/29/16 12:10		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 14:46	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/06/16 14:46	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/06/16 14:46	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 14:46	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 14:46	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/06/16 14:46	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/06/16 14:46	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/06/16 14:46	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-7 DUP		Lab ID: 1276153031	Collected: 09/29/16 12:10	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 14:46	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 14:46	106-46-7	
1,1-Dichloroethane	1.1	ug/L	0.50	1		10/06/16 14:46	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 14:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 14:46	75-35-4	
cis-1,2-Dichloroethene	10.9	ug/L	0.50	1		10/06/16 14:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 14:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 14:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 14:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 14:46	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 14:46	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 14:46	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 14:46	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 14:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 14:46	79-00-5	
Trichloroethene	6.0	ug/L	0.50	1		10/06/16 14:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 14:46	75-69-4	
Vinyl chloride	5.5	ug/L	0.50	1		10/06/16 14:46	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/06/16 14:46	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/06/16 14:46	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/06/16 14:46	460-00-4	

Sample: MW-9		Lab ID: 1276153032	Collected: 09/29/16 12:58	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 15:05	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 15:05	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 15:05	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 15:05	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 15:05	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 15:05	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 15:05	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 15:05	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 15:05	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:05	106-46-7	
1,1-Dichloroethane	1.2	ug/L	0.50	1		10/06/16 15:05	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 15:05	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 15:05	75-35-4	
cis-1,2-Dichloroethene	39.3	ug/L	0.50	1		10/06/16 15:05	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-9		Lab ID: 1276153032	Collected: 09/29/16 12:58	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	1.8	ug/L	0.50	1		10/06/16 15:05	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 15:05	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 15:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 15:05	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 15:05	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 15:05	79-34-5	
Tetrachloroethene	192	ug/L	0.50	1		10/06/16 15:05	127-18-4	
1,1,1-Trichloroethane	2.5	ug/L	0.50	1		10/06/16 15:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 15:05	79-00-5	
Trichloroethene	91.9	ug/L	0.50	1		10/06/16 15:05	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 15:05	75-69-4	
Vinyl chloride	0.76	ug/L	0.50	1		10/06/16 15:05	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		10/06/16 15:05	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/06/16 15:05	2037-26-5	
4-Bromofluorobenzene (S)	99	%	70-130	1		10/06/16 15:05	460-00-4	

Sample: MGMS2-40		Lab ID: 1276153033	Collected: 09/29/16 15:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		10/06/16 16:41	75-27-4	
Bromoform	ND	ug/L	5.0	10		10/06/16 16:41	75-25-2	
Bromomethane	ND	ug/L	200	10		10/06/16 16:41	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		10/06/16 16:41	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		10/06/16 16:41	108-90-7	
Chloroethane	ND	ug/L	20.0	10		10/06/16 16:41	75-00-3	
Chloroform	ND	ug/L	5.0	10		10/06/16 16:41	67-66-3	
Chloromethane	ND	ug/L	5.0	10		10/06/16 16:41	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		10/06/16 16:41	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		10/06/16 16:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		10/06/16 16:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		10/06/16 16:41	106-46-7	
1,1-Dichloroethane	12.1	ug/L	5.0	10		10/06/16 16:41	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		10/06/16 16:41	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	10		10/06/16 16:41	75-35-4	
cis-1,2-Dichloroethene	115	ug/L	5.0	10		10/06/16 16:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	10		10/06/16 16:41	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		10/06/16 16:41	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		10/06/16 16:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		10/06/16 16:41	10061-02-6	
Methylene Chloride	ND	ug/L	50.0	10		10/06/16 16:41	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		10/06/16 16:41	79-34-5	
Tetrachloroethene	33.3	ug/L	5.0	10		10/06/16 16:41	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	5.0	10		10/06/16 16:41	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MGMS2-40		Lab ID: 1276153033	Collected: 09/29/16 15:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	5.0	10		10/06/16 16:41	79-00-5	
Trichloroethene	24.8	ug/L	5.0	10		10/06/16 16:41	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	10		10/06/16 16:41	75-69-4	
Vinyl chloride	142	ug/L	5.0	10		10/06/16 16:41	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%	70-130	10		10/06/16 16:41	17060-07-0	
Toluene-d8 (S)	103	%	70-130	10		10/06/16 16:41	2037-26-5	
4-Bromofluorobenzene (S)	100	%	70-130	10		10/06/16 16:41	460-00-4	

Sample: MGMS2-110		Lab ID: 1276153034	Collected: 09/29/16 16:07	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 15:24	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 15:24	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 15:24	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 15:24	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 15:24	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 15:24	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 15:24	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 15:24	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 15:24	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:24	106-46-7	
1,1-Dichloroethane	0.62	ug/L	0.50	1		10/06/16 15:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 15:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 15:24	75-35-4	
cis-1,2-Dichloroethene	16.8	ug/L	0.50	1		10/06/16 15:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 15:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 15:24	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 15:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 15:24	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 15:24	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 15:24	79-34-5	
Tetrachloroethene	6.5	ug/L	0.50	1		10/06/16 15:24	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 15:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 15:24	79-00-5	
Trichloroethene	6.3	ug/L	0.50	1		10/06/16 15:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 15:24	75-69-4	
Vinyl chloride	5.8	ug/L	0.50	1		10/06/16 15:24	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/06/16 15:24	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/06/16 15:24	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1		10/06/16 15:24	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MGMS2-132		Lab ID: 1276153035		Collected: 09/29/16 16:25		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 15:43	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/06/16 15:43	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/06/16 15:43	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 15:43	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 15:43	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/06/16 15:43	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/06/16 15:43	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/06/16 15:43	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 15:43	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:43	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:43	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 15:43	106-46-7		
1,1-Dichloroethane	0.70	ug/L	0.50	1		10/06/16 15:43	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 15:43	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 15:43	75-35-4		
cis-1,2-Dichloroethene	31.4	ug/L	0.50	1		10/06/16 15:43	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 15:43	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 15:43	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 15:43	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 15:43	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 15:43	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 15:43	79-34-5		
Tetrachloroethene	6.4	ug/L	0.50	1		10/06/16 15:43	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 15:43	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 15:43	79-00-5		
Trichloroethene	7.9	ug/L	0.50	1		10/06/16 15:43	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 15:43	75-69-4		
Vinyl chloride	8.2	ug/L	0.50	1		10/06/16 15:43	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/06/16 15:43	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		10/06/16 15:43	2037-26-5		
4-Bromofluorobenzene (S)	98	%	70-130	1		10/06/16 15:43	460-00-4		

Sample: MW-3		Lab ID: 1276153036		Collected: 09/30/16 07:54		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 16:02	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/06/16 16:02	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/06/16 16:02	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 16:02	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 16:02	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/06/16 16:02	75-00-3		
Chloroform	0.67	ug/L	0.50	1		10/06/16 16:02	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/06/16 16:02	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-3		Lab ID: 1276153036		Collected: 09/30/16 07:54		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 16:02	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 16:02	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 16:02	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 16:02	106-46-7		
1,1-Dichloroethane	8.2	ug/L	0.50	1		10/06/16 16:02	75-34-3		
1,2-Dichloroethane	0.73	ug/L	0.50	1		10/06/16 16:02	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 16:02	75-35-4		
cis-1,2-Dichloroethene	95.3	ug/L	0.50	1		10/06/16 16:02	156-59-2		
trans-1,2-Dichloroethene	1.5	ug/L	0.50	1		10/06/16 16:02	156-60-5		
1,2-Dichloropropane	1.6	ug/L	0.50	1		10/06/16 16:02	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 16:02	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 16:02	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 16:02	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 16:02	79-34-5		
Tetrachloroethene	145	ug/L	0.50	1		10/06/16 16:02	127-18-4		
1,1,1-Trichloroethane	2.0	ug/L	0.50	1		10/06/16 16:02	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 16:02	79-00-5		
Trichloroethene	40.1	ug/L	0.50	1		10/06/16 16:02	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 16:02	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 16:02	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/06/16 16:02	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		10/06/16 16:02	2037-26-5		
4-Bromofluorobenzene (S)	99	%	70-130	1		10/06/16 16:02	460-00-4		

Sample: MW-15		Lab ID: 1276153037		Collected: 09/30/16 08:33		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 13:34	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/07/16 13:34	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/07/16 13:34	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 13:34	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 13:34	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/07/16 13:34	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/07/16 13:34	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/07/16 13:34	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 13:34	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 13:34	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 13:34	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 13:34	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/07/16 13:34	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 13:34	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/07/16 13:34	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 13:34	156-59-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MW-15		Lab ID: 1276153037		Collected: 09/30/16 08:33		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 13:34	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 13:34	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 13:34	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 13:34	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 13:34	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 13:34	79-34-5		
Tetrachloroethene	0.51	ug/L	0.50	1		10/07/16 13:34	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 13:34	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 13:34	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		10/07/16 13:34	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 13:34	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/07/16 13:34	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/07/16 13:34	17060-07-0		
Toluene-d8 (S)	102	%	70-130	1		10/07/16 13:34	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	1		10/07/16 13:34	460-00-4		

Sample: MW-24d		Lab ID: 1276153038		Collected: 09/30/16 10:15		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 10:40	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/07/16 10:40	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/07/16 10:40	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 10:40	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 10:40	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/07/16 10:40	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/07/16 10:40	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/07/16 10:40	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 10:40	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 10:40	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 10:40	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 10:40	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/07/16 10:40	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 10:40	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/07/16 10:40	75-35-4		
cis-1,2-Dichloroethene	0.62	ug/L	0.50	1		10/07/16 10:40	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 10:40	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 10:40	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 10:40	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 10:40	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 10:40	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 10:40	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		10/07/16 10:40	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 10:40	71-55-6		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MW-24d		Lab ID: 1276153038	Collected: 09/30/16 10:15	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 10:40	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/07/16 10:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 10:40	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/07/16 10:40	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		10/07/16 10:40	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/07/16 10:40	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	70-130	1		10/07/16 10:40	460-00-4	

Sample: Field Blank 1		Lab ID: 1276153039	Collected: 09/26/16 15:00	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/05/16 12:19	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/05/16 12:19	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/05/16 12:19	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/05/16 12:19	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/05/16 12:19	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/05/16 12:19	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/05/16 12:19	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/05/16 12:19	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/05/16 12:19	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 12:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 12:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/05/16 12:19	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/05/16 12:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/05/16 12:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/05/16 12:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 12:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/05/16 12:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/05/16 12:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 12:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/05/16 12:19	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/05/16 12:19	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/05/16 12:19	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/05/16 12:19	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/05/16 12:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/05/16 12:19	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/05/16 12:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/05/16 12:19	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/05/16 12:19	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%.	70-130	1		10/05/16 12:19	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/05/16 12:19	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	70-130	1		10/05/16 12:19	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: Field Blank 2		Lab ID: 1276153040	Collected: 09/27/16 16:00	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 12:12	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 12:12	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 12:12	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 12:12	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 12:12	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 12:12	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 12:12	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 12:12	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 12:12	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:12	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:12	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:12	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 12:12	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 12:12	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:12	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:12	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:12	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 12:12	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 12:12	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 12:12	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 12:12	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 12:12	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 12:12	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 12:12	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 12:12	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/06/16 12:12	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 12:12	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 12:12	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/06/16 12:12	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/06/16 12:12	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1		10/06/16 12:12	460-00-4	

Sample: Field Blank 3		Lab ID: 1276153041	Collected: 09/28/16 16:20	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 12:31	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 12:31	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 12:31	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 12:31	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 12:31	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 12:31	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 12:31	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 12:31	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: Field Blank 3	Lab ID: 1276153041	Collected: 09/28/16 16:20	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 12:31	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:31	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 12:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 12:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 12:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 12:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 12:31	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 12:31	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 12:31	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 12:31	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 12:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 12:31	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/06/16 12:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 12:31	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 12:31	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/06/16 12:31	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		10/06/16 12:31	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/06/16 12:31	460-00-4	

Sample: Field Blank 4	Lab ID: 1276153042	Collected: 09/29/16 16:30	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 12:50	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 12:50	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 12:50	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 12:50	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 12:50	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 12:50	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 12:50	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 12:50	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 12:50	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 12:50	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 12:50	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 12:50	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:50	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: Field Blank 4		Lab ID: 1276153042	Collected: 09/29/16 16:30		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 12:50	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 12:50	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 12:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 12:50	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 12:50	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 12:50	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 12:50	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 12:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 12:50	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/06/16 12:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 12:50	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 12:50	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/06/16 12:50	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		10/06/16 12:50	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/06/16 12:50	460-00-4	

Sample: Field Blank 5		Lab ID: 1276153043	Collected: 09/30/16 15:00		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 13:10	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 13:10	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 13:10	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 13:10	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 13:10	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 13:10	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 13:10	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 13:10	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 13:10	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:10	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:10	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:10	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 13:10	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 13:10	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:10	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 13:10	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 13:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 13:10	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 13:10	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 13:10	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 13:10	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 13:10	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: Field Blank 5		Lab ID: 1276153043	Collected: 09/30/16 15:00	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 13:10	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/06/16 13:10	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 13:10	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 13:10	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		10/06/16 13:10	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/06/16 13:10	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	70-130	1		10/06/16 13:10	460-00-4	

Sample: Equipment Blank		Lab ID: 1276153044	Collected: 09/30/16 15:00	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 13:29	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 13:29	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 13:29	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 13:29	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 13:29	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 13:29	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 13:29	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 13:29	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 13:29	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:29	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 13:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 13:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 13:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 13:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 13:29	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 13:29	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 13:29	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 13:29	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 13:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 13:29	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/06/16 13:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 13:29	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 13:29	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1		10/06/16 13:29	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/06/16 13:29	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		10/06/16 13:29	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: Trip Blank		Lab ID: 1276153045	Collected: 09/30/16 15:00	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/06/16 13:48	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/06/16 13:48	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/06/16 13:48	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/06/16 13:48	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/06/16 13:48	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/06/16 13:48	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/06/16 13:48	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/06/16 13:48	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/06/16 13:48	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/06/16 13:48	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/06/16 13:48	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/06/16 13:48	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:48	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/06/16 13:48	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/06/16 13:48	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 13:48	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/06/16 13:48	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/06/16 13:48	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/06/16 13:48	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		10/06/16 13:48	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/06/16 13:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/06/16 13:48	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		10/06/16 13:48	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/06/16 13:48	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/06/16 13:48	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		10/06/16 13:48	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		10/06/16 13:48	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1		10/06/16 13:48	460-00-4	

Sample: MGMS2-60		Lab ID: 1276153046	Collected: 09/30/16 11:12	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 11:58	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/07/16 11:58	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/07/16 11:58	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 11:58	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 11:58	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/07/16 11:58	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/07/16 11:58	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/07/16 11:58	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MGMS2-60		Lab ID: 1276153046		Collected: 09/30/16 11:12		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 11:58	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 11:58	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 11:58	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 11:58	106-46-7		
1,1-Dichloroethane	2.0	ug/L	0.50	1		10/07/16 11:58	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 11:58	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/07/16 11:58	75-35-4		
cis-1,2-Dichloroethene	40.0	ug/L	0.50	1		10/07/16 11:58	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 11:58	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 11:58	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 11:58	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 11:58	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 11:58	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 11:58	79-34-5		
Tetrachloroethene	9.6	ug/L	0.50	1		10/07/16 11:58	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 11:58	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 11:58	79-00-5		
Trichloroethene	11.5	ug/L	0.50	1		10/07/16 11:58	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 11:58	75-69-4		
Vinyl chloride	9.6	ug/L	0.50	1		10/07/16 11:58	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/07/16 11:58	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		10/07/16 11:58	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	1		10/07/16 11:58	460-00-4		

Sample: MGMS1-40		Lab ID: 1276153047		Collected: 09/30/16 11:43		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	16.4	ug/L	10.0	1		10/10/16 11:31	74-84-0		
Ethene	ND	ug/L	10.0	1		10/10/16 11:31	74-85-1		
Methane	1670	ug/L	10.0	1		10/10/16 11:31	74-82-8		
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	8.3	16.67		10/07/16 15:11	75-27-4		
Bromoform	ND	ug/L	8.3	16.67		10/07/16 15:11	75-25-2		
Bromomethane	ND	ug/L	333	16.67		10/07/16 15:11	74-83-9		
Carbon tetrachloride	ND	ug/L	8.3	16.67		10/07/16 15:11	56-23-5		
Chlorobenzene	ND	ug/L	8.3	16.67		10/07/16 15:11	108-90-7		
Chloroethane	ND	ug/L	33.3	16.67		10/07/16 15:11	75-00-3		
Chloroform	ND	ug/L	8.3	16.67		10/07/16 15:11	67-66-3		
Chloromethane	ND	ug/L	8.3	16.67		10/07/16 15:11	74-87-3		
Dibromochloromethane	ND	ug/L	8.3	16.67		10/07/16 15:11	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	8.3	16.67		10/07/16 15:11	95-50-1		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MGMS1-40		Lab ID: 1276153047		Collected: 09/30/16 11:43		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
1,3-Dichlorobenzene	ND	ug/L	8.3	16.67		10/07/16 15:11	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	8.3	16.67		10/07/16 15:11	106-46-7		
1,1-Dichloroethane	81.9	ug/L	8.3	16.67		10/07/16 15:11	75-34-3		
1,2-Dichloroethane	ND	ug/L	8.3	16.67		10/07/16 15:11	107-06-2		
1,1-Dichloroethene	13.5	ug/L	8.3	16.67		10/07/16 15:11	75-35-4		
cis-1,2-Dichloroethene	1980	ug/L	8.3	16.67		10/07/16 15:11	156-59-2		
trans-1,2-Dichloroethene	24.2	ug/L	8.3	16.67		10/07/16 15:11	156-60-5		
1,2-Dichloropropane	ND	ug/L	8.3	16.67		10/07/16 15:11	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	8.3	16.67		10/07/16 15:11	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	8.3	16.67		10/07/16 15:11	10061-02-6		
Methylene Chloride	ND	ug/L	83.4	16.67		10/07/16 15:11	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	8.3	16.67		10/07/16 15:11	79-34-5		
Tetrachloroethene	230	ug/L	8.3	16.67		10/07/16 15:11	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	8.3	16.67		10/07/16 15:11	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	8.3	16.67		10/07/16 15:11	79-00-5		
Trichloroethene	336	ug/L	8.3	16.67		10/07/16 15:11	79-01-6		
Trichlorofluoromethane	ND	ug/L	8.3	16.67		10/07/16 15:11	75-69-4		
Vinyl chloride	52.0	ug/L	8.3	16.67		10/07/16 15:11	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	16.67		10/07/16 15:11	17060-07-0		
Toluene-d8 (S)	100	%	70-130	16.67		10/07/16 15:11	2037-26-5		
4-Bromofluorobenzene (S)	98	%	70-130	16.67		10/07/16 15:11	460-00-4		

5310B TOC		Analytical Method: SM 5310B							
Total Organic Carbon	9.0	mg/L	1.0	1		10/06/16 23:01	7440-44-0		

Sample: MGMS1-60		Lab ID: 1276153048		Collected: 09/30/16 12:15		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 13:15	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/07/16 13:15	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/07/16 13:15	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 13:15	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 13:15	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/07/16 13:15	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/07/16 13:15	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/07/16 13:15	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 13:15	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 13:15	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 13:15	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 13:15	106-46-7		
1,1-Dichloroethane	0.89	ug/L	0.50	1		10/07/16 13:15	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 13:15	107-06-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MGMS1-60		Lab ID: 1276153048	Collected: 09/30/16 12:15	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1-Dichloroethene	ND	ug/L	0.50	1		10/07/16 13:15	75-35-4	
cis-1,2-Dichloroethene	17.7	ug/L	0.50	1		10/07/16 13:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 13:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 13:15	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 13:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 13:15	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 13:15	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 13:15	79-34-5	
Tetrachloroethene	22.5	ug/L	0.50	1		10/07/16 13:15	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 13:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 13:15	79-00-5	
Trichloroethene	17.6	ug/L	0.50	1		10/07/16 13:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 13:15	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/07/16 13:15	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/07/16 13:15	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/07/16 13:15	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1		10/07/16 13:15	460-00-4	

Sample: MGMS1-132		Lab ID: 1276153049	Collected: 09/30/16 12:45	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 12:17	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/07/16 12:17	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/07/16 12:17	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 12:17	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 12:17	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/07/16 12:17	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/07/16 12:17	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/07/16 12:17	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 12:17	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:17	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:17	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:17	106-46-7	
1,1-Dichloroethane	1.2	ug/L	0.50	1		10/07/16 12:17	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 12:17	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/07/16 12:17	75-35-4	
cis-1,2-Dichloroethene	56.7	ug/L	0.50	1		10/07/16 12:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 12:17	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 12:17	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 12:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 12:17	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 12:17	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 12:17	79-34-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MGMS1-132		Lab ID: 1276153049	Collected: 09/30/16 12:45	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Tetrachloroethene	18.4	ug/L	0.50	1		10/07/16 12:17	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 12:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 12:17	79-00-5	
Trichloroethene	28.7	ug/L	0.50	1		10/07/16 12:17	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 12:17	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/07/16 12:17	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/07/16 12:17	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/07/16 12:17	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	1		10/07/16 12:17	460-00-4	

Sample: MGMS3-40		Lab ID: 1276153050	Collected: 09/30/16 13:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	35.6	ug/L	10.0	1		10/10/16 11:40	74-84-0	
Ethene	ND	ug/L	10.0	1		10/10/16 11:40	74-85-1	
Methane	2020	ug/L	10.0	1		10/10/16 11:40	74-82-8	
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/11/16 13:31	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/11/16 13:31	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/11/16 13:31	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/11/16 13:31	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/11/16 13:31	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/11/16 13:31	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/11/16 13:31	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/11/16 13:31	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/11/16 13:31	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:31	106-46-7	
1,1-Dichloroethane	4.1	ug/L	0.50	1		10/11/16 13:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/11/16 13:31	107-06-2	
1,1-Dichloroethene	0.54	ug/L	0.50	1		10/11/16 13:31	75-35-4	
cis-1,2-Dichloroethene	226	ug/L	2.5	5		10/07/16 14:32	156-59-2	
trans-1,2-Dichloroethene	1.8	ug/L	0.50	1		10/11/16 13:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/11/16 13:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/11/16 13:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/11/16 13:31	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/11/16 13:31	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/11/16 13:31	79-34-5	
Tetrachloroethene	1.7	ug/L	0.50	1		10/11/16 13:31	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/11/16 13:31	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MGMS3-40		Lab ID: 1276153050	Collected: 09/30/16 13:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/11/16 13:31	79-00-5	
Trichloroethene	1.3	ug/L	0.50	1		10/11/16 13:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/11/16 13:31	75-69-4	
Vinyl chloride	45.8	ug/L	0.50	1		10/11/16 13:31	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/11/16 13:31	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/11/16 13:31	2037-26-5	
4-Bromofluorobenzene (S)	100	%	70-130	1		10/11/16 13:31	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	36.2	mg/L	1.0	1		10/06/16 23:25	7440-44-0	

Sample: MGMS3-40 DUP		Lab ID: 1276153051	Collected: 09/30/16 13:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/11/16 13:50	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/11/16 13:50	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/11/16 13:50	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/11/16 13:50	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/11/16 13:50	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/11/16 13:50	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/11/16 13:50	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/11/16 13:50	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/11/16 13:50	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/11/16 13:50	106-46-7	
1,1-Dichloroethane	4.5	ug/L	0.50	1		10/11/16 13:50	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/11/16 13:50	107-06-2	
1,1-Dichloroethene	0.60	ug/L	0.50	1		10/11/16 13:50	75-35-4	
cis-1,2-Dichloroethene	219	ug/L	2.5	5		10/07/16 14:52	156-59-2	
trans-1,2-Dichloroethene	2.0	ug/L	0.50	1		10/11/16 13:50	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/11/16 13:50	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/11/16 13:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/11/16 13:50	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/11/16 13:50	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/11/16 13:50	79-34-5	
Tetrachloroethene	1.5	ug/L	0.50	1		10/11/16 13:50	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/11/16 13:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/11/16 13:50	79-00-5	
Trichloroethene	1.4	ug/L	0.50	1		10/11/16 13:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/11/16 13:50	75-69-4	
Vinyl chloride	52.1	ug/L	0.50	1		10/11/16 13:50	75-01-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Sample: MGMS3-40 DUP		Lab ID: 1276153051	Collected: 09/30/16 13:25	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/11/16 13:50	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/11/16 13:50	2037-26-5	
4-Bromofluorobenzene (S)	99	%	70-130	1		10/11/16 13:50	460-00-4	

Sample: MGMS3-60		Lab ID: 1276153052	Collected: 09/30/16 13:54	Received: 10/04/16 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 12:36	75-27-4	
Bromoform	ND	ug/L	0.50	1		10/07/16 12:36	75-25-2	
Bromomethane	ND	ug/L	20.0	1		10/07/16 12:36	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 12:36	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 12:36	108-90-7	
Chloroethane	ND	ug/L	2.0	1		10/07/16 12:36	75-00-3	
Chloroform	ND	ug/L	0.50	1		10/07/16 12:36	67-66-3	
Chloromethane	ND	ug/L	0.50	1		10/07/16 12:36	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 12:36	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:36	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		10/07/16 12:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 12:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		10/07/16 12:36	75-35-4	
cis-1,2-Dichloroethene	7.7	ug/L	0.50	1		10/07/16 12:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 12:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 12:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 12:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 12:36	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 12:36	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 12:36	79-34-5	
Tetrachloroethene	3.7	ug/L	0.50	1		10/07/16 12:36	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 12:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 12:36	79-00-5	
Trichloroethene	1.9	ug/L	0.50	1		10/07/16 12:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 12:36	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/07/16 12:36	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/07/16 12:36	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/07/16 12:36	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		10/07/16 12:36	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MGMS3-110		Lab ID: 1276153053		Collected: 09/30/16 14:25		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 12:56	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/07/16 12:56	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/07/16 12:56	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 12:56	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 12:56	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/07/16 12:56	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/07/16 12:56	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/07/16 12:56	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 12:56	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:56	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:56	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 12:56	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		10/07/16 12:56	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 12:56	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		10/07/16 12:56	75-35-4		
cis-1,2-Dichloroethene	6.5	ug/L	0.50	1		10/07/16 12:56	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 12:56	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 12:56	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 12:56	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 12:56	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 12:56	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 12:56	79-34-5		
Tetrachloroethene	4.4	ug/L	0.50	1		10/07/16 12:56	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 12:56	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 12:56	79-00-5		
Trichloroethene	3.0	ug/L	0.50	1		10/07/16 12:56	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 12:56	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		10/07/16 12:56	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/07/16 12:56	17060-07-0		
Toluene-d8 (S)	102	%	70-130	1		10/07/16 12:56	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	1		10/07/16 12:56	460-00-4		

Sample: MGMS3-132		Lab ID: 1276153054		Collected: 09/30/16 14:45		Received: 10/04/16 10:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		10/07/16 08:25	75-27-4		
Bromoform	ND	ug/L	0.50	1		10/07/16 08:25	75-25-2		
Bromomethane	ND	ug/L	20.0	1		10/07/16 08:25	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		10/07/16 08:25	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		10/07/16 08:25	108-90-7		
Chloroethane	ND	ug/L	2.0	1		10/07/16 08:25	75-00-3		
Chloroform	ND	ug/L	0.50	1		10/07/16 08:25	67-66-3		
Chloromethane	ND	ug/L	0.50	1		10/07/16 08:25	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Sample: MGMS3-132	Lab ID: 1276153054	Collected: 09/30/16 14:45	Received: 10/04/16 10:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		10/07/16 08:25	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 08:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 08:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		10/07/16 08:25	106-46-7	
1,1-Dichloroethane	0.84	ug/L	0.50	1		10/07/16 08:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		10/07/16 08:25	107-06-2	
1,1-Dichloroethene	0.54	ug/L	0.50	1		10/07/16 08:25	75-35-4	
cis-1,2-Dichloroethene	12.9	ug/L	0.50	1		10/07/16 08:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		10/07/16 08:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		10/07/16 08:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 08:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		10/07/16 08:25	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		10/07/16 08:25	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		10/07/16 08:25	79-34-5	
Tetrachloroethene	13.8	ug/L	0.50	1		10/07/16 08:25	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		10/07/16 08:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		10/07/16 08:25	79-00-5	
Trichloroethene	11.9	ug/L	0.50	1		10/07/16 08:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		10/07/16 08:25	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		10/07/16 08:25	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		10/07/16 08:25	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		10/07/16 08:25	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		10/07/16 08:25	460-00-4	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

QC Batch: 440104 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 1276153004, 1276153005, 1276153012, 1276153015, 1276153018, 1276153019, 1276153047, 1276153050

METHOD BLANK: 2393168 Matrix: Water
Associated Lab Samples: 1276153004, 1276153005, 1276153012, 1276153015, 1276153018, 1276153019, 1276153047, 1276153050

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	10/10/16 09:11	
Ethene	ug/L	ND	10.0	10/10/16 09:11	
Methane	ug/L	ND	10.0	10/10/16 09:11	

LABORATORY CONTROL SAMPLE & LCSD: 2393169

Parameter	Units	2393170								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	110	113	97	99	85-115	3	20	
Ethene	ug/L	106	102	104	96	98	85-115	2	20	
Methane	ug/L	60.7	58.5	59.2	96	98	85-115	1	20	

SAMPLE DUPLICATE: 2394283

Parameter	Units	1276153004		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	5.5J		20	
Ethene	ug/L	ND	4J		20	
Methane	ug/L	948	1560	49	20 R1	

SAMPLE DUPLICATE: 2394286

Parameter	Units	35268563006		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	0.87U	ND		20	
Ethene	ug/L	0.77U	ND		20	
Methane	ug/L	1560	1360	14	20	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

QC Batch: 96238 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1276153001, 1276153002, 1276153003, 1276153005, 1276153006, 1276153007

METHOD BLANK: 379530 Matrix: Water
Associated Lab Samples: 1276153001, 1276153002, 1276153003, 1276153005, 1276153006, 1276153007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/04/16 19:54	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/04/16 19:54	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/04/16 19:54	
1,1-Dichloroethane	ug/L	ND	0.50	10/04/16 19:54	
1,1-Dichloroethene	ug/L	ND	0.50	10/04/16 19:54	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/04/16 19:54	
1,2-Dichloroethane	ug/L	ND	0.50	10/04/16 19:54	
1,2-Dichloropropane	ug/L	ND	0.50	10/04/16 19:54	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/04/16 19:54	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/04/16 19:54	
Bromodichloromethane	ug/L	ND	0.50	10/04/16 19:54	
Bromoform	ug/L	ND	0.50	10/04/16 19:54	
Bromomethane	ug/L	ND	20.0	10/04/16 19:54	
Carbon tetrachloride	ug/L	ND	0.50	10/04/16 19:54	
Chlorobenzene	ug/L	ND	0.50	10/04/16 19:54	
Chloroethane	ug/L	ND	2.0	10/04/16 19:54	
Chloroform	ug/L	ND	0.50	10/04/16 19:54	
Chloromethane	ug/L	ND	0.50	10/04/16 19:54	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/04/16 19:54	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/04/16 19:54	
Dibromochloromethane	ug/L	ND	0.50	10/04/16 19:54	
Methylene Chloride	ug/L	ND	5.0	10/04/16 19:54	
Tetrachloroethene	ug/L	ND	0.50	10/04/16 19:54	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/04/16 19:54	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/04/16 19:54	
Trichloroethene	ug/L	ND	0.50	10/04/16 19:54	
Trichlorofluoromethane	ug/L	ND	0.50	10/04/16 19:54	
Vinyl chloride	ug/L	ND	0.50	10/04/16 19:54	
1,2-Dichloroethane-d4 (S)	%	102	70-130	10/04/16 19:54	
4-Bromofluorobenzene (S)	%	99	70-130	10/04/16 19:54	
Toluene-d8 (S)	%	101	70-130	10/04/16 19:54	

LABORATORY CONTROL SAMPLE: 379531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	39.5	99	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	41.7	104	75-125	
1,1,2-Trichloroethane	ug/L	40	40.4	101	75-126	
1,1-Dichloroethane	ug/L	40	39.6	99	71-131	
1,1-Dichloroethene	ug/L	40	39.4	99	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 379531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	38.2	96	75-125	
1,2-Dichloroethane	ug/L	40	40.1	100	64-141	
1,2-Dichloropropane	ug/L	40	39.4	98	73-127	
1,3-Dichlorobenzene	ug/L	40	37.8	95	75-125	
1,4-Dichlorobenzene	ug/L	40	38.2	96	75-125	
Bromodichloromethane	ug/L	40	40.6	102	70-134	
Bromoform	ug/L	40	43.0	108	68-130	
Bromomethane	ug/L	40	36.0	90	30-150	
Carbon tetrachloride	ug/L	40	39.6	99	66-135	
Chlorobenzene	ug/L	40	39.6	99	75-125	
Chloroethane	ug/L	40	39.7	99	55-150	
Chloroform	ug/L	40	39.7	99	72-131	
Chloromethane	ug/L	40	40.5	101	54-132	
cis-1,2-Dichloroethene	ug/L	40	39.9	100	75-125	
cis-1,3-Dichloropropene	ug/L	40	41.7	104	74-130	
Dibromochloromethane	ug/L	40	41.2	103	70-132	
Methylene Chloride	ug/L	40	39.6	99	68-125	
Tetrachloroethene	ug/L	40	37.8	95	75-130	
trans-1,2-Dichloroethene	ug/L	40	39.2	98	75-125	
trans-1,3-Dichloropropene	ug/L	40	42.1	105	69-137	
Trichloroethene	ug/L	40	39.9	100	75-125	
Trichlorofluoromethane	ug/L	40	41.6	104	59-140	
Vinyl chloride	ug/L	40	37.2	93	68-132	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 379532 379533

Parameter	Units	379532		379533		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		1275993001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
1,1,1-Trichloroethane	ug/L	ND	40	40	29.0	29.9	73	75	63-142	3	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	21.5	22.8	54	57	75-125	6	30	M1
1,1,2-Trichloroethane	ug/L	ND	40	40	28.7	28.7	72	72	75-132	0	30	M1
1,1-Dichloroethane	ug/L	ND	40	40	35.7	36.3	89	91	75-126	2	30	
1,1-Dichloroethene	ug/L	ND	40	40	30.6	31.5	77	79	75-125	3	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	9.3	11.3	23	28	75-125	19	30	M1
1,2-Dichloroethane	ug/L	ND	40	40	34.5	35.6	86	89	75-137	3	30	
1,2-Dichloropropane	ug/L	ND	40	40	29.4	29.3	73	73	74-131	0	30	M1
1,3-Dichlorobenzene	ug/L	ND	40	40	8.0	10.8	20	27	75-126	29	30	M1
1,4-Dichlorobenzene	ug/L	ND	40	40	9.3	10.7	23	27	73-125	14	30	M1
Bromodichloromethane	ug/L	ND	40	40	31.4	31.7	79	79	65-137	1	30	
Bromoform	ug/L	ND	40	40	24.7	24.8	62	62	60-147	0	30	
Bromomethane	ug/L	ND	40	40	38.9	43.6	97	109	30-150	11	30	
Carbon tetrachloride	ug/L	ND	40	40	26.2	27.2	66	68	45-150	4	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 379532		379533		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1275993001 Result	MS Spike Conc.	MSD Spike Conc.									
Chlorobenzene	ug/L	ND	40	40	13.0	13.6	33	34	75-125	5	30	M1	
Chloroethane	ug/L	ND	40	40	36.7	38.6	92	96	66-145	5	30		
Chloroform	ug/L	ND	40	40	34.9	35.4	86	87	74-128	1	30		
Chloromethane	ug/L	ND	40	40	40.0	41.4	100	103	51-150	3	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	30.1	30.4	75	76	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	24.6	25.3	61	63	75-129	3	30	M1	
Dibromochloromethane	ug/L	ND	40	40	27.5	27.8	69	70	66-141	1	30		
Methylene Chloride	ug/L	ND	40	40	37.5	38.3	94	96	74-125	2	30		
Tetrachloroethene	ug/L	ND	40	40	15.1	16.2	38	41	75-135	7	30	M1	
trans-1,2-Dichloroethene	ug/L	ND	40	40	25.3	25.7	63	64	75-125	2	30	M1	
trans-1,3-Dichloropropene	ug/L	ND	40	40	22.9	23.6	57	59	67-139	3	30	M1	
Trichloroethene	ug/L	ND	40	40	20.4	20.6	51	52	75-130	1	30	M1	
Trichlorofluoromethane	ug/L	ND	40	40	34.9	35.8	87	90	57-144	3	30		
Vinyl chloride	ug/L	ND	40	40	34.0	34.9	85	87	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%						100	100	70-130				
4-Bromofluorobenzene (S)	%						90	100	70-130				
Toluene-d8 (S)	%						100	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

QC Batch: 96313 Analysis Method: EPA 8260B
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
 Associated Lab Samples: 1276153008, 1276153009, 1276153010, 1276153011, 1276153012, 1276153014, 1276153017, 1276153039

METHOD BLANK: 379866 Matrix: Water
 Associated Lab Samples: 1276153008, 1276153009, 1276153010, 1276153011, 1276153012, 1276153014, 1276153017, 1276153039

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/05/16 07:34	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/05/16 07:34	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/05/16 07:34	
1,1-Dichloroethane	ug/L	ND	0.50	10/05/16 07:34	
1,1-Dichloroethene	ug/L	ND	0.50	10/05/16 07:34	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/05/16 07:34	
1,2-Dichloroethane	ug/L	ND	0.50	10/05/16 07:34	
1,2-Dichloropropane	ug/L	ND	0.50	10/05/16 07:34	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/05/16 07:34	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/05/16 07:34	
Bromodichloromethane	ug/L	ND	0.50	10/05/16 07:34	
Bromoform	ug/L	ND	0.50	10/05/16 07:34	
Bromomethane	ug/L	ND	20.0	10/05/16 07:34	
Carbon tetrachloride	ug/L	ND	0.50	10/05/16 07:34	
Chlorobenzene	ug/L	ND	0.50	10/05/16 07:34	
Chloroethane	ug/L	ND	2.0	10/05/16 07:34	
Chloroform	ug/L	ND	0.50	10/05/16 07:34	
Chloromethane	ug/L	ND	0.50	10/05/16 07:34	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/05/16 07:34	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/05/16 07:34	
Dibromochloromethane	ug/L	ND	0.50	10/05/16 07:34	
Methylene Chloride	ug/L	ND	5.0	10/05/16 07:34	
Tetrachloroethene	ug/L	ND	0.50	10/05/16 07:34	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/05/16 07:34	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/05/16 07:34	
Trichloroethene	ug/L	ND	0.50	10/05/16 07:34	
Trichlorofluoromethane	ug/L	ND	0.50	10/05/16 07:34	
Vinyl chloride	ug/L	ND	0.50	10/05/16 07:34	
1,2-Dichloroethane-d4 (S)	%	102	70-130	10/05/16 07:34	
4-Bromofluorobenzene (S)	%	97	70-130	10/05/16 07:34	
Toluene-d8 (S)	%	102	70-130	10/05/16 07:34	

LABORATORY CONTROL SAMPLE: 379867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	38.2	95	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	38.4	96	75-125	
1,1,2-Trichloroethane	ug/L	40	37.9	95	75-126	
1,1-Dichloroethane	ug/L	40	38.2	95	71-131	
1,1-Dichloroethene	ug/L	40	38.3	96	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 379867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	38.6	97	75-125	
1,2-Dichloroethane	ug/L	40	38.2	95	64-141	
1,2-Dichloropropane	ug/L	40	38.2	96	73-127	
1,3-Dichlorobenzene	ug/L	40	39.2	98	75-125	
1,4-Dichlorobenzene	ug/L	40	38.6	96	75-125	
Bromodichloromethane	ug/L	40	39.2	98	70-134	
Bromoform	ug/L	40	41.1	103	68-130	
Bromomethane	ug/L	40	51.8	130	30-150	
Carbon tetrachloride	ug/L	40	38.7	97	66-135	
Chlorobenzene	ug/L	40	38.7	97	75-125	
Chloroethane	ug/L	40	38.2	95	55-150	
Chloroform	ug/L	40	38.6	96	72-131	
Chloromethane	ug/L	40	40.2	100	54-132	
cis-1,2-Dichloroethene	ug/L	40	38.4	96	75-125	
cis-1,3-Dichloropropene	ug/L	40	39.5	99	74-130	
Dibromochloromethane	ug/L	40	39.4	99	70-132	
Methylene Chloride	ug/L	40	38.3	96	68-125	
Tetrachloroethene	ug/L	40	37.9	95	75-130	
trans-1,2-Dichloroethene	ug/L	40	38.4	96	75-125	
trans-1,3-Dichloropropene	ug/L	40	40.2	101	69-137	
Trichloroethene	ug/L	40	38.8	97	75-125	
Trichlorofluoromethane	ug/L	40	40.5	101	59-140	
Vinyl chloride	ug/L	40	36.1	90	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 379873 379874

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		1276153012	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1-Trichloroethane	ug/L	ND	800	800	786	818	98	102	63-142	4	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	800	800	836	891	105	111	75-125	6	30	
1,1,2-Trichloroethane	ug/L	ND	800	800	803	844	100	105	75-132	5	30	
1,1-Dichloroethane	ug/L	26.0	800	800	817	851	99	103	75-126	4	30	
1,1-Dichloroethene	ug/L	ND	800	800	796	833	99	104	75-125	5	30	
1,2-Dichlorobenzene	ug/L	ND	800	800	742	776	93	97	75-125	4	30	
1,2-Dichloroethane	ug/L	ND	800	800	791	829	99	104	75-137	5	30	
1,2-Dichloropropane	ug/L	ND	800	800	786	815	98	102	74-131	4	30	
1,3-Dichlorobenzene	ug/L	ND	800	800	741	779	93	97	75-126	5	30	
1,4-Dichlorobenzene	ug/L	ND	800	800	740	769	92	96	73-125	4	30	
Bromodichloromethane	ug/L	ND	800	800	807	840	101	105	65-137	4	30	
Bromoform	ug/L	ND	800	800	851	913	106	114	60-147	7	30	
Bromomethane	ug/L	ND	800	800	848	946	106	118	30-150	11	30	
Carbon tetrachloride	ug/L	ND	800	800	789	822	99	103	45-150	4	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Parameter	Units	1276153012		379873		379874		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chlorobenzene	ug/L	ND	800	800	767	803	96	100	75-125	5	30		
Chloroethane	ug/L	ND	800	800	778	808	97	101	66-145	4	30		
Chloroform	ug/L	ND	800	800	800	822	100	103	74-128	3	30		
Chloromethane	ug/L	ND	800	800	830	852	104	106	51-150	3	30		
cis-1,2-Dichloroethene	ug/L	525	800	800	1320	1380	100	107	75-125	4	30		
cis-1,3-Dichloropropene	ug/L	ND	800	800	822	861	103	108	75-129	5	30		
Dibromochloromethane	ug/L	ND	800	800	832	870	104	109	66-141	5	30		
Methylene Chloride	ug/L	ND	800	800	792	816	99	102	74-125	3	30		
Tetrachloroethene	ug/L	67.6	800	800	812	853	93	98	75-135	5	30		
trans-1,2-Dichloroethene	ug/L	ND	800	800	787	820	98	102	75-125	4	30		
trans-1,3-Dichloropropene	ug/L	ND	800	800	843	880	105	110	67-139	4	30		
Trichloroethene	ug/L	45.4	800	800	836	878	99	104	75-130	5	30		
Trichlorofluoromethane	ug/L	ND	800	800	815	846	102	106	57-144	4	30		
Vinyl chloride	ug/L	14.8	800	800	749	780	92	96	70-136	4	30		
1,2-Dichloroethane-d4 (S)	%						101	101	70-130				
4-Bromofluorobenzene (S)	%						101	103	70-130				
Toluene-d8 (S)	%						101	102	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

QC Batch: 96378 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1276153004, 1276153005, 1276153018, 1276153019, 1276153020, 1276153021, 1276153022, 1276153023, 1276153024, 1276153025, 1276153026

METHOD BLANK: 380160 Matrix: Water
Associated Lab Samples: 1276153004, 1276153005, 1276153018, 1276153019, 1276153020, 1276153021, 1276153022, 1276153023, 1276153024, 1276153025, 1276153026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/05/16 18:49	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/05/16 18:49	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/05/16 18:49	
1,1-Dichloroethane	ug/L	ND	0.50	10/05/16 18:49	
1,1-Dichloroethene	ug/L	ND	0.50	10/05/16 18:49	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/05/16 18:49	
1,2-Dichloroethane	ug/L	ND	0.50	10/05/16 18:49	
1,2-Dichloropropane	ug/L	ND	0.50	10/05/16 18:49	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/05/16 18:49	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/05/16 18:49	
Bromodichloromethane	ug/L	ND	0.50	10/05/16 18:49	
Bromoform	ug/L	ND	0.50	10/05/16 18:49	
Bromomethane	ug/L	ND	20.0	10/05/16 18:49	
Carbon tetrachloride	ug/L	ND	0.50	10/05/16 18:49	
Chlorobenzene	ug/L	ND	0.50	10/05/16 18:49	
Chloroethane	ug/L	ND	2.0	10/05/16 18:49	
Chloroform	ug/L	ND	0.50	10/05/16 18:49	
Chloromethane	ug/L	ND	0.50	10/05/16 18:49	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/05/16 18:49	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/05/16 18:49	
Dibromochloromethane	ug/L	ND	0.50	10/05/16 18:49	
Methylene Chloride	ug/L	ND	5.0	10/05/16 18:49	
Tetrachloroethene	ug/L	ND	0.50	10/05/16 18:49	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/05/16 18:49	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/05/16 18:49	
Trichloroethene	ug/L	ND	0.50	10/05/16 18:49	
Trichlorofluoromethane	ug/L	ND	0.50	10/05/16 18:49	
Vinyl chloride	ug/L	ND	0.50	10/05/16 18:49	
1,2-Dichloroethane-d4 (S)	%	101	70-130	10/05/16 18:49	
4-Bromofluorobenzene (S)	%	99	70-130	10/05/16 18:49	
Toluene-d8 (S)	%	101	70-130	10/05/16 18:49	

LABORATORY CONTROL SAMPLE: 380161

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	40.1	100	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	41.6	104	75-125	
1,1,2-Trichloroethane	ug/L	40	40.8	102	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 380161

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	40.1	100	71-131	
1,1-Dichloroethene	ug/L	40	41.1	103	74-126	
1,2-Dichlorobenzene	ug/L	40	40.3	101	75-125	
1,2-Dichloroethane	ug/L	40	40.3	101	64-141	
1,2-Dichloropropane	ug/L	40	40.5	101	73-127	
1,3-Dichlorobenzene	ug/L	40	40.9	102	75-125	
1,4-Dichlorobenzene	ug/L	40	40.6	102	75-125	
Bromodichloromethane	ug/L	40	41.2	103	70-134	
Bromoform	ug/L	40	43.3	108	68-130	
Bromomethane	ug/L	40	46.7	117	30-150	
Carbon tetrachloride	ug/L	40	41.0	102	66-135	
Chlorobenzene	ug/L	40	40.4	101	75-125	
Chloroethane	ug/L	40	40.8	102	55-150	
Chloroform	ug/L	40	40.2	101	72-131	
Chloromethane	ug/L	40	44.0	110	54-132	
cis-1,2-Dichloroethene	ug/L	40	40.8	102	75-125	
cis-1,3-Dichloropropene	ug/L	40	41.7	104	74-130	
Dibromochloromethane	ug/L	40	42.3	106	70-132	
Methylene Chloride	ug/L	40	40.3	101	68-125	
Tetrachloroethene	ug/L	40	40.4	101	75-130	
trans-1,2-Dichloroethene	ug/L	40	40.4	101	75-125	
trans-1,3-Dichloropropene	ug/L	40	42.6	107	69-137	
Trichloroethene	ug/L	40	41.1	103	75-125	
Trichlorofluoromethane	ug/L	40	42.9	107	59-140	
Vinyl chloride	ug/L	40	39.4	98	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 380181 380182

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		1276153019 Result	Spike Conc.	Spike Conc.	MSD Result							
1,1,1-Trichloroethane	ug/L	ND	40	40	39.4	39.7	99	99	63-142	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	39.7	39.7	99	99	75-125	0	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	39.9	40.1	100	100	75-132	1	30	
1,1-Dichloroethane	ug/L	0.53	40	40	39.9	40.3	98	99	75-126	1	30	
1,1-Dichloroethene	ug/L	ND	40	40	39.8	40.2	99	101	75-125	1	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	39.0	39.5	97	99	75-125	1	30	
1,2-Dichloroethane	ug/L	ND	40	40	39.6	40.0	99	100	75-137	1	30	
1,2-Dichloropropane	ug/L	ND	40	40	39.0	39.4	98	98	74-131	1	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	39.6	40.1	99	100	75-126	1	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	39.2	39.4	98	99	73-125	1	30	
Bromodichloromethane	ug/L	ND	40	40	40.3	41.0	101	102	65-137	2	30	
Bromoform	ug/L	ND	40	40	42.0	42.6	105	106	60-147	1	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Parameter	Units	1276153019		380181		380182		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Bromomethane	ug/L	ND	40	40	49.2	55.4	123	139	30-150	12	30		
Carbon tetrachloride	ug/L	ND	40	40	40.1	40.4	100	101	45-150	1	30		
Chlorobenzene	ug/L	ND	40	40	39.6	39.7	99	99	75-125	0	30		
Chloroethane	ug/L	ND	40	40	39.3	39.8	98	100	66-145	1	30		
Chloroform	ug/L	ND	40	40	39.8	39.9	99	100	74-128	0	30		
Chloromethane	ug/L	ND	40	40	43.5	44.1	109	110	51-150	1	30		
cis-1,2-Dichloroethene	ug/L	5.4	40	40	45.2	45.5	99	100	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	40.7	41.3	102	103	75-129	1	30		
Dibromochloromethane	ug/L	ND	40	40	41.2	41.7	103	104	66-141	1	30		
Methylene Chloride	ug/L	ND	40	40	39.3	39.6	98	99	74-125	1	30		
Tetrachloroethene	ug/L	5.8	40	40	44.7	44.9	97	98	75-135	0	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	39.2	39.5	98	99	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	41.2	42.1	103	105	67-139	2	30		
Trichloroethene	ug/L	3.1	40	40	42.9	43.0	100	100	75-130	0	30		
Trichlorofluoromethane	ug/L	ND	40	40	42.1	42.1	105	105	57-144	0	30		
Vinyl chloride	ug/L	ND	40	40	38.0	39.1	95	98	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%.						100	99	70-130				
4-Bromofluorobenzene (S)	%.						102	102	70-130				
Toluene-d8 (S)	%.						101	102	70-130				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

QC Batch: 96457 Analysis Method: EPA 8260B
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
 Associated Lab Samples: 1276153027, 1276153028, 1276153029, 1276153030, 1276153031, 1276153032, 1276153033, 1276153034,
 1276153035, 1276153036, 1276153040, 1276153041, 1276153042, 1276153043, 1276153044, 1276153045

METHOD BLANK: 380767 Matrix: Water
 Associated Lab Samples: 1276153027, 1276153028, 1276153029, 1276153030, 1276153031, 1276153032, 1276153033, 1276153034,
 1276153035, 1276153036, 1276153040, 1276153041, 1276153042, 1276153043, 1276153044, 1276153045

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/06/16 10:10	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/06/16 10:10	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/06/16 10:10	
1,1-Dichloroethane	ug/L	ND	0.50	10/06/16 10:10	
1,1-Dichloroethene	ug/L	ND	0.50	10/06/16 10:10	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/06/16 10:10	
1,2-Dichloroethane	ug/L	ND	0.50	10/06/16 10:10	
1,2-Dichloropropane	ug/L	ND	0.50	10/06/16 10:10	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/06/16 10:10	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/06/16 10:10	
Bromodichloromethane	ug/L	ND	0.50	10/06/16 10:10	
Bromoform	ug/L	ND	0.50	10/06/16 10:10	
Bromomethane	ug/L	ND	20.0	10/06/16 10:10	
Carbon tetrachloride	ug/L	ND	0.50	10/06/16 10:10	
Chlorobenzene	ug/L	ND	0.50	10/06/16 10:10	
Chloroethane	ug/L	ND	2.0	10/06/16 10:10	
Chloroform	ug/L	ND	0.50	10/06/16 10:10	
Chloromethane	ug/L	ND	0.50	10/06/16 10:10	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/06/16 10:10	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/06/16 10:10	
Dibromochloromethane	ug/L	ND	0.50	10/06/16 10:10	
Methylene Chloride	ug/L	ND	5.0	10/06/16 10:10	
Tetrachloroethene	ug/L	ND	0.50	10/06/16 10:10	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/06/16 10:10	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/06/16 10:10	
Trichloroethene	ug/L	ND	0.50	10/06/16 10:10	
Trichlorofluoromethane	ug/L	ND	0.50	10/06/16 10:10	
Vinyl chloride	ug/L	ND	0.50	10/06/16 10:10	
1,2-Dichloroethane-d4 (S)	%	101	70-130	10/06/16 10:10	
4-Bromofluorobenzene (S)	%	98	70-130	10/06/16 10:10	
Toluene-d8 (S)	%	101	70-130	10/06/16 10:10	

LABORATORY CONTROL SAMPLE: 380768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	39.5	99	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	39.8	99	75-125	
1,1,2-Trichloroethane	ug/L	40	40.0	100	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 380768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	39.2	98	71-131	
1,1-Dichloroethene	ug/L	40	39.6	99	74-126	
1,2-Dichlorobenzene	ug/L	40	39.3	98	75-125	
1,2-Dichloroethane	ug/L	40	39.8	99	64-141	
1,2-Dichloropropane	ug/L	40	39.6	99	73-127	
1,3-Dichlorobenzene	ug/L	40	40.3	101	75-125	
1,4-Dichlorobenzene	ug/L	40	39.7	99	75-125	
Bromodichloromethane	ug/L	40	40.4	101	70-134	
Bromoform	ug/L	40	42.3	106	68-130	
Bromomethane	ug/L	40	54.7	137	30-150	
Carbon tetrachloride	ug/L	40	40.1	100	66-135	
Chlorobenzene	ug/L	40	39.9	100	75-125	
Chloroethane	ug/L	40	38.6	96	55-150	
Chloroform	ug/L	40	39.6	99	72-131	
Chloromethane	ug/L	40	41.9	105	54-132	
cis-1,2-Dichloroethene	ug/L	40	40.2	100	75-125	
cis-1,3-Dichloropropene	ug/L	40	41.3	103	74-130	
Dibromochloromethane	ug/L	40	41.4	104	70-132	
Methylene Chloride	ug/L	40	39.4	98	68-125	
Tetrachloroethene	ug/L	40	39.9	100	75-130	
trans-1,2-Dichloroethene	ug/L	40	39.5	99	75-125	
trans-1,3-Dichloropropene	ug/L	40	41.4	104	69-137	
Trichloroethene	ug/L	40	40.4	101	75-125	
Trichlorofluoromethane	ug/L	40	41.4	104	59-140	
Vinyl chloride	ug/L	40	36.9	92	68-132	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 380769 380770

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		1276153027 Result	Spike Conc.	Spike Conc.	Result							
1,1,1-Trichloroethane	ug/L	ND	40	40	41.2	40.3	103	101	63-142	2	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	41.9	42.5	105	106	75-125	1	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	41.2	40.9	103	102	75-132	1	30	
1,1-Dichloroethane	ug/L	ND	40	40	40.9	40.2	102	101	75-126	2	30	
1,1-Dichloroethene	ug/L	ND	40	40	41.5	40.6	104	101	75-125	2	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	41.2	40.2	103	101	75-125	2	30	
1,2-Dichloroethane	ug/L	ND	40	40	41.1	40.4	103	101	75-137	2	30	
1,2-Dichloropropane	ug/L	ND	40	40	40.8	40.0	102	100	74-131	2	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	42.1	40.8	105	102	75-126	3	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	41.3	40.4	103	101	73-125	2	30	
Bromodichloromethane	ug/L	ND	40	40	42.1	41.3	105	103	65-137	2	30	
Bromoform	ug/L	ND	40	40	44.5	44.6	111	112	60-147	0	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Parameter	Units	1276153027		380769		380770		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Bromomethane	ug/L	ND	40	40	52.5	52.4	131	131	30-150	0	30			
Carbon tetrachloride	ug/L	ND	40	40	41.6	41.0	104	103	45-150	1	30			
Chlorobenzene	ug/L	ND	40	40	41.3	40.2	103	100	75-125	3	30			
Chloroethane	ug/L	ND	40	40	42.5	41.0	102	98	66-145	4	30			
Chloroform	ug/L	ND	40	40	41.2	40.4	103	101	74-128	2	30			
Chloromethane	ug/L	ND	40	40	43.1	41.9	108	105	51-150	3	30			
cis-1,2-Dichloroethene	ug/L	ND	40	40	41.4	40.4	103	101	75-125	2	30			
cis-1,3-Dichloropropene	ug/L	ND	40	40	42.3	41.5	106	104	75-129	2	30			
Dibromochloromethane	ug/L	ND	40	40	42.8	42.8	107	107	66-141	0	30			
Methylene Chloride	ug/L	ND	40	40	40.9	40.4	102	101	74-125	1	30			
Tetrachloroethene	ug/L	ND	40	40	41.4	40.5	103	101	75-135	2	30			
trans-1,2-Dichloroethene	ug/L	ND	40	40	41.4	40.3	104	101	75-125	3	30			
trans-1,3-Dichloropropene	ug/L	ND	40	40	42.9	42.6	107	106	67-139	1	30			
Trichloroethene	ug/L	ND	40	40	41.9	40.9	105	102	75-130	2	30			
Trichlorofluoromethane	ug/L	ND	40	40	43.1	42.1	108	105	57-144	2	30			
Vinyl chloride	ug/L	ND	40	40	38.0	37.3	95	93	70-136	2	30			
1,2-Dichloroethane-d4 (S)	%.						99	99	70-130					
4-Bromofluorobenzene (S)	%.						103	102	70-130					
Toluene-d8 (S)	%.						101	101	70-130					

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

QC Batch: 96600 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1276153037, 1276153038, 1276153046, 1276153047, 1276153048, 1276153049, 1276153050, 1276153051, 1276153052, 1276153053, 1276153054

METHOD BLANK: 381293 Matrix: Water
Associated Lab Samples: 1276153037, 1276153038, 1276153046, 1276153047, 1276153048, 1276153049, 1276153050, 1276153051, 1276153052, 1276153053, 1276153054

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/07/16 08:06	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/07/16 08:06	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/07/16 08:06	
1,1-Dichloroethane	ug/L	ND	0.50	10/07/16 08:06	
1,1-Dichloroethene	ug/L	ND	0.50	10/07/16 08:06	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/07/16 08:06	
1,2-Dichloroethane	ug/L	ND	0.50	10/07/16 08:06	
1,2-Dichloropropane	ug/L	ND	0.50	10/07/16 08:06	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/07/16 08:06	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/07/16 08:06	
Bromodichloromethane	ug/L	ND	0.50	10/07/16 08:06	
Bromoform	ug/L	ND	0.50	10/07/16 08:06	
Bromomethane	ug/L	ND	20.0	10/07/16 08:06	
Carbon tetrachloride	ug/L	ND	0.50	10/07/16 08:06	
Chlorobenzene	ug/L	ND	0.50	10/07/16 08:06	
Chloroethane	ug/L	ND	2.0	10/07/16 08:06	
Chloroform	ug/L	ND	0.50	10/07/16 08:06	
Chloromethane	ug/L	ND	0.50	10/07/16 08:06	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/07/16 08:06	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/07/16 08:06	
Dibromochloromethane	ug/L	ND	0.50	10/07/16 08:06	
Methylene Chloride	ug/L	ND	5.0	10/07/16 08:06	
Tetrachloroethene	ug/L	ND	0.50	10/07/16 08:06	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/07/16 08:06	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/07/16 08:06	
Trichloroethene	ug/L	ND	0.50	10/07/16 08:06	
Trichlorofluoromethane	ug/L	ND	0.50	10/07/16 08:06	
Vinyl chloride	ug/L	ND	0.50	10/07/16 08:06	
1,2-Dichloroethane-d4 (S)	%	102	70-130	10/07/16 08:06	
4-Bromofluorobenzene (S)	%	97	70-130	10/07/16 08:06	
Toluene-d8 (S)	%	102	70-130	10/07/16 08:06	

LABORATORY CONTROL SAMPLE: 381294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	38.3	96	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	37.6	94	75-125	
1,1,2-Trichloroethane	ug/L	40	37.9	95	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 381294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	37.8	94	71-131	
1,1-Dichloroethene	ug/L	40	39.0	97	74-126	
1,2-Dichlorobenzene	ug/L	40	38.3	96	75-125	
1,2-Dichloroethane	ug/L	40	37.9	95	64-141	
1,2-Dichloropropane	ug/L	40	37.9	95	73-127	
1,3-Dichlorobenzene	ug/L	40	39.5	99	75-125	
1,4-Dichlorobenzene	ug/L	40	38.4	96	75-125	
Bromodichloromethane	ug/L	40	39.1	98	70-134	
Bromoform	ug/L	40	40.5	101	68-130	
Bromomethane	ug/L	40	45.0	112	30-150	
Carbon tetrachloride	ug/L	40	38.9	97	66-135	
Chlorobenzene	ug/L	40	38.8	97	75-125	
Chloroethane	ug/L	40	38.4	96	55-150	
Chloroform	ug/L	40	38.1	95	72-131	
Chloromethane	ug/L	40	39.6	99	54-132	
cis-1,2-Dichloroethene	ug/L	40	38.7	97	75-125	
cis-1,3-Dichloropropene	ug/L	40	39.2	98	74-130	
Dibromochloromethane	ug/L	40	39.6	99	70-132	
Methylene Chloride	ug/L	40	38.1	95	68-125	
Tetrachloroethene	ug/L	40	38.5	96	75-130	
trans-1,2-Dichloroethene	ug/L	40	38.4	96	75-125	
trans-1,3-Dichloropropene	ug/L	40	39.6	99	69-137	
Trichloroethene	ug/L	40	38.8	97	75-125	
Trichlorofluoromethane	ug/L	40	41.1	103	59-140	
Vinyl chloride	ug/L	40	36.6	91	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			103	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 381295 381296

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		1276153054	Spike Conc.	Spike Conc.	Result							
1,1,1-Trichloroethane	ug/L	ND	40	40	40.1	40.5	99	100	63-142	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	38.5	38.9	96	97	75-125	1	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	38.9	39.5	97	99	75-132	1	30	
1,1-Dichloroethane	ug/L	0.84	40	40	39.5	40.5	97	99	75-126	2	30	
1,1-Dichloroethene	ug/L	0.54	40	40	40.7	41.3	100	102	75-125	1	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	39.8	40.0	99	100	75-125	1	30	
1,2-Dichloroethane	ug/L	ND	40	40	39.1	39.5	98	99	75-137	1	30	
1,2-Dichloropropane	ug/L	ND	40	40	38.6	39.2	96	98	74-131	2	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	40.5	40.7	101	102	75-126	0	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	39.9	40.2	100	100	73-125	1	30	
Bromodichloromethane	ug/L	ND	40	40	40.2	40.4	100	101	65-137	1	30	
Bromoform	ug/L	ND	40	40	41.3	41.6	103	104	60-147	1	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Parameter	Units	381295		381296		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1276153054 Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
Bromomethane	ug/L	ND	40	40	48.3	55.6	121	139	30-150	14	30		
Carbon tetrachloride	ug/L	ND	40	40	40.2	40.9	101	102	45-150	2	30		
Chlorobenzene	ug/L	ND	40	40	39.9	40.0	100	100	75-125	0	30		
Chloroethane	ug/L	ND	40	40	39.3	39.3	98	98	66-145	0	30		
Chloroform	ug/L	ND	40	40	39.4	39.7	98	99	74-128	1	30		
Chloromethane	ug/L	ND	40	40	41.2	42.4	103	106	51-150	3	30		
cis-1,2-Dichloroethene	ug/L	12.9	40	40	53.1	52.7	100	100	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	40.2	40.7	100	102	75-129	1	30		
Dibromochloromethane	ug/L	ND	40	40	40.5	41.5	101	104	66-141	2	30		
Methylene Chloride	ug/L	ND	40	40	39.0	39.7	97	99	74-125	2	30		
Tetrachloroethene	ug/L	13.8	40	40	53.0	53.3	98	99	75-135	1	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	40.3	40.1	100	100	75-125	0	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	40.7	41.3	102	103	67-139	1	30		
Trichloroethene	ug/L	11.9	40	40	52.2	52.7	101	102	75-130	1	30		
Trichlorofluoromethane	ug/L	ND	40	40	42.7	42.4	107	106	57-144	1	30		
Vinyl chloride	ug/L	ND	40	40	37.8	38.4	94	95	70-136	2	30		
1,2-Dichloroethane-d4 (S)	%.						99	98	70-130				
4-Bromofluorobenzene (S)	%.						102	102	70-130				
Toluene-d8 (S)	%.						101	101	70-130				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

QC Batch: 96701 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1276153004

METHOD BLANK: 381691 Matrix: Water
Associated Lab Samples: 1276153004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/07/16 18:54	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/07/16 18:54	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/07/16 18:54	
1,1-Dichloroethane	ug/L	ND	0.50	10/07/16 18:54	
1,1-Dichloroethene	ug/L	ND	0.50	10/07/16 18:54	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/07/16 18:54	
1,2-Dichloroethane	ug/L	ND	0.50	10/07/16 18:54	
1,2-Dichloropropane	ug/L	ND	0.50	10/07/16 18:54	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/07/16 18:54	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/07/16 18:54	
Bromodichloromethane	ug/L	ND	0.50	10/07/16 18:54	
Bromoform	ug/L	ND	0.50	10/07/16 18:54	
Bromomethane	ug/L	ND	20.0	10/07/16 18:54	
Carbon tetrachloride	ug/L	ND	0.50	10/07/16 18:54	
Chlorobenzene	ug/L	ND	0.50	10/07/16 18:54	
Chloroethane	ug/L	ND	2.0	10/07/16 18:54	
Chloroform	ug/L	ND	0.50	10/07/16 18:54	
Chloromethane	ug/L	ND	0.50	10/07/16 18:54	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/07/16 18:54	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/07/16 18:54	
Dibromochloromethane	ug/L	ND	0.50	10/07/16 18:54	
Methylene Chloride	ug/L	ND	5.0	10/07/16 18:54	
Tetrachloroethene	ug/L	ND	0.50	10/07/16 18:54	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/07/16 18:54	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/07/16 18:54	
Trichloroethene	ug/L	ND	0.50	10/07/16 18:54	
Trichlorofluoromethane	ug/L	ND	0.50	10/07/16 18:54	
Vinyl chloride	ug/L	ND	0.50	10/07/16 18:54	
1,2-Dichloroethane-d4 (S)	%	101	70-130	10/07/16 18:54	
4-Bromofluorobenzene (S)	%	97	70-130	10/07/16 18:54	
Toluene-d8 (S)	%	101	70-130	10/07/16 18:54	

LABORATORY CONTROL SAMPLE: 381692

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	39.2	98	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	41.6	104	75-125	
1,1,2-Trichloroethane	ug/L	40	39.8	100	75-126	
1,1-Dichloroethane	ug/L	40	38.5	96	71-131	
1,1-Dichloroethene	ug/L	40	39.7	99	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 381692

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	39.5	99	75-125	
1,2-Dichloroethane	ug/L	40	39.4	99	64-141	
1,2-Dichloropropane	ug/L	40	38.6	97	73-127	
1,3-Dichlorobenzene	ug/L	40	39.8	99	75-125	
1,4-Dichlorobenzene	ug/L	40	39.6	99	75-125	
Bromodichloromethane	ug/L	40	39.9	100	70-134	
Bromoform	ug/L	40	43.6	109	68-130	
Bromomethane	ug/L	40	41.6	104	30-150	
Carbon tetrachloride	ug/L	40	39.7	99	66-135	
Chlorobenzene	ug/L	40	39.2	98	75-125	
Chloroethane	ug/L	40	39.2	98	55-150	
Chloroform	ug/L	40	39.0	98	72-131	
Chloromethane	ug/L	40	41.2	103	54-132	
cis-1,2-Dichloroethene	ug/L	40	39.3	98	75-125	
cis-1,3-Dichloropropene	ug/L	40	40.6	102	74-130	
Dibromochloromethane	ug/L	40	41.1	103	70-132	
Methylene Chloride	ug/L	40	38.9	97	68-125	
Tetrachloroethene	ug/L	40	39.3	98	75-130	
trans-1,2-Dichloroethene	ug/L	40	39.3	98	75-125	
trans-1,3-Dichloropropene	ug/L	40	41.1	103	69-137	
Trichloroethene	ug/L	40	39.6	99	75-125	
Trichlorofluoromethane	ug/L	40	42.3	106	59-140	
Vinyl chloride	ug/L	40	37.1	93	68-132	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 381696 381697

Parameter	Units	1276372001		381696		381697		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,1-Trichloroethane	ug/L	ND	40	40	40.2	39.0	101	98	63-142	3	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	41.1	39.8	103	99	75-125	3	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	40.2	39.5	100	99	75-132	2	30		
1,1-Dichloroethane	ug/L	ND	40	40	39.9	38.4	100	96	75-126	4	30		
1,1-Dichloroethene	ug/L	ND	40	40	40.7	39.6	102	99	75-125	3	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	40.7	39.2	102	98	75-125	4	30		
1,2-Dichloroethane	ug/L	ND	40	40	40.1	38.7	100	97	75-137	4	30		
1,2-Dichloropropane	ug/L	ND	40	40	39.6	38.7	99	97	74-131	2	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	41.0	39.9	102	100	75-126	3	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	40.6	39.1	101	98	73-125	4	30		
Bromodichloromethane	ug/L	ND	40	40	40.6	39.8	102	99	65-137	2	30		
Bromoform	ug/L	ND	40	40	43.2	42.9	108	107	60-147	1	30		
Bromomethane	ug/L	ND	40	40	49.0	50.7	122	127	30-150	3	30		
Carbon tetrachloride	ug/L	ND	40	40	41.1	39.8	103	99	45-150	3	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		381696		381697		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1276372001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Chlorobenzene	ug/L	ND	40	40	40.5	39.7	101	99	75-125	2	30		
Chloroethane	ug/L	ND	40	40	39.9	38.4	100	96	66-145	4	30		
Chloroform	ug/L	ND	40	40	40.0	39.0	100	98	74-128	3	30		
Chloromethane	ug/L	ND	40	40	42.2	41.3	106	103	51-150	2	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	40.3	39.4	101	98	75-125	2	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	41.0	39.7	102	99	75-129	3	30		
Dibromochloromethane	ug/L	ND	40	40	41.9	41.2	105	103	66-141	2	30		
Methylene Chloride	ug/L	ND	40	40	39.8	38.6	99	97	74-125	3	30		
Tetrachloroethene	ug/L	ND	40	40	40.4	39.0	101	97	75-135	4	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	40.2	38.8	100	97	75-125	4	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	41.9	40.8	105	102	67-139	3	30		
Trichloroethene	ug/L	ND	40	40	41.0	39.7	103	99	75-130	3	30		
Trichlorofluoromethane	ug/L	ND	40	40	43.0	41.5	108	104	57-144	4	30		
Vinyl chloride	ug/L	ND	40	40	38.0	36.8	95	92	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%						100	100	70-130				
4-Bromofluorobenzene (S)	%						102	103	70-130				
Toluene-d8 (S)	%						101	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

QC Batch: 96782 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1276153009, 1276153013, 1276153015, 1276153016, 1276153017, 1276153018

METHOD BLANK: 382075 Matrix: Water
Associated Lab Samples: 1276153009, 1276153013, 1276153015, 1276153016, 1276153017, 1276153018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/10/16 20:00	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/10/16 20:00	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/10/16 20:00	
1,1-Dichloroethane	ug/L	ND	0.50	10/10/16 20:00	
1,1-Dichloroethene	ug/L	ND	0.50	10/10/16 20:00	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/10/16 20:00	
1,2-Dichloroethane	ug/L	ND	0.50	10/10/16 20:00	
1,2-Dichloropropane	ug/L	ND	0.50	10/10/16 20:00	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/10/16 20:00	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/10/16 20:00	
Bromodichloromethane	ug/L	ND	0.50	10/10/16 20:00	
Bromoform	ug/L	ND	0.50	10/10/16 20:00	
Bromomethane	ug/L	ND	20.0	10/10/16 20:00	
Carbon tetrachloride	ug/L	ND	0.50	10/10/16 20:00	
Chlorobenzene	ug/L	ND	0.50	10/10/16 20:00	
Chloroethane	ug/L	ND	2.0	10/10/16 20:00	
Chloroform	ug/L	ND	0.50	10/10/16 20:00	
Chloromethane	ug/L	ND	2.0	10/10/16 20:00	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/10/16 20:00	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/10/16 20:00	
Dibromochloromethane	ug/L	ND	0.50	10/10/16 20:00	
Methylene Chloride	ug/L	ND	5.0	10/10/16 20:00	
Tetrachloroethene	ug/L	ND	0.50	10/10/16 20:00	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/10/16 20:00	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/10/16 20:00	
Trichloroethene	ug/L	ND	0.50	10/10/16 20:00	
Trichlorofluoromethane	ug/L	ND	0.50	10/10/16 20:00	
Vinyl chloride	ug/L	ND	0.50	10/10/16 20:00	
1,2-Dichloroethane-d4 (S)	%	103	70-130	10/10/16 20:00	
4-Bromofluorobenzene (S)	%	94	70-130	10/10/16 20:00	
Toluene-d8 (S)	%	99	70-130	10/10/16 20:00	

LABORATORY CONTROL SAMPLE: 382076

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	38.5	96	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	40.0	100	75-125	
1,1,2-Trichloroethane	ug/L	40	38.0	95	75-126	
1,1-Dichloroethane	ug/L	40	38.4	96	71-131	
1,1-Dichloroethene	ug/L	40	35.9	90	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 382076

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	38.2	95	75-125	
1,2-Dichloroethane	ug/L	40	42.5	106	64-141	
1,2-Dichloropropane	ug/L	40	41.6	104	73-127	
1,3-Dichlorobenzene	ug/L	40	35.2	88	75-125	
1,4-Dichlorobenzene	ug/L	40	37.5	94	75-125	
Bromodichloromethane	ug/L	40	37.1	93	70-134	
Bromoform	ug/L	40	38.8	97	68-130	
Bromomethane	ug/L	40	41.0	103	30-150	
Carbon tetrachloride	ug/L	40	37.1	93	66-135	
Chlorobenzene	ug/L	40	37.0	92	75-125	
Chloroethane	ug/L	40	41.5	104	55-150	
Chloroform	ug/L	40	37.7	94	72-131	
Chloromethane	ug/L	40	33.6	84	54-132	
cis-1,2-Dichloroethene	ug/L	40	37.5	94	75-125	
cis-1,3-Dichloropropene	ug/L	40	42.9	107	74-130	
Dibromochloromethane	ug/L	40	37.1	93	70-132	
Methylene Chloride	ug/L	40	36.2	90	68-125	
Tetrachloroethene	ug/L	40	34.5	86	75-130	
trans-1,2-Dichloroethene	ug/L	40	35.6	89	75-125	
trans-1,3-Dichloropropene	ug/L	40	41.4	103	69-137	
Trichloroethene	ug/L	40	33.5	84	75-125	
Trichlorofluoromethane	ug/L	40	34.5	86	59-140	
Vinyl chloride	ug/L	40	35.4	89	68-132	
1,2-Dichloroethane-d4 (S)	%			106	70-130	
4-Bromofluorobenzene (S)	%			92	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 382197 382198

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		1276599025 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1-Trichloroethane	ug/L	ND	40	40	37.7	39.8	94	100	63-142	5	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	38.3	40.4	96	101	75-125	5	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	37.9	38.6	95	97	75-132	2	30	
1,1-Dichloroethane	ug/L	ND	40	40	38.4	40.4	96	101	75-126	5	30	
1,1-Dichloroethene	ug/L	ND	40	40	35.7	37.4	89	93	75-125	5	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	38.5	40.6	96	101	75-125	5	30	
1,2-Dichloroethane	ug/L	ND	40	40	40.9	42.6	102	107	75-137	4	30	
1,2-Dichloropropane	ug/L	ND	40	40	41.8	43.5	104	109	74-131	4	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	36.4	37.3	91	93	75-126	3	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	38.3	40.4	96	101	73-125	5	30	
Bromodichloromethane	ug/L	ND	40	40	36.7	38.5	92	96	65-137	5	30	
Bromoform	ug/L	ND	40	40	38.5	40.1	96	100	60-147	4	30	
Bromomethane	ug/L	ND	40	40	41.8	43.4	104	109	30-150	4	30	
Carbon tetrachloride	ug/L	ND	40	40	37.3	39.9	93	100	45-150	7	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 382197		382198		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1276599025 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Chlorobenzene	ug/L	ND	40	40	37.7	39.5	94	99	75-125	4	30		
Chloroethane	ug/L	ND	40	40	40.7	39.7	102	99	66-145	2	30		
Chloroform	ug/L	ND	40	40	37.7	39.1	94	98	74-128	4	30		
Chloromethane	ug/L	ND	40	40	33.8	35.7	84	89	51-150	5	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	36.7	39.3	92	98	75-125	7	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	41.8	44.4	104	111	75-129	6	30		
Dibromochloromethane	ug/L	ND	40	40	36.6	38.7	91	97	66-141	6	30		
Methylene Chloride	ug/L	ND	40	40	34.1	38.3	85	96	74-125	12	30		
Tetrachloroethene	ug/L	ND	40	40	34.0	36.3	85	91	75-135	6	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	34.9	37.5	87	94	75-125	7	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	40.2	42.6	101	106	67-139	6	30		
Trichloroethene	ug/L	ND	40	40	34.3	34.7	86	87	75-130	1	30		
Trichlorofluoromethane	ug/L	ND	40	40	32.9	35.3	82	88	57-144	7	30		
Vinyl chloride	ug/L	ND	40	40	35.6	37.4	89	94	70-136	5	30		
1,2-Dichloroethane-d4 (S)	%						103	103	70-130				
4-Bromofluorobenzene (S)	%						94	94	70-130				
Toluene-d8 (S)	%						99	99	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

QC Batch: 96881 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1276153050, 1276153051

METHOD BLANK: 382524 Matrix: Water

Associated Lab Samples: 1276153050, 1276153051

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/11/16 11:35	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/11/16 11:35	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/11/16 11:35	
1,1-Dichloroethane	ug/L	ND	0.50	10/11/16 11:35	
1,1-Dichloroethene	ug/L	ND	0.50	10/11/16 11:35	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/11/16 11:35	
1,2-Dichloroethane	ug/L	ND	0.50	10/11/16 11:35	
1,2-Dichloropropane	ug/L	ND	0.50	10/11/16 11:35	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/11/16 11:35	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/11/16 11:35	
Bromodichloromethane	ug/L	ND	0.50	10/11/16 11:35	
Bromoform	ug/L	ND	0.50	10/11/16 11:35	
Bromomethane	ug/L	ND	20.0	10/11/16 11:35	
Carbon tetrachloride	ug/L	ND	0.50	10/11/16 11:35	
Chlorobenzene	ug/L	ND	0.50	10/11/16 11:35	
Chloroethane	ug/L	ND	2.0	10/11/16 11:35	
Chloroform	ug/L	ND	0.50	10/11/16 11:35	
Chloromethane	ug/L	ND	0.50	10/11/16 11:35	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/11/16 11:35	
Dibromochloromethane	ug/L	ND	0.50	10/11/16 11:35	
Methylene Chloride	ug/L	ND	5.0	10/11/16 11:35	
Tetrachloroethene	ug/L	ND	0.50	10/11/16 11:35	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/11/16 11:35	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/11/16 11:35	
Trichloroethene	ug/L	ND	0.50	10/11/16 11:35	
Trichlorofluoromethane	ug/L	ND	0.50	10/11/16 11:35	
Vinyl chloride	ug/L	ND	0.50	10/11/16 11:35	
1,2-Dichloroethane-d4 (S)	%	101	70-130	10/11/16 11:35	
4-Bromofluorobenzene (S)	%	101	70-130	10/11/16 11:35	
Toluene-d8 (S)	%	100	70-130	10/11/16 11:35	

LABORATORY CONTROL SAMPLE: 382525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	40.0	100	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	39.8	99	75-125	
1,1,2-Trichloroethane	ug/L	40	39.0	98	75-126	
1,1-Dichloroethane	ug/L	40	39.1	98	71-131	
1,1-Dichloroethene	ug/L	40	41.2	103	74-126	
1,2-Dichlorobenzene	ug/L	40	39.9	100	75-125	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 382525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane	ug/L	40	38.7	97	64-141	
1,2-Dichloropropane	ug/L	40	40.9	102	73-127	
1,3-Dichlorobenzene	ug/L	40	40.3	101	75-125	
1,4-Dichlorobenzene	ug/L	40	40.0	100	75-125	
Bromodichloromethane	ug/L	40	39.4	98	70-134	
Bromoform	ug/L	40	41.9	105	68-130	
Bromomethane	ug/L	40	25.4	63	30-150	
Carbon tetrachloride	ug/L	40	39.8	99	66-135	
Chlorobenzene	ug/L	40	40.2	101	75-125	
Chloroethane	ug/L	40	38.4	96	55-150	
Chloroform	ug/L	40	38.9	97	72-131	
Chloromethane	ug/L	40	37.5	94	54-132	
cis-1,3-Dichloropropene	ug/L	40	43.5	109	74-130	
Dibromochloromethane	ug/L	40	40.0	100	70-132	
Methylene Chloride	ug/L	40	39.3	98	68-125	
Tetrachloroethene	ug/L	40	40.0	100	75-130	
trans-1,2-Dichloroethene	ug/L	40	39.6	99	75-125	
trans-1,3-Dichloropropene	ug/L	40	42.7	107	69-137	
Trichloroethene	ug/L	40	40.1	100	75-125	
Trichlorofluoromethane	ug/L	40	39.6	99	59-140	
Vinyl chloride	ug/L	40	36.2	91	68-132	
1,2-Dichloroethane-d4 (S)	%			98	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 382528 382529

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1276601003	Spike Conc.	MSD Spike Conc.	Result								
1,1,1-Trichloroethane	ug/L	ND	40	40	40.0	41.6	100	104	63-142	4	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	42.5	44.6	106	111	75-125	5	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	40.4	41.8	101	105	75-132	3	30		
1,1-Dichloroethane	ug/L	ND	40	40	39.1	40.9	98	102	75-126	4	30		
1,1-Dichloroethene	ug/L	ND	40	40	41.2	42.2	103	106	75-125	2	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	39.2	41.0	98	102	75-125	4	30		
1,2-Dichloroethane	ug/L	ND	40	40	38.8	40.6	97	101	75-137	4	30		
1,2-Dichloropropane	ug/L	ND	40	40	40.9	42.4	102	106	74-131	3	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	39.8	41.4	100	103	75-126	4	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	39.3	41.0	98	102	73-125	4	30		
Bromodichloromethane	ug/L	ND	40	40	39.5	41.0	99	103	65-137	4	30		
Bromoform	ug/L	ND	40	40	43.9	46.0	110	115	60-147	5	30		
Bromomethane	ug/L	ND	40	40	33.5	40.4	84	101	30-150	19	30		
Carbon tetrachloride	ug/L	ND	40	40	39.9	41.8	100	105	45-150	5	30		
Chlorobenzene	ug/L	ND	40	40	39.9	41.3	100	103	75-125	4	30		
Chloroethane	ug/L	ND	40	40	38.3	39.4	96	99	66-145	3	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 382528		382529		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1276601003 Result	MS Spike Conc.	MSD Spike Conc.									
Chloroform	ug/L	ND	40	40	38.9	40.6	97	101	74-128	4	30		
Chloromethane	ug/L	ND	40	40	36.7	39.0	92	98	51-150	6	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	43.4	45.2	108	113	75-129	4	30		
Dibromochloromethane	ug/L	ND	40	40	40.6	42.8	102	107	66-141	5	30		
Methylene Chloride	ug/L	ND	40	40	39.5	40.7	99	102	74-125	3	30		
Tetrachloroethene	ug/L	ND	40	40	39.7	40.7	99	101	75-135	2	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	39.6	41.0	99	103	75-125	4	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	43.4	45.4	109	114	67-139	5	30		
Trichloroethene	ug/L	ND	40	40	39.9	41.4	100	104	75-130	4	30		
Trichlorofluoromethane	ug/L	ND	40	40	41.1	42.0	103	105	57-144	2	30		
Vinyl chloride	ug/L	ND	40	40	36.7	38.3	92	96	70-136	4	30		
1,2-Dichloroethane-d4 (S)	%.						99	99	70-130				
4-Bromofluorobenzene (S)	%.						103	103	70-130				
Toluene-d8 (S)	%.						100	100	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

QC Batch: 96897 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1276153018

METHOD BLANK: 382608 Matrix: Water
Associated Lab Samples: 1276153018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	10/11/16 13:34	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	10/11/16 13:34	
1,1,2-Trichloroethane	ug/L	ND	0.50	10/11/16 13:34	
1,1-Dichloroethane	ug/L	ND	0.50	10/11/16 13:34	
1,1-Dichloroethene	ug/L	ND	0.50	10/11/16 13:34	
1,2-Dichlorobenzene	ug/L	ND	0.50	10/11/16 13:34	
1,2-Dichloroethane	ug/L	ND	0.50	10/11/16 13:34	
1,2-Dichloropropane	ug/L	ND	0.50	10/11/16 13:34	
1,3-Dichlorobenzene	ug/L	ND	0.50	10/11/16 13:34	
1,4-Dichlorobenzene	ug/L	ND	0.50	10/11/16 13:34	
Bromodichloromethane	ug/L	ND	0.50	10/11/16 13:34	
Bromoform	ug/L	ND	0.50	10/11/16 13:34	
Bromomethane	ug/L	ND	20.0	10/11/16 13:34	
Carbon tetrachloride	ug/L	ND	0.50	10/11/16 13:34	
Chlorobenzene	ug/L	ND	0.50	10/11/16 13:34	
Chloroethane	ug/L	ND	2.0	10/11/16 13:34	
Chloroform	ug/L	ND	0.50	10/11/16 13:34	
Chloromethane	ug/L	ND	2.0	10/11/16 13:34	
cis-1,2-Dichloroethene	ug/L	ND	0.50	10/11/16 13:34	
cis-1,3-Dichloropropene	ug/L	ND	0.50	10/11/16 13:34	
Dibromochloromethane	ug/L	ND	0.50	10/11/16 13:34	
Methylene Chloride	ug/L	ND	5.0	10/11/16 13:34	
Tetrachloroethene	ug/L	ND	0.50	10/11/16 13:34	
trans-1,2-Dichloroethene	ug/L	ND	0.50	10/11/16 13:34	
trans-1,3-Dichloropropene	ug/L	ND	0.50	10/11/16 13:34	
Trichloroethene	ug/L	ND	0.50	10/11/16 13:34	
Trichlorofluoromethane	ug/L	ND	0.50	10/11/16 13:34	
Vinyl chloride	ug/L	ND	0.50	10/11/16 13:34	
1,2-Dichloroethane-d4 (S)	%	105	70-130	10/11/16 13:34	
4-Bromofluorobenzene (S)	%	89	70-130	10/11/16 13:34	
Toluene-d8 (S)	%	99	70-130	10/11/16 13:34	

LABORATORY CONTROL SAMPLE: 382609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	39.1	98	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	39.7	99	75-125	
1,1,2-Trichloroethane	ug/L	40	37.7	94	75-126	
1,1-Dichloroethane	ug/L	40	38.7	97	71-131	
1,1-Dichloroethene	ug/L	40	36.1	90	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

LABORATORY CONTROL SAMPLE: 382609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	38.1	95	75-125	
1,2-Dichloroethane	ug/L	40	41.0	103	64-141	
1,2-Dichloropropane	ug/L	40	42.5	106	73-127	
1,3-Dichlorobenzene	ug/L	40	35.4	89	75-125	
1,4-Dichlorobenzene	ug/L	40	38.5	96	75-125	
Bromodichloromethane	ug/L	40	37.0	92	70-134	
Bromoform	ug/L	40	38.6	97	68-130	
Bromomethane	ug/L	40	41.9	105	30-150	
Carbon tetrachloride	ug/L	40	38.1	95	66-135	
Chlorobenzene	ug/L	40	37.1	93	75-125	
Chloroethane	ug/L	40	42.1	105	55-150	
Chloroform	ug/L	40	37.3	93	72-131	
Chloromethane	ug/L	40	33.4	84	54-132	
cis-1,2-Dichloroethene	ug/L	40	37.1	93	75-125	
cis-1,3-Dichloropropene	ug/L	40	42.7	107	74-130	
Dibromochloromethane	ug/L	40	36.6	92	70-132	
Methylene Chloride	ug/L	40	35.7	89	68-125	
Tetrachloroethene	ug/L	40	34.7	87	75-130	
trans-1,2-Dichloroethene	ug/L	40	35.2	88	75-125	
trans-1,3-Dichloropropene	ug/L	40	41.2	103	69-137	
Trichloroethene	ug/L	40	34.0	85	75-125	
Trichlorofluoromethane	ug/L	40	33.5	84	59-140	
Vinyl chloride	ug/L	40	35.5	89	68-132	
1,2-Dichloroethane-d4 (S)	%			103	70-130	
4-Bromofluorobenzene (S)	%			91	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 382610 382611

Parameter	Units	382610		382611		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
1,1,1-Trichloroethane	ug/L	ND	40	40	41.6	40.5	104	101	63-142	3	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	40.5	38.4	101	96	75-125	5	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	38.9	36.7	97	92	75-132	6	30	
1,1-Dichloroethane	ug/L	1.3	40	40	42.6	41.2	103	100	75-126	3	30	
1,1-Dichloroethene	ug/L	3.1	40	40	41.1	41.1	95	95	75-125	0	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	40.5	39.5	101	99	75-125	3	30	
1,2-Dichloroethane	ug/L	ND	40	40	43.0	41.0	108	103	75-137	5	30	
1,2-Dichloropropane	ug/L	ND	40	40	43.5	42.5	109	106	74-131	2	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	36.8	36.6	92	91	75-126	1	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	41.2	40.3	103	101	73-125	2	30	
Bromodichloromethane	ug/L	ND	40	40	37.7	37.1	94	93	65-137	1	30	
Bromoform	ug/L	ND	40	40	40.0	38.6	100	97	60-147	4	30	
Bromomethane	ug/L	ND	40	40	46.6	45.2	117	113	30-150	3	30	
Carbon tetrachloride	ug/L	ND	40	40	40.6	40.0	102	100	45-150	2	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Parameter	Units	382610		382611		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1276153018 Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
Chlorobenzene	ug/L	ND	40	40	38.9	38.9	97	97	97	75-125	0	30	
Chloroethane	ug/L	ND	40	40	42.4	37.8	106	94	94	66-145	12	30	
Chloroform	ug/L	ND	40	40	39.3	37.9	98	95	95	74-128	4	30	
Chloromethane	ug/L	ND	40	40	37.5	36.7	94	92	92	51-150	2	30	
cis-1,2-Dichloroethene	ug/L	40.5	40	40	78.1	74.1	94	84	84	75-125	5	30	
cis-1,3-Dichloropropene	ug/L	ND	40	40	44.0	42.9	110	107	107	75-129	2	30	
Dibromochloromethane	ug/L	ND	40	40	37.9	36.9	95	92	92	66-141	3	30	
Methylene Chloride	ug/L	ND	40	40	37.1	35.5	93	89	89	74-125	4	30	
Tetrachloroethene	ug/L	99.4	40	40	130	126	78	66	66	75-135	4	30	M1
trans-1,2-Dichloroethene	ug/L	ND	40	40	38.0	38.5	94	95	95	75-125	1	30	
trans-1,3-Dichloropropene	ug/L	ND	40	40	42.2	40.5	106	101	101	67-139	4	30	
Trichloroethene	ug/L	35.5	40	40	70.5	68.3	87	82	82	75-130	3	30	
Trichlorofluoromethane	ug/L	ND	40	40	37.4	36.9	94	92	92	57-144	1	30	
Vinyl chloride	ug/L	3.3	40	40	39.9	41.5	92	96	96	70-136	4	30	
1,2-Dichloroethane-d4 (S)	%							103	99	70-130			
4-Bromofluorobenzene (S)	%							90	91	70-130			
Toluene-d8 (S)	%							98	98	70-130			

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

QC Batch: 64924

Analysis Method: SM 5310B

QC Batch Method: SM 5310B

Analysis Description: 5310B TOC

Associated Lab Samples: 1276153004, 1276153005, 1276153012, 1276153019, 1276153047, 1276153050

METHOD BLANK: 269410

Matrix: Water

Associated Lab Samples: 1276153004, 1276153005, 1276153012, 1276153019, 1276153047, 1276153050

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	10/06/16 16:20	

LABORATORY CONTROL SAMPLE: 269411

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	20.1	19.3	96	90-110	

MATRIX SPIKE SAMPLE: 269413

Parameter	Units	2043723001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	ND	2000	1780	88	75-125	

SAMPLE DUPLICATE: 269412

Parameter	Units	2043723001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

QC Batch: 64976	Analysis Method: SM 5310B
QC Batch Method: SM 5310B	Analysis Description: 5310B TOC
Associated Lab Samples: 1276153018	

METHOD BLANK: 269620 Matrix: Water

Associated Lab Samples: 1276153018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	10/07/16 18:10	

LABORATORY CONTROL SAMPLE: 269621

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	20.1	19.1	95	90-110	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

QC Batch: 65151	Analysis Method: SM 5310B
QC Batch Method: SM 5310B	Analysis Description: 5310B TOC
Associated Lab Samples: 1276153015	

METHOD BLANK: 270288 Matrix: Water

Associated Lab Samples: 1276153015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	10/11/16 09:48	

LABORATORY CONTROL SAMPLE: 270289

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	20.1	20.8	103	90-110	

MATRIX SPIKE SAMPLE: 270291

Parameter	Units	1276153015 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	33600	20000	61700	140	75-125	M6

SAMPLE DUPLICATE: 270290

Parameter	Units	1276153015 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	33600	37300	10	20	

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QUALIFIERS

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-DAV Pace Analytical Services - Davis
PASI-M Pace Analytical Services - Minneapolis
PASI-N Pace Analytical Services - New Orleans

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver GWM

Pace Project No.: 1276153

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1276153004	MW-19	RSK 175	440104		
1276153005	MW-14	RSK 175	440104		
1276153012	MW-12	RSK 175	440104		
1276153015	MW-13	RSK 175	440104		
1276153018	MP-1	RSK 175	440104		
1276153019	MW-24i	RSK 175	440104		
1276153047	MGMS1-40	RSK 175	440104		
1276153050	MGMS3-40	RSK 175	440104		
1276153001	S-2	EPA 8260B	96238		
1276153002	MW-21i-105	EPA 8260B	96238		
1276153003	MW-21i-40	EPA 8260B	96238		
1276153004	MW-19	EPA 8260B	96378		
1276153004	MW-19	EPA 8260B	96701		
1276153005	MW-14	EPA 8260B	96238		
1276153005	MW-14	EPA 8260B	96378		
1276153006	MW-23i	EPA 8260B	96238		
1276153007	MW-17	EPA 8260B	96238		
1276153008	S-1	EPA 8260B	96313		
1276153009	MW-26	EPA 8260B	96313		
1276153009	MW-26	EPA 8260B	96782		
1276153010	MW-10	EPA 8260B	96313		
1276153011	MW-1	EPA 8260B	96313		
1276153012	MW-12	EPA 8260B	96313		
1276153013	MW-12 DUP	EPA 8260B	96782		
1276153014	MW-8	EPA 8260B	96313		
1276153015	MW-13	EPA 8260B	96782		
1276153016	MW-13 DUP	EPA 8260B	96782		
1276153017	EX-1	EPA 8260B	96313		
1276153017	EX-1	EPA 8260B	96782		
1276153018	MP-1	EPA 8260B	96378		
1276153018	MP-1	EPA 8260B	96782		
1276153018	MP-1	EPA 8260B	96897		
1276153019	MW-24i	EPA 8260B	96378		
1276153020	MW-22i	EPA 8260B	96378		
1276153021	MW-16	EPA 8260B	96378		
1276153022	MW-18i	EPA 8260B	96378		
1276153023	MW-20i	EPA 8260B	96378		
1276153024	MW-19i	EPA 8260B	96378		
1276153025	MW-6	EPA 8260B	96378		
1276153026	MW-25i	EPA 8260B	96378		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver GWM
Pace Project No.: 1276153

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1276153027	MW-2	EPA 8260B	96457		
1276153028	EW-1	EPA 8260B	96457		
1276153029	MW-5	EPA 8260B	96457		
1276153030	MW-7	EPA 8260B	96457		
1276153031	MW-7 DUP	EPA 8260B	96457		
1276153032	MW-9	EPA 8260B	96457		
1276153033	MGMS2-40	EPA 8260B	96457		
1276153034	MGMS2-110	EPA 8260B	96457		
1276153035	MGMS2-132	EPA 8260B	96457		
1276153036	MW-3	EPA 8260B	96457		
1276153037	MW-15	EPA 8260B	96600		
1276153038	MW-24d	EPA 8260B	96600		
1276153039	Field Blank 1	EPA 8260B	96313		
1276153040	Field Blank 2	EPA 8260B	96457		
1276153041	Field Blank 3	EPA 8260B	96457		
1276153042	Field Blank 4	EPA 8260B	96457		
1276153043	Field Blank 5	EPA 8260B	96457		
1276153044	Equipment Blank	EPA 8260B	96457		
1276153045	Trip Blank	EPA 8260B	96457		
1276153046	MGMS2-60	EPA 8260B	96600		
1276153047	MGMS1-40	EPA 8260B	96600		
1276153048	MGMS1-60	EPA 8260B	96600		
1276153049	MGMS1-132	EPA 8260B	96600		
1276153050	MGMS3-40	EPA 8260B	96600		
1276153050	MGMS3-40	EPA 8260B	96881		
1276153051	MGMS3-40 DUP	EPA 8260B	96600		
1276153051	MGMS3-40 DUP	EPA 8260B	96881		
1276153052	MGMS3-60	EPA 8260B	96600		
1276153053	MGMS3-110	EPA 8260B	96600		
1276153054	MGMS3-132	EPA 8260B	96600		
1276153004	MW-19	SM 5310B	64924		
1276153005	MW-14	SM 5310B	64924		
1276153012	MW-12	SM 5310B	64924		
1276153015	MW-13	SM 5310B	65151		
1276153018	MP-1	SM 5310B	64976		
1276153019	MW-24i	SM 5310B	64924		
1276153047	MGMS1-40	SM 5310B	64924		
1276153050	MGMS3-40	SM 5310B	64924		

REPORT OF LABORATORY ANALYSIS

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2795 2nd Street, Suite 300
 Davis, CA 95618
 Lab: 530.297.4800
 Fax: 530.297.4802

1276153

SRG # / Lab No.

Project Contact (Hardcopy or PDF To): Stephanie Bosze		California EDF Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		CRA EQUIS Required <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		XLS Report Required <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No												
Company / Address: Apex Companies 3015 SW 1st Ave., Portland, OR 97201		Global ID:		Chain-of-Custody Record and Analysis Request														
Phone Number: 503-924-4704 ext 1925		EDD Deliverable To (Email Address): Ssaalisbury@apexcos.com		Analysis Request														
Fax Number: 503-924-4707		Bill to: Apex Companies		Other: Please Specify														
Project #: 320001126-18		P.O. #:		Methane, Ethane, Ethene														
Project Name: NuStar Vancouver GWM		Sampler Name & Signature: Kyle Kline		TOC														
Project Address:		Sampling		Volatile Halocarbons (EPA 8260B)														
		Date	Time	40 ml VOA	Sleeve	Poly	250 mL Glass	Container	HCl	HNO ₃	H ₂ SO ₄	Preservative	Matrix	Water	Soil	Air	TAT	
Sample Designation		Date	Time	40 ml VOA	Sleeve	Poly	250 mL Glass	Container	HCl	HNO ₃	H ₂ SO ₄	Preservative	Matrix	Water	Soil	Air	TAT	
MW-2		9/29/2016	0905	3					X					X			X	12 hr
EW-1		9/29/2016	0955	3					X					X			X	24 hr
MW-5		9/29/2016	1126	3					X					X			X	48hr
MW-7		9/29/2016	1210	3					X					X			X	72hr
MW-7 DUP		9/29/2016	1210	3					X					X			X	1 wk
MW-9		9/29/2016	1258	3					X					X			X	
MGMS2-40		9/29/2016	1525	3					X					X			X	
MGMS2-110		9/29/2016	1607	3					X					X			X	
MGMS2-132		9/29/2016	1625	3					X					X			X	
MW-3		9/30/2016	0754	3					X					X			X	
MW-15		9/30/2016	0833	3					X					X			X	
MW-24d		9/30/2016	1015	3					X					X			X	
Relinquished by: <i>Kyle Kline / Apex</i>		Date	10/3/16	Time	1130	Remarks: MS/MSD is from well MW-12 (extra bottles labeled as MW-12 MS/MSD)												
Relinquished by:		Date		Time		Received by: <i>[Signature]</i> PALE analyzed 10/3/16												
Relinquished by:		Date		Time		Received by Laboratory:												
		Date		Time		Temp °C												
		Initials		Date		For Lab Use Only: Sample Receipt												
		Time		Therm. ID #		Coolant Present												
		Yes / No		Yes / No		Yes / No												



2795 2nd Street, Suite 300
 Davis, CA 95618
 Lab: 530.297.4800
 Fax: 530.297.4802

SRG # / Lab No.

1226157

Project Contact (Hardcopy or PDF To):
 Stephanie Bosze
 Company / Address: Apex Companies
 3015 SW 1st Ave., Portland, OR 97201
 Phone Number: 503-924-4704 ext 1925
 Fax Number: 503-924-4707
 Project #: P.O. #:
 320001126-18
 Project Name: NuStar Vancouver GWM
 Project Address:

Sample Designation	Date	Time	Container			Preservative			Matrix			TAT	
			40 ml VOA	250 mL Glass	Tedlar	HCl	HNO ₃	H ₂ SO ₄	None	Water	Soil		Air
Field Blank 1	9/26/2016	1500	3			X			X			X	039
Field Blank 2	9/27/2016	1600	3			X			X			X	040
Field Blank 3	9/28/2016	1620	3			X			X			X	041
Field Blank 4	9/29/2016	1630	3			X			X			X	042
Field Blank 5	9/30/2016	1500	3			X			X			X	043
Equipment Blank	9/30/2016	1500	3			X			X			X	044
Trip Blank	9/30/2016	1500	2			X			X			X	045

Global ID:
 EDD Deliverable To (Email Address): Ssalisbury@apexcos.com
 Bill to: Apex Companies
 Sampler Name & Signature: Kyle Kline

California EDF Report? Yes No
 CRA EQUIS Required Yes No
 XLS Report Required Yes No

Analysis Request
 Other, Please Specify
 Methane, Ethane, Ethene
 TOC
 Volatile Halocarbons (EPA 826B)
 HOLD

For Lab Use Only
 12 hr
 24 hr
 48hr
 72hr
 1 wk

Remarks:
 MS/MSD is from well MW-12 (extra bottles labeled as MW-12 MS/MSD)

Relinquished by: Kyle K / Apex
 Date: 10/13/16
 Time: 1130

Received by: [Signature]
 Date: [Blank]
 Time: [Blank]

Relinquished by: [Blank]
 Date: [Blank]
 Time: [Blank]

Received by Laboratory: [Blank]
 Date: [Blank]
 Time: [Blank]

For Lab Use Only: Sample Receipt
 Temp °C: [Blank] Initials: [Blank] Date: [Blank] Time: [Blank] Therm. ID #: [Blank] Coolant Present: [Blank]
 Yes / No

Sample Condition Upon Receipt

Client Name: Apex Companies

Project #: _____

WO#: 1276153



1276153

Courier: Fed Ex UPS USPS Client
 Commercial Pace OnTrac Other: _____
Tracking Number: 8107 8807 7240 / 7230

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermom. Used: DA1434 DA2285 **Type of Ice:** Wet Blue Dry Ice None Samples on ice, cooling process has begun

Cooler Temp Read(°C): 2.4/1.8 **Cooler Temp Corrected(°C):** 2.9/2.3 **Biological Tissue Frozen?** Yes No N/A
 Temp should be above freezing to 6°C **Correction Factor:** -10.5 **Date and Initials of Person Examining Contents:** 10/4/16

		Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1. 2 of the 5 pages of the COC
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2. have "page 1 of 4" are the upper
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3. right hand corner of the page.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4. SR will treat the page with
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. 9 samples on page 5 until further
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6. clarification.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8. Sample has one broken
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. container.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. A few containers do not have the true. Field blanks do not have numbers on
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample # The labels for the sample ID
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: Scott Jones **Date:** 10/4/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

December 30, 2016

Stephanie Bosze-Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

RE: Project: NuStar Vancouver
Pace Project No.: 1280701

Dear Stephanie Bosze-Salisbury:

Enclosed are the analytical results for sample(s) received by the laboratory on December 20, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott M Forbes
scott.forbes@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: NuStar Vancouver

Pace Project No.: 1280701

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

525 N 8th Street, Salina, KS 67401

Alaska Certification UST-107

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

Davis Certification IDs

2795 Second Street Suite 300 Davis, CA 95618

North Dakota Certification #: R-214

Oregon Certification #: CA300002

Washington Certification #: C926-15a

California Certification #: 08263CA

Minnesota Department of Health Certification #: 006-999-465

New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):
T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119

Commonwealth of Virginia (TNI): 480246

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver

Pace Project No.: 1280701

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1280701001	MW-1	Water	12/16/16 09:44	12/20/16 10:15
1280701002	MW-3	Water	12/16/16 11:19	12/20/16 10:15
1280701003	MW-5	Water	12/14/16 13:09	12/20/16 10:15
1280701004	MW-7	Water	12/14/16 13:37	12/20/16 10:15
1280701005	MW-8	Water	12/14/16 08:27	12/20/16 10:15
1280701006	MW-9	Water	12/14/16 14:27	12/20/16 10:15
1280701007	MW-12	Water	12/14/16 15:12	12/20/16 10:15
1280701008	MW-13	Water	12/16/16 08:44	12/20/16 10:15
1280701009	MW-14	Water	12/13/16 11:02	12/20/16 10:15
1280701010	MW-16	Water	12/14/16 10:32	12/20/16 10:15
1280701011	S-1	Water	12/13/16 09:17	12/20/16 10:15
1280701012	MW-18i	Water	12/14/16 09:47	12/20/16 10:15
1280701013	MW-19i	Water	12/14/16 11:29	12/20/16 10:15
1280701014	MW-20i	Water	12/14/16 09:02	12/20/16 10:15
1280701015	MW-21i-40	Water	12/13/16 16:09	12/20/16 10:15
1280701016	MW-22i	Water	12/13/16 13:47	12/20/16 10:15
1280701017	MW-23i	Water	12/13/16 10:39	12/20/16 10:15
1280701018	MW-21i-105	Water	12/13/16 14:49	12/20/16 10:15
1280701019	MW-7 DUP	Water	12/14/16 13:37	12/20/16 10:15
1280701020	MW-12 DUP	Water	12/14/16 15:12	12/20/16 10:15
1280701021	MW-19	Water	12/12/16 13:17	12/20/16 10:15
1280701022	MW-32S	Water	12/14/16 12:11	12/20/16 10:15
1280701023	MGMS1-43	Water	12/16/16 11:44	12/20/16 10:15
1280701024	MGMS2-40	Water	12/16/16 12:54	12/20/16 10:15
1280701025	MGMS3-40	Water	12/16/16 10:19	12/20/16 10:15
1280701026	MP-1	Water	12/13/16 08:14	12/20/16 10:15
1280701027	EX-1	Water	12/12/16 14:07	12/20/16 10:15
1280701028	MGMS1-60	Water	12/16/16 12:19	12/20/16 10:15
1280701029	MGMS2-60	Water	12/16/16 13:14	12/20/16 10:15
1280701030	MGMS3-60	Water	12/16/16 10:44	12/20/16 10:15
1280701031	MW-19 DUP	Water	12/12/16 13:17	12/20/16 10:15
1280701032	MW-24i	Water	12/12/16 14:44	12/20/16 10:15
1280701033	MW-25i	Water	12/13/16 12:54	12/20/16 10:15
1280701034	MW-26	Water	12/13/16 12:07	12/20/16 10:15
1280701035	TRIP BLANK	Water	12/16/16 13:35	12/20/16 10:15
1280701036	Field Blank	Water	12/12/16 08:00	12/20/16 10:15
1280701037	Equipment Blank	Water	12/16/16 13:40	12/20/16 10:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver

Pace Project No.: 1280701

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1280701038	MW 24D	Water	12/12/16 15:49	12/20/16 10:15
1280701039	S-2	Water	12/13/16 09:39	12/20/16 10:15
1280701040	Field Blank 1	Water	12/12/16 13:30	12/20/16 10:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver

Pace Project No.: 1280701

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1280701001	MW-1	EPA 8260B	JCP	31	PASI-DAV
1280701002	MW-3	EPA 8260B	JCP	31	PASI-DAV
1280701003	MW-5	EPA 8260B	SJ1	31	PASI-DAV
1280701004	MW-7	EPA 8260B	JCP	31	PASI-DAV
1280701005	MW-8	EPA 8260B	JCP	31	PASI-DAV
1280701006	MW-9	EPA 8260B	JCP	31	PASI-DAV
1280701007	MW-12	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP, SJ1	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701008	MW-13	RSK 175	DR1	3	PASI-M
		EPA 8260B	SJ1	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701009	MW-14	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701010	MW-16	EPA 8260B	JCP	31	PASI-DAV
1280701011	S-1	EPA 8260B	JCP	31	PASI-DAV
1280701012	MW-18i	EPA 8260B	JCP	31	PASI-DAV
1280701013	MW-19i	EPA 8260B	JCP	31	PASI-DAV
1280701014	MW-20i	EPA 8260B	JCP	31	PASI-DAV
1280701015	MW-21i-40	EPA 8260B	JCP	31	PASI-DAV
1280701016	MW-22i	EPA 8260B	JCP	31	PASI-DAV
1280701017	MW-23i	EPA 8260B	JCP	31	PASI-DAV
1280701018	MW-21i-105	EPA 8260B	JCP	31	PASI-DAV
1280701019	MW-7 DUP	EPA 8260B	JCP	31	PASI-DAV
1280701020	MW-12 DUP	EPA 8260B	SJ1	31	PASI-DAV
1280701021	MW-19	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701022	MW-32S	EPA 8260B	JCP	31	PASI-DAV
1280701023	MGMS1-43	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701024	MGMS2-40	EPA 8260B	JCP	31	PASI-DAV
1280701025	MGMS3-40	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver
Pace Project No.: 1280701

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1280701026	MP-1	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701027	EX-1	EPA 8260B	JCP	31	PASI-DAV
1280701028	MGMS1-60	EPA 8260B	JCP	31	PASI-DAV
1280701029	MGMS2-60	EPA 8260B	JCP	31	PASI-DAV
1280701030	MGMS3-60	EPA 8260B	JCP	31	PASI-DAV
1280701031	MW-19 DUP	EPA 8260B	JCP	31	PASI-DAV
1280701032	MW-24i	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701033	MW-25i	EPA 8260B	JCP	31	PASI-DAV
1280701034	MW-26	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	TAE	1	PASI-N
1280701035	TRIP BLANK	EPA 8260B	JCP	31	PASI-DAV
1280701036	Field Blank	EPA 8260B	JCP	31	PASI-DAV
1280701037	Equipment Blank	EPA 8260B	JCP	31	PASI-DAV
1280701038	MW 24D	EPA 8260B	JCP	31	PASI-DAV
1280701039	S-2	EPA 8260B	JCP	31	PASI-DAV

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-1	Lab ID: 1280701001	Collected: 12/16/16 09:44	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/26/16 21:31	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/26/16 21:31	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/26/16 21:31	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/26/16 21:31	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/26/16 21:31	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/26/16 21:31	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/26/16 21:31	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/26/16 21:31	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/26/16 21:31	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 21:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 21:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 21:31	106-46-7	
1,1-Dichloroethane	3.4	ug/L	0.50	1		12/26/16 21:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/26/16 21:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/26/16 21:31	75-35-4	
cis-1,2-Dichloroethene	22.5	ug/L	0.50	1		12/26/16 21:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/26/16 21:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/26/16 21:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 21:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 21:31	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/26/16 21:31	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/26/16 21:31	79-34-5	
Tetrachloroethene	8.0	ug/L	0.50	1		12/26/16 21:31	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/26/16 21:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/26/16 21:31	79-00-5	
Trichloroethene	5.8	ug/L	0.50	1		12/26/16 21:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/26/16 21:31	75-69-4	
Vinyl chloride	0.86	ug/L	0.50	1		12/26/16 21:31	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%	70-130	1		12/26/16 21:31	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		12/26/16 21:31	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		12/26/16 21:31	460-00-4	

Sample: MW-3	Lab ID: 1280701002	Collected: 12/16/16 11:19	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/26/16 19:32	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/26/16 19:32	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/26/16 19:32	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/26/16 19:32	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/26/16 19:32	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/26/16 19:32	75-00-3	
Chloroform	0.52	ug/L	0.50	1		12/26/16 19:32	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/26/16 19:32	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-3	Lab ID: 1280701002	Collected: 12/16/16 11:19	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		12/26/16 19:32	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 19:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 19:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 19:32	106-46-7	
1,1-Dichloroethane	1.1	ug/L	0.50	1		12/26/16 19:32	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/26/16 19:32	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/26/16 19:32	75-35-4	
cis-1,2-Dichloroethene	26.8	ug/L	0.50	1		12/26/16 19:32	156-59-2	
trans-1,2-Dichloroethene	0.90	ug/L	0.50	1		12/26/16 19:32	156-60-5	
1,2-Dichloropropane	0.57	ug/L	0.50	1		12/26/16 19:32	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 19:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 19:32	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/26/16 19:32	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/26/16 19:32	79-34-5	
Tetrachloroethene	86.2	ug/L	0.50	1		12/26/16 19:32	127-18-4	
1,1,1-Trichloroethane	1.2	ug/L	0.50	1		12/26/16 19:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/26/16 19:32	79-00-5	
Trichloroethene	23.9	ug/L	0.50	1		12/26/16 19:32	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/26/16 19:32	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/26/16 19:32	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1		12/26/16 19:32	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		12/26/16 19:32	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1		12/26/16 19:32	460-00-4	

Sample: MW-5	Lab ID: 1280701003	Collected: 12/14/16 13:09	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/28/16 12:43	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/28/16 12:43	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/28/16 12:43	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/28/16 12:43	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/28/16 12:43	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/28/16 12:43	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/28/16 12:43	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/28/16 12:43	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/28/16 12:43	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/28/16 12:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/28/16 12:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/28/16 12:43	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/28/16 12:43	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/28/16 12:43	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/28/16 12:43	75-35-4	
cis-1,2-Dichloroethene	4.3	ug/L	0.50	1		12/28/16 12:43	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-5		Lab ID: 1280701003	Collected: 12/14/16 13:09	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/28/16 12:43	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/28/16 12:43	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/28/16 12:43	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/28/16 12:43	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/28/16 12:43	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/28/16 12:43	79-34-5	
Tetrachloroethene	11.5	ug/L	0.50	1		12/28/16 12:43	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/28/16 12:43	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/28/16 12:43	79-00-5	
Trichloroethene	2.5	ug/L	0.50	1		12/28/16 12:43	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/28/16 12:43	75-69-4	
Vinyl chloride	1.1	ug/L	0.50	1		12/28/16 12:43	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/28/16 12:43	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/28/16 12:43	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		12/28/16 12:43	460-00-4	

Sample: MW-7		Lab ID: 1280701004	Collected: 12/14/16 13:37	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/26/16 21:51	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/26/16 21:51	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/26/16 21:51	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/26/16 21:51	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/26/16 21:51	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/26/16 21:51	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/26/16 21:51	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/26/16 21:51	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/26/16 21:51	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 21:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 21:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 21:51	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/26/16 21:51	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/26/16 21:51	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/26/16 21:51	75-35-4	
cis-1,2-Dichloroethene	9.2	ug/L	0.50	1		12/26/16 21:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/26/16 21:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/26/16 21:51	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 21:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 21:51	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/26/16 21:51	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/26/16 21:51	79-34-5	
Tetrachloroethene	0.65	ug/L	0.50	1		12/26/16 21:51	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/26/16 21:51	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-7		Lab ID: 1280701004	Collected: 12/14/16 13:37	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/26/16 21:51	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/26/16 21:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/26/16 21:51	75-69-4	
Vinyl chloride	0.98	ug/L	0.50	1		12/26/16 21:51	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%.	70-130	1		12/26/16 21:51	17060-07-0	
Toluene-d8 (S)	103	%.	70-130	1		12/26/16 21:51	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		12/26/16 21:51	460-00-4	

Sample: MW-8		Lab ID: 1280701005	Collected: 12/14/16 08:27	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/26/16 22:11	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/26/16 22:11	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/26/16 22:11	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/26/16 22:11	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/26/16 22:11	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/26/16 22:11	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/26/16 22:11	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/26/16 22:11	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/26/16 22:11	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 22:11	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 22:11	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 22:11	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/26/16 22:11	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/26/16 22:11	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/26/16 22:11	75-35-4	
cis-1,2-Dichloroethene	3.1	ug/L	0.50	1		12/26/16 22:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/26/16 22:11	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/26/16 22:11	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 22:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 22:11	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/26/16 22:11	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/26/16 22:11	79-34-5	
Tetrachloroethene	3.8	ug/L	0.50	1		12/26/16 22:11	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/26/16 22:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/26/16 22:11	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/26/16 22:11	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/26/16 22:11	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/26/16 22:11	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%.	70-130	1		12/26/16 22:11	17060-07-0	
Toluene-d8 (S)	103	%.	70-130	1		12/26/16 22:11	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	70-130	1		12/26/16 22:11	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-9	Lab ID: 1280701006	Collected: 12/14/16 14:27	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/26/16 22:31	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/26/16 22:31	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/26/16 22:31	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/26/16 22:31	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/26/16 22:31	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/26/16 22:31	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/26/16 22:31	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/26/16 22:31	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/26/16 22:31	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 22:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 22:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 22:31	106-46-7	
1,1-Dichloroethane	1.3	ug/L	0.50	1		12/26/16 22:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/26/16 22:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/26/16 22:31	75-35-4	
cis-1,2-Dichloroethene	59.7	ug/L	0.50	1		12/26/16 22:31	156-59-2	
trans-1,2-Dichloroethene	1.6	ug/L	0.50	1		12/26/16 22:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/26/16 22:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 22:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 22:31	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/26/16 22:31	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/26/16 22:31	79-34-5	
Tetrachloroethene	75.8	ug/L	0.50	1		12/26/16 22:31	127-18-4	
1,1,1-Trichloroethane	1.1	ug/L	0.50	1		12/26/16 22:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/26/16 22:31	79-00-5	
Trichloroethene	44.9	ug/L	0.50	1		12/26/16 22:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/26/16 22:31	75-69-4	
Vinyl chloride	0.52	ug/L	0.50	1		12/26/16 22:31	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	70-130	1		12/26/16 22:31	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		12/26/16 22:31	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		12/26/16 22:31	460-00-4	

Sample: MW-12	Lab ID: 1280701007	Collected: 12/14/16 15:12	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	13.1	ug/L	10.0	1		12/27/16 16:43	74-84-0	
Ethene	ND	ug/L	10.0	1		12/27/16 16:43	74-85-1	
Methane	1020	ug/L	10.0	1		12/27/16 16:43	74-82-8	
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	1.0	2		12/26/16 22:51	75-27-4	
Bromoform	ND	ug/L	1.0	2		12/26/16 22:51	75-25-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-12	Lab ID: 1280701007	Collected: 12/14/16 15:12	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromomethane	ND	ug/L	40.0	2		12/26/16 22:51	74-83-9	
Carbon tetrachloride	ND	ug/L	1.0	2		12/26/16 22:51	56-23-5	
Chlorobenzene	ND	ug/L	1.0	2		12/26/16 22:51	108-90-7	
Chloroethane	ND	ug/L	4.0	2		12/26/16 22:51	75-00-3	
Chloroform	ND	ug/L	1.0	2		12/26/16 22:51	67-66-3	
Chloromethane	ND	ug/L	4.0	2		12/26/16 22:51	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	2		12/26/16 22:51	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	1.0	2		12/26/16 22:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	2		12/26/16 22:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	2		12/26/16 22:51	106-46-7	
1,1-Dichloroethane	ND	ug/L	1.0	2		12/26/16 22:51	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	2		12/26/16 22:51	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	2		12/26/16 22:51	75-35-4	
cis-1,2-Dichloroethene	6.9	ug/L	1.0	2		12/26/16 22:51	156-59-2	
trans-1,2-Dichloroethene	2.3	ug/L	1.0	2		12/26/16 22:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	2		12/26/16 22:51	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	2		12/26/16 22:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	2		12/26/16 22:51	10061-02-6	
Methylene Chloride	ND	ug/L	10.0	2		12/26/16 22:51	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	2		12/26/16 22:51	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	2		12/26/16 22:51	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	1.0	2		12/26/16 22:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	2		12/26/16 22:51	79-00-5	
Trichloroethene	ND	ug/L	1.0	2		12/26/16 22:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	2		12/26/16 22:51	75-69-4	
Vinyl chloride	20.5	ug/L	6.2	12.5		12/28/16 13:46	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	2		12/26/16 22:51	17060-07-0	
Toluene-d8 (S)	103	%	70-130	2		12/26/16 22:51	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	2		12/26/16 22:51	460-00-4	

Sample: MW-12	Lab ID: 1280701007	Collected: 12/14/16 15:12	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	1930	mg/L	25.0	25		12/29/16 09:49	7440-44-0	D6,M6

Sample: MW-13	Lab ID: 1280701008	Collected: 12/16/16 08:44	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		12/27/16 16:51	74-84-0	
Ethene	ND	ug/L	10.0	1		12/27/16 16:51	74-85-1	
Methane	89.4	ug/L	10.0	1		12/27/16 16:51	74-82-8	

Sample: MW-12	Lab ID: 1280701007	Collected: 12/14/16 15:12	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		12/28/16 14:26	75-27-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: MW-13	Lab ID: 1280701008	Collected: 12/16/16 08:44	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromoform	ND	ug/L	5.0	10		12/28/16 14:26	75-25-2	
Bromomethane	ND	ug/L	200	10		12/28/16 14:26	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		12/28/16 14:26	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		12/28/16 14:26	108-90-7	
Chloroethane	ND	ug/L	20.0	10		12/28/16 14:26	75-00-3	
Chloroform	ND	ug/L	5.0	10		12/28/16 14:26	67-66-3	
Chloromethane	ND	ug/L	20.0	10		12/28/16 14:26	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		12/28/16 14:26	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		12/28/16 14:26	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		12/28/16 14:26	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		12/28/16 14:26	106-46-7	
1,1-Dichloroethane	ND	ug/L	5.0	10		12/28/16 14:26	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		12/28/16 14:26	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	10		12/28/16 14:26	75-35-4	
cis-1,2-Dichloroethene	509	ug/L	5.0	10		12/28/16 14:26	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	10		12/28/16 14:26	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		12/28/16 14:26	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		12/28/16 14:26	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		12/28/16 14:26	10061-02-6	
Methylene Chloride	ND	ug/L	50.0	10		12/28/16 14:26	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		12/28/16 14:26	79-34-5	
Tetrachloroethene	1020	ug/L	5.0	10		12/28/16 14:26	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	5.0	10		12/28/16 14:26	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	10		12/28/16 14:26	79-00-5	
Trichloroethene	394	ug/L	5.0	10		12/28/16 14:26	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	10		12/28/16 14:26	75-69-4	
Vinyl chloride	ND	ug/L	5.0	10		12/28/16 14:26	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	10		12/28/16 14:26	17060-07-0	
Toluene-d8 (S)	104	%	70-130	10		12/28/16 14:26	2037-26-5	
4-Bromofluorobenzene (S)	93	%	70-130	10		12/28/16 14:26	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	2220	mg/L	25.0	25		12/29/16 10:46	7440-44-0	

Sample: MW-14	Lab ID: 1280701009	Collected: 12/13/16 11:02	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		12/27/16 16:18	74-84-0	
Ethene	ND	ug/L	10.0	1		12/27/16 16:18	74-85-1	
Methane	ND	ug/L	10.0	1		12/27/16 16:18	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-14	Lab ID: 1280701009	Collected: 12/13/16 11:02	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 21:21	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 21:21	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 21:21	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 21:21	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 21:21	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 21:21	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 21:21	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 21:21	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 21:21	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:21	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 21:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 21:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 21:21	75-35-4	
cis-1,2-Dichloroethene	1.3	ug/L	0.50	1		12/23/16 21:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 21:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 21:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 21:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 21:21	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 21:21	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 21:21	79-34-5	
Tetrachloroethene	0.56	ug/L	0.50	1		12/23/16 21:21	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 21:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 21:21	79-00-5	
Trichloroethene	0.97	ug/L	0.50	1		12/23/16 21:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 21:21	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 21:21	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		12/23/16 21:21	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/23/16 21:21	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		12/23/16 21:21	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	5.1	mg/L	1.0	1		12/29/16 11:05	7440-44-0	

Sample: MW-16	Lab ID: 1280701010	Collected: 12/14/16 10:32	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/27/16 20:15	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/27/16 20:15	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/27/16 20:15	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/27/16 20:15	56-23-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-16		Lab ID: 1280701010	Collected: 12/14/16 10:32	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Chlorobenzene	ND	ug/L	0.50	1		12/27/16 20:15	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/27/16 20:15	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/27/16 20:15	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/27/16 20:15	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/27/16 20:15	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:15	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/27/16 20:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/27/16 20:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/27/16 20:15	75-35-4	
cis-1,2-Dichloroethene	3.1	ug/L	0.50	1		12/27/16 20:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/27/16 20:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/27/16 20:15	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 20:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 20:15	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/27/16 20:15	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/27/16 20:15	79-34-5	
Tetrachloroethene	51.5	ug/L	0.50	1		12/27/16 20:15	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/27/16 20:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/27/16 20:15	79-00-5	
Trichloroethene	11.6	ug/L	0.50	1		12/27/16 20:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/27/16 20:15	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/27/16 20:15	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	110	%	70-130	1		12/27/16 20:15	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		12/27/16 20:15	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	1		12/27/16 20:15	460-00-4	

Sample: S-1		Lab ID: 1280701011	Collected: 12/13/16 09:17	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 21:40	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 21:40	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 21:40	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 21:40	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 21:40	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 21:40	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 21:40	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 21:40	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 21:40	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:40	106-46-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: S-1		Lab ID: 1280701011	Collected: 12/13/16 09:17	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 21:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 21:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 21:40	75-35-4	
cis-1,2-Dichloroethene	0.57	ug/L	0.50	1		12/23/16 21:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 21:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 21:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 21:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 21:40	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 21:40	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 21:40	79-34-5	
Tetrachloroethene	0.54	ug/L	0.50	1		12/23/16 21:40	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 21:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 21:40	79-00-5	
Trichloroethene	1.6	ug/L	0.50	1		12/23/16 21:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 21:40	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 21:40	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/23/16 21:40	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		12/23/16 21:40	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		12/23/16 21:40	460-00-4	

Sample: MW-18i		Lab ID: 1280701012	Collected: 12/14/16 09:47	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/27/16 20:35	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/27/16 20:35	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/27/16 20:35	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/27/16 20:35	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/27/16 20:35	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/27/16 20:35	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/27/16 20:35	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/27/16 20:35	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/27/16 20:35	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:35	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/27/16 20:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/27/16 20:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/27/16 20:35	75-35-4	
cis-1,2-Dichloroethene	2.8	ug/L	0.50	1		12/27/16 20:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/27/16 20:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/27/16 20:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 20:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 20:35	10061-02-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: MW-18i		Lab ID: 1280701012	Collected: 12/14/16 09:47	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Methylene Chloride	ND	ug/L	5.0	1		12/27/16 20:35	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/27/16 20:35	79-34-5	
Tetrachloroethene	1.5	ug/L	0.50	1		12/27/16 20:35	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/27/16 20:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/27/16 20:35	79-00-5	
Trichloroethene	1.2	ug/L	0.50	1		12/27/16 20:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/27/16 20:35	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/27/16 20:35	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%.	70-130	1		12/27/16 20:35	17060-07-0	
Toluene-d8 (S)	104	%.	70-130	1		12/27/16 20:35	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	70-130	1		12/27/16 20:35	460-00-4	

Sample: MW-19i		Lab ID: 1280701013	Collected: 12/14/16 11:29	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/27/16 20:55	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/27/16 20:55	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/27/16 20:55	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/27/16 20:55	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/27/16 20:55	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/27/16 20:55	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/27/16 20:55	67-66-3	
Chloromethane	ND	ug/L	2.0	1		12/27/16 20:55	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/27/16 20:55	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:55	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 20:55	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/27/16 20:55	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/27/16 20:55	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/27/16 20:55	75-35-4	
cis-1,2-Dichloroethene	2.4	ug/L	0.50	1		12/27/16 20:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/27/16 20:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/27/16 20:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 20:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 20:55	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/27/16 20:55	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/27/16 20:55	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/27/16 20:55	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/27/16 20:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/27/16 20:55	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/27/16 20:55	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/27/16 20:55	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/27/16 20:55	75-01-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-19i		Lab ID: 1280701013	Collected: 12/14/16 11:29	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%.	70-130	1		12/27/16 20:55	17060-07-0	
Toluene-d8 (S)	104	%.	70-130	1		12/27/16 20:55	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1		12/27/16 20:55	460-00-4	

Sample: MW-20i		Lab ID: 1280701014	Collected: 12/14/16 09:02	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 16:33	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 16:33	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 16:33	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 16:33	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 16:33	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 16:33	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 16:33	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 16:33	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 16:33	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 16:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 16:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 16:33	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 16:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 16:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 16:33	75-35-4	
cis-1,2-Dichloroethene	2.5	ug/L	0.50	1		12/23/16 16:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 16:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 16:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 16:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 16:33	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 16:33	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 16:33	79-34-5	
Tetrachloroethene	0.54	ug/L	0.50	1		12/23/16 16:33	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 16:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 16:33	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/23/16 16:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 16:33	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 16:33	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1		12/23/16 16:33	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		12/23/16 16:33	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	70-130	1		12/23/16 16:33	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-21i-40		Lab ID: 1280701015	Collected: 12/13/16 16:09	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 21:59	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 21:59	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 21:59	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 21:59	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 21:59	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 21:59	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 21:59	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 21:59	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 21:59	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 21:59	106-46-7	
1,1-Dichloroethane	2.4	ug/L	0.50	1		12/23/16 21:59	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 21:59	107-06-2	
1,1-Dichloroethene	0.83	ug/L	0.50	1		12/23/16 21:59	75-35-4	
cis-1,2-Dichloroethene	74.2	ug/L	0.50	1		12/23/16 21:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 21:59	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 21:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 21:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 21:59	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 21:59	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 21:59	79-34-5	
Tetrachloroethene	21.4	ug/L	0.50	1		12/23/16 21:59	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 21:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 21:59	79-00-5	
Trichloroethene	19.4	ug/L	0.50	1		12/23/16 21:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 21:59	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 21:59	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/23/16 21:59	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/23/16 21:59	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		12/23/16 21:59	460-00-4	

Sample: MW-22i		Lab ID: 1280701016	Collected: 12/13/16 13:47	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 22:19	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 22:19	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 22:19	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 22:19	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 22:19	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 22:19	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 22:19	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 22:19	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-22i		Lab ID: 1280701016		Collected: 12/13/16 13:47		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 22:19	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:19	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:19	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:19	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 22:19	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 22:19	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:19	75-35-4		
cis-1,2-Dichloroethene	8.6	ug/L	0.50	1		12/23/16 22:19	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:19	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 22:19	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 22:19	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 22:19	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 22:19	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 22:19	79-34-5		
Tetrachloroethene	2.0	ug/L	0.50	1		12/23/16 22:19	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 22:19	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 22:19	79-00-5		
Trichloroethene	10.2	ug/L	0.50	1		12/23/16 22:19	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 22:19	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 22:19	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		12/23/16 22:19	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		12/23/16 22:19	2037-26-5		
4-Bromofluorobenzene (S)	103	%	70-130	1		12/23/16 22:19	460-00-4		

Sample: MW-23i		Lab ID: 1280701017		Collected: 12/13/16 10:39		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 22:38	75-27-4		
Bromoform	ND	ug/L	0.50	1		12/23/16 22:38	75-25-2		
Bromomethane	ND	ug/L	20.0	1		12/23/16 22:38	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 22:38	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 22:38	108-90-7		
Chloroethane	ND	ug/L	2.0	1		12/23/16 22:38	75-00-3		
Chloroform	ND	ug/L	0.50	1		12/23/16 22:38	67-66-3		
Chloromethane	ND	ug/L	0.50	1		12/23/16 22:38	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 22:38	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:38	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:38	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:38	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 22:38	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 22:38	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:38	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:38	156-59-2		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-23i		Lab ID: 1280701017		Collected: 12/13/16 10:39	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 22:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 22:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 22:38	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 22:38	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 22:38	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/23/16 22:38	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 22:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 22:38	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/23/16 22:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 22:38	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 22:38	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		12/23/16 22:38	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/23/16 22:38	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		12/23/16 22:38	460-00-4	

Sample: MW-21i-105		Lab ID: 1280701018		Collected: 12/13/16 14:49	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 22:57	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 22:57	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 22:57	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 22:57	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 22:57	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 22:57	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 22:57	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 22:57	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 22:57	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:57	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:57	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 22:57	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 22:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 22:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 22:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 22:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 22:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 22:57	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 22:57	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 22:57	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/23/16 22:57	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 22:57	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: MW-21i-105		Lab ID: 1280701018		Collected: 12/13/16 14:49		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 22:57	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		12/23/16 22:57	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 22:57	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 22:57	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		12/23/16 22:57	17060-07-0		
Toluene-d8 (S)	101	%.	70-130	1		12/23/16 22:57	2037-26-5		
4-Bromofluorobenzene (S)	101	%.	70-130	1		12/23/16 22:57	460-00-4		

Sample: MW-7 DUP		Lab ID: 1280701019		Collected: 12/14/16 13:37		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 16:53	75-27-4		
Bromoform	ND	ug/L	0.50	1		12/23/16 16:53	75-25-2		
Bromomethane	ND	ug/L	20.0	1		12/23/16 16:53	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 16:53	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 16:53	108-90-7		
Chloroethane	ND	ug/L	2.0	1		12/23/16 16:53	75-00-3		
Chloroform	ND	ug/L	0.50	1		12/23/16 16:53	67-66-3		
Chloromethane	ND	ug/L	0.50	1		12/23/16 16:53	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 16:53	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 16:53	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 16:53	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 16:53	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 16:53	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 16:53	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 16:53	75-35-4		
cis-1,2-Dichloroethene	9.4	ug/L	0.50	1		12/23/16 16:53	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 16:53	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 16:53	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 16:53	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 16:53	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 16:53	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 16:53	79-34-5		
Tetrachloroethene	0.78	ug/L	0.50	1		12/23/16 16:53	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 16:53	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 16:53	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		12/23/16 16:53	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 16:53	75-69-4		
Vinyl chloride	1.0	ug/L	0.50	1		12/23/16 16:53	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1		12/23/16 16:53	17060-07-0		
Toluene-d8 (S)	102	%.	70-130	1		12/23/16 16:53	2037-26-5		
4-Bromofluorobenzene (S)	103	%.	70-130	1		12/23/16 16:53	460-00-4		

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: MW-12 DUP		Lab ID: 1280701020		Collected: 12/14/16 15:12	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	2.5	5		12/28/16 13:26	75-27-4	
Bromoform	ND	ug/L	2.5	5		12/28/16 13:26	75-25-2	
Bromomethane	ND	ug/L	100	5		12/28/16 13:26	74-83-9	
Carbon tetrachloride	ND	ug/L	2.5	5		12/28/16 13:26	56-23-5	
Chlorobenzene	ND	ug/L	2.5	5		12/28/16 13:26	108-90-7	
Chloroethane	29.1	ug/L	10.0	5		12/28/16 13:26	75-00-3	
Chloroform	ND	ug/L	2.5	5		12/28/16 13:26	67-66-3	
Chloromethane	ND	ug/L	10.0	5		12/28/16 13:26	74-87-3	
Dibromochloromethane	ND	ug/L	2.5	5		12/28/16 13:26	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	2.5	5		12/28/16 13:26	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.5	5		12/28/16 13:26	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.5	5		12/28/16 13:26	106-46-7	
1,1-Dichloroethane	16.5	ug/L	2.5	5		12/28/16 13:26	75-34-3	
1,2-Dichloroethane	ND	ug/L	2.5	5		12/28/16 13:26	107-06-2	
1,1-Dichloroethene	4.7	ug/L	2.5	5		12/28/16 13:26	75-35-4	
cis-1,2-Dichloroethene	744	ug/L	2.5	5		12/28/16 13:26	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.5	5		12/28/16 13:26	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.5	5		12/28/16 13:26	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	2.5	5		12/28/16 13:26	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.5	5		12/28/16 13:26	10061-02-6	
Methylene Chloride	ND	ug/L	25.0	5		12/28/16 13:26	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.5	5		12/28/16 13:26	79-34-5	
Tetrachloroethene	62.3	ug/L	2.5	5		12/28/16 13:26	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	2.5	5		12/28/16 13:26	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.5	5		12/28/16 13:26	79-00-5	
Trichloroethene	42.2	ug/L	2.5	5		12/28/16 13:26	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.5	5		12/28/16 13:26	75-69-4	
Vinyl chloride	21.2	ug/L	2.5	5		12/28/16 13:26	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	70-130	5		12/28/16 13:26	17060-07-0	
Toluene-d8 (S)	103	%	70-130	5		12/28/16 13:26	2037-26-5	
4-Bromofluorobenzene (S)	92	%	70-130	5		12/28/16 13:26	460-00-4	

Sample: MW-19		Lab ID: 1280701021		Collected: 12/12/16 13:17	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	10.3	ug/L	10.0	1		12/27/16 15:54	74-84-0	H1
Ethene	ND	ug/L	10.0	1		12/27/16 15:54	74-85-1	H1
Methane	2350	ug/L	10.0	1		12/27/16 15:54	74-82-8	H1
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		12/23/16 01:39	75-27-4	
Bromoform	ND	ug/L	5.0	10		12/23/16 01:39	75-25-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-19	Lab ID: 1280701021	Collected: 12/12/16 13:17	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromomethane	ND	ug/L	200	10		12/23/16 01:39	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		12/23/16 01:39	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		12/23/16 01:39	108-90-7	
Chloroethane	ND	ug/L	20.0	10		12/23/16 01:39	75-00-3	
Chloroform	ND	ug/L	5.0	10		12/23/16 01:39	67-66-3	
Chloromethane	ND	ug/L	5.0	10		12/23/16 01:39	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		12/23/16 01:39	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		12/23/16 01:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		12/23/16 01:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		12/23/16 01:39	106-46-7	
1,1-Dichloroethane	72.8	ug/L	5.0	10		12/23/16 01:39	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		12/23/16 01:39	107-06-2	
1,1-Dichloroethene	11.2	ug/L	5.0	10		12/23/16 01:39	75-35-4	
cis-1,2-Dichloroethene	1030	ug/L	5.0	10		12/23/16 01:39	156-59-2	
trans-1,2-Dichloroethene	10.7	ug/L	5.0	10		12/23/16 01:39	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		12/23/16 01:39	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		12/23/16 01:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		12/23/16 01:39	10061-02-6	
Methylene Chloride	ND	ug/L	50.0	10		12/23/16 01:39	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		12/23/16 01:39	79-34-5	
Tetrachloroethene	1730	ug/L	25.0	50		12/24/16 17:45	127-18-4	
1,1,1-Trichloroethane	10.9	ug/L	5.0	10		12/23/16 01:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	10		12/23/16 01:39	79-00-5	
Trichloroethene	812	ug/L	5.0	10		12/23/16 01:39	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	10		12/23/16 01:39	75-69-4	
Vinyl chloride	28.2	ug/L	5.0	10		12/23/16 01:39	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	10		12/23/16 01:39	17060-07-0	
Toluene-d8 (S)	101	%	70-130	10		12/23/16 01:39	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	10		12/23/16 01:39	460-00-4	

Sample: MW-32S	Lab ID: 1280701022	Collected: 12/14/16 12:11	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	8.1	mg/L	1.0	1		12/29/16 11:24	7440-44-0	

Sample: MW-32S	Lab ID: 1280701022	Collected: 12/14/16 12:11	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 11:58	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 11:58	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 11:58	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 11:58	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 11:58	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/24/16 11:58	75-00-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: MW-32S		Lab ID: 1280701022	Collected: 12/14/16 12:11	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Chloroform	ND	ug/L	0.50	1		12/24/16 11:58	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 11:58	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 11:58	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 11:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 11:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 11:58	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/24/16 11:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 11:58	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 11:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 11:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 11:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 11:58	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 11:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 11:58	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 11:58	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 11:58	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/24/16 11:58	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 11:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 11:58	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/24/16 11:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 11:58	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/24/16 11:58	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/24/16 11:58	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/24/16 11:58	2037-26-5	
4-Bromofluorobenzene (S)	100	%	70-130	1		12/24/16 11:58	460-00-4	

Sample: MGMS1-43		Lab ID: 1280701023	Collected: 12/16/16 11:44	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	17.9	ug/L	10.0	1		12/27/16 16:59	74-84-0	
Ethene	ND	ug/L	10.0	1		12/27/16 16:59	74-85-1	
Methane	2110	ug/L	10.0	1		12/27/16 16:59	74-82-8	
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	8.4	16.7		12/26/16 19:22	75-27-4	
Bromoform	ND	ug/L	8.4	16.7		12/26/16 19:22	75-25-2	
Bromomethane	ND	ug/L	334	16.7		12/26/16 19:22	74-83-9	
Carbon tetrachloride	ND	ug/L	8.4	16.7		12/26/16 19:22	56-23-5	
Chlorobenzene	ND	ug/L	8.4	16.7		12/26/16 19:22	108-90-7	
Chloroethane	ND	ug/L	33.4	16.7		12/26/16 19:22	75-00-3	
Chloroform	ND	ug/L	8.4	16.7		12/26/16 19:22	67-66-3	
Chloromethane	ND	ug/L	8.4	16.7		12/26/16 19:22	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MGMS1-43		Lab ID: 1280701023	Collected: 12/16/16 11:44	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	8.4	16.7		12/26/16 19:22	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	8.4	16.7		12/26/16 19:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	8.4	16.7		12/26/16 19:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	8.4	16.7		12/26/16 19:22	106-46-7	
1,1-Dichloroethane	92.6	ug/L	8.4	16.7		12/26/16 19:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	8.4	16.7		12/26/16 19:22	107-06-2	
1,1-Dichloroethene	9.5	ug/L	8.4	16.7		12/26/16 19:22	75-35-4	
cis-1,2-Dichloroethene	1810	ug/L	8.4	16.7		12/26/16 19:22	156-59-2	
trans-1,2-Dichloroethene	20.1	ug/L	8.4	16.7		12/26/16 19:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	8.4	16.7		12/26/16 19:22	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	8.4	16.7		12/26/16 19:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	8.4	16.7		12/26/16 19:22	10061-02-6	
Methylene Chloride	ND	ug/L	83.5	16.7		12/26/16 19:22	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	8.4	16.7		12/26/16 19:22	79-34-5	
Tetrachloroethene	64.1	ug/L	8.4	16.7		12/26/16 19:22	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	8.4	16.7		12/26/16 19:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	8.4	16.7		12/26/16 19:22	79-00-5	
Trichloroethene	171	ug/L	8.4	16.7		12/26/16 19:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	8.4	16.7		12/26/16 19:22	75-69-4	
Vinyl chloride	239	ug/L	8.4	16.7		12/26/16 19:22	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	16.7		12/26/16 19:22	17060-07-0	
Toluene-d8 (S)	101	%	70-130	16.7		12/26/16 19:22	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	16.7		12/26/16 19:22	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	6.2	mg/L	1.0	1		12/29/16 11:43	7440-44-0	

Sample: MGMS2-40		Lab ID: 1280701024	Collected: 12/16/16 12:54	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/27/16 12:30	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/27/16 12:30	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/27/16 12:30	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/27/16 12:30	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/27/16 12:30	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/27/16 12:30	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/27/16 12:30	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/27/16 12:30	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/27/16 12:30	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 12:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 12:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 12:30	106-46-7	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: MGMS2-40		Lab ID: 1280701024		Collected: 12/16/16 12:54		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
1,1-Dichloroethane	10.3	ug/L	0.50	1		12/27/16 12:30	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		12/27/16 12:30	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		12/27/16 12:30	75-35-4		
cis-1,2-Dichloroethene	5.2	ug/L	0.50	1		12/27/16 12:30	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/27/16 12:30	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		12/27/16 12:30	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 12:30	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 12:30	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		12/27/16 12:30	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/27/16 12:30	79-34-5		
Tetrachloroethene	2.6	ug/L	0.50	1		12/27/16 12:30	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/27/16 12:30	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/27/16 12:30	79-00-5		
Trichloroethene	1.9	ug/L	0.50	1		12/27/16 12:30	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		12/27/16 12:30	75-69-4		
Vinyl chloride	2.0	ug/L	0.50	1		12/27/16 12:30	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/27/16 12:30	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		12/27/16 12:30	2037-26-5		
4-Bromofluorobenzene (S)	97	%	70-130	1		12/27/16 12:30	460-00-4		

Sample: MGMS3-40		Lab ID: 1280701025		Collected: 12/16/16 10:19		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		12/27/16 17:07	74-84-0		
Ethene	55.2	ug/L	10.0	1		12/27/16 17:07	74-85-1		
Methane	6340	ug/L	10.0	1		12/27/16 17:07	74-82-8		
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		12/27/16 12:49	75-27-4		
Bromoform	ND	ug/L	0.50	1		12/27/16 12:49	75-25-2		
Bromomethane	ND	ug/L	20.0	1		12/27/16 12:49	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		12/27/16 12:49	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		12/27/16 12:49	108-90-7		
Chloroethane	ND	ug/L	2.0	1		12/27/16 12:49	75-00-3		
Chloroform	ND	ug/L	0.50	1		12/27/16 12:49	67-66-3		
Chloromethane	ND	ug/L	0.50	1		12/27/16 12:49	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		12/27/16 12:49	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 12:49	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 12:49	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/27/16 12:49	106-46-7		
1,1-Dichloroethane	1.0	ug/L	0.50	1		12/27/16 12:49	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		12/27/16 12:49	107-06-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MGMS3-40		Lab ID: 1280701025		Collected: 12/16/16 10:19	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1-Dichloroethene	ND	ug/L	0.50	1		12/27/16 12:49	75-35-4	
cis-1,2-Dichloroethene	1.3	ug/L	0.50	1		12/27/16 12:49	156-59-2	
trans-1,2-Dichloroethene	0.97	ug/L	0.50	1		12/27/16 12:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/27/16 12:49	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 12:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/27/16 12:49	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/27/16 12:49	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/27/16 12:49	79-34-5	
Tetrachloroethene	0.63	ug/L	0.50	1		12/27/16 12:49	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/27/16 12:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/27/16 12:49	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/27/16 12:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/27/16 12:49	75-69-4	
Vinyl chloride	0.88	ug/L	0.50	1		12/27/16 12:49	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		12/27/16 12:49	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		12/27/16 12:49	2037-26-5	
4-Bromofluorobenzene (S)	98	%	70-130	1		12/27/16 12:49	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	86.9	mg/L	1.0	1		12/29/16 12:02	7440-44-0	

Sample: MP-1		Lab ID: 1280701026		Collected: 12/13/16 08:14	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		12/27/16 16:26	74-84-0	
Ethene	ND	ug/L	10.0	1		12/27/16 16:26	74-85-1	
Methane	2810	ug/L	10.0	1		12/27/16 16:26	74-82-8	
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 23:16	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 23:16	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 23:16	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 23:16	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 23:16	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 23:16	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 23:16	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 23:16	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 23:16	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 23:16	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 23:16	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 23:16	106-46-7	
1,1-Dichloroethane	0.64	ug/L	0.50	1		12/23/16 23:16	75-34-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: MP-1		Lab ID: 1280701026	Collected: 12/13/16 08:14	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 23:16	107-06-2	
1,1-Dichloroethene	0.92	ug/L	0.50	1		12/23/16 23:16	75-35-4	
cis-1,2-Dichloroethene	209	ug/L	2.5	5		12/26/16 18:43	156-59-2	
trans-1,2-Dichloroethene	0.55	ug/L	0.50	1		12/23/16 23:16	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 23:16	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 23:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 23:16	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 23:16	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 23:16	79-34-5	
Tetrachloroethene	2.9	ug/L	0.50	1		12/23/16 23:16	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 23:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 23:16	79-00-5	
Trichloroethene	1.0	ug/L	0.50	1		12/23/16 23:16	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 23:16	75-69-4	
Vinyl chloride	4.3	ug/L	0.50	1		12/23/16 23:16	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		12/23/16 23:16	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/23/16 23:16	2037-26-5	
4-Bromofluorobenzene (S)	104	%	70-130	1		12/23/16 23:16	460-00-4	

Sample: 5310B TOC		Lab ID: 1280701027	Collected: 12/12/16 14:07	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Total Organic Carbon	130	mg/L	10.0	10		12/29/16 12:21	7440-44-0	

Sample: EX-1		Lab ID: 1280701027	Collected: 12/12/16 14:07	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 17:06	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 17:06	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 17:06	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 17:06	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 17:06	108-90-7	
Chloroethane	3.7	ug/L	2.0	1		12/24/16 17:06	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/24/16 17:06	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 17:06	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 17:06	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 17:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 17:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 17:06	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/24/16 17:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 17:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 17:06	75-35-4	
cis-1,2-Dichloroethene	8.1	ug/L	0.50	1		12/24/16 17:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 17:06	156-60-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: EX-1		Lab ID: 1280701027	Collected: 12/12/16 14:07	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 17:06	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 17:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 17:06	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 17:06	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 17:06	79-34-5	
Tetrachloroethene	4.3	ug/L	0.50	1		12/24/16 17:06	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 17:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 17:06	79-00-5	
Trichloroethene	0.96	ug/L	0.50	1		12/24/16 17:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 17:06	75-69-4	
Vinyl chloride	51.9	ug/L	0.50	1		12/24/16 17:06	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/24/16 17:06	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/24/16 17:06	2037-26-5	
4-Bromofluorobenzene (S)	100	%	70-130	1		12/24/16 17:06	460-00-4	

Sample: MGMS1-60		Lab ID: 1280701028	Collected: 12/16/16 12:19	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 12:17	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 12:17	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 12:17	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 12:17	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 12:17	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/24/16 12:17	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/24/16 12:17	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 12:17	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 12:17	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:17	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:17	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:17	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/24/16 12:17	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 12:17	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 12:17	75-35-4	
cis-1,2-Dichloroethene	5.1	ug/L	0.50	1		12/24/16 12:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 12:17	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 12:17	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 12:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 12:17	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 12:17	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 12:17	79-34-5	
Tetrachloroethene	7.6	ug/L	0.50	1		12/24/16 12:17	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 12:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 12:17	79-00-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MGMS1-60		Lab ID: 1280701028	Collected: 12/16/16 12:19	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Trichloroethene	4.7	ug/L	0.50	1		12/24/16 12:17	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 12:17	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/24/16 12:17	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1		12/24/16 12:17	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		12/24/16 12:17	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	70-130	1		12/24/16 12:17	460-00-4	

Sample: MGMS2-60		Lab ID: 1280701029	Collected: 12/16/16 13:14	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 12:37	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 12:37	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 12:37	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 12:37	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 12:37	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/24/16 12:37	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/24/16 12:37	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 12:37	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 12:37	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:37	106-46-7	
1,1-Dichloroethane	1.7	ug/L	0.50	1		12/24/16 12:37	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 12:37	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 12:37	75-35-4	
cis-1,2-Dichloroethene	35.3	ug/L	0.50	1		12/24/16 12:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 12:37	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 12:37	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 12:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 12:37	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 12:37	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 12:37	79-34-5	
Tetrachloroethene	40.7	ug/L	0.50	1		12/24/16 12:37	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 12:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 12:37	79-00-5	
Trichloroethene	24.8	ug/L	0.50	1		12/24/16 12:37	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 12:37	75-69-4	
Vinyl chloride	1.4	ug/L	0.50	1		12/24/16 12:37	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1		12/24/16 12:37	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1		12/24/16 12:37	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	70-130	1		12/24/16 12:37	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MGMS3-60		Lab ID: 1280701030		Collected: 12/16/16 10:44	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 12:56	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 12:56	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 12:56	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 12:56	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 12:56	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/24/16 12:56	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/24/16 12:56	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 12:56	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 12:56	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:56	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:56	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 12:56	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/24/16 12:56	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 12:56	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 12:56	75-35-4	
cis-1,2-Dichloroethene	1.4	ug/L	0.50	1		12/24/16 12:56	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 12:56	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 12:56	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 12:56	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 12:56	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 12:56	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 12:56	79-34-5	
Tetrachloroethene	1.7	ug/L	0.50	1		12/24/16 12:56	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 12:56	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 12:56	79-00-5	
Trichloroethene	0.68	ug/L	0.50	1		12/24/16 12:56	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 12:56	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/24/16 12:56	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/24/16 12:56	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/24/16 12:56	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		12/24/16 12:56	460-00-4	

Sample: MW-19 DUP		Lab ID: 1280701031		Collected: 12/12/16 13:17	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	2.5	5		12/24/16 17:26	75-27-4	
Bromoform	ND	ug/L	2.5	5		12/24/16 17:26	75-25-2	
Bromomethane	ND	ug/L	100	5		12/24/16 17:26	74-83-9	
Carbon tetrachloride	ND	ug/L	2.5	5		12/24/16 17:26	56-23-5	
Chlorobenzene	ND	ug/L	2.5	5		12/24/16 17:26	108-90-7	
Chloroethane	ND	ug/L	10.0	5		12/24/16 17:26	75-00-3	
Chloroform	ND	ug/L	2.5	5		12/24/16 17:26	67-66-3	
Chloromethane	ND	ug/L	2.5	5		12/24/16 17:26	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-19 DUP		Lab ID: 1280701031		Collected: 12/12/16 13:17		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	2.5	5		12/24/16 17:26	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	2.5	5		12/24/16 17:26	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	2.5	5		12/24/16 17:26	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	2.5	5		12/24/16 17:26	106-46-7		
1,1-Dichloroethane	78.7	ug/L	2.5	5		12/24/16 17:26	75-34-3		
1,2-Dichloroethane	ND	ug/L	2.5	5		12/24/16 17:26	107-06-2		
1,1-Dichloroethene	14.2	ug/L	2.5	5		12/24/16 17:26	75-35-4		
cis-1,2-Dichloroethene	1010	ug/L	12.5	25		12/23/16 02:17	156-59-2		
trans-1,2-Dichloroethene	11.6	ug/L	2.5	5		12/24/16 17:26	156-60-5		
1,2-Dichloropropane	ND	ug/L	2.5	5		12/24/16 17:26	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	2.5	5		12/24/16 17:26	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	2.5	5		12/24/16 17:26	10061-02-6		
Methylene Chloride	ND	ug/L	25.0	5		12/24/16 17:26	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	2.5	5		12/24/16 17:26	79-34-5		
Tetrachloroethene	1530	ug/L	12.5	25		12/23/16 02:17	127-18-4		
1,1,1-Trichloroethane	15.5	ug/L	2.5	5		12/24/16 17:26	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	2.5	5		12/24/16 17:26	79-00-5		
Trichloroethene	975	ug/L	12.5	25		12/23/16 02:17	79-01-6		
Trichlorofluoromethane	ND	ug/L	2.5	5		12/24/16 17:26	75-69-4		
Vinyl chloride	31.9	ug/L	2.5	5		12/24/16 17:26	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%	70-130	5		12/24/16 17:26	17060-07-0		
Toluene-d8 (S)	99	%	70-130	5		12/24/16 17:26	2037-26-5		
4-Bromofluorobenzene (S)	101	%	70-130	5		12/24/16 17:26	460-00-4		

Sample: MW-24i		Lab ID: 1280701032		Collected: 12/12/16 14:44		Received: 12/20/16 10:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		12/27/16 16:10	74-84-0	H1	
Ethene	ND	ug/L	10.0	1		12/27/16 16:10	74-85-1	H1	
Methane	ND	ug/L	10.0	1		12/27/16 16:10	74-82-8	H1	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 00:41	75-27-4		
Bromoform	ND	ug/L	0.50	1		12/23/16 00:41	75-25-2		
Bromomethane	ND	ug/L	20.0	1		12/23/16 00:41	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 00:41	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 00:41	108-90-7		
Chloroethane	ND	ug/L	2.0	1		12/23/16 00:41	75-00-3		
Chloroform	ND	ug/L	0.50	1		12/23/16 00:41	67-66-3		
Chloromethane	ND	ug/L	0.50	1		12/23/16 00:41	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 00:41	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 00:41	95-50-1		

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-24i		Lab ID: 1280701032		Collected: 12/12/16 14:44	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 00:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 00:41	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 00:41	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 00:41	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 00:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 00:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 00:41	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 00:41	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 00:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 00:41	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 00:41	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 00:41	79-34-5	
Tetrachloroethene	1.1	ug/L	0.50	1		12/23/16 00:41	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 00:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 00:41	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/23/16 00:41	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 00:41	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 00:41	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		12/23/16 00:41	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/23/16 00:41	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		12/23/16 00:41	460-00-4	

5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	1.5	mg/L	1.0	1		12/29/16 12:39	7440-44-0	

Sample: MW-25i		Lab ID: 1280701033		Collected: 12/13/16 12:54	Received: 12/20/16 10:15	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/26/16 17:06	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/26/16 17:06	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/26/16 17:06	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/26/16 17:06	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/26/16 17:06	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/26/16 17:06	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/26/16 17:06	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/26/16 17:06	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/26/16 17:06	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 17:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 17:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/26/16 17:06	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/26/16 17:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/26/16 17:06	107-06-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-25i	Lab ID: 1280701033	Collected: 12/13/16 12:54	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1-Dichloroethene	ND	ug/L	0.50	1		12/26/16 17:06	75-35-4	
cis-1,2-Dichloroethene	0.77	ug/L	0.50	1		12/26/16 17:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/26/16 17:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/26/16 17:06	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 17:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/26/16 17:06	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/26/16 17:06	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/26/16 17:06	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/26/16 17:06	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/26/16 17:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/26/16 17:06	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/26/16 17:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/26/16 17:06	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/26/16 17:06	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		12/26/16 17:06	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/26/16 17:06	2037-26-5	
4-Bromofluorobenzene (S)	99	%	70-130	1		12/26/16 17:06	460-00-4	

Sample: MW-26	Lab ID: 1280701034	Collected: 12/13/16 12:07	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		12/27/16 16:34	74-84-0	
Ethene	ND	ug/L	10.0	1		12/27/16 16:34	74-85-1	
Methane	198	ug/L	10.0	1		12/27/16 16:34	74-82-8	
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 23:55	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 23:55	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 23:55	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 23:55	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 23:55	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 23:55	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 23:55	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 23:55	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 23:55	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 23:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 23:55	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 23:55	106-46-7	
1,1-Dichloroethane	8.9	ug/L	0.50	1		12/23/16 23:55	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 23:55	107-06-2	
1,1-Dichloroethene	2.4	ug/L	0.50	1		12/23/16 23:55	75-35-4	
cis-1,2-Dichloroethene	85.9	ug/L	0.50	1		12/23/16 23:55	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW-26	Lab ID: 1280701034	Collected: 12/13/16 12:07	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	2.0	ug/L	0.50	1		12/23/16 23:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 23:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 23:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 23:55	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 23:55	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 23:55	79-34-5	
Tetrachloroethene	167	ug/L	5.0	10		12/26/16 19:03	127-18-4	
1,1,1-Trichloroethane	3.3	ug/L	0.50	1		12/23/16 23:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 23:55	79-00-5	
Trichloroethene	410	ug/L	5.0	10		12/26/16 19:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 23:55	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 23:55	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		12/23/16 23:55	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		12/23/16 23:55	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		12/23/16 23:55	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	2.4	mg/L	1.0	1		12/29/16 13:36	7440-44-0	

Sample: TRIP BLANK	Lab ID: 1280701035	Collected: 12/16/16 13:35	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 13:15	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 13:15	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 13:15	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 13:15	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 13:15	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/24/16 13:15	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/24/16 13:15	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 13:15	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 13:15	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 13:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 13:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 13:15	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/24/16 13:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 13:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 13:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 13:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 13:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 13:15	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 13:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 13:15	10061-02-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: TRIP BLANK		Lab ID: 1280701035	Collected: 12/16/16 13:35	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 13:15	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 13:15	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/24/16 13:15	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 13:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 13:15	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/24/16 13:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 13:15	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/24/16 13:15	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		12/24/16 13:15	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		12/24/16 13:15	2037-26-5	
4-Bromofluorobenzene (S)	102	%	70-130	1		12/24/16 13:15	460-00-4	

Sample: Field Blank		Lab ID: 1280701036	Collected: 12/12/16 08:00	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 01:00	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 01:00	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 01:00	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 01:00	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 01:00	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 01:00	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 01:00	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 01:00	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 01:00	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 01:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 01:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 01:00	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 01:00	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 01:00	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 01:00	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 01:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 01:00	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 01:00	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 01:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 01:00	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 01:00	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 01:00	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/23/16 01:00	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 01:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 01:00	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/23/16 01:00	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 01:00	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 01:00	75-01-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver

Pace Project No.: 1280701

Sample: Field Blank		Lab ID: 1280701036	Collected: 12/12/16 08:00	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		12/23/16 01:00	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		12/23/16 01:00	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	70-130	1		12/23/16 01:00	460-00-4	

Sample: Equipment Blank		Lab ID: 1280701037	Collected: 12/16/16 13:40	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 13:34	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 13:34	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 13:34	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 13:34	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 13:34	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/24/16 13:34	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/24/16 13:34	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 13:34	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 13:34	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 13:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 13:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 13:34	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/24/16 13:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 13:34	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 13:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 13:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 13:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 13:34	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 13:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 13:34	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 13:34	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 13:34	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/24/16 13:34	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 13:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 13:34	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/24/16 13:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 13:34	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/24/16 13:34	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		12/24/16 13:34	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		12/24/16 13:34	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	70-130	1		12/24/16 13:34	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: MW 24D		Lab ID: 1280701038	Collected: 12/12/16 15:49	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/23/16 01:19	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/23/16 01:19	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/23/16 01:19	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/23/16 01:19	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/23/16 01:19	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/23/16 01:19	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/23/16 01:19	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/23/16 01:19	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		12/23/16 01:19	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 01:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 01:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/23/16 01:19	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		12/23/16 01:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/23/16 01:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/23/16 01:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 01:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/23/16 01:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/23/16 01:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 01:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/23/16 01:19	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/23/16 01:19	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		12/23/16 01:19	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/23/16 01:19	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/23/16 01:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/23/16 01:19	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/23/16 01:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/23/16 01:19	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/23/16 01:19	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		12/23/16 01:19	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		12/23/16 01:19	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	70-130	1		12/23/16 01:19	460-00-4	

Sample: S-2		Lab ID: 1280701039	Collected: 12/13/16 09:39	Received: 12/20/16 10:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		12/24/16 00:14	75-27-4	
Bromoform	ND	ug/L	0.50	1		12/24/16 00:14	75-25-2	
Bromomethane	ND	ug/L	20.0	1		12/24/16 00:14	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		12/24/16 00:14	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		12/24/16 00:14	108-90-7	
Chloroethane	ND	ug/L	2.0	1		12/24/16 00:14	75-00-3	
Chloroform	ND	ug/L	0.50	1		12/24/16 00:14	67-66-3	
Chloromethane	ND	ug/L	0.50	1		12/24/16 00:14	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver
Pace Project No.: 1280701

Sample: S-2	Lab ID: 1280701039	Collected: 12/13/16 09:39	Received: 12/20/16 10:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		12/24/16 00:14	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 00:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 00:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		12/24/16 00:14	106-46-7	
1,1-Dichloroethane	3.5	ug/L	0.50	1		12/24/16 00:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		12/24/16 00:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		12/24/16 00:14	75-35-4	
cis-1,2-Dichloroethene	4.9	ug/L	0.50	1		12/24/16 00:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		12/24/16 00:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		12/24/16 00:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 00:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		12/24/16 00:14	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		12/24/16 00:14	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		12/24/16 00:14	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		12/24/16 00:14	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		12/24/16 00:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		12/24/16 00:14	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		12/24/16 00:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		12/24/16 00:14	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		12/24/16 00:14	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		12/24/16 00:14	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		12/24/16 00:14	2037-26-5	
4-Bromofluorobenzene (S)	104	%.	70-130	1		12/24/16 00:14	460-00-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

QC Batch: 453342 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 1280701007, 1280701008, 1280701009, 1280701021, 1280701023, 1280701025, 1280701026, 1280701032, 1280701034

METHOD BLANK: 2481938 Matrix: Water
Associated Lab Samples: 1280701007, 1280701008, 1280701009, 1280701021, 1280701023, 1280701025, 1280701026, 1280701032, 1280701034

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	12/27/16 15:46	
Ethene	ug/L	ND	10.0	12/27/16 15:46	
Methane	ug/L	ND	10.0	12/27/16 15:46	

LABORATORY CONTROL SAMPLE & LCSD: 2481939 2481940

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	119	124	104	109	85-115	4	20	
Ethene	ug/L	106	111	115	105	108	85-115	4	20	
Methane	ug/L	60.7	64.2	65.6	106	108	85-115	2	20	

SAMPLE DUPLICATE: 2482691

Parameter	Units	1280701021 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	10.3	10.1	2	20	
Ethene	ug/L	ND	1.7J		20	
Methane	ug/L	2350	2320	1	20	

SAMPLE DUPLICATE: 2482692

Parameter	Units	60234729001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	1.2J		20	

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

QC Batch: 102751 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1280701021, 1280701027, 1280701031, 1280701032, 1280701036, 1280701038

METHOD BLANK: 408424 Matrix: Water
Associated Lab Samples: 1280701021, 1280701027, 1280701031, 1280701032, 1280701036, 1280701038

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/22/16 18:55	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/22/16 18:55	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/22/16 18:55	
1,1-Dichloroethane	ug/L	ND	0.50	12/22/16 18:55	
1,1-Dichloroethene	ug/L	ND	0.50	12/22/16 18:55	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/22/16 18:55	
1,2-Dichloroethane	ug/L	ND	0.50	12/22/16 18:55	
1,2-Dichloropropane	ug/L	ND	0.50	12/22/16 18:55	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/22/16 18:55	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/22/16 18:55	
Bromodichloromethane	ug/L	ND	0.50	12/22/16 18:55	
Bromoform	ug/L	ND	0.50	12/22/16 18:55	
Bromomethane	ug/L	ND	20.0	12/22/16 18:55	
Carbon tetrachloride	ug/L	ND	0.50	12/22/16 18:55	
Chlorobenzene	ug/L	ND	0.50	12/22/16 18:55	
Chloroethane	ug/L	ND	2.0	12/22/16 18:55	
Chloroform	ug/L	ND	0.50	12/22/16 18:55	
Chloromethane	ug/L	ND	0.50	12/22/16 18:55	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/22/16 18:55	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/22/16 18:55	
Dibromochloromethane	ug/L	ND	0.50	12/22/16 18:55	
Methylene Chloride	ug/L	ND	5.0	12/22/16 18:55	
Tetrachloroethene	ug/L	ND	0.50	12/22/16 18:55	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/22/16 18:55	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/22/16 18:55	
Trichloroethene	ug/L	ND	0.50	12/22/16 18:55	
Trichlorofluoromethane	ug/L	ND	0.50	12/22/16 18:55	
Vinyl chloride	ug/L	ND	0.50	12/22/16 18:55	
1,2-Dichloroethane-d4 (S)	%	102	70-130	12/22/16 18:55	
4-Bromofluorobenzene (S)	%	102	70-130	12/22/16 18:55	
Toluene-d8 (S)	%	101	70-130	12/22/16 18:55	

LABORATORY CONTROL SAMPLE: 408425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	38.5	96	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	39.6	99	75-125	
1,1,2-Trichloroethane	ug/L	40	38.6	97	75-126	
1,1-Dichloroethane	ug/L	40	37.0	93	71-131	
1,1-Dichloroethene	ug/L	40	37.4	94	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 408425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	37.2	93	75-125	
1,2-Dichloroethane	ug/L	40	40.4	101	64-141	
1,2-Dichloropropane	ug/L	40	37.6	94	73-127	
1,3-Dichlorobenzene	ug/L	40	38.2	96	75-125	
1,4-Dichlorobenzene	ug/L	40	36.3	91	75-125	
Bromodichloromethane	ug/L	40	38.3	96	70-134	
Bromoform	ug/L	40	41.5	104	68-130	
Bromomethane	ug/L	40	30.8	77	30-150	
Carbon tetrachloride	ug/L	40	39.1	98	66-135	
Chlorobenzene	ug/L	40	37.8	95	75-125	
Chloroethane	ug/L	40	36.4	91	55-150	
Chloroform	ug/L	40	38.4	96	72-131	
Chloromethane	ug/L	40	29.6	74	54-132	
cis-1,2-Dichloroethene	ug/L	40	37.8	95	75-125	
cis-1,3-Dichloropropene	ug/L	40	38.3	96	74-130	
Dibromochloromethane	ug/L	40	39.1	98	70-132	
Methylene Chloride	ug/L	40	37.2	93	68-125	
Tetrachloroethene	ug/L	40	37.9	95	75-130	
trans-1,2-Dichloroethene	ug/L	40	38.1	95	75-125	
trans-1,3-Dichloropropene	ug/L	40	38.7	97	69-137	
Trichloroethene	ug/L	40	38.7	97	75-125	
Trichlorofluoromethane	ug/L	40	40.9	102	59-140	
Vinyl chloride	ug/L	40	36.0	90	68-132	
1,2-Dichloroethane-d4 (S)	%			101	70-130	
4-Bromofluorobenzene (S)	%			105	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408428 408429

Parameter	Units	1280432004		408429		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1-Trichloroethane	ug/L	ND	40	39.3	39.5	98	99	63-142	0	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40.2	39.2	100	98	75-125	2	30	
1,1,2-Trichloroethane	ug/L	ND	40	38.8	38.8	97	97	75-132	0	30	
1,1-Dichloroethane	ug/L	ND	40	37.7	37.6	94	94	75-126	0	30	
1,1-Dichloroethene	ug/L	ND	40	37.8	37.7	95	94	75-125	0	30	
1,2-Dichlorobenzene	ug/L	ND	40	38.9	38.6	97	97	75-125	1	30	
1,2-Dichloroethane	ug/L	ND	40	40.6	40.8	102	102	75-137	0	30	
1,2-Dichloropropane	ug/L	ND	40	37.9	38.1	95	95	74-131	1	30	
1,3-Dichlorobenzene	ug/L	ND	40	39.9	40.4	100	101	75-126	1	30	
1,4-Dichlorobenzene	ug/L	ND	40	37.9	37.6	95	94	73-125	1	30	
Bromodichloromethane	ug/L	ND	40	39.0	38.9	97	97	65-137	0	30	
Bromoform	ug/L	ND	40	41.8	41.5	104	104	60-147	1	30	
Bromomethane	ug/L	ND	40	32.8	37.3	82	93	30-150	13	30	
Carbon tetrachloride	ug/L	ND	40	39.9	40.3	100	101	45-150	1	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408428		408429		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1280432004 Result	MS Spike Conc.	MSD Spike Conc.									
Chlorobenzene	ug/L	ND	40	40	38.2	38.6	95	96	75-125	1	30		
Chloroethane	ug/L	ND	40	40	36.9	35.7	92	89	66-145	3	30		
Chloroform	ug/L	ND	40	40	38.8	39.0	97	97	74-128	0	30		
Chloromethane	ug/L	ND	40	40	30.8	29.4	76	73	51-150	4	30		
cis-1,2-Dichloroethene	ug/L	7.0	40	40	46.1	45.4	98	96	75-125	2	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	38.2	38.3	96	96	75-129	0	30		
Dibromochloromethane	ug/L	ND	40	40	39.7	39.5	99	99	66-141	1	30		
Methylene Chloride	ug/L	ND	40	40	37.7	37.6	94	94	74-125	0	30		
Tetrachloroethene	ug/L	ND	40	40	39.2	39.6	98	99	75-135	1	30		
trans-1,2-Dichloroethene	ug/L	6.0	40	40	44.6	44.3	97	96	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	39.2	38.8	98	97	67-139	1	30		
Trichloroethene	ug/L	ND	40	40	39.3	39.3	98	98	75-130	0	30		
Trichlorofluoromethane	ug/L	ND	40	40	41.7	41.0	104	103	57-144	2	30		
1,2-Dichloroethane-d4 (S)	%						102	101	70-130				
4-Bromofluorobenzene (S)	%						106	107	70-130				
Toluene-d8 (S)	%						101	100	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

QC Batch: 102804 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1280701014, 1280701019

METHOD BLANK: 408606 Matrix: Water

Associated Lab Samples: 1280701014, 1280701019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/23/16 10:09	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/23/16 10:09	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/23/16 10:09	
1,1-Dichloroethane	ug/L	ND	0.50	12/23/16 10:09	
1,1-Dichloroethene	ug/L	ND	0.50	12/23/16 10:09	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/23/16 10:09	
1,2-Dichloroethane	ug/L	ND	0.50	12/23/16 10:09	
1,2-Dichloropropane	ug/L	ND	0.50	12/23/16 10:09	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/23/16 10:09	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/23/16 10:09	
Bromodichloromethane	ug/L	ND	0.50	12/23/16 10:09	
Bromoform	ug/L	ND	0.50	12/23/16 10:09	
Bromomethane	ug/L	ND	20.0	12/23/16 10:09	
Carbon tetrachloride	ug/L	ND	0.50	12/23/16 10:09	
Chlorobenzene	ug/L	ND	0.50	12/23/16 10:09	
Chloroethane	ug/L	ND	2.0	12/23/16 10:09	
Chloroform	ug/L	ND	0.50	12/23/16 10:09	
Chloromethane	ug/L	ND	0.50	12/23/16 10:09	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/23/16 10:09	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/23/16 10:09	
Dibromochloromethane	ug/L	ND	0.50	12/23/16 10:09	
Methylene Chloride	ug/L	ND	5.0	12/23/16 10:09	
Tetrachloroethene	ug/L	ND	0.50	12/23/16 10:09	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/23/16 10:09	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/23/16 10:09	
Trichloroethene	ug/L	ND	0.50	12/23/16 10:09	
Trichlorofluoromethane	ug/L	ND	0.50	12/23/16 10:09	
Vinyl chloride	ug/L	ND	0.50	12/23/16 10:09	
1,2-Dichloroethane-d4 (S)	%	103	70-130	12/23/16 10:09	
4-Bromofluorobenzene (S)	%	102	70-130	12/23/16 10:09	
Toluene-d8 (S)	%	102	70-130	12/23/16 10:09	

LABORATORY CONTROL SAMPLE: 408607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	38.8	97	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	39.5	99	75-125	
1,1,2-Trichloroethane	ug/L	40	38.6	96	75-126	
1,1-Dichloroethane	ug/L	40	37.3	93	71-131	
1,1-Dichloroethene	ug/L	40	38.5	96	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 408607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	37.6	94	75-125	
1,2-Dichloroethane	ug/L	40	40.0	100	64-141	
1,2-Dichloropropane	ug/L	40	37.5	94	73-127	
1,3-Dichlorobenzene	ug/L	40	38.8	97	75-125	
1,4-Dichlorobenzene	ug/L	40	37.0	92	75-125	
Bromodichloromethane	ug/L	40	38.6	96	70-134	
Bromoform	ug/L	40	40.6	102	68-130	
Bromomethane	ug/L	40	39.7	99	30-150	
Carbon tetrachloride	ug/L	40	39.6	99	66-135	
Chlorobenzene	ug/L	40	38.3	96	75-125	
Chloroethane	ug/L	40	38.5	96	55-150	
Chloroform	ug/L	40	38.9	97	72-131	
Chloromethane	ug/L	40	31.9	80	54-132	
cis-1,2-Dichloroethene	ug/L	40	38.4	96	75-125	
cis-1,3-Dichloropropene	ug/L	40	38.2	96	74-130	
Dibromochloromethane	ug/L	40	39.2	98	70-132	
Methylene Chloride	ug/L	40	37.8	94	68-125	
Tetrachloroethene	ug/L	40	38.6	97	75-130	
trans-1,2-Dichloroethene	ug/L	40	38.4	96	75-125	
trans-1,3-Dichloropropene	ug/L	40	38.6	97	69-137	
Trichloroethene	ug/L	40	38.9	97	75-125	
Trichlorofluoromethane	ug/L	40	42.6	107	59-140	
Vinyl chloride	ug/L	40	38.1	95	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			103	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408608 408609

Parameter	Units	1280639004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,1,1-Trichloroethane	ug/L	ND	40	40	39.4	39.7	99	99	63-142	1	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	38.4	37.9	96	95	75-125	1	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	39.3	38.9	98	97	75-132	1	30		
1,1-Dichloroethane	ug/L	ND	40	40	38.2	38.4	96	96	75-126	0	30		
1,1-Dichloroethene	ug/L	ND	40	40	39.2	39.2	98	98	75-125	0	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	38.4	37.9	96	95	75-125	1	30		
1,2-Dichloroethane	ug/L	ND	40	40	40.7	40.6	102	102	75-137	0	30		
1,2-Dichloropropane	ug/L	ND	40	40	38.6	38.6	97	96	74-131	0	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	39.0	39.0	98	97	75-126	0	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	38.3	37.3	96	93	73-125	3	30		
Bromodichloromethane	ug/L	ND	40	40	39.6	39.1	99	98	65-137	1	30		
Bromoform	ug/L	ND	40	40	39.7	39.5	99	99	60-147	0	30		
Bromomethane	ug/L	ND	40	40	40.7	43.5	101	108	30-150	7	30		
Carbon tetrachloride	ug/L	ND	40	40	39.6	40.3	99	101	45-150	2	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408608		408609		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1280639004 Result	MS Spike Conc.	MSD Spike Conc.									
Chlorobenzene	ug/L	ND	40	40	38.1	38.1	95	95	75-125	0	30		
Chloroethane	ug/L	ND	40	40	38.8	38.8	97	97	66-145	0	30		
Chloroform	ug/L	ND	40	40	39.4	39.5	99	99	74-128	0	30		
Chloromethane	ug/L	ND	40	40	32.5	32.8	81	82	51-150	1	30		
cis-1,2-Dichloroethene	ug/L	1.4	40	40	40.6	41.1	98	99	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	38.8	38.8	97	97	75-129	0	30		
Dibromochloromethane	ug/L	ND	40	40	39.3	39.4	98	99	66-141	0	30		
Methylene Chloride	ug/L	ND	40	40	38.9	38.7	97	97	74-125	0	30		
Tetrachloroethene	ug/L	ND	40	40	39.6	39.5	99	99	75-135	0	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	38.9	39.3	97	98	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	38.5	38.6	96	96	67-139	0	30		
Trichloroethene	ug/L	ND	40	40	39.5	39.7	99	99	75-130	0	30		
Trichlorofluoromethane	ug/L	ND	40	40	41.2	42.6	103	106	57-144	3	30		
Vinyl chloride	ug/L	ND	40	40	39.0	39.1	97	97	70-136	0	30		
1,2-Dichloroethane-d4 (S)	%.						101	101	70-130				
4-Bromofluorobenzene (S)	%.						103	102	70-130				
Toluene-d8 (S)	%.						101	102	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

QC Batch: 102817 Analysis Method: EPA 8260B
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
 Associated Lab Samples: 1280701009, 1280701011, 1280701015, 1280701016, 1280701017, 1280701018, 1280701026, 1280701033, 1280701034, 1280701039

METHOD BLANK: 408621 Matrix: Water
 Associated Lab Samples: 1280701009, 1280701011, 1280701015, 1280701016, 1280701017, 1280701018, 1280701026, 1280701033, 1280701034, 1280701039

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/23/16 18:47	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/23/16 18:47	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/23/16 18:47	
1,1-Dichloroethane	ug/L	ND	0.50	12/23/16 18:47	
1,1-Dichloroethene	ug/L	ND	0.50	12/23/16 18:47	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/23/16 18:47	
1,2-Dichloroethane	ug/L	ND	0.50	12/23/16 18:47	
1,2-Dichloropropane	ug/L	ND	0.50	12/23/16 18:47	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/23/16 18:47	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/23/16 18:47	
Bromodichloromethane	ug/L	ND	0.50	12/23/16 18:47	
Bromoform	ug/L	ND	0.50	12/23/16 18:47	
Bromomethane	ug/L	ND	20.0	12/23/16 18:47	
Carbon tetrachloride	ug/L	ND	0.50	12/23/16 18:47	
Chlorobenzene	ug/L	ND	0.50	12/23/16 18:47	
Chloroethane	ug/L	ND	2.0	12/23/16 18:47	
Chloroform	ug/L	ND	0.50	12/23/16 18:47	
Chloromethane	ug/L	ND	0.50	12/23/16 18:47	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/23/16 18:47	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/23/16 18:47	
Dibromochloromethane	ug/L	ND	0.50	12/23/16 18:47	
Methylene Chloride	ug/L	ND	5.0	12/23/16 18:47	
Tetrachloroethene	ug/L	ND	0.50	12/23/16 18:47	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/23/16 18:47	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/23/16 18:47	
Trichloroethene	ug/L	ND	0.50	12/23/16 18:47	
Trichlorofluoromethane	ug/L	ND	0.50	12/23/16 18:47	
Vinyl chloride	ug/L	ND	0.50	12/23/16 18:47	
1,2-Dichloroethane-d4 (S)	%	101	70-130	12/23/16 18:47	
4-Bromofluorobenzene (S)	%	101	70-130	12/23/16 18:47	
Toluene-d8 (S)	%	101	70-130	12/23/16 18:47	

LABORATORY CONTROL SAMPLE: 408622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	40.1	100	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	38.4	96	75-125	
1,1,2-Trichloroethane	ug/L	40	39.1	98	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 408622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	39.1	98	71-131	
1,1-Dichloroethene	ug/L	40	38.9	97	74-126	
1,2-Dichlorobenzene	ug/L	40	35.8	89	75-125	
1,2-Dichloroethane	ug/L	40	41.0	102	64-141	
1,2-Dichloropropane	ug/L	40	39.5	99	73-127	
1,3-Dichlorobenzene	ug/L	40	36.0	90	75-125	
1,4-Dichlorobenzene	ug/L	40	35.3	88	75-125	
Bromodichloromethane	ug/L	40	40.0	100	70-134	
Bromoform	ug/L	40	38.8	97	68-130	
Bromomethane	ug/L	40	30.4	76	30-150	
Carbon tetrachloride	ug/L	40	39.7	99	66-135	
Chlorobenzene	ug/L	40	38.7	97	75-125	
Chloroethane	ug/L	40	38.4	96	55-150	
Chloroform	ug/L	40	40.1	100	72-131	
Chloromethane	ug/L	40	31.3	78	54-132	
cis-1,2-Dichloroethene	ug/L	40	39.9	100	75-125	
cis-1,3-Dichloropropene	ug/L	40	39.0	97	74-130	
Dibromochloromethane	ug/L	40	39.7	99	70-132	
Methylene Chloride	ug/L	40	38.9	97	68-125	
Tetrachloroethene	ug/L	40	37.7	94	75-130	
trans-1,2-Dichloroethene	ug/L	40	39.8	99	75-125	
trans-1,3-Dichloropropene	ug/L	40	38.3	96	69-137	
Trichloroethene	ug/L	40	40.4	101	75-125	
Trichlorofluoromethane	ug/L	40	41.2	103	59-140	
Vinyl chloride	ug/L	40	38.5	96	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408623 408624

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1280668003 Result	Spike Conc.	Spike Conc.	Result								
1,1,1-Trichloroethane	ug/L	ND	40	40	38.8	39.8	97	100	63-142	3	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	40.0	40.3	100	101	75-125	1	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	39.4	39.9	99	100	75-132	1	30		
1,1-Dichloroethane	ug/L	ND	40	40	38.2	38.7	96	97	75-126	1	30		
1,1-Dichloroethene	ug/L	ND	40	40	38.9	40.0	97	100	75-125	3	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	35.5	37.0	89	93	75-125	4	30		
1,2-Dichloroethane	ug/L	ND	40	40	40.8	41.0	102	102	75-137	0	30		
1,2-Dichloropropane	ug/L	ND	40	40	38.2	38.9	96	97	74-131	2	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	36.0	37.0	90	92	75-126	3	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	34.8	36.1	87	90	73-125	4	30		
Bromodichloromethane	ug/L	ND	40	40	39.2	40.0	98	100	65-137	2	30		
Bromoform	ug/L	ND	40	40	40.0	40.5	100	101	60-147	1	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	1280668003		408623		408624		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Bromomethane	ug/L	ND	40	40	45.4	49.0	111	120	30-150	8	30			
Carbon tetrachloride	ug/L	ND	40	40	38.4	39.5	96	99	45-150	3	30			
Chlorobenzene	ug/L	ND	40	40	38.0	38.2	95	95	75-125	0	30			
Chloroethane	ug/L	ND	40	40	38.4	39.4	96	99	66-145	3	30			
Chloroform	ug/L	ND	40	40	39.2	40.0	98	100	74-128	2	30			
Chloromethane	ug/L	ND	40	40	32.9	33.4	82	83	51-150	1	30			
cis-1,2-Dichloroethene	ug/L	ND	40	40	39.1	40.1	98	100	75-125	3	30			
cis-1,3-Dichloropropene	ug/L	ND	40	40	38.4	38.9	96	97	75-129	1	30			
Dibromochloromethane	ug/L	ND	40	40	39.3	39.8	98	100	66-141	1	30			
Methylene Chloride	ug/L	ND	40	40	38.5	39.8	96	99	74-125	3	30			
Tetrachloroethene	ug/L	ND	40	40	36.9	37.9	92	95	75-135	3	30			
trans-1,2-Dichloroethene	ug/L	ND	40	40	38.9	39.7	97	99	75-125	2	30			
trans-1,3-Dichloropropene	ug/L	ND	40	40	38.2	39.3	96	98	67-139	3	30			
Trichloroethene	ug/L	ND	40	40	38.9	39.7	97	99	75-130	2	30			
Trichlorofluoromethane	ug/L	ND	40	40	39.6	41.8	99	105	57-144	5	30			
Vinyl chloride	ug/L	ND	40	40	37.8	39.0	94	98	70-136	3	30			
1,2-Dichloroethane-d4 (S)	%.						100	101	70-130					
4-Bromofluorobenzene (S)	%.						105	102	70-130					
Toluene-d8 (S)	%.						101	101	70-130					

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

QC Batch: 102845 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1280701001, 1280701002, 1280701003, 1280701004, 1280701005, 1280701006, 1280701007, 1280701008, 1280701010, 1280701012, 1280701013

METHOD BLANK: 408722 Matrix: Water
Associated Lab Samples: 1280701001, 1280701002, 1280701003, 1280701004, 1280701005, 1280701006, 1280701007, 1280701008, 1280701010, 1280701012, 1280701013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/26/16 19:12	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/26/16 19:12	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/26/16 19:12	
1,1-Dichloroethane	ug/L	ND	0.50	12/26/16 19:12	
1,1-Dichloroethene	ug/L	ND	0.50	12/26/16 19:12	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/26/16 19:12	
1,2-Dichloroethane	ug/L	ND	0.50	12/26/16 19:12	
1,2-Dichloropropane	ug/L	ND	0.50	12/26/16 19:12	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/26/16 19:12	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/26/16 19:12	
Bromodichloromethane	ug/L	ND	0.50	12/26/16 19:12	
Bromoform	ug/L	ND	0.50	12/26/16 19:12	
Bromomethane	ug/L	ND	20.0	12/26/16 19:12	
Carbon tetrachloride	ug/L	ND	0.50	12/26/16 19:12	
Chlorobenzene	ug/L	ND	0.50	12/26/16 19:12	
Chloroethane	ug/L	ND	2.0	12/26/16 19:12	
Chloroform	ug/L	ND	0.50	12/26/16 19:12	
Chloromethane	ug/L	ND	2.0	12/26/16 19:12	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/26/16 19:12	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/26/16 19:12	
Dibromochloromethane	ug/L	ND	0.50	12/26/16 19:12	
Methylene Chloride	ug/L	ND	5.0	12/26/16 19:12	
Tetrachloroethene	ug/L	ND	0.50	12/26/16 19:12	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/26/16 19:12	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/26/16 19:12	
Trichloroethene	ug/L	ND	0.50	12/26/16 19:12	
Trichlorofluoromethane	ug/L	ND	0.50	12/26/16 19:12	
Vinyl chloride	ug/L	ND	0.50	12/26/16 19:12	
1,2-Dichloroethane-d4 (S)	%	109	70-130	12/26/16 19:12	
4-Bromofluorobenzene (S)	%	97	70-130	12/26/16 19:12	
Toluene-d8 (S)	%	103	70-130	12/26/16 19:12	

LABORATORY CONTROL SAMPLE: 408723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	39.5	99	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	42.1	105	75-125	
1,1,2-Trichloroethane	ug/L	40	42.5	106	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 408723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	40.0	100	71-131	
1,1-Dichloroethene	ug/L	40	38.8	97	74-126	
1,2-Dichlorobenzene	ug/L	40	35.5	89	75-125	
1,2-Dichloroethane	ug/L	40	43.6	109	64-141	
1,2-Dichloropropane	ug/L	40	41.1	103	73-127	
1,3-Dichlorobenzene	ug/L	40	32.3	81	75-125	
1,4-Dichlorobenzene	ug/L	40	32.6	82	75-125	
Bromodichloromethane	ug/L	40	40.4	101	70-134	
Bromoform	ug/L	40	40.4	101	68-130	
Bromomethane	ug/L	40	34.5	86	30-150	
Carbon tetrachloride	ug/L	40	37.9	95	66-135	
Chlorobenzene	ug/L	40	35.4	89	75-125	
Chloroethane	ug/L	40	34.6	87	55-150	
Chloroform	ug/L	40	40.7	102	72-131	
Chloromethane	ug/L	40	42.5	106	54-132	
cis-1,2-Dichloroethene	ug/L	40	39.4	99	75-125	
cis-1,3-Dichloropropene	ug/L	40	39.7	99	74-130	
Dibromochloromethane	ug/L	40	42.2	105	70-132	
Methylene Chloride	ug/L	40	39.6	99	68-125	
Tetrachloroethene	ug/L	40	35.4	89	75-130	
trans-1,2-Dichloroethene	ug/L	40	38.0	95	75-125	
trans-1,3-Dichloropropene	ug/L	40	40.8	102	69-137	
Trichloroethene	ug/L	40	37.9	95	75-125	
Trichlorofluoromethane	ug/L	40	38.7	97	59-140	
Vinyl chloride	ug/L	40	40.5	101	68-132	
1,2-Dichloroethane-d4 (S)	%			109	70-130	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			104	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408729 408730

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		1280701002 Result	Spike Conc.	Spike Conc.	MS Result							
1,1,1-Trichloroethane	ug/L	1.2	40	40	40.1	39.0	97	94	63-142	3	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	40.2	41.6	101	104	75-125	3	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	41.7	41.8	104	105	75-132	0	30	
1,1-Dichloroethane	ug/L	1.1	40	40	40.6	39.7	99	97	75-126	2	30	
1,1-Dichloroethene	ug/L	ND	40	40	38.3	37.6	96	94	75-125	2	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	36.4	34.3	91	86	75-125	6	30	
1,2-Dichloroethane	ug/L	ND	40	40	42.8	42.2	107	105	75-137	1	30	
1,2-Dichloropropane	ug/L	0.57	40	40	41.0	40.8	101	101	74-131	1	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	33.3	31.0	83	78	75-126	7	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	33.4	31.5	84	79	73-125	6	30	
Bromodichloromethane	ug/L	ND	40	40	40.4	39.8	101	100	65-137	1	30	
Bromoform	ug/L	ND	40	40	39.9	40.9	100	102	60-147	2	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408729		408730		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1280701002 Result	MS Spike Conc.	MSD Spike Conc.									
Bromomethane	ug/L	ND	40	40	35.7	34.1	89	85	30-150	5	30		
Carbon tetrachloride	ug/L	ND	40	40	38.1	37.3	95	93	45-150	2	30		
Chlorobenzene	ug/L	ND	40	40	36.1	34.3	90	86	75-125	5	30		
Chloroethane	ug/L	ND	40	40	35.0	32.6	88	81	66-145	7	30		
Chloroform	ug/L	0.52	40	40	40.7	39.7	100	98	74-128	2	30		
Chloromethane	ug/L	ND	40	40	40.8	39.7	102	99	51-150	3	30		
cis-1,2-Dichloroethene	ug/L	26.8	40	40	63.9	63.1	93	91	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	39.2	38.5	98	96	75-129	2	30		
Dibromochloromethane	ug/L	ND	40	40	41.5	41.6	104	104	66-141	0	30		
Methylene Chloride	ug/L	ND	40	40	39.0	37.2	98	93	74-125	5	30		
Tetrachloroethene	ug/L	86.2	40	40	117	112	78	65	75-135	5	30		
trans-1,2-Dichloroethene	ug/L	0.90	40	40	39.1	37.7	96	92	75-125	4	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	40.1	39.7	100	99	67-139	1	30		
Trichloroethene	ug/L	23.9	40	40	60.5	57.7	92	85	75-130	5	30		
Trichlorofluoromethane	ug/L	ND	40	40	38.6	37.3	96	93	57-144	3	30		
Vinyl chloride	ug/L	ND	40	40	40.2	39.0	99	96	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%.						108	110	70-130				
4-Bromofluorobenzene (S)	%.						98	99	70-130				
Toluene-d8 (S)	%.						104	104	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

QC Batch: 102850 Analysis Method: EPA 8260B
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
 Associated Lab Samples: 1280701021, 1280701022, 1280701027, 1280701028, 1280701029, 1280701030, 1280701031, 1280701035, 1280701037

METHOD BLANK: 408731 Matrix: Water
 Associated Lab Samples: 1280701021, 1280701022, 1280701027, 1280701028, 1280701029, 1280701030, 1280701031, 1280701035, 1280701037

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/24/16 10:21	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/24/16 10:21	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/24/16 10:21	
1,1-Dichloroethane	ug/L	ND	0.50	12/24/16 10:21	
1,1-Dichloroethene	ug/L	ND	0.50	12/24/16 10:21	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/24/16 10:21	
1,2-Dichloroethane	ug/L	ND	0.50	12/24/16 10:21	
1,2-Dichloropropane	ug/L	ND	0.50	12/24/16 10:21	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/24/16 10:21	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/24/16 10:21	
Bromodichloromethane	ug/L	ND	0.50	12/24/16 10:21	
Bromoform	ug/L	ND	0.50	12/24/16 10:21	
Bromomethane	ug/L	ND	20.0	12/24/16 10:21	
Carbon tetrachloride	ug/L	ND	0.50	12/24/16 10:21	
Chlorobenzene	ug/L	ND	0.50	12/24/16 10:21	
Chloroethane	ug/L	ND	2.0	12/24/16 10:21	
Chloroform	ug/L	ND	0.50	12/24/16 10:21	
Chloromethane	ug/L	ND	0.50	12/24/16 10:21	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/24/16 10:21	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/24/16 10:21	
Dibromochloromethane	ug/L	ND	0.50	12/24/16 10:21	
Methylene Chloride	ug/L	ND	5.0	12/24/16 10:21	
Tetrachloroethene	ug/L	ND	0.50	12/24/16 10:21	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/24/16 10:21	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/24/16 10:21	
Trichloroethene	ug/L	ND	0.50	12/24/16 10:21	
Trichlorofluoromethane	ug/L	ND	0.50	12/24/16 10:21	
Vinyl chloride	ug/L	ND	0.50	12/24/16 10:21	
1,2-Dichloroethane-d4 (S)	%	102	70-130	12/24/16 10:21	
4-Bromofluorobenzene (S)	%	100	70-130	12/24/16 10:21	
Toluene-d8 (S)	%	101	70-130	12/24/16 10:21	

LABORATORY CONTROL SAMPLE: 408732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	37.4	94	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	37.7	94	75-125	
1,1,2-Trichloroethane	ug/L	40	37.4	93	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 408732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	37.2	93	71-131	
1,1-Dichloroethene	ug/L	40	37.5	94	74-126	
1,2-Dichlorobenzene	ug/L	40	34.4	86	75-125	
1,2-Dichloroethane	ug/L	40	39.4	99	64-141	
1,2-Dichloropropane	ug/L	40	37.6	94	73-127	
1,3-Dichlorobenzene	ug/L	40	34.3	86	75-125	
1,4-Dichlorobenzene	ug/L	40	33.4	83	75-125	
Bromodichloromethane	ug/L	40	37.9	95	70-134	
Bromoform	ug/L	40	37.7	94	68-130	
Bromomethane	ug/L	40	44.1	110	30-150	
Carbon tetrachloride	ug/L	40	36.4	91	66-135	
Chlorobenzene	ug/L	40	36.6	91	75-125	
Chloroethane	ug/L	40	37.6	94	55-150	
Chloroform	ug/L	40	38.1	95	72-131	
Chloromethane	ug/L	40	32.6	82	54-132	
cis-1,2-Dichloroethene	ug/L	40	38.2	96	75-125	
cis-1,3-Dichloropropene	ug/L	40	37.4	94	74-130	
Dibromochloromethane	ug/L	40	37.4	93	70-132	
Methylene Chloride	ug/L	40	37.4	93	68-125	
Tetrachloroethene	ug/L	40	34.2	86	75-130	
trans-1,2-Dichloroethene	ug/L	40	37.6	94	75-125	
trans-1,3-Dichloropropene	ug/L	40	37.0	92	69-137	
Trichloroethene	ug/L	40	37.5	94	75-125	
Trichlorofluoromethane	ug/L	40	38.7	97	59-140	
Vinyl chloride	ug/L	40	37.8	95	68-132	
1,2-Dichloroethane-d4 (S)	%			101	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408733 408734

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1280767002 Result	Spike Conc.	Spike Conc.	MS Result								
1,1,1-Trichloroethane	ug/L	ND	40	40	37.6	38.1	94	95	63-142	1	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	36.6	37.4	92	94	75-125	2	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	37.4	37.6	93	94	75-132	1	30		
1,1-Dichloroethane	ug/L	ND	40	40	37.4	37.9	93	94	75-126	1	30		
1,1-Dichloroethene	ug/L	ND	40	40	37.7	38.4	94	96	75-125	2	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	37.0	37.7	92	94	75-125	2	30		
1,2-Dichloroethane	ug/L	ND	40	40	39.4	39.7	98	99	75-137	1	30		
1,2-Dichloropropane	ug/L	ND	40	40	37.3	37.6	93	94	74-131	1	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	37.5	38.4	94	96	75-126	2	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	36.6	37.1	91	92	73-125	1	30		
Bromodichloromethane	ug/L	ND	40	40	37.6	38.4	94	96	65-137	2	30		
Bromoform	ug/L	ND	40	40	37.2	37.6	93	94	60-147	1	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408733		408734		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1280767002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Bromomethane	ug/L	ND	40	40	42.5	45.2	106	113	30-150	6	30		
Carbon tetrachloride	ug/L	ND	40	40	37.3	38.0	93	95	45-150	2	30		
Chlorobenzene	ug/L	ND	40	40	37.4	37.3	94	93	75-125	0	30		
Chloroethane	ug/L	ND	40	40	37.3	37.5	93	94	66-145	1	30		
Chloroform	ug/L	ND	40	40	38.0	38.4	95	96	74-128	1	30		
Chloromethane	ug/L	ND	40	40	32.3	32.6	81	81	51-150	1	30		
cis-1,2-Dichloroethene	ug/L	7.2	40	40	45.2	45.9	95	97	75-125	2	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	37.2	37.1	93	93	75-129	0	30		
Dibromochloromethane	ug/L	ND	40	40	37.1	37.7	93	94	66-141	2	30		
Methylene Chloride	ug/L	ND	40	40	37.4	38.1	94	95	74-125	2	30		
Tetrachloroethene	ug/L	1.5	40	40	39.0	39.3	94	95	75-135	1	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	37.8	38.5	94	96	75-125	2	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	36.1	37.0	90	93	67-139	2	30		
Trichloroethene	ug/L	ND	40	40	38.2	38.5	95	96	75-130	1	30		
Trichlorofluoromethane	ug/L	ND	40	40	39.7	40.4	99	101	57-144	2	30		
Vinyl chloride	ug/L	ND	40	40	37.3	37.9	93	95	70-136	2	30		
1,2-Dichloroethane-d4 (S)	%.						100	100	70-130				
4-Bromofluorobenzene (S)	%.						102	104	70-130				
Toluene-d8 (S)	%.						100	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

QC Batch: 102852 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1280701023, 1280701024, 1280701025, 1280701026, 1280701033, 1280701034

METHOD BLANK: 408735 Matrix: Water
Associated Lab Samples: 1280701023, 1280701024, 1280701025, 1280701026, 1280701033, 1280701034

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/26/16 12:36	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/26/16 12:36	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/26/16 12:36	
1,1-Dichloroethane	ug/L	ND	0.50	12/26/16 12:36	
1,1-Dichloroethene	ug/L	ND	0.50	12/26/16 12:36	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/26/16 12:36	
1,2-Dichloroethane	ug/L	ND	0.50	12/26/16 12:36	
1,2-Dichloropropane	ug/L	ND	0.50	12/26/16 12:36	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/26/16 12:36	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/26/16 12:36	
Bromodichloromethane	ug/L	ND	0.50	12/26/16 12:36	
Bromoform	ug/L	ND	0.50	12/26/16 12:36	
Bromomethane	ug/L	ND	20.0	12/26/16 12:36	
Carbon tetrachloride	ug/L	ND	0.50	12/26/16 12:36	
Chlorobenzene	ug/L	ND	0.50	12/26/16 12:36	
Chloroethane	ug/L	ND	2.0	12/26/16 12:36	
Chloroform	ug/L	ND	0.50	12/26/16 12:36	
Chloromethane	ug/L	ND	0.50	12/26/16 12:36	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/26/16 12:36	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/26/16 12:36	
Dibromochloromethane	ug/L	ND	0.50	12/26/16 12:36	
Methylene Chloride	ug/L	ND	5.0	12/26/16 12:36	
Tetrachloroethene	ug/L	ND	0.50	12/26/16 12:36	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/26/16 12:36	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/26/16 12:36	
Trichloroethene	ug/L	ND	0.50	12/26/16 12:36	
Trichlorofluoromethane	ug/L	ND	0.50	12/26/16 12:36	
Vinyl chloride	ug/L	ND	0.50	12/26/16 12:36	
1,2-Dichloroethane-d4 (S)	%	102	70-130	12/26/16 12:36	
4-Bromofluorobenzene (S)	%	100	70-130	12/26/16 12:36	
Toluene-d8 (S)	%	101	70-130	12/26/16 12:36	

LABORATORY CONTROL SAMPLE: 408736

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	36.2	91	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	36.6	91	75-125	
1,1,2-Trichloroethane	ug/L	40	36.6	91	75-126	
1,1-Dichloroethane	ug/L	40	36.7	92	71-131	
1,1-Dichloroethene	ug/L	40	36.8	92	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 408736

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	35.5	89	75-125	
1,2-Dichloroethane	ug/L	40	38.0	95	64-141	
1,2-Dichloropropane	ug/L	40	37.3	93	73-127	
1,3-Dichlorobenzene	ug/L	40	35.6	89	75-125	
1,4-Dichlorobenzene	ug/L	40	34.9	87	75-125	
Bromodichloromethane	ug/L	40	37.4	93	70-134	
Bromoform	ug/L	40	37.3	93	68-130	
Bromomethane	ug/L	40	42.4	106	30-150	
Carbon tetrachloride	ug/L	40	36.1	90	66-135	
Chlorobenzene	ug/L	40	36.4	91	75-125	
Chloroethane	ug/L	40	38.4	96	55-150	
Chloroform	ug/L	40	37.3	93	72-131	
Chloromethane	ug/L	40	32.2	81	54-132	
cis-1,2-Dichloroethene	ug/L	40	37.0	92	75-125	
cis-1,3-Dichloropropene	ug/L	40	36.2	90	74-130	
Dibromochloromethane	ug/L	40	36.4	91	70-132	
Methylene Chloride	ug/L	40	36.6	91	68-125	
Tetrachloroethene	ug/L	40	35.1	88	75-130	
trans-1,2-Dichloroethene	ug/L	40	37.4	94	75-125	
trans-1,3-Dichloropropene	ug/L	40	35.5	89	69-137	
Trichloroethene	ug/L	40	37.1	93	75-125	
Trichlorofluoromethane	ug/L	40	37.6	94	59-140	
Vinyl chloride	ug/L	40	36.9	92	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408737 408738

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1280773002	Spike Conc.	Spike Conc.	Result								
1,1,1-Trichloroethane	ug/L	ND	40	40	37.9	36.6	95	91	63-142	4	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	38.1	37.6	95	94	75-125	1	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	39.0	37.7	97	94	75-132	3	30		
1,1-Dichloroethane	ug/L	ND	40	40	38.6	36.6	96	91	75-126	5	30		
1,1-Dichloroethene	ug/L	ND	40	40	38.6	37.1	96	93	75-125	4	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	38.6	37.1	96	93	75-125	4	30		
1,2-Dichloroethane	ug/L	ND	40	40	40.3	39.3	101	98	75-137	3	30		
1,2-Dichloropropane	ug/L	ND	40	40	38.9	37.3	97	93	74-131	4	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	39.6	37.9	99	95	75-126	4	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	38.0	36.3	95	91	73-125	5	30		
Bromodichloromethane	ug/L	ND	40	40	38.7	37.3	97	93	65-137	4	30		
Bromoform	ug/L	ND	40	40	38.4	37.9	96	95	60-147	1	30		
Bromomethane	ug/L	ND	40	40	44.4	43.6	111	109	30-150	2	30		
Carbon tetrachloride	ug/L	ND	40	40	37.7	36.8	94	92	45-150	3	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408737		408738		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1280773002 Result	MS Spike Conc.	MSD Spike Conc.									
Chlorobenzene	ug/L	ND	40	40	38.2	36.8	95	92	75-125	4	30		
Chloroethane	ug/L	ND	40	40	39.7	38.0	99	95	66-145	4	30		
Chloroform	ug/L	ND	40	40	39.7	37.9	99	94	74-128	5	30		
Chloromethane	ug/L	ND	40	40	33.8	32.3	84	81	51-150	4	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	39.5	37.6	98	94	75-125	5	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	37.5	36.1	94	90	75-129	4	30		
Dibromochloromethane	ug/L	ND	40	40	38.2	36.8	95	92	66-141	4	30		
Methylene Chloride	ug/L	ND	40	40	39.2	36.9	98	92	74-125	6	30		
Tetrachloroethene	ug/L	0.51	40	40	38.9	37.7	96	93	75-135	3	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	39.6	36.8	99	92	75-125	7	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	36.5	36.1	91	90	67-139	1	30		
Trichloroethene	ug/L	ND	40	40	39.1	36.9	98	92	75-130	6	30		
Trichlorofluoromethane	ug/L	ND	40	40	41.2	39.4	103	99	57-144	4	30		
Vinyl chloride	ug/L	ND	40	40	39.1	37.6	98	94	70-136	4	30		
1,2-Dichloroethane-d4 (S)	%							101	100	70-130			
4-Bromofluorobenzene (S)	%							102	103	70-130			
Toluene-d8 (S)	%							101	101	70-130			

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

QC Batch: 102884 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1280701024, 1280701025

METHOD BLANK: 408860 Matrix: Water
Associated Lab Samples: 1280701024, 1280701025

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/27/16 10:33	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/27/16 10:33	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/27/16 10:33	
1,1-Dichloroethane	ug/L	ND	0.50	12/27/16 10:33	
1,1-Dichloroethene	ug/L	ND	0.50	12/27/16 10:33	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/27/16 10:33	
1,2-Dichloroethane	ug/L	ND	0.50	12/27/16 10:33	
1,2-Dichloropropane	ug/L	ND	0.50	12/27/16 10:33	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/27/16 10:33	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/27/16 10:33	
Bromodichloromethane	ug/L	ND	0.50	12/27/16 10:33	
Bromoform	ug/L	ND	0.50	12/27/16 10:33	
Bromomethane	ug/L	ND	20.0	12/27/16 10:33	
Carbon tetrachloride	ug/L	ND	0.50	12/27/16 10:33	
Chlorobenzene	ug/L	ND	0.50	12/27/16 10:33	
Chloroethane	ug/L	ND	2.0	12/27/16 10:33	
Chloroform	ug/L	ND	0.50	12/27/16 10:33	
Chloromethane	ug/L	ND	0.50	12/27/16 10:33	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/27/16 10:33	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/27/16 10:33	
Dibromochloromethane	ug/L	ND	0.50	12/27/16 10:33	
Methylene Chloride	ug/L	ND	5.0	12/27/16 10:33	
Tetrachloroethene	ug/L	ND	0.50	12/27/16 10:33	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/27/16 10:33	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/27/16 10:33	
Trichloroethene	ug/L	ND	0.50	12/27/16 10:33	
Trichlorofluoromethane	ug/L	ND	0.50	12/27/16 10:33	
Vinyl chloride	ug/L	ND	0.50	12/27/16 10:33	
1,2-Dichloroethane-d4 (S)	%	103	70-130	12/27/16 10:33	
4-Bromofluorobenzene (S)	%	96	70-130	12/27/16 10:33	
Toluene-d8 (S)	%	101	70-130	12/27/16 10:33	

LABORATORY CONTROL SAMPLE: 408861

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	37.6	94	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	37.8	94	75-125	
1,1,2-Trichloroethane	ug/L	40	38.5	96	75-126	
1,1-Dichloroethane	ug/L	40	38.6	96	71-131	
1,1-Dichloroethene	ug/L	40	38.4	96	74-126	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 408861

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	35.3	88	75-125	
1,2-Dichloroethane	ug/L	40	40.0	100	64-141	
1,2-Dichloropropane	ug/L	40	39.0	97	73-127	
1,3-Dichlorobenzene	ug/L	40	34.4	86	75-125	
1,4-Dichlorobenzene	ug/L	40	33.8	85	75-125	
Bromodichloromethane	ug/L	40	38.7	97	70-134	
Bromoform	ug/L	40	37.7	94	68-130	
Bromomethane	ug/L	40	44.0	110	30-150	
Carbon tetrachloride	ug/L	40	37.3	93	66-135	
Chlorobenzene	ug/L	40	37.6	94	75-125	
Chloroethane	ug/L	40	39.8	99	55-150	
Chloroform	ug/L	40	38.7	97	72-131	
Chloromethane	ug/L	40	33.0	82	54-132	
cis-1,2-Dichloroethene	ug/L	40	38.7	97	75-125	
cis-1,3-Dichloropropene	ug/L	40	37.7	94	74-130	
Dibromochloromethane	ug/L	40	37.9	95	70-132	
Methylene Chloride	ug/L	40	38.2	96	68-125	
Tetrachloroethene	ug/L	40	34.8	87	75-130	
trans-1,2-Dichloroethene	ug/L	40	38.6	96	75-125	
trans-1,3-Dichloropropene	ug/L	40	37.2	93	69-137	
Trichloroethene	ug/L	40	38.0	95	75-125	
Trichlorofluoromethane	ug/L	40	39.4	99	59-140	
Vinyl chloride	ug/L	40	38.2	96	68-132	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408862 408863

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1280773007	Spike Conc.	Spike Conc.	Result								
1,1,1-Trichloroethane	ug/L	ND	40	40	38.3	37.6	96	94	63-142	2	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	39.7	39.6	99	99	75-125	0	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	39.3	39.1	98	98	75-132	0	30		
1,1-Dichloroethane	ug/L	ND	40	40	39.4	38.1	99	95	75-126	3	30		
1,1-Dichloroethene	ug/L	ND	40	40	39.3	37.7	98	94	75-125	4	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	35.0	37.9	87	95	75-125	8	30		
1,2-Dichloroethane	ug/L	ND	40	40	40.6	40.1	101	100	75-137	1	30		
1,2-Dichloropropane	ug/L	ND	40	40	39.5	38.3	99	96	74-131	3	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	34.2	37.6	85	94	75-126	10	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	34.0	36.9	85	92	73-125	8	30		
Bromodichloromethane	ug/L	ND	40	40	39.1	38.4	98	96	65-137	2	30		
Bromoform	ug/L	ND	40	40	38.2	38.3	95	96	60-147	0	30		
Bromomethane	ug/L	ND	40	40	33.1	33.4	83	83	30-150	1	30		
Carbon tetrachloride	ug/L	ND	40	40	37.9	37.4	95	94	45-150	1	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 408862		408863		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1280773007 Result	MS Spike Conc.	MSD Spike Conc.									
Chlorobenzene	ug/L	ND	40	40	38.3	37.6	96	94	75-125	2	30		
Chloroethane	ug/L	ND	40	40	39.1	41.3	98	103	66-145	5	30		
Chloroform	ug/L	ND	40	40	39.6	38.5	99	96	74-128	3	30		
Chloromethane	ug/L	ND	40	40	32.6	30.2	81	75	51-150	8	30		
cis-1,2-Dichloroethene	ug/L	1.8	40	40	40.9	40.4	98	96	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	38.0	37.3	95	93	75-129	2	30		
Dibromochloromethane	ug/L	ND	40	40	38.4	37.8	96	94	66-141	2	30		
Methylene Chloride	ug/L	ND	40	40	40.0	37.9	100	95	74-125	5	30		
Tetrachloroethene	ug/L	0.93	40	40	36.9	38.7	90	94	75-135	5	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	39.4	38.0	99	95	75-125	4	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	37.3	37.1	93	93	67-139	0	30		
Trichloroethene	ug/L	ND	40	40	39.2	38.3	97	95	75-130	2	30		
Trichlorofluoromethane	ug/L	ND	40	40	42.2	41.0	105	102	57-144	3	30		
Vinyl chloride	ug/L	ND	40	40	39.6	37.7	99	94	70-136	5	30		
1,2-Dichloroethane-d4 (S)	%						100	101	70-130				
4-Bromofluorobenzene (S)	%						100	102	70-130				
Toluene-d8 (S)	%						101	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

QC Batch: 102927 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1280701007, 1280701008, 1280701020

METHOD BLANK: 409013 Matrix: Water
Associated Lab Samples: 1280701007, 1280701008, 1280701020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/28/16 11:27	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/28/16 11:27	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/28/16 11:27	
1,1-Dichloroethane	ug/L	ND	0.50	12/28/16 11:27	
1,1-Dichloroethene	ug/L	ND	0.50	12/28/16 11:27	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/28/16 11:27	
1,2-Dichloroethane	ug/L	ND	0.50	12/28/16 11:27	
1,2-Dichloropropane	ug/L	ND	0.50	12/28/16 11:27	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/28/16 11:27	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/28/16 11:27	
Bromodichloromethane	ug/L	ND	0.50	12/28/16 11:27	
Bromoform	ug/L	ND	0.50	12/28/16 11:27	
Bromomethane	ug/L	ND	20.0	12/28/16 11:27	
Carbon tetrachloride	ug/L	ND	0.50	12/28/16 11:27	
Chlorobenzene	ug/L	ND	0.50	12/28/16 11:27	
Chloroethane	ug/L	ND	2.0	12/28/16 11:27	
Chloroform	ug/L	ND	0.50	12/28/16 11:27	
Chloromethane	ug/L	ND	2.0	12/28/16 11:27	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/28/16 11:27	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/28/16 11:27	
Dibromochloromethane	ug/L	ND	0.50	12/28/16 11:27	
Methylene Chloride	ug/L	ND	5.0	12/28/16 11:27	
Tetrachloroethene	ug/L	ND	0.50	12/28/16 11:27	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/28/16 11:27	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/28/16 11:27	
Trichloroethene	ug/L	ND	0.50	12/28/16 11:27	
Trichlorofluoromethane	ug/L	ND	0.50	12/28/16 11:27	
Vinyl chloride	ug/L	ND	0.50	12/28/16 11:27	
1,2-Dichloroethane-d4 (S)	%	107	70-130	12/28/16 11:27	
4-Bromofluorobenzene (S)	%	92	70-130	12/28/16 11:27	
Toluene-d8 (S)	%	103	70-130	12/28/16 11:27	

LABORATORY CONTROL SAMPLE: 409014

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	43.7	109	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	39.4	98	75-125	
1,1,2-Trichloroethane	ug/L	40	42.6	106	75-126	
1,1-Dichloroethane	ug/L	40	44.2	111	71-131	
1,1-Dichloroethene	ug/L	40	42.1	105	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 409014

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	40.2	101	75-125	
1,2-Dichloroethane	ug/L	40	45.3	113	64-141	
1,2-Dichloropropane	ug/L	40	44.7	112	73-127	
1,3-Dichlorobenzene	ug/L	40	37.8	95	75-125	
1,4-Dichlorobenzene	ug/L	40	39.9	100	75-125	
Bromodichloromethane	ug/L	40	43.5	109	70-134	
Bromoform	ug/L	40	38.0	95	68-130	
Bromomethane	ug/L	40	14.4J	36	30-150	
Carbon tetrachloride	ug/L	40	43.3	108	66-135	
Chlorobenzene	ug/L	40	39.2	98	75-125	
Chloroethane	ug/L	40	39.2	98	55-150	
Chloroform	ug/L	40	44.7	112	72-131	
Chloromethane	ug/L	40	34.5	86	54-132	
cis-1,2-Dichloroethene	ug/L	40	42.5	106	75-125	
cis-1,3-Dichloropropene	ug/L	40	44.0	110	74-130	
Dibromochloromethane	ug/L	40	42.7	107	70-132	
Methylene Chloride	ug/L	40	41.8	104	68-125	
Tetrachloroethene	ug/L	40	41.8	105	75-130	
trans-1,2-Dichloroethene	ug/L	40	43.1	108	75-125	
trans-1,3-Dichloropropene	ug/L	40	44.2	110	69-137	
Trichloroethene	ug/L	40	42.4	106	75-125	
Trichlorofluoromethane	ug/L	40	42.7	107	59-140	
Vinyl chloride	ug/L	40	39.1	98	68-132	
1,2-Dichloroethane-d4 (S)	%			108	70-130	
4-Bromofluorobenzene (S)	%			95	70-130	
Toluene-d8 (S)	%			104	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 409024 409025

Parameter	Units	1280875002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,1,1-Trichloroethane	ug/L	ND	40	40	40.3	40.2	101	101	63-142	0	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	34.0	35.5	85	89	75-125	4	30		
1,1,2-Trichloroethane	ug/L	ND	40	40	36.2	37.7	90	94	75-132	4	30		
1,1-Dichloroethane	ug/L	ND	40	40	38.9	40.1	97	100	75-126	3	30		
1,1-Dichloroethene	ug/L	ND	40	40	39.9	40.2	100	101	75-125	1	30		
1,2-Dichlorobenzene	ug/L	ND	40	40	33.1	33.1	83	83	75-125	0	30		
1,2-Dichloroethane	ug/L	ND	40	40	38.8	40.6	97	101	75-137	4	30		
1,2-Dichloropropane	ug/L	ND	40	40	37.7	39.7	94	99	74-131	5	30		
1,3-Dichlorobenzene	ug/L	ND	40	40	32.3	31.5	81	79	75-126	3	30		
1,4-Dichlorobenzene	ug/L	ND	40	40	32.4	32.2	81	80	73-125	1	30		
Bromodichloromethane	ug/L	ND	40	40	36.5	38.1	91	95	65-137	4	30		
Bromoform	ug/L	ND	40	40	31.4	32.7	78	82	60-147	4	30		
Bromomethane	ug/L	ND	40	40	13.6J	16.5J	34	41	30-150		30		
Carbon tetrachloride	ug/L	ND	40	40	40.8	40.7	102	102	45-150	0	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 409024		409025		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1280875002 Result	MS Spike Conc.	MSD Spike Conc.									
Chlorobenzene	ug/L	ND	40	40	33.5	34.2	84	86	75-125	2	30		
Chloroethane	ug/L	ND	40	40	31.5	34.9	79	87	66-145	10	30		
Chloroform	ug/L	ND	40	40	38.3	39.7	96	99	74-128	4	30		
Chloromethane	ug/L	ND	40	40	31.6	32.8	79	82	51-150	4	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	37.2	38.2	93	96	75-125	3	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	36.8	38.6	92	96	75-129	5	30		
Dibromochloromethane	ug/L	ND	40	40	35.8	37.5	90	94	66-141	5	30		
Methylene Chloride	ug/L	ND	40	40	35.4	36.7	88	92	74-125	4	30		
Tetrachloroethene	ug/L	ND	40	40	38.5	37.6	96	94	75-135	2	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	38.2	38.8	95	97	75-125	2	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	36.6	38.5	92	96	67-139	5	30		
Trichloroethene	ug/L	ND	40	40	37.9	38.7	95	97	75-130	2	30		
Trichlorofluoromethane	ug/L	ND	40	40	38.7	40.1	97	100	57-144	4	30		
Vinyl chloride	ug/L	ND	40	40	37.5	37.8	94	94	70-136	1	30		
1,2-Dichloroethane-d4 (S)	%						115	114	70-130				
4-Bromofluorobenzene (S)	%						96	95	70-130				
Toluene-d8 (S)	%						105	105	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

QC Batch: 102974 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1280701003

METHOD BLANK: 409211 Matrix: Water
Associated Lab Samples: 1280701003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	12/28/16 10:58	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	12/28/16 10:58	
1,1,2-Trichloroethane	ug/L	ND	0.50	12/28/16 10:58	
1,1-Dichloroethane	ug/L	ND	0.50	12/28/16 10:58	
1,1-Dichloroethene	ug/L	ND	0.50	12/28/16 10:58	
1,2-Dichlorobenzene	ug/L	ND	0.50	12/28/16 10:58	
1,2-Dichloroethane	ug/L	ND	0.50	12/28/16 10:58	
1,2-Dichloropropane	ug/L	ND	0.50	12/28/16 10:58	
1,3-Dichlorobenzene	ug/L	ND	0.50	12/28/16 10:58	
1,4-Dichlorobenzene	ug/L	ND	0.50	12/28/16 10:58	
Bromodichloromethane	ug/L	ND	0.50	12/28/16 10:58	
Bromoform	ug/L	ND	0.50	12/28/16 10:58	
Bromomethane	ug/L	ND	20.0	12/28/16 10:58	
Carbon tetrachloride	ug/L	ND	0.50	12/28/16 10:58	
Chlorobenzene	ug/L	ND	0.50	12/28/16 10:58	
Chloroethane	ug/L	ND	2.0	12/28/16 10:58	
Chloroform	ug/L	ND	0.50	12/28/16 10:58	
Chloromethane	ug/L	ND	0.50	12/28/16 10:58	
cis-1,2-Dichloroethene	ug/L	ND	0.50	12/28/16 10:58	
cis-1,3-Dichloropropene	ug/L	ND	0.50	12/28/16 10:58	
Dibromochloromethane	ug/L	ND	0.50	12/28/16 10:58	
Methylene Chloride	ug/L	ND	5.0	12/28/16 10:58	
Tetrachloroethene	ug/L	ND	0.50	12/28/16 10:58	
trans-1,2-Dichloroethene	ug/L	ND	0.50	12/28/16 10:58	
trans-1,3-Dichloropropene	ug/L	ND	0.50	12/28/16 10:58	
Trichloroethene	ug/L	ND	0.50	12/28/16 10:58	
Trichlorofluoromethane	ug/L	ND	0.50	12/28/16 10:58	
Vinyl chloride	ug/L	ND	0.50	12/28/16 10:58	
1,2-Dichloroethane-d4 (S)	%	101	70-130	12/28/16 10:58	
4-Bromofluorobenzene (S)	%	95	70-130	12/28/16 10:58	
Toluene-d8 (S)	%	101	70-130	12/28/16 10:58	

LABORATORY CONTROL SAMPLE: 409212

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	36.1	90	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	37.8	94	75-125	
1,1,2-Trichloroethane	ug/L	40	38.4	96	75-126	
1,1-Dichloroethane	ug/L	40	37.6	94	71-131	
1,1-Dichloroethene	ug/L	40	37.1	93	74-126	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver
Pace Project No.: 1280701

LABORATORY CONTROL SAMPLE: 409212

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	35.1	88	75-125	
1,2-Dichloroethane	ug/L	40	39.3	98	64-141	
1,2-Dichloropropane	ug/L	40	38.6	96	73-127	
1,3-Dichlorobenzene	ug/L	40	34.3	86	75-125	
1,4-Dichlorobenzene	ug/L	40	33.7	84	75-125	
Bromodichloromethane	ug/L	40	37.9	95	70-134	
Bromoform	ug/L	40	37.2	93	68-130	
Bromomethane	ug/L	40	43.3	108	30-150	
Carbon tetrachloride	ug/L	40	35.6	89	66-135	
Chlorobenzene	ug/L	40	36.3	91	75-125	
Chloroethane	ug/L	40	39.7	99	55-150	
Chloroform	ug/L	40	37.9	95	72-131	
Chloromethane	ug/L	40	32.0	80	54-132	
cis-1,2-Dichloroethene	ug/L	40	37.5	94	75-125	
cis-1,3-Dichloropropene	ug/L	40	36.9	92	74-130	
Dibromochloromethane	ug/L	40	37.3	93	70-132	
Methylene Chloride	ug/L	40	37.5	94	68-125	
Tetrachloroethene	ug/L	40	33.4	83	75-130	
trans-1,2-Dichloroethene	ug/L	40	37.8	94	75-125	
trans-1,3-Dichloropropene	ug/L	40	36.7	92	69-137	
Trichloroethene	ug/L	40	36.7	92	75-125	
Trichlorofluoromethane	ug/L	40	37.9	95	59-140	
Vinyl chloride	ug/L	40	37.8	94	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 409242 409243

Parameter	Units	1280887002		409243		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1-Trichloroethane	ug/L	40	40	34.9	36.8	87	92	63-142	5	30	
1,1,2,2-Tetrachloroethane	ug/L	40	40	36.0	39.3	90	98	75-125	9	30	
1,1,2-Trichloroethane	ug/L	40	40	36.6	39.3	92	98	75-132	7	30	
1,1-Dichloroethane	ug/L	40	40	36.2	37.9	90	95	75-126	5	30	
1,1-Dichloroethene	ug/L	40	40	35.8	37.1	89	93	75-125	4	30	
1,2-Dichlorobenzene	ug/L	40	40	36.4	35.5	91	89	75-125	2	30	
1,2-Dichloroethane	ug/L	40	40	38.4	40.2	96	101	75-137	5	30	
1,2-Dichloropropane	ug/L	40	40	37.2	38.8	93	97	74-131	4	30	
1,3-Dichlorobenzene	ug/L	40	40	37.3	35.2	93	88	75-126	6	30	
1,4-Dichlorobenzene	ug/L	40	40	35.8	34.5	89	86	73-125	4	30	
Bromodichloromethane	ug/L	40	40	36.1	38.4	90	96	65-137	6	30	
Bromoform	ug/L	40	40	35.1	38.1	88	95	60-147	8	30	
Bromomethane	ug/L	40	40	42.1	44.8	105	112	30-150	6	30	
Carbon tetrachloride	ug/L	40	40	35.1	36.4	88	91	45-150	4	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		409242		409243		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		1280887002	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Chlorobenzene	ug/L		40	40	35.9	37.2	90	93	75-125	3	30		
Chloroethane	ug/L		40	40	38.0	39.8	95	99	66-145	5	30		
Chloroform	ug/L		40	40	36.7	38.3	92	96	74-128	4	30		
Chloromethane	ug/L		40	40	31.2	32.6	78	82	51-150	4	30		
cis-1,2-Dichloroethene	ug/L		40	40	36.3	37.7	91	94	75-125	4	30		
cis-1,3-Dichloropropene	ug/L		40	40	35.3	37.3	88	93	75-129	5	30		
Dibromochloromethane	ug/L		40	40	35.4	37.7	88	94	66-141	6	30		
Methylene Chloride	ug/L		40	40	36.2	37.6	91	94	74-125	4	30		
Tetrachloroethene	ug/L		40	40	35.9	35.2	90	88	75-135	2	30		
trans-1,2-Dichloroethene	ug/L		40	40	36.2	38.0	91	95	75-125	5	30		
trans-1,3-Dichloropropene	ug/L		40	40	34.6	37.3	87	93	67-139	7	30		
Trichloroethene	ug/L		40	40	36.0	37.4	90	93	75-130	4	30		
Trichlorofluoromethane	ug/L		40	40	38.1	38.8	95	97	57-144	2	30		
Vinyl chloride	ug/L		40	40	36.7	37.9	92	95	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%						101	101	70-130				
4-Bromofluorobenzene (S)	%						101	100	70-130				
Toluene-d8 (S)	%						101	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver

Pace Project No.: 1280701

QC Batch: 70924

Analysis Method: SM 5310B

QC Batch Method: SM 5310B

Analysis Description: 5310B TOC

Associated Lab Samples: 1280701007, 1280701008, 1280701009, 1280701021, 1280701023, 1280701025, 1280701026, 1280701032, 1280701034

METHOD BLANK: 296727

Matrix: Water

Associated Lab Samples: 1280701007, 1280701008, 1280701009, 1280701021, 1280701023, 1280701025, 1280701026, 1280701032, 1280701034

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	12/29/16 09:30	

LABORATORY CONTROL SAMPLE: 296728

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	31.6	31.4	99	90-110	

MATRIX SPIKE SAMPLE: 297170

Parameter	Units	1280701007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	1930	500	2700	153	75-125	M6

SAMPLE DUPLICATE: 297169

Parameter	Units	1280701007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	1930	2380	21	20	D6

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: NuStar Vancouver
Pace Project No.: 1280701

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DAV Pace Analytical Services - Davis
PASI-M Pace Analytical Services - Minneapolis
PASI-N Pace Analytical Services - New Orleans

BATCH QUALIFIERS

Batch: 102751

[1] Dichlorodifluoromethane and Hexachloro-1,3-butadiene exceeded secondary source verification criteria for the initial calibration. The reported Dichlorodifluoromethane and Hexachloro-1,3-butadiene results should be considered as estimated values.

[2] The continuing calibration for Hexachloro-1,3-butadiene is outside of Pace Analytical acceptance limits. The Hexachloro-1,3-butadiene results may be biased.

Batch: 102804

[1] The initial calibrations for Dichlorodifluoromethane and Hexachloro-1,3-butadiene were outside of method control limits. These results are estimated.

Batch: 102817

[1] The initial calibrations for Dichlorodifluoromethane and Hexachloro-1,3-butadiene were outside of method control limits. These results are estimated.

Batch: 102845

[1] The continuing calibration for Bromomethane is outside of Pace Analytical acceptance limits. The Bromomethane results may be biased low.

Batch: 102850

[1] The initial calibrations for Dichlorodifluoromethane and Hexachloro-1,3-butadiene were outside of method control limits. These results are estimated.

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QUALIFIERS

Project: NuStar Vancouver

Pace Project No.: 1280701

BATCH QUALIFIERS

Batch: 102852

- [1] The initial calibrations for Dichlorodifluoromethane and Hexachloro-1,3-butadiene were outside of method control limits. These results are estimated.

Batch: 102884

- [1] Dichlorodifluoromethane and Hexachloro-1,3-butadiene exceeded secondary source verification criteria for the initial calibration. The reported Dichlorodifluoromethane and Hexachloro-1,3-butadiene results should be considered an estimated value.

Batch: 102974

- [1] The initial calibrations for Dichlorodifluoromethane and Hexachloro-1,3-butadiene were outside of method control limits. These results are estimated.

ANALYTE QUALIFIERS

- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- H1 Analysis conducted outside the recognized method holding time.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver
Pace Project No.: 1280701

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1280701007	MW-12	RSK 175	453342		
1280701008	MW-13	RSK 175	453342		
1280701009	MW-14	RSK 175	453342		
1280701021	MW-19	RSK 175	453342		
1280701023	MGMS1-43	RSK 175	453342		
1280701025	MGMS3-40	RSK 175	453342		
1280701026	MP-1	RSK 175	453342		
1280701032	MW-24i	RSK 175	453342		
1280701034	MW-26	RSK 175	453342		
1280701001	MW-1	EPA 8260B	102845		
1280701002	MW-3	EPA 8260B	102845		
1280701003	MW-5	EPA 8260B	102845		
1280701003	MW-5	EPA 8260B	102974		
1280701004	MW-7	EPA 8260B	102845		
1280701005	MW-8	EPA 8260B	102845		
1280701006	MW-9	EPA 8260B	102845		
1280701007	MW-12	EPA 8260B	102845		
1280701007	MW-12	EPA 8260B	102927		
1280701008	MW-13	EPA 8260B	102845		
1280701008	MW-13	EPA 8260B	102927		
1280701009	MW-14	EPA 8260B	102817		
1280701010	MW-16	EPA 8260B	102845		
1280701011	S-1	EPA 8260B	102817		
1280701012	MW-18i	EPA 8260B	102845		
1280701013	MW-19i	EPA 8260B	102845		
1280701014	MW-20i	EPA 8260B	102804		
1280701015	MW-21i-40	EPA 8260B	102817		
1280701016	MW-22i	EPA 8260B	102817		
1280701017	MW-23i	EPA 8260B	102817		
1280701018	MW-21i-105	EPA 8260B	102817		
1280701019	MW-7 DUP	EPA 8260B	102804		
1280701020	MW-12 DUP	EPA 8260B	102927		
1280701021	MW-19	EPA 8260B	102751		
1280701021	MW-19	EPA 8260B	102850		
1280701022	MW-32S	EPA 8260B	102850		
1280701023	MGMS1-43	EPA 8260B	102852		
1280701024	MGMS2-40	EPA 8260B	102852		
1280701024	MGMS2-40	EPA 8260B	102884		
1280701025	MGMS3-40	EPA 8260B	102852		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver
Pace Project No.: 1280701

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1280701025	MGMS3-40	EPA 8260B	102884		
1280701026	MP-1	EPA 8260B	102817		
1280701026	MP-1	EPA 8260B	102852		
1280701027	EX-1	EPA 8260B	102751		
1280701027	EX-1	EPA 8260B	102850		
1280701028	MGMS1-60	EPA 8260B	102850		
1280701029	MGMS2-60	EPA 8260B	102850		
1280701030	MGMS3-60	EPA 8260B	102850		
1280701031	MW-19 DUP	EPA 8260B	102751		
1280701031	MW-19 DUP	EPA 8260B	102850		
1280701032	MW-24i	EPA 8260B	102751		
1280701033	MW-25i	EPA 8260B	102817		
1280701033	MW-25i	EPA 8260B	102852		
1280701034	MW-26	EPA 8260B	102817		
1280701034	MW-26	EPA 8260B	102852		
1280701035	TRIP BLANK	EPA 8260B	102850		
1280701036	Field Blank	EPA 8260B	102751		
1280701037	Equipment Blank	EPA 8260B	102850		
1280701038	MW 24D	EPA 8260B	102751		
1280701039	S-2	EPA 8260B	102817		
1280701007	MW-12	SM 5310B	70924		
1280701008	MW-13	SM 5310B	70924		
1280701009	MW-14	SM 5310B	70924		
1280701021	MW-19	SM 5310B	70924		
1280701023	MGMS1-43	SM 5310B	70924		
1280701025	MGMS3-40	SM 5310B	70924		
1280701026	MP-1	SM 5310B	70924		
1280701032	MW-24i	SM 5310B	70924		
1280701034	MW-26	SM 5310B	70924		

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Document Name:
Sample Condition Upon Receipt Form

Document Revised: 25Feb2015
Page 1 of 1

Document No.:
F-DAV-C-002-rev.02

Issuing Authority:
Pace Davis, CA Quality Office

Sample Condition
Upon Receipt

Client Name:

Project #:

WO#: 1280701



Courier: Fed Ex UPS USPS Client

Commercial Pace OnTrac Other:

Tracking Number: 8107 8807 7803
7779 8967 7290 ~ no seals

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: Temp Blank? Yes No

Thermom. Used: DA1434 DA2285 Type of Ice: Wet Blue Dry Ice None Samples on ice, cooling process has begun

Cooler Temp Read(°C): 0.8/1.8 Cooler Temp Corrected(°C): 1.4/2.4 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: +0.6 Date and Initials of Person Examining Contents: [Signature] 12/20/16

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1. No sample containers labeled as	(12/20/16)
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2. MW-12 was received, SR will not	
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3. except page 4 of 4. will select	
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.	3 containers for MW-12
Samples Arrived within Hold Time?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5.	Dup. All dates
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.	one time match the COC for both samples.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7. No TAT on COC	
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8. Sample -007 has 10 containers total.	
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. Sample -022 has 6 containers total.	
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample -034 has 4 containers total.	
Containers Intact?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10. Sample -024 was frozen and one container was broken at receipt.	
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.	
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample 26 has "EX" on the labels.	
-Includes Date/Time/ID/Analysis Matrix: WT		13. Sample -03 has one container w/ no info. It was received in the same bag as sample -03.	
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:	
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. 3 40ml vials (HCL) were received	
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. Labeled as Field Blanks 1, 12/12/16	
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	copy time of 1330 - NOT on COC.	
Pace Trip Blank Lot # (if purchased):		16. Sample -002 has a time of 1119	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: SR log corrected - SMF

11 Samples 1-6 will be logged in for HPLC until further clarification. The same for sample 10.

Project Manager Review: Scott Jones

Date: 12/21/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

April 14, 2017

Stephanie Bosze-Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

RE: Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Dear Stephanie Bosze-Salisbury:

Enclosed are the analytical results for sample(s) received by the laboratory on April 04, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

The analysis for methane, ethane, and ethene by method RSK 175, could not be completed within hold time. The data will be compared against historical values, and is considered to be representable for this purpose.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott M Forbes
scott.forbes@pacelabs.com
(530) 297-4800
Project Manager

Enclosures

cc: Kelsi Evans, Apex Companies, LLC



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

Davis Certification IDs

2795 Second Street Suite 300 Davis, CA 95618

North Dakota Certification #: R-214

Oregon Certification #: CA300002

Washington Certification #: C926-15a

California Certification #: 08263CA

Minnesota Department of Health Certification #: 006-999-465

New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):
T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119

Commonwealth of Virginia (TNI): 480246

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1285102001	MW-23i	Water	03/27/17 15:25	04/04/17 09:33
1285102002	MW-14	Water	03/27/17 14:55	04/04/17 09:33
1285102005	EX	Water	03/28/17 16:12	04/04/17 09:33
1285102006	MW-19	Water	03/28/17 15:45	04/04/17 09:33
1285102011	MGMS3-40	Water	03/28/17 14:03	04/04/17 09:33
1285102028	MW-26	Water	03/29/17 09:15	04/04/17 09:33
1285102030	MW-13	Water	03/30/17 15:25	04/04/17 09:33
1285102031	MW-24i	Water	03/30/17 14:48	04/04/17 09:33
1285102032	MP-1	Water	03/30/17 13:56	04/04/17 09:33
1285102047	MGMS1-43	Water	03/31/17 08:30	04/04/17 09:33
1285102039	MW-12	Water	03/30/17 09:30	04/04/17 09:33
1285102003	S-1	Water	03/27/17 14:20	04/04/17 09:33
1285102004	S-2	Water	03/27/17 13:45	04/04/17 09:33
1285102007	MW-19 DUP	Water	03/28/17 15:45	04/04/17 09:33
1285102008	MGMS3-132	Water	03/28/17 15:05	04/04/17 09:33
1285102009	MGMS3-110	Water	03/28/17 14:45	04/04/17 09:33
1285102010	MGMS3-60	Water	03/28/17 14:23	04/04/17 09:33
1285102012	MGMS3-40 DUP	Water	03/28/17 14:03	04/04/17 09:33
1285102013	MW-24d	Water	03/28/17 11:50	04/04/17 09:33
1285102014	MW-2	Water	03/28/17 11:10	04/04/17 09:33
1285102015	MW-15	Water	03/28/17 10:10	04/04/17 09:33
1285102016	MW-5	Water	03/28/17 09:36	04/04/17 09:33
1285102017	MW-7	Water	03/28/17 08:55	04/04/17 09:33
1285102018	MW-7 DUP	Water	03/28/17 08:55	04/04/17 09:33
1285102019	MW-9	Water	03/28/17 08:23	04/04/17 09:33
1285102020	MW-19i	Water	03/29/17 15:20	04/04/17 09:33
1285102021	MW-18i	Water	03/29/17 14:37	04/04/17 09:33
1285102022	MW-16	Water	03/29/17 13:32	04/04/17 09:33
1285102023	MW-3	Water	03/29/17 12:48	04/04/17 09:33
1285102024	MW-21i-40	Water	03/29/17 12:00	04/04/17 09:33
1285102025	MW-21i-105	Water	03/29/17 11:35	04/04/17 09:33
1285102026	MW-22i	Water	03/29/17 10:38	04/04/17 09:33
1285102027	MW-25i	Water	03/29/17 10:00	04/04/17 09:33
1285102029	MW-17	Water	03/29/17 08:47	04/04/17 09:33
1285102033	MW-8	Water	03/30/17 13:07	04/04/17 09:33
1285102034	MW-20i	Water	03/30/17 12:00	04/04/17 09:33
1285102035	MW-10	Water	03/30/17 11:27	04/04/17 09:33

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1285102036	MW-1	Water	03/30/17 10:52	04/04/17 09:33
1285102037	EW-1	Water	03/30/17 13:18	04/04/17 09:33
1285102038	MW-6	Water	03/30/17 08:28	04/04/17 09:33
1285102040	MW-12 DUP	Water	03/30/17 09:30	04/04/17 09:33
1285102041	MGMS2-40	Water	03/31/17 11:44	04/04/17 09:33
1285102042	MGMS2-110	Water	03/31/17 10:00	04/04/17 09:33
1285102043	MGMS2-60	Water	03/31/17 11:17	04/04/17 09:33
1285102044	MGMS2-132	Water	03/31/17 10:27	04/04/17 09:33
1285102045	MGMS1-132	Water	03/31/17 09:20	04/04/17 09:33
1285102046	MGMS1-60	Water	03/31/17 08:58	04/04/17 09:33
1285102048	Equipment Blank	Water	03/30/17 15:40	04/04/17 09:33
1285102049	Field Blank	Water	03/27/17 15:50	04/04/17 09:33
1285102050	Field Blank	Water	03/28/17 16:30	04/04/17 09:33
1285102051	Field Blank	Water	03/29/17 15:40	04/04/17 09:33
1285102052	Field Blank	Water	03/30/17 15:40	04/04/17 09:33
1285102053	Field Blank	Water	03/31/17 10:00	04/04/17 09:33

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1285102001	MW-23i	EPA 8260B	JCP	31	PASI-DAV
1285102002	MW-14	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102005	EX	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102006	MW-19	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102011	MGMS3-40	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102028	MW-26	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102030	MW-13	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102031	MW-24i	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102032	MP-1	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102047	MGMS1-43	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102039	MW-12	RSK 175	DR1	3	PASI-M
		EPA 8260B	JCP	31	PASI-DAV
		SM 5310B	CN	1	PASI-N
1285102003	S-1	EPA 8260B	JCP	31	PASI-DAV
1285102004	S-2	EPA 8260B	JCP	31	PASI-DAV
1285102007	MW-19 DUP	EPA 8260B	JCP	31	PASI-DAV
1285102008	MGMS3-132	EPA 8260B	JCP	31	PASI-DAV
1285102009	MGMS3-110	EPA 8260B	JCP	31	PASI-DAV
1285102010	MGMS3-60	EPA 8260B	JCP	31	PASI-DAV

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1285102012	MGMS3-40 DUP	EPA 8260B	JCP	31	PASI-DAV
1285102013	MW-24d	EPA 8260B	JCP	31	PASI-DAV
1285102014	MW-2	EPA 8260B	JCP	31	PASI-DAV
1285102015	MW-15	EPA 8260B	JCP	31	PASI-DAV
1285102016	MW-5	EPA 8260B	JCP	31	PASI-DAV
1285102017	MW-7	EPA 8260B	JCP	31	PASI-DAV
1285102018	MW-7 DUP	EPA 8260B	JCP	31	PASI-DAV
1285102019	MW-9	EPA 8260B	JCP	31	PASI-DAV
1285102020	MW-19i	EPA 8260B	JCP	31	PASI-DAV
1285102021	MW-18i	EPA 8260B	JCP	31	PASI-DAV
1285102022	MW-16	EPA 8260B	JCP	31	PASI-DAV
1285102023	MW-3	EPA 8260B	JCP	31	PASI-DAV
1285102024	MW-21i-40	EPA 8260B	JCP	31	PASI-DAV
1285102025	MW-21i-105	EPA 8260B	JCP	31	PASI-DAV
1285102026	MW-22i	EPA 8260B	JCP	31	PASI-DAV
1285102027	MW-25i	EPA 8260B	JCP	31	PASI-DAV
1285102029	MW-17	EPA 8260B	JCP	31	PASI-DAV
1285102033	MW-8	EPA 8260B	JCP	31	PASI-DAV
1285102034	MW-20i	EPA 8260B	JCP	31	PASI-DAV
1285102035	MW-10	EPA 8260B	JCP	31	PASI-DAV
1285102036	MW-1	EPA 8260B	JCP	31	PASI-DAV
1285102037	EW-1	EPA 8260B	JCP	31	PASI-DAV
1285102038	MW-6	EPA 8260B	JCP	31	PASI-DAV
1285102040	MW-12 DUP	EPA 8260B	JCP	31	PASI-DAV
1285102041	MGMS2-40	EPA 8260B	JCP	31	PASI-DAV
1285102042	MGMS2-110	EPA 8260B	JCP	31	PASI-DAV
1285102043	MGMS2-60	EPA 8260B	JCP	31	PASI-DAV
1285102044	MGMS2-132	EPA 8260B	JCP	31	PASI-DAV
1285102045	MGMS1-132	EPA 8260B	JCP	31	PASI-DAV
1285102046	MGMS1-60	EPA 8260B	JCP	31	PASI-DAV
1285102048	Equipment Blank	EPA 8260B	JCP	31	PASI-DAV
1285102049	Field Blank	EPA 8260B	JCP	31	PASI-DAV
1285102050	Field Blank	EPA 8260B	JCP	31	PASI-DAV
1285102051	Field Blank	EPA 8260B	JCP	31	PASI-DAV
1285102052	Field Blank	EPA 8260B	JCP	31	PASI-DAV
1285102053	Field Blank	EPA 8260B	JCP	31	PASI-DAV

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-23i		Lab ID: 1285102001		Collected: 03/27/17 15:25		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 12:25	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/05/17 12:25	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/05/17 12:25	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 12:25	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 12:25	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/05/17 12:25	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/05/17 12:25	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/05/17 12:25	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 12:25	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 12:25	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 12:25	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 12:25	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/05/17 12:25	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 12:25	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/05/17 12:25	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 12:25	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 12:25	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 12:25	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 12:25	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 12:25	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 12:25	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 12:25	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		04/05/17 12:25	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 12:25	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 12:25	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		04/05/17 12:25	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 12:25	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/05/17 12:25	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/05/17 12:25	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		04/05/17 12:25	2037-26-5		
4-Bromofluorobenzene (S)	95	%	70-130	1		04/05/17 12:25	460-00-4		

Sample: MW-14		Lab ID: 1285102002		Collected: 03/27/17 14:55		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		04/10/17 10:32	74-84-0		
Ethene	ND	ug/L	10.0	1		04/10/17 10:32	74-85-1		
Methane	1180	ug/L	10.0	1		04/10/17 10:32	74-82-8		
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 12:44	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/05/17 12:44	75-25-2		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: MW-14	Lab ID: 1285102002	Collected: 03/27/17 14:55	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

8260 MSV Med Water

Analytical Method: EPA 8260B

Bromomethane	ND	ug/L	20.0	1		04/05/17 12:44	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 12:44	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 12:44	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/05/17 12:44	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/05/17 12:44	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/05/17 12:44	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 12:44	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 12:44	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 12:44	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 12:44	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/05/17 12:44	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 12:44	107-06-2	
1,1-Dichloroethene	0.57	ug/L	0.50	1		04/05/17 12:44	75-35-4	
cis-1,2-Dichloroethene	69.2	ug/L	0.50	1		04/05/17 12:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 12:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 12:44	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 12:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 12:44	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 12:44	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 12:44	79-34-5	
Tetrachloroethene	14.7	ug/L	0.50	1		04/05/17 12:44	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 12:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 12:44	79-00-5	
Trichloroethene	33.4	ug/L	0.50	1		04/05/17 12:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 12:44	75-69-4	
Vinyl chloride	0.62	ug/L	0.50	1		04/05/17 12:44	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/05/17 12:44	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/05/17 12:44	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/05/17 12:44	460-00-4	

5310B TOC

Analytical Method: SM 5310B

Total Organic Carbon	3.9	mg/L	1.0	1		04/10/17 10:38	7440-44-0	
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Sample: EX	Lab ID: 1285102005	Collected: 03/28/17 16:12	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

RSK 175 AIR Headspace

Analytical Method: RSK 175

Ethane	23.5	ug/L	10.0	1		04/10/17 10:47	74-84-0	
Ethene	23.5	ug/L	10.0	1		04/10/17 10:47	74-85-1	
Methane	3280	ug/L	10.0	1		04/10/17 10:47	74-82-8	

8260 MSV Med Water

Analytical Method: EPA 8260B

Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 12:38	75-27-4	
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: EX		Lab ID: 1285102005		Collected: 03/28/17 16:12	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromoform	ND	ug/L	0.50	1		04/07/17 12:38	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/07/17 12:38	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 12:38	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 12:38	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/07/17 12:38	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/07/17 12:38	67-66-3	
Chloromethane	ND	ug/L	2.0	1		04/07/17 12:38	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 12:38	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 12:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 12:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 12:38	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/07/17 12:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/07/17 12:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 12:38	75-35-4	
cis-1,2-Dichloroethene	5.2	ug/L	0.50	1		04/07/17 12:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/07/17 12:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 12:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 12:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 12:38	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 12:38	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 12:38	79-34-5	
Tetrachloroethene	6.1	ug/L	0.50	1		04/07/17 12:38	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/07/17 12:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 12:38	79-00-5	
Trichloroethene	1.9	ug/L	0.50	1		04/07/17 12:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 12:38	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/07/17 12:38	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/07/17 12:38	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/07/17 12:38	2037-26-5	
4-Bromofluorobenzene (S)	100	%	70-130	1		04/07/17 12:38	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	347	mg/L	10.0	10		04/13/17 00:37	7440-44-0	

Sample: MW-19		Lab ID: 1285102006		Collected: 03/28/17 15:45	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	17.8	ug/L	10.0	1		04/10/17 10:54	74-84-0	
Ethene	ND	ug/L	10.0	1		04/10/17 10:54	74-85-1	
Methane	3240	ug/L	10.0	1		04/10/17 10:54	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-19	Lab ID: 1285102006	Collected: 03/28/17 15:45	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		04/05/17 16:21	75-27-4	
Bromoform	ND	ug/L	5.0	10		04/05/17 16:21	75-25-2	
Bromomethane	ND	ug/L	200	10		04/05/17 16:21	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		04/05/17 16:21	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		04/05/17 16:21	108-90-7	
Chloroethane	ND	ug/L	20.0	10		04/05/17 16:21	75-00-3	
Chloroform	ND	ug/L	5.0	10		04/05/17 16:21	67-66-3	
Chloromethane	ND	ug/L	5.0	10		04/05/17 16:21	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		04/05/17 16:21	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:21	106-46-7	
1,1-Dichloroethane	197	ug/L	5.0	10		04/05/17 16:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		04/05/17 16:21	107-06-2	
1,1-Dichloroethene	25.5	ug/L	5.0	10		04/05/17 16:21	75-35-4	
cis-1,2-Dichloroethene	1930	ug/L	5.0	10		04/05/17 16:21	156-59-2	
trans-1,2-Dichloroethene	19.7	ug/L	5.0	10		04/05/17 16:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		04/05/17 16:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		04/05/17 16:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		04/05/17 16:21	10061-02-6	
Methylene Chloride	ND	ug/L	50.0	10		04/05/17 16:21	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		04/05/17 16:21	79-34-5	
Tetrachloroethene	664	ug/L	5.0	10		04/05/17 16:21	127-18-4	
1,1,1-Trichloroethane	17.0	ug/L	5.0	10		04/05/17 16:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	10		04/05/17 16:21	79-00-5	
Trichloroethene	826	ug/L	5.0	10		04/05/17 16:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	10		04/05/17 16:21	75-69-4	
Vinyl chloride	58.5	ug/L	5.0	10		04/05/17 16:21	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	10		04/05/17 16:21	17060-07-0	
Toluene-d8 (S)	100	%	70-130	10		04/05/17 16:21	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	10		04/05/17 16:21	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	4.8	mg/L	1.0	1		04/10/17 11:16	7440-44-0	

Sample: MGMS3-40	Lab ID: 1285102011	Collected: 03/28/17 14:03	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	176	ug/L	10.0	1		04/10/17 11:01	74-84-0	
Ethene	68.1	ug/L	10.0	1		04/10/17 11:01	74-85-1	
Methane	4560	ug/L	10.0	1		04/10/17 11:01	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS3-40	Lab ID: 1285102011	Collected: 03/28/17 14:03	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 14:03	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/05/17 14:03	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/05/17 14:03	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 14:03	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 14:03	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/05/17 14:03	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/05/17 14:03	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/05/17 14:03	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 14:03	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 14:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 14:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 14:03	106-46-7	
1,1-Dichloroethane	22.5	ug/L	0.50	1		04/05/17 14:03	75-34-3	
1,2-Dichloroethane	0.68	ug/L	0.50	1		04/05/17 14:03	107-06-2	
1,1-Dichloroethene	2.8	ug/L	0.50	1		04/05/17 14:03	75-35-4	
cis-1,2-Dichloroethene	979	ug/L	25.0	50		04/07/17 03:02	156-59-2	
trans-1,2-Dichloroethene	5.5	ug/L	0.50	1		04/05/17 14:03	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 14:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 14:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 14:03	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 14:03	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 14:03	79-34-5	
Tetrachloroethene	1.4	ug/L	0.50	1		04/05/17 14:03	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 14:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 14:03	79-00-5	
Trichloroethene	0.60	ug/L	0.50	1		04/05/17 14:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 14:03	75-69-4	
Vinyl chloride	257	ug/L	25.0	50		04/07/17 03:02	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/05/17 14:03	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/05/17 14:03	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/05/17 14:03	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	5.0	mg/L	1.0	1		04/10/17 11:34	7440-44-0	

Sample: MW-26	Lab ID: 1285102028	Collected: 03/29/17 09:15	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		04/10/17 11:08	74-84-0	
Ethene	ND	ug/L	10.0	1		04/10/17 11:08	74-85-1	
Methane	225	ug/L	10.0	1		04/10/17 11:08	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-26	Lab ID: 1285102028	Collected: 03/29/17 09:15	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		04/05/17 16:40	75-27-4	
Bromoform	ND	ug/L	5.0	10		04/05/17 16:40	75-25-2	
Bromomethane	ND	ug/L	200	10		04/05/17 16:40	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		04/05/17 16:40	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		04/05/17 16:40	108-90-7	
Chloroethane	ND	ug/L	20.0	10		04/05/17 16:40	75-00-3	
Chloroform	ND	ug/L	5.0	10		04/05/17 16:40	67-66-3	
Chloromethane	ND	ug/L	5.0	10		04/05/17 16:40	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		04/05/17 16:40	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:40	106-46-7	
1,1-Dichloroethane	ND	ug/L	5.0	10		04/05/17 16:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		04/05/17 16:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	10		04/05/17 16:40	75-35-4	
cis-1,2-Dichloroethene	170	ug/L	5.0	10		04/05/17 16:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	10		04/05/17 16:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		04/05/17 16:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		04/05/17 16:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		04/05/17 16:40	10061-02-6	
Methylene Chloride	ND	ug/L	50.0	10		04/05/17 16:40	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		04/05/17 16:40	79-34-5	
Tetrachloroethene	214	ug/L	5.0	10		04/05/17 16:40	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	5.0	10		04/05/17 16:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	10		04/05/17 16:40	79-00-5	
Trichloroethene	452	ug/L	5.0	10		04/05/17 16:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	10		04/05/17 16:40	75-69-4	
Vinyl chloride	ND	ug/L	5.0	10		04/05/17 16:40	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	10		04/05/17 16:40	17060-07-0	
Toluene-d8 (S)	100	%	70-130	10		04/05/17 16:40	2037-26-5	
4-Bromofluorobenzene (S)	93	%	70-130	10		04/05/17 16:40	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	1.3	mg/L	1.0	1		04/10/17 11:53	7440-44-0	

Sample: MW-13	Lab ID: 1285102030	Collected: 03/30/17 15:25	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		04/10/17 11:15	74-84-0	
Ethene	ND	ug/L	10.0	1		04/10/17 11:15	74-85-1	
Methane	524	ug/L	10.0	1		04/10/17 11:15	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-13		Lab ID: 1285102030		Collected: 03/30/17 15:25	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		04/05/17 16:59	75-27-4	
Bromoform	ND	ug/L	5.0	10		04/05/17 16:59	75-25-2	
Bromomethane	ND	ug/L	200	10		04/05/17 16:59	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		04/05/17 16:59	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		04/05/17 16:59	108-90-7	
Chloroethane	ND	ug/L	20.0	10		04/05/17 16:59	75-00-3	
Chloroform	ND	ug/L	5.0	10		04/05/17 16:59	67-66-3	
Chloromethane	ND	ug/L	5.0	10		04/05/17 16:59	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		04/05/17 16:59	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		04/05/17 16:59	106-46-7	
1,1-Dichloroethane	ND	ug/L	5.0	10		04/05/17 16:59	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		04/05/17 16:59	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	10		04/05/17 16:59	75-35-4	
cis-1,2-Dichloroethene	101	ug/L	5.0	10		04/05/17 16:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	10		04/05/17 16:59	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		04/05/17 16:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		04/05/17 16:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		04/05/17 16:59	10061-02-6	
Methylene Chloride	ND	ug/L	50.0	10		04/05/17 16:59	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		04/05/17 16:59	79-34-5	
Tetrachloroethene	176	ug/L	5.0	10		04/05/17 16:59	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	5.0	10		04/05/17 16:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	10		04/05/17 16:59	79-00-5	
Trichloroethene	57.6	ug/L	5.0	10		04/05/17 16:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	10		04/05/17 16:59	75-69-4	
Vinyl chloride	ND	ug/L	5.0	10		04/05/17 16:59	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	10		04/05/17 16:59	17060-07-0	
Toluene-d8 (S)	101	%	70-130	10		04/05/17 16:59	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	10		04/05/17 16:59	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	341	mg/L	10.0	10		04/10/17 12:12	7440-44-0	

Sample: MW-24i		Lab ID: 1285102031		Collected: 03/30/17 14:48	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	ND	ug/L	10.0	1		04/10/17 11:23	74-84-0	
Ethene	ND	ug/L	10.0	1		04/10/17 11:23	74-85-1	
Methane	ND	ug/L	10.0	1		04/10/17 11:23	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-24i		Lab ID: 1285102031		Collected: 03/30/17 14:48		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 23:50	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 23:50	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 23:50	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 23:50	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 23:50	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 23:50	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 23:50	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 23:50	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 23:50	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:50	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:50	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:50	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 23:50	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 23:50	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 23:50	75-35-4		
cis-1,2-Dichloroethene	0.70	ug/L	0.50	1		04/06/17 23:50	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 23:50	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 23:50	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 23:50	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 23:50	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 23:50	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 23:50	79-34-5		
Tetrachloroethene	1.0	ug/L	0.50	1		04/06/17 23:50	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 23:50	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 23:50	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		04/06/17 23:50	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 23:50	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 23:50	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/06/17 23:50	17060-07-0		
Toluene-d8 (S)	100	%	70-130	1		04/06/17 23:50	2037-26-5		
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 23:50	460-00-4		
5310B TOC		Analytical Method: SM 5310B							
Total Organic Carbon	3.4	mg/L	1.0	1		04/10/17 12:31	7440-44-0		

Sample: MP-1		Lab ID: 1285102032		Collected: 03/30/17 13:56		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 AIR Headspace		Analytical Method: RSK 175							
Ethane	20.1	ug/L	10.0	1		04/10/17 11:30	74-84-0		
Ethene	328	ug/L	10.0	1		04/10/17 11:30	74-85-1		
Methane	19600	ug/L	10.0	1		04/10/17 11:30	74-82-8		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MP-1		Lab ID: 1285102032		Collected: 03/30/17 13:56	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 20:25	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/07/17 20:25	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/07/17 20:25	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 20:25	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 20:25	108-90-7	
Chloroethane	71.4	ug/L	2.0	1		04/07/17 20:25	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/07/17 20:25	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/07/17 20:25	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 20:25	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 20:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 20:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 20:25	106-46-7	
1,1-Dichloroethane	7.5	ug/L	0.50	1		04/07/17 20:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/07/17 20:25	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 20:25	75-35-4	
cis-1,2-Dichloroethene	177	ug/L	2.5	5		04/07/17 01:45	156-59-2	
trans-1,2-Dichloroethene	6.0	ug/L	0.50	1		04/07/17 20:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 20:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 20:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 20:25	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 20:25	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 20:25	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/07/17 20:25	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/07/17 20:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 20:25	79-00-5	
Trichloroethene	0.79	ug/L	0.50	1		04/07/17 20:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 20:25	75-69-4	
Vinyl chloride	186	ug/L	0.50	1		04/07/17 20:25	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/07/17 20:25	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/07/17 20:25	2037-26-5	
4-Bromofluorobenzene (S)	101	%	70-130	1		04/07/17 20:25	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	137	mg/L	10.0	10		04/13/17 00:56	7440-44-0	

Sample: MGMS1-43		Lab ID: 1285102047		Collected: 03/31/17 08:30	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	19.4	ug/L	10.0	1		04/10/17 12:18	74-84-0	
Ethene	14.8	ug/L	10.0	1		04/10/17 12:18	74-85-1	
Methane	3380	ug/L	10.0	1		04/10/17 12:18	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS1-43	Lab ID: 1285102047	Collected: 03/31/17 08:30	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	8.4	16.7		04/07/17 02:43	75-27-4	
Bromoform	ND	ug/L	8.4	16.7		04/07/17 02:43	75-25-2	
Bromomethane	ND	ug/L	334	16.7		04/07/17 02:43	74-83-9	
Carbon tetrachloride	ND	ug/L	8.4	16.7		04/07/17 02:43	56-23-5	
Chlorobenzene	ND	ug/L	8.4	16.7		04/07/17 02:43	108-90-7	
Chloroethane	ND	ug/L	33.4	16.7		04/07/17 02:43	75-00-3	
Chloroform	ND	ug/L	8.4	16.7		04/07/17 02:43	67-66-3	
Chloromethane	ND	ug/L	8.4	16.7		04/07/17 02:43	74-87-3	
Dibromochloromethane	ND	ug/L	8.4	16.7		04/07/17 02:43	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	8.4	16.7		04/07/17 02:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	8.4	16.7		04/07/17 02:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	8.4	16.7		04/07/17 02:43	106-46-7	
1,1-Dichloroethane	90.8	ug/L	8.4	16.7		04/07/17 02:43	75-34-3	
1,2-Dichloroethane	ND	ug/L	8.4	16.7		04/07/17 02:43	107-06-2	
1,1-Dichloroethene	12.5	ug/L	8.4	16.7		04/07/17 02:43	75-35-4	
cis-1,2-Dichloroethene	1430	ug/L	8.4	16.7		04/07/17 02:43	156-59-2	
trans-1,2-Dichloroethene	15.2	ug/L	8.4	16.7		04/07/17 02:43	156-60-5	
1,2-Dichloropropane	ND	ug/L	8.4	16.7		04/07/17 02:43	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	8.4	16.7		04/07/17 02:43	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	8.4	16.7		04/07/17 02:43	10061-02-6	
Methylene Chloride	ND	ug/L	83.5	16.7		04/07/17 02:43	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	8.4	16.7		04/07/17 02:43	79-34-5	
Tetrachloroethene	45.8	ug/L	8.4	16.7		04/07/17 02:43	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	8.4	16.7		04/07/17 02:43	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	8.4	16.7		04/07/17 02:43	79-00-5	
Trichloroethene	119	ug/L	8.4	16.7		04/07/17 02:43	79-01-6	
Trichlorofluoromethane	ND	ug/L	8.4	16.7		04/07/17 02:43	75-69-4	
Vinyl chloride	348	ug/L	8.4	16.7		04/07/17 02:43	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	70-130	16.7		04/07/17 02:43	17060-07-0	
Toluene-d8 (S)	101	%	70-130	16.7		04/07/17 02:43	2037-26-5	
4-Bromofluorobenzene (S)	91	%	70-130	16.7		04/07/17 02:43	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	7.0	mg/L	1.0	1		04/10/17 16:08	7440-44-0	

Sample: MW-12	Lab ID: 1285102039	Collected: 03/30/17 09:30	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace		Analytical Method: RSK 175						
Ethane	12.4	ug/L	10.0	1		04/10/17 11:37	74-84-0	
Ethene	75.2	ug/L	10.0	1		04/10/17 11:37	74-85-1	
Methane	6810	ug/L	10.0	1		04/10/17 11:37	74-82-8	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-12	Lab ID: 1285102039	Collected: 03/30/17 09:30	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	10.0	20		04/05/17 10:27	75-27-4	
Bromoform	ND	ug/L	10.0	20		04/05/17 10:27	75-25-2	
Bromomethane	ND	ug/L	400	20		04/05/17 10:27	74-83-9	
Carbon tetrachloride	ND	ug/L	10.0	20		04/05/17 10:27	56-23-5	
Chlorobenzene	ND	ug/L	10.0	20		04/05/17 10:27	108-90-7	
Chloroethane	ND	ug/L	40.0	20		04/05/17 10:27	75-00-3	
Chloroform	ND	ug/L	10.0	20		04/05/17 10:27	67-66-3	
Chloromethane	ND	ug/L	10.0	20		04/05/17 10:27	74-87-3	
Dibromochloromethane	ND	ug/L	10.0	20		04/05/17 10:27	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	10.0	20		04/05/17 10:27	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	10.0	20		04/05/17 10:27	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.0	20		04/05/17 10:27	106-46-7	
1,1-Dichloroethane	ND	ug/L	10.0	20		04/05/17 10:27	75-34-3	
1,2-Dichloroethane	ND	ug/L	10.0	20		04/05/17 10:27	107-06-2	
1,1-Dichloroethene	ND	ug/L	10.0	20		04/05/17 10:27	75-35-4	
cis-1,2-Dichloroethene	1120	ug/L	10.0	20		04/05/17 10:27	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	10.0	20		04/05/17 10:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	10.0	20		04/05/17 10:27	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	10.0	20		04/05/17 10:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	10.0	20		04/05/17 10:27	10061-02-6	
Methylene Chloride	ND	ug/L	100	20		04/05/17 10:27	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	20		04/05/17 10:27	79-34-5	
Tetrachloroethene	55.9	ug/L	10.0	20		04/05/17 10:27	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	10.0	20		04/05/17 10:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	20		04/05/17 10:27	79-00-5	
Trichloroethene	29.6	ug/L	10.0	20		04/05/17 10:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	10.0	20		04/05/17 10:27	75-69-4	
Vinyl chloride	37.8	ug/L	10.0	20		04/05/17 10:27	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	20		04/05/17 10:27	17060-07-0	
Toluene-d8 (S)	101	%	70-130	20		04/05/17 10:27	2037-26-5	
4-Bromofluorobenzene (S)	93	%	70-130	20		04/05/17 10:27	460-00-4	
5310B TOC		Analytical Method: SM 5310B						
Total Organic Carbon	490	mg/L	10.0	10		04/10/17 15:49	7440-44-0	

Sample: S-1	Lab ID: 1285102003	Collected: 03/27/17 14:20	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 13:04	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/05/17 13:04	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/05/17 13:04	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 13:04	56-23-5	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: S-1		Lab ID: 1285102003		Collected: 03/27/17 14:20		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 13:04	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/05/17 13:04	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/05/17 13:04	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/05/17 13:04	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 13:04	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:04	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:04	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:04	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/05/17 13:04	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 13:04	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:04	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:04	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:04	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 13:04	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 13:04	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 13:04	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 13:04	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 13:04	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		04/05/17 13:04	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 13:04	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 13:04	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		04/05/17 13:04	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 13:04	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/05/17 13:04	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/05/17 13:04	17060-07-0		
Toluene-d8 (S)	100	%	70-130	1		04/05/17 13:04	2037-26-5		
4-Bromofluorobenzene (S)	96	%	70-130	1		04/05/17 13:04	460-00-4		

Sample: S-2		Lab ID: 1285102004		Collected: 03/27/17 13:45		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 13:24	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/05/17 13:24	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/05/17 13:24	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 13:24	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 13:24	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/05/17 13:24	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/05/17 13:24	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/05/17 13:24	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 13:24	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:24	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:24	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:24	106-46-7		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: S-2		Lab ID: 1285102004	Collected: 03/27/17 13:45	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1-Dichloroethane	2.6	ug/L	0.50	1		04/05/17 13:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 13:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:24	75-35-4	
cis-1,2-Dichloroethene	4.0	ug/L	0.50	1		04/05/17 13:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 13:24	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 13:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 13:24	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 13:24	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 13:24	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/05/17 13:24	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 13:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 13:24	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/05/17 13:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 13:24	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/05/17 13:24	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/05/17 13:24	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/05/17 13:24	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/05/17 13:24	460-00-4	

Sample: MW-19 DUP		Lab ID: 1285102007	Collected: 03/28/17 15:45	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	5.0	10		04/07/17 02:23	75-27-4	
Bromoform	ND	ug/L	5.0	10		04/07/17 02:23	75-25-2	
Bromomethane	ND	ug/L	200	10		04/07/17 02:23	74-83-9	
Carbon tetrachloride	ND	ug/L	5.0	10		04/07/17 02:23	56-23-5	
Chlorobenzene	ND	ug/L	5.0	10		04/07/17 02:23	108-90-7	
Chloroethane	ND	ug/L	20.0	10		04/07/17 02:23	75-00-3	
Chloroform	ND	ug/L	5.0	10		04/07/17 02:23	67-66-3	
Chloromethane	ND	ug/L	5.0	10		04/07/17 02:23	74-87-3	
Dibromochloromethane	ND	ug/L	5.0	10		04/07/17 02:23	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	5.0	10		04/07/17 02:23	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	10		04/07/17 02:23	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	10		04/07/17 02:23	106-46-7	
1,1-Dichloroethane	214	ug/L	5.0	10		04/07/17 02:23	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	10		04/07/17 02:23	107-06-2	
1,1-Dichloroethene	26.7	ug/L	5.0	10		04/07/17 02:23	75-35-4	
cis-1,2-Dichloroethene	1990	ug/L	10.0	20		04/07/17 22:00	156-59-2	
trans-1,2-Dichloroethene	21.5	ug/L	5.0	10		04/07/17 02:23	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	10		04/07/17 02:23	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	5.0	10		04/07/17 02:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	10		04/07/17 02:23	10061-02-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-19 DUP		Lab ID: 1285102007		Collected: 03/28/17 15:45		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Methylene Chloride	ND	ug/L	50.0	10		04/07/17 02:23	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	10		04/07/17 02:23	79-34-5		
Tetrachloroethene	755	ug/L	5.0	10		04/07/17 02:23	127-18-4		
1,1,1-Trichloroethane	19.9	ug/L	5.0	10		04/07/17 02:23	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	5.0	10		04/07/17 02:23	79-00-5		
Trichloroethene	896	ug/L	5.0	10		04/07/17 02:23	79-01-6		
Trichlorofluoromethane	ND	ug/L	5.0	10		04/07/17 02:23	75-69-4		
Vinyl chloride	63.2	ug/L	5.0	10		04/07/17 02:23	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	98	%	70-130	10		04/07/17 02:23	17060-07-0		
Toluene-d8 (S)	101	%	70-130	10		04/07/17 02:23	2037-26-5		
4-Bromofluorobenzene (S)	95	%	70-130	10		04/07/17 02:23	460-00-4		

Sample: MGMS3-132		Lab ID: 1285102008		Collected: 03/28/17 15:05		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 15:03	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/05/17 15:03	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/05/17 15:03	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 15:03	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 15:03	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/05/17 15:03	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/05/17 15:03	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/05/17 15:03	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 15:03	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:03	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:03	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:03	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/05/17 15:03	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 15:03	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/05/17 15:03	75-35-4		
cis-1,2-Dichloroethene	7.9	ug/L	0.50	1		04/05/17 15:03	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 15:03	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 15:03	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 15:03	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 15:03	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 15:03	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 15:03	79-34-5		
Tetrachloroethene	13.8	ug/L	0.50	1		04/05/17 15:03	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 15:03	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 15:03	79-00-5		
Trichloroethene	9.6	ug/L	0.50	1		04/05/17 15:03	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 15:03	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/05/17 15:03	75-01-4		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: MGMS3-132		Lab ID: 1285102008		Collected: 03/28/17 15:05	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/05/17 15:03	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/05/17 15:03	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/05/17 15:03	460-00-4	

Sample: MGMS3-110		Lab ID: 1285102009		Collected: 03/28/17 14:45	Received: 04/04/17 09:33	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 15:22	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/05/17 15:22	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/05/17 15:22	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 15:22	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 15:22	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/05/17 15:22	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/05/17 15:22	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/05/17 15:22	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 15:22	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:22	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/05/17 15:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 15:22	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/05/17 15:22	75-35-4	
cis-1,2-Dichloroethene	7.0	ug/L	0.50	1		04/05/17 15:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 15:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 15:22	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 15:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 15:22	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 15:22	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 15:22	79-34-5	
Tetrachloroethene	7.0	ug/L	0.50	1		04/05/17 15:22	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 15:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 15:22	79-00-5	
Trichloroethene	6.0	ug/L	0.50	1		04/05/17 15:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 15:22	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/05/17 15:22	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/05/17 15:22	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/05/17 15:22	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/05/17 15:22	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS3-60		Lab ID: 1285102010	Collected: 03/28/17 14:23	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 15:42	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/05/17 15:42	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/05/17 15:42	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 15:42	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 15:42	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/05/17 15:42	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/05/17 15:42	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/05/17 15:42	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 15:42	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 15:42	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/05/17 15:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 15:42	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/05/17 15:42	75-35-4	
cis-1,2-Dichloroethene	0.62	ug/L	0.50	1		04/05/17 15:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 15:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 15:42	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 15:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 15:42	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 15:42	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 15:42	79-34-5	
Tetrachloroethene	1.1	ug/L	0.50	1		04/05/17 15:42	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 15:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 15:42	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/05/17 15:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 15:42	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/05/17 15:42	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/05/17 15:42	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/05/17 15:42	2037-26-5	
4-Bromofluorobenzene (S)	91	%	70-130	1		04/05/17 15:42	460-00-4	

Sample: MGMS3-40 DUP		Lab ID: 1285102012	Collected: 03/28/17 14:03	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	2.5	5		04/07/17 18:59	75-27-4	
Bromoform	ND	ug/L	2.5	5		04/07/17 18:59	75-25-2	
Bromomethane	ND	ug/L	100	5		04/07/17 18:59	74-83-9	
Carbon tetrachloride	ND	ug/L	2.5	5		04/07/17 18:59	56-23-5	
Chlorobenzene	ND	ug/L	2.5	5		04/07/17 18:59	108-90-7	
Chloroethane	ND	ug/L	10.0	5		04/07/17 18:59	75-00-3	
Chloroform	ND	ug/L	2.5	5		04/07/17 18:59	67-66-3	
Chloromethane	ND	ug/L	10.0	5		04/07/17 18:59	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS3-40 DUP		Lab ID: 1285102012	Collected: 03/28/17 14:03	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	2.5	5		04/07/17 18:59	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	2.5	5		04/07/17 18:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.5	5		04/07/17 18:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.5	5		04/07/17 18:59	106-46-7	
1,1-Dichloroethane	20.7	ug/L	2.5	5		04/07/17 18:59	75-34-3	
1,2-Dichloroethane	ND	ug/L	2.5	5		04/07/17 18:59	107-06-2	
1,1-Dichloroethene	3.3	ug/L	2.5	5		04/07/17 18:59	75-35-4	
cis-1,2-Dichloroethene	1050	ug/L	10.0	20		04/10/17 14:25	156-59-2	
trans-1,2-Dichloroethene	6.0	ug/L	2.5	5		04/07/17 18:59	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.5	5		04/07/17 18:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	2.5	5		04/07/17 18:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.5	5		04/07/17 18:59	10061-02-6	
Methylene Chloride	ND	ug/L	25.0	5		04/07/17 18:59	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.5	5		04/07/17 18:59	79-34-5	
Tetrachloroethene	ND	ug/L	2.5	5		04/07/17 18:59	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	2.5	5		04/07/17 18:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.5	5		04/07/17 18:59	79-00-5	
Trichloroethene	ND	ug/L	2.5	5		04/07/17 18:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.5	5		04/07/17 18:59	75-69-4	
Vinyl chloride	323	ug/L	2.5	5		04/07/17 18:59	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	70-130	5		04/07/17 18:59	17060-07-0	
Toluene-d8 (S)	101	%	70-130	5		04/07/17 18:59	2037-26-5	
4-Bromofluorobenzene (S)	101	%	70-130	5		04/07/17 18:59	460-00-4	

Sample: MW-24d		Lab ID: 1285102013	Collected: 03/28/17 11:50	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 10:29	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 10:29	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 10:29	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 10:29	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 10:29	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 10:29	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 10:29	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 10:29	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 10:29	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 10:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 10:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 10:29	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 10:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 10:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 10:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 10:29	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-24d		Lab ID: 1285102013	Collected: 03/28/17 11:50	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 10:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 10:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 10:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 10:29	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 10:29	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 10:29	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 10:29	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 10:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 10:29	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 10:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 10:29	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 10:29	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/06/17 10:29	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 10:29	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/06/17 10:29	460-00-4	

Sample: MW-2		Lab ID: 1285102014	Collected: 03/28/17 11:10	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 11:47	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 11:47	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 11:47	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 11:47	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 11:47	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 11:47	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 11:47	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 11:47	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 11:47	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 11:47	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 11:47	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 11:47	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 11:47	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 11:47	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 11:47	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 11:47	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 11:47	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 11:47	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 11:47	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 11:47	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 11:47	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 11:47	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 11:47	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 11:47	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: MW-2		Lab ID: 1285102014	Collected: 03/28/17 11:10	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 11:47	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 11:47	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 11:47	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 11:47	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		04/06/17 11:47	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 11:47	2037-26-5	
4-Bromofluorobenzene (S)	93	%	70-130	1		04/06/17 11:47	460-00-4	

Sample: MW-15		Lab ID: 1285102015	Collected: 03/28/17 10:10	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 12:07	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 12:07	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 12:07	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 12:07	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 12:07	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 12:07	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 12:07	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 12:07	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 12:07	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:07	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 12:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 12:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 12:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 12:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 12:07	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 12:07	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 12:07	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 12:07	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 12:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 12:07	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 12:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 12:07	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 12:07	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/06/17 12:07	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 12:07	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 12:07	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-5		Lab ID: 1285102016		Collected: 03/28/17 09:36		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 12:58	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/07/17 12:58	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/07/17 12:58	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 12:58	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 12:58	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/07/17 12:58	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/07/17 12:58	67-66-3		
Chloromethane	ND	ug/L	2.0	1		04/07/17 12:58	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 12:58	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 12:58	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 12:58	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 12:58	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/07/17 12:58	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/07/17 12:58	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 12:58	75-35-4		
cis-1,2-Dichloroethene	8.4	ug/L	0.50	1		04/07/17 12:58	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/07/17 12:58	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 12:58	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 12:58	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 12:58	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 12:58	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 12:58	79-34-5		
Tetrachloroethene	6.5	ug/L	0.50	1		04/07/17 12:58	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/07/17 12:58	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 12:58	79-00-5		
Trichloroethene	5.8	ug/L	0.50	1		04/07/17 12:58	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 12:58	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/07/17 12:58	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/07/17 12:58	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		04/07/17 12:58	2037-26-5		
4-Bromofluorobenzene (S)	99	%	70-130	1		04/07/17 12:58	460-00-4		

Sample: MW-7		Lab ID: 1285102017		Collected: 03/28/17 08:55		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 12:26	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 12:26	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 12:26	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 12:26	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 12:26	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 12:26	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 12:26	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 12:26	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-7		Lab ID: 1285102017		Collected: 03/28/17 08:55		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 12:26	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:26	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:26	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:26	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 12:26	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 12:26	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:26	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:26	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:26	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 12:26	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 12:26	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 12:26	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 12:26	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 12:26	79-34-5		
Tetrachloroethene	1.1	ug/L	0.50	1		04/06/17 12:26	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 12:26	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 12:26	79-00-5		
Trichloroethene	0.73	ug/L	0.50	1		04/06/17 12:26	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 12:26	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 12:26	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 12:26	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		04/06/17 12:26	2037-26-5		
4-Bromofluorobenzene (S)	95	%	70-130	1		04/06/17 12:26	460-00-4		

Sample: MW-7 DUP		Lab ID: 1285102018		Collected: 03/28/17 08:55		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 12:46	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 12:46	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 12:46	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 12:46	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 12:46	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 12:46	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 12:46	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 12:46	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 12:46	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:46	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:46	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 12:46	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 12:46	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 12:46	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:46	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:46	156-59-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-7 DUP		Lab ID: 1285102018	Collected: 03/28/17 08:55	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 12:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 12:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 12:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 12:46	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 12:46	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 12:46	79-34-5	
Tetrachloroethene	1.2	ug/L	0.50	1		04/06/17 12:46	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 12:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 12:46	79-00-5	
Trichloroethene	0.69	ug/L	0.50	1		04/06/17 12:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 12:46	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 12:46	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 12:46	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/06/17 12:46	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 12:46	460-00-4	

Sample: MW-9		Lab ID: 1285102019	Collected: 03/28/17 08:23	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 13:18	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/07/17 13:18	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/07/17 13:18	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 13:18	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 13:18	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/07/17 13:18	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/07/17 13:18	67-66-3	
Chloromethane	ND	ug/L	2.0	1		04/07/17 13:18	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 13:18	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:18	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/07/17 13:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/07/17 13:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 13:18	75-35-4	
cis-1,2-Dichloroethene	0.77	ug/L	0.50	1		04/07/17 13:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/07/17 13:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 13:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 13:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 13:18	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 13:18	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 13:18	79-34-5	
Tetrachloroethene	27.9	ug/L	0.50	1		04/07/17 13:18	127-18-4	
1,1,1-Trichloroethane	0.89	ug/L	0.50	1		04/07/17 13:18	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: MW-9		Lab ID: 1285102019	Collected: 03/28/17 08:23	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 13:18	79-00-5	
Trichloroethene	12.5	ug/L	0.50	1		04/07/17 13:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 13:18	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/07/17 13:18	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		04/07/17 13:18	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/07/17 13:18	2037-26-5	
4-Bromofluorobenzene (S)	103	%	70-130	1		04/07/17 13:18	460-00-4	

Sample: MW-19i		Lab ID: 1285102020	Collected: 03/29/17 15:20	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 13:38	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/07/17 13:38	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/07/17 13:38	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 13:38	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 13:38	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/07/17 13:38	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/07/17 13:38	67-66-3	
Chloromethane	ND	ug/L	2.0	1		04/07/17 13:38	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 13:38	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:38	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/07/17 13:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/07/17 13:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 13:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/07/17 13:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/07/17 13:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 13:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 13:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 13:38	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 13:38	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 13:38	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/07/17 13:38	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/07/17 13:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 13:38	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/07/17 13:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 13:38	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/07/17 13:38	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/07/17 13:38	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/07/17 13:38	2037-26-5	
4-Bromofluorobenzene (S)	99	%	70-130	1		04/07/17 13:38	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-18i		Lab ID: 1285102021		Collected: 03/29/17 14:37		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 13:58	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/07/17 13:58	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/07/17 13:58	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 13:58	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 13:58	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/07/17 13:58	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/07/17 13:58	67-66-3		
Chloromethane	ND	ug/L	2.0	1		04/07/17 13:58	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 13:58	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:58	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:58	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 13:58	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/07/17 13:58	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/07/17 13:58	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 13:58	75-35-4		
cis-1,2-Dichloroethene	1.5	ug/L	0.50	1		04/07/17 13:58	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/07/17 13:58	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 13:58	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 13:58	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 13:58	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 13:58	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 13:58	79-34-5		
Tetrachloroethene	1.4	ug/L	0.50	1		04/07/17 13:58	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/07/17 13:58	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 13:58	79-00-5		
Trichloroethene	1.2	ug/L	0.50	1		04/07/17 13:58	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 13:58	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/07/17 13:58	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		04/07/17 13:58	17060-07-0		
Toluene-d8 (S)	100	%	70-130	1		04/07/17 13:58	2037-26-5		
4-Bromofluorobenzene (S)	99	%	70-130	1		04/07/17 13:58	460-00-4		

Sample: MW-16		Lab ID: 1285102022		Collected: 03/29/17 13:32		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 14:18	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/07/17 14:18	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/07/17 14:18	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 14:18	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 14:18	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/07/17 14:18	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/07/17 14:18	67-66-3		
Chloromethane	ND	ug/L	2.0	1		04/07/17 14:18	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-16		Lab ID: 1285102022		Collected: 03/29/17 13:32		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 14:18	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 14:18	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 14:18	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 14:18	106-46-7		
1,1-Dichloroethane	1.6	ug/L	0.50	1		04/07/17 14:18	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/07/17 14:18	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 14:18	75-35-4		
cis-1,2-Dichloroethene	19.0	ug/L	0.50	1		04/07/17 14:18	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/07/17 14:18	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 14:18	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 14:18	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 14:18	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 14:18	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 14:18	79-34-5		
Tetrachloroethene	27.0	ug/L	0.50	1		04/07/17 14:18	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/07/17 14:18	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 14:18	79-00-5		
Trichloroethene	6.4	ug/L	0.50	1		04/07/17 14:18	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 14:18	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/07/17 14:18	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		04/07/17 14:18	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		04/07/17 14:18	2037-26-5		
4-Bromofluorobenzene (S)	103	%	70-130	1		04/07/17 14:18	460-00-4		

Sample: MW-3		Lab ID: 1285102023		Collected: 03/29/17 12:48		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/07/17 14:38	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/07/17 14:38	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/07/17 14:38	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/07/17 14:38	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/07/17 14:38	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/07/17 14:38	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/07/17 14:38	67-66-3		
Chloromethane	ND	ug/L	2.0	1		04/07/17 14:38	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/07/17 14:38	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 14:38	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 14:38	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/07/17 14:38	106-46-7		
1,1-Dichloroethane	7.1	ug/L	0.50	1		04/07/17 14:38	75-34-3		
1,2-Dichloroethane	1.3	ug/L	0.50	1		04/07/17 14:38	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/07/17 14:38	75-35-4		
cis-1,2-Dichloroethene	77.9	ug/L	0.50	1		04/07/17 14:38	156-59-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-3		Lab ID: 1285102023	Collected: 03/29/17 12:48	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	1.2	ug/L	0.50	1		04/07/17 14:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/07/17 14:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 14:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/07/17 14:38	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/07/17 14:38	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/07/17 14:38	79-34-5	
Tetrachloroethene	67.6	ug/L	0.50	1		04/07/17 14:38	127-18-4	
1,1,1-Trichloroethane	0.64	ug/L	0.50	1		04/07/17 14:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/07/17 14:38	79-00-5	
Trichloroethene	20.2	ug/L	0.50	1		04/07/17 14:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/07/17 14:38	75-69-4	
Vinyl chloride	2.5	ug/L	0.50	1		04/07/17 14:38	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		04/07/17 14:38	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/07/17 14:38	2037-26-5	
4-Bromofluorobenzene (S)	102	%	70-130	1		04/07/17 14:38	460-00-4	

Sample: MW-21i-40		Lab ID: 1285102024	Collected: 03/29/17 12:00	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 13:05	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 13:05	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 13:05	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 13:05	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 13:05	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 13:05	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 13:05	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 13:05	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 13:05	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:05	106-46-7	
1,1-Dichloroethane	2.6	ug/L	0.50	1		04/06/17 13:05	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 13:05	107-06-2	
1,1-Dichloroethene	0.91	ug/L	0.50	1		04/06/17 13:05	75-35-4	
cis-1,2-Dichloroethene	87.6	ug/L	0.50	1		04/06/17 13:05	156-59-2	
trans-1,2-Dichloroethene	0.58	ug/L	0.50	1		04/06/17 13:05	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 13:05	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 13:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 13:05	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 13:05	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 13:05	79-34-5	
Tetrachloroethene	21.8	ug/L	0.50	1		04/06/17 13:05	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 13:05	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: MW-21i-40		Lab ID: 1285102024	Collected: 03/29/17 12:00	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 13:05	79-00-5	
Trichloroethene	16.2	ug/L	0.50	1		04/06/17 13:05	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 13:05	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 13:05	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 13:05	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/06/17 13:05	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/06/17 13:05	460-00-4	

Sample: MW-21i-105		Lab ID: 1285102025	Collected: 03/29/17 11:35	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 13:25	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 13:25	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 13:25	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 13:25	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 13:25	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 13:25	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 13:25	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 13:25	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 13:25	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:25	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 13:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 13:25	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 13:25	75-35-4	
cis-1,2-Dichloroethene	4.8	ug/L	0.50	1		04/06/17 13:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 13:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 13:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 13:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 13:25	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 13:25	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 13:25	79-34-5	
Tetrachloroethene	5.7	ug/L	0.50	1		04/06/17 13:25	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 13:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 13:25	79-00-5	
Trichloroethene	2.9	ug/L	0.50	1		04/06/17 13:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 13:25	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 13:25	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/06/17 13:25	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 13:25	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 13:25	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-22i		Lab ID: 1285102026		Collected: 03/29/17 10:38		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 13:44	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 13:44	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 13:44	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 13:44	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 13:44	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 13:44	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 13:44	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 13:44	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 13:44	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:44	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:44	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 13:44	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 13:44	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 13:44	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 13:44	75-35-4		
cis-1,2-Dichloroethene	10	ug/L	0.50	1		04/06/17 13:44	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 13:44	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 13:44	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 13:44	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 13:44	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 13:44	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 13:44	79-34-5		
Tetrachloroethene	1.1	ug/L	0.50	1		04/06/17 13:44	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 13:44	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 13:44	79-00-5		
Trichloroethene	9.7	ug/L	0.50	1		04/06/17 13:44	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 13:44	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 13:44	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/06/17 13:44	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		04/06/17 13:44	2037-26-5		
4-Bromofluorobenzene (S)	93	%	70-130	1		04/06/17 13:44	460-00-4		

Sample: MW-25i		Lab ID: 1285102027		Collected: 03/29/17 10:00		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 14:04	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 14:04	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 14:04	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 14:04	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 14:04	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 14:04	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 14:04	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 14:04	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-25i		Lab ID: 1285102027		Collected: 03/29/17 10:00		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 14:04	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:04	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:04	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:04	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 14:04	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 14:04	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 14:04	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 14:04	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 14:04	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 14:04	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 14:04	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 14:04	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 14:04	75-09-2		
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 14:04	79-34-5		
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 14:04	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 14:04	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 14:04	79-00-5		
Trichloroethene	ND	ug/L	0.50	1		04/06/17 14:04	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 14:04	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 14:04	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 14:04	17060-07-0		
Toluene-d8 (S)	100	%	70-130	1		04/06/17 14:04	2037-26-5		
4-Bromofluorobenzene (S)	93	%	70-130	1		04/06/17 14:04	460-00-4		

Sample: MW-17		Lab ID: 1285102029		Collected: 03/29/17 08:47		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 14:24	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 14:24	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 14:24	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 14:24	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 14:24	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 14:24	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 14:24	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 14:24	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 14:24	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:24	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:24	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:24	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 14:24	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 14:24	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 14:24	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 14:24	156-59-2		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: MW-17		Lab ID: 1285102029	Collected: 03/29/17 08:47	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 14:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 14:24	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 14:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 14:24	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 14:24	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 14:24	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 14:24	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 14:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 14:24	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 14:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 14:24	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 14:24	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/06/17 14:24	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/06/17 14:24	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 14:24	460-00-4	

Sample: MW-8		Lab ID: 1285102033	Collected: 03/30/17 13:07	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 14:43	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 14:43	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 14:43	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 14:43	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 14:43	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 14:43	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 14:43	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 14:43	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 14:43	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 14:43	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 14:43	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 14:43	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 14:43	75-35-4	
cis-1,2-Dichloroethene	35.7	ug/L	0.50	1		04/06/17 14:43	156-59-2	
trans-1,2-Dichloroethene	0.96	ug/L	0.50	1		04/06/17 14:43	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 14:43	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 14:43	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 14:43	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 14:43	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 14:43	79-34-5	
Tetrachloroethene	2.3	ug/L	0.50	1		04/06/17 14:43	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 14:43	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-8		Lab ID: 1285102033	Collected: 03/30/17 13:07	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 14:43	79-00-5	
Trichloroethene	0.57	ug/L	0.50	1		04/06/17 14:43	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 14:43	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 14:43	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		04/06/17 14:43	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 14:43	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 14:43	460-00-4	

Sample: MW-20i		Lab ID: 1285102034	Collected: 03/30/17 12:00	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 15:03	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 15:03	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 15:03	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 15:03	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 15:03	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 15:03	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 15:03	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 15:03	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 15:03	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 15:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 15:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 15:03	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 15:03	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 15:03	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 15:03	75-35-4	
cis-1,2-Dichloroethene	1.5	ug/L	0.50	1		04/06/17 15:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 15:03	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 15:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 15:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 15:03	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 15:03	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 15:03	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 15:03	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 15:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 15:03	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 15:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 15:03	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 15:03	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		04/06/17 15:03	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 15:03	2037-26-5	
4-Bromofluorobenzene (S)	91	%	70-130	1		04/06/17 15:03	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-10		Lab ID: 1285102035		Collected: 03/30/17 11:27		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 15:22	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 15:22	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 15:22	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 15:22	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 15:22	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 15:22	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 15:22	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 15:22	74-87-3		
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 15:22	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 15:22	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 15:22	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 15:22	106-46-7		
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 15:22	75-34-3		
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 15:22	107-06-2		
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 15:22	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 15:22	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 15:22	156-60-5		
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 15:22	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 15:22	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 15:22	10061-02-6		
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 15:22	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 15:22	79-34-5		
Tetrachloroethene	1.4	ug/L	0.50	1		04/06/17 15:22	127-18-4		
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 15:22	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 15:22	79-00-5		
Trichloroethene	1.5	ug/L	0.50	1		04/06/17 15:22	79-01-6		
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 15:22	75-69-4		
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 15:22	75-01-4		
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		04/06/17 15:22	17060-07-0		
Toluene-d8 (S)	101	%	70-130	1		04/06/17 15:22	2037-26-5		
4-Bromofluorobenzene (S)	92	%	70-130	1		04/06/17 15:22	460-00-4		

Sample: MW-1		Lab ID: 1285102036		Collected: 03/30/17 10:52		Received: 04/04/17 09:33		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260 MSV Med Water		Analytical Method: EPA 8260B							
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 00:00	75-27-4		
Bromoform	ND	ug/L	0.50	1		04/06/17 00:00	75-25-2		
Bromomethane	ND	ug/L	20.0	1		04/06/17 00:00	74-83-9		
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 00:00	56-23-5		
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 00:00	108-90-7		
Chloroethane	ND	ug/L	2.0	1		04/06/17 00:00	75-00-3		
Chloroform	ND	ug/L	0.50	1		04/06/17 00:00	67-66-3		
Chloromethane	ND	ug/L	0.50	1		04/06/17 00:00	74-87-3		

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-1		Lab ID: 1285102036	Collected: 03/30/17 10:52	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 00:00	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:00	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:00	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:00	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:00	75-35-4	
cis-1,2-Dichloroethene	1.6	ug/L	0.50	1		04/06/17 00:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:00	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 00:00	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:00	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 00:00	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 00:00	79-34-5	
Tetrachloroethene	4.6	ug/L	0.50	1		04/06/17 00:00	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:00	79-00-5	
Trichloroethene	1.6	ug/L	0.50	1		04/06/17 00:00	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 00:00	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 00:00	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/06/17 00:00	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 00:00	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	1		04/06/17 00:00	460-00-4	

Sample: EW-1		Lab ID: 1285102037	Collected: 03/30/17 13:18	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 00:19	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 00:19	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 00:19	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 00:19	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 00:19	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 00:19	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 00:19	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 00:19	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 00:19	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:19	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:19	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: EW-1		Lab ID: 1285102037	Collected: 03/30/17 13:18	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 00:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:19	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 00:19	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 00:19	79-34-5	
Tetrachloroethene	10.7	ug/L	0.50	1		04/06/17 00:19	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:19	79-00-5	
Trichloroethene	2.4	ug/L	0.50	1		04/06/17 00:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 00:19	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 00:19	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/06/17 00:19	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 00:19	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/06/17 00:19	460-00-4	

Sample: MW-6		Lab ID: 1285102038	Collected: 03/30/17 08:28	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 00:39	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 00:39	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 00:39	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 00:39	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 00:39	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 00:39	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 00:39	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 00:39	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 00:39	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:39	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:39	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:39	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:39	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:39	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 00:39	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:39	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 00:39	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 00:39	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 00:39	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:39	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MW-6		Lab ID: 1285102038	Collected: 03/30/17 08:28	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:39	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 00:39	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 00:39	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 00:39	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/06/17 00:39	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 00:39	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 00:39	460-00-4	

Sample: MW-12 DUP		Lab ID: 1285102040	Collected: 03/30/17 09:30	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	2.5	5		04/07/17 02:04	75-27-4	
Bromoform	ND	ug/L	2.5	5		04/07/17 02:04	75-25-2	
Bromomethane	ND	ug/L	100	5		04/07/17 02:04	74-83-9	
Carbon tetrachloride	ND	ug/L	2.5	5		04/07/17 02:04	56-23-5	
Chlorobenzene	ND	ug/L	2.5	5		04/07/17 02:04	108-90-7	
Chloroethane	ND	ug/L	10.0	5		04/07/17 02:04	75-00-3	
Chloroform	ND	ug/L	2.5	5		04/07/17 02:04	67-66-3	
Chloromethane	ND	ug/L	2.5	5		04/07/17 02:04	74-87-3	
Dibromochloromethane	ND	ug/L	2.5	5		04/07/17 02:04	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	2.5	5		04/07/17 02:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.5	5		04/07/17 02:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.5	5		04/07/17 02:04	106-46-7	
1,1-Dichloroethane	11.4	ug/L	2.5	5		04/07/17 02:04	75-34-3	
1,2-Dichloroethane	ND	ug/L	2.5	5		04/07/17 02:04	107-06-2	
1,1-Dichloroethene	3.8	ug/L	2.5	5		04/07/17 02:04	75-35-4	
cis-1,2-Dichloroethene	853	ug/L	2.5	5		04/07/17 02:04	156-59-2	
trans-1,2-Dichloroethene	6.1	ug/L	2.5	5		04/07/17 02:04	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.5	5		04/07/17 02:04	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	2.5	5		04/07/17 02:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.5	5		04/07/17 02:04	10061-02-6	
Methylene Chloride	ND	ug/L	25.0	5		04/07/17 02:04	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.5	5		04/07/17 02:04	79-34-5	
Tetrachloroethene	49.0	ug/L	2.5	5		04/07/17 02:04	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	2.5	5		04/07/17 02:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.5	5		04/07/17 02:04	79-00-5	
Trichloroethene	26.0	ug/L	2.5	5		04/07/17 02:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.5	5		04/07/17 02:04	75-69-4	
Vinyl chloride	28.3	ug/L	2.5	5		04/07/17 02:04	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	5		04/07/17 02:04	17060-07-0	
Toluene-d8 (S)	101	%	70-130	5		04/07/17 02:04	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	5		04/07/17 02:04	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS2-40		Lab ID: 1285102041	Collected: 03/31/17 11:44	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 21:54	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 21:54	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 21:54	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 21:54	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 21:54	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 21:54	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 21:54	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 21:54	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 21:54	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:54	106-46-7	
1,1-Dichloroethane	57.6	ug/L	0.50	1		04/06/17 21:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 21:54	107-06-2	
1,1-Dichloroethene	14.3	ug/L	0.50	1		04/06/17 21:54	75-35-4	
cis-1,2-Dichloroethene	236	ug/L	5.0	10		04/07/17 21:03	156-59-2	
trans-1,2-Dichloroethene	0.60	ug/L	0.50	1		04/06/17 21:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 21:54	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 21:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 21:54	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 21:54	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 21:54	79-34-5	
Tetrachloroethene	4.3	ug/L	0.50	1		04/06/17 21:54	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 21:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 21:54	79-00-5	
Trichloroethene	14.4	ug/L	0.50	1		04/06/17 21:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 21:54	75-69-4	
Vinyl chloride	235	ug/L	5.0	10		04/07/17 21:03	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		04/06/17 21:54	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/06/17 21:54	2037-26-5	
4-Bromofluorobenzene (S)	94	%	70-130	1		04/06/17 21:54	460-00-4	

Sample: MGMS2-110		Lab ID: 1285102042	Collected: 03/31/17 10:00	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 22:14	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 22:14	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 22:14	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 22:14	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 22:14	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 22:14	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 22:14	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 22:14	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Sample: MGMS2-110	Lab ID: 1285102042	Collected: 03/31/17 10:00	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 22:14	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:14	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 22:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 22:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 22:14	75-35-4	
cis-1,2-Dichloroethene	19.5	ug/L	0.50	1		04/06/17 22:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 22:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 22:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 22:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 22:14	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 22:14	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 22:14	79-34-5	
Tetrachloroethene	6.4	ug/L	0.50	1		04/06/17 22:14	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 22:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 22:14	79-00-5	
Trichloroethene	6.6	ug/L	0.50	1		04/06/17 22:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 22:14	75-69-4	
Vinyl chloride	6.4	ug/L	0.50	1		04/06/17 22:14	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 22:14	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/06/17 22:14	2037-26-5	
4-Bromofluorobenzene (S)	92	%	70-130	1		04/06/17 22:14	460-00-4	

Sample: MGMS2-60	Lab ID: 1285102043	Collected: 03/31/17 11:17	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 22:33	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 22:33	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 22:33	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 22:33	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 22:33	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 22:33	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 22:33	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 22:33	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 22:33	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:33	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 22:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 22:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 22:33	75-35-4	
cis-1,2-Dichloroethene	18.5	ug/L	0.50	1		04/06/17 22:33	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS2-60		Lab ID: 1285102043	Collected: 03/31/17 11:17	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 22:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 22:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 22:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 22:33	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 22:33	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 22:33	79-34-5	
Tetrachloroethene	26.0	ug/L	0.50	1		04/06/17 22:33	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 22:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 22:33	79-00-5	
Trichloroethene	11.2	ug/L	0.50	1		04/06/17 22:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 22:33	75-69-4	
Vinyl chloride	0.75	ug/L	0.50	1		04/06/17 22:33	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 22:33	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/06/17 22:33	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/06/17 22:33	460-00-4	

Sample: MGMS2-132		Lab ID: 1285102044	Collected: 03/31/17 10:27	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 22:52	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 22:52	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 22:52	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 22:52	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 22:52	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 22:52	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 22:52	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 22:52	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 22:52	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:52	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:52	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 22:52	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 22:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 22:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 22:52	75-35-4	
cis-1,2-Dichloroethene	15.6	ug/L	0.50	1		04/06/17 22:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 22:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 22:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 22:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 22:52	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 22:52	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 22:52	79-34-5	
Tetrachloroethene	5.2	ug/L	0.50	1		04/06/17 22:52	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 22:52	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS2-132		Lab ID: 1285102044	Collected: 03/31/17 10:27	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 22:52	79-00-5	
Trichloroethene	4.7	ug/L	0.50	1		04/06/17 22:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 22:52	75-69-4	
Vinyl chloride	4.8	ug/L	0.50	1		04/06/17 22:52	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 22:52	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/06/17 22:52	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/06/17 22:52	460-00-4	

Sample: MGMS1-132		Lab ID: 1285102045	Collected: 03/31/17 09:20	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 23:12	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 23:12	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 23:12	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 23:12	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 23:12	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 23:12	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 23:12	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 23:12	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 23:12	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:12	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:12	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:12	106-46-7	
1,1-Dichloroethane	13.3	ug/L	0.50	1		04/06/17 23:12	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 23:12	107-06-2	
1,1-Dichloroethene	1.1	ug/L	0.50	1		04/06/17 23:12	75-35-4	
cis-1,2-Dichloroethene	328	ug/L	5.0	10		04/07/17 21:22	156-59-2	
trans-1,2-Dichloroethene	0.70	ug/L	0.50	1		04/06/17 23:12	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 23:12	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 23:12	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 23:12	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 23:12	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 23:12	79-34-5	
Tetrachloroethene	20.1	ug/L	0.50	1		04/06/17 23:12	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 23:12	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 23:12	79-00-5	
Trichloroethene	62.0	ug/L	0.50	1		04/06/17 23:12	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 23:12	75-69-4	
Vinyl chloride	6.5	ug/L	0.50	1		04/06/17 23:12	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		04/06/17 23:12	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 23:12	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		04/06/17 23:12	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: MGMS1-60		Lab ID: 1285102046	Collected: 03/31/17 08:58	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 23:31	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 23:31	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 23:31	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 23:31	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 23:31	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 23:31	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 23:31	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 23:31	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 23:31	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 23:31	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 23:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 23:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 23:31	75-35-4	
cis-1,2-Dichloroethene	15.6	ug/L	0.50	1		04/06/17 23:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 23:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 23:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 23:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 23:31	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 23:31	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 23:31	79-34-5	
Tetrachloroethene	13.6	ug/L	0.50	1		04/06/17 23:31	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 23:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 23:31	79-00-5	
Trichloroethene	13.2	ug/L	0.50	1		04/06/17 23:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 23:31	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 23:31	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/06/17 23:31	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 23:31	2037-26-5	
4-Bromofluorobenzene (S)	93	%	70-130	1		04/06/17 23:31	460-00-4	

Sample: Equipment Blank		Lab ID: 1285102048	Collected: 03/30/17 15:40	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 21:35	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 21:35	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 21:35	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 21:35	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 21:35	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 21:35	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 21:35	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 21:35	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: Equipment Blank		Lab ID: 1285102048	Collected: 03/30/17 15:40	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 21:35	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:35	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 21:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 21:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 21:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 21:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 21:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 21:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 21:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 21:35	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 21:35	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 21:35	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 21:35	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 21:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 21:35	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 21:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 21:35	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 21:35	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		04/06/17 21:35	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/06/17 21:35	2037-26-5	
4-Bromofluorobenzene (S)	93	%	70-130	1		04/06/17 21:35	460-00-4	

Sample: Field Blank		Lab ID: 1285102049	Collected: 03/27/17 15:50	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/05/17 13:43	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/05/17 13:43	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/05/17 13:43	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/05/17 13:43	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/05/17 13:43	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/05/17 13:43	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/05/17 13:43	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/05/17 13:43	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/05/17 13:43	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/05/17 13:43	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/05/17 13:43	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/05/17 13:43	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:43	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:43	156-59-2	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: Field Blank		Lab ID: 1285102049	Collected: 03/27/17 15:50	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/05/17 13:43	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/05/17 13:43	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 13:43	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/05/17 13:43	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/05/17 13:43	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/05/17 13:43	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/05/17 13:43	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/05/17 13:43	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/05/17 13:43	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/05/17 13:43	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/05/17 13:43	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/05/17 13:43	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/05/17 13:43	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/05/17 13:43	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	1		04/05/17 13:43	460-00-4	

Sample: Field Blank		Lab ID: 1285102050	Collected: 03/28/17 16:30	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 00:58	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 00:58	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 00:58	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 00:58	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 00:58	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 00:58	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 00:58	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 00:58	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 00:58	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 00:58	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 00:58	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 00:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 00:58	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 00:58	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 00:58	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 00:58	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 00:58	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:58	71-55-6	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: Field Blank		Lab ID: 1285102050	Collected: 03/28/17 16:30	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 00:58	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 00:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 00:58	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 00:58	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		04/06/17 00:58	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		04/06/17 00:58	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	70-130	1		04/06/17 00:58	460-00-4	

Sample: Field Blank		Lab ID: 1285102051	Collected: 03/29/17 15:40	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 01:18	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 01:18	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 01:18	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 01:18	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 01:18	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 01:18	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 01:18	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 01:18	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 01:18	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 01:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 01:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 01:18	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 01:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 01:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 01:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 01:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 01:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 01:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 01:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 01:18	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 01:18	75-09-2	
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 01:18	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 01:18	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 01:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 01:18	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 01:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 01:18	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 01:18	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		04/06/17 01:18	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		04/06/17 01:18	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	70-130	1		04/06/17 01:18	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: Field Blank		Lab ID: 1285102052	Collected: 03/30/17 15:40	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 01:38	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 01:38	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 01:38	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 01:38	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 01:38	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 01:38	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 01:38	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 01:38	74-87-3	
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 01:38	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 01:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 01:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 01:38	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 01:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 01:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 01:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 01:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 01:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 01:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 01:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 01:38	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 01:38	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 01:38	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 01:38	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 01:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 01:38	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 01:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 01:38	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 01:38	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/06/17 01:38	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/06/17 01:38	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	1		04/06/17 01:38	460-00-4	

Sample: Field Blank		Lab ID: 1285102053	Collected: 03/31/17 10:00	Received: 04/04/17 09:33	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Bromodichloromethane	ND	ug/L	0.50	1		04/06/17 21:15	75-27-4	
Bromoform	ND	ug/L	0.50	1		04/06/17 21:15	75-25-2	
Bromomethane	ND	ug/L	20.0	1		04/06/17 21:15	74-83-9	
Carbon tetrachloride	ND	ug/L	0.50	1		04/06/17 21:15	56-23-5	
Chlorobenzene	ND	ug/L	0.50	1		04/06/17 21:15	108-90-7	
Chloroethane	ND	ug/L	2.0	1		04/06/17 21:15	75-00-3	
Chloroform	ND	ug/L	0.50	1		04/06/17 21:15	67-66-3	
Chloromethane	ND	ug/L	0.50	1		04/06/17 21:15	74-87-3	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Sample: Field Blank	Lab ID: 1285102053	Collected: 03/31/17 10:00	Received: 04/04/17 09:33	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Water		Analytical Method: EPA 8260B						
Dibromochloromethane	ND	ug/L	0.50	1		04/06/17 21:15	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.50	1		04/06/17 21:15	106-46-7	
1,1-Dichloroethane	ND	ug/L	0.50	1		04/06/17 21:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	0.50	1		04/06/17 21:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	0.50	1		04/06/17 21:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 21:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	0.50	1		04/06/17 21:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	0.50	1		04/06/17 21:15	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 21:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	0.50	1		04/06/17 21:15	10061-02-6	
Methylene Chloride	ND	ug/L	5.0	1		04/06/17 21:15	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	1		04/06/17 21:15	79-34-5	
Tetrachloroethene	ND	ug/L	0.50	1		04/06/17 21:15	127-18-4	
1,1,1-Trichloroethane	ND	ug/L	0.50	1		04/06/17 21:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	0.50	1		04/06/17 21:15	79-00-5	
Trichloroethene	ND	ug/L	0.50	1		04/06/17 21:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	0.50	1		04/06/17 21:15	75-69-4	
Vinyl chloride	ND	ug/L	0.50	1		04/06/17 21:15	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		04/06/17 21:15	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		04/06/17 21:15	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	70-130	1		04/06/17 21:15	460-00-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

QC Batch: 467360 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 1285102002, 1285102005, 1285102006, 1285102011, 1285102028, 1285102030, 1285102031, 1285102032, 1285102039, 1285102047

METHOD BLANK: 2553396 Matrix: Water
Associated Lab Samples: 1285102002, 1285102005, 1285102006, 1285102011, 1285102028, 1285102030, 1285102031, 1285102032, 1285102039, 1285102047

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	04/10/17 09:51	
Ethene	ug/L	ND	10.0	04/10/17 09:51	
Methane	ug/L	ND	10.0	04/10/17 09:51	

LABORATORY CONTROL SAMPLE & LCSD: 2553397

Parameter	Units	2553397		2553398		% Rec % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec					
Ethane	ug/L	114	106	107	93	94	85-115	1	20	
Ethene	ug/L	106	99.9	101	94	95	85-115	1	20	
Methane	ug/L	60.7	56.2	57.8	93	95	85-115	3	20	

SAMPLE DUPLICATE: 2556437

Parameter	Units	1285102002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	1180	2640	76	20 R1	

SAMPLE DUPLICATE: 2556438

Parameter	Units	1285102047 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	19.4	19.6	1	20	
Ethene	ug/L	14.8	11.7	24	20 R1	
Methane	ug/L	3380	3340	1	20	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

QC Batch: 110023 Analysis Method: EPA 8260B
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
 Associated Lab Samples: 1285102001, 1285102002, 1285102003, 1285102004, 1285102005, 1285102006, 1285102008, 1285102009,
 1285102010, 1285102011, 1285102028, 1285102030, 1285102031, 1285102039, 1285102049

METHOD BLANK: 435227 Matrix: Water
 Associated Lab Samples: 1285102001, 1285102002, 1285102003, 1285102004, 1285102005, 1285102006, 1285102008, 1285102009,
 1285102010, 1285102011, 1285102028, 1285102030, 1285102031, 1285102039, 1285102049

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	04/05/17 10:07	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	04/05/17 10:07	
1,1,2-Trichloroethane	ug/L	ND	0.50	04/05/17 10:07	
1,1-Dichloroethane	ug/L	ND	0.50	04/05/17 10:07	
1,1-Dichloroethene	ug/L	ND	0.50	04/05/17 10:07	
1,2-Dichlorobenzene	ug/L	ND	0.50	04/05/17 10:07	
1,2-Dichloroethane	ug/L	ND	0.50	04/05/17 10:07	
1,2-Dichloropropane	ug/L	ND	0.50	04/05/17 10:07	
1,3-Dichlorobenzene	ug/L	ND	0.50	04/05/17 10:07	
1,4-Dichlorobenzene	ug/L	ND	0.50	04/05/17 10:07	
Bromodichloromethane	ug/L	ND	0.50	04/05/17 10:07	
Bromoform	ug/L	ND	0.50	04/05/17 10:07	
Bromomethane	ug/L	ND	20.0	04/05/17 10:07	
Carbon tetrachloride	ug/L	ND	0.50	04/05/17 10:07	
Chlorobenzene	ug/L	ND	0.50	04/05/17 10:07	
Chloroethane	ug/L	ND	2.0	04/05/17 10:07	
Chloroform	ug/L	ND	0.50	04/05/17 10:07	
Chloromethane	ug/L	ND	0.50	04/05/17 10:07	
cis-1,2-Dichloroethene	ug/L	ND	0.50	04/05/17 10:07	
cis-1,3-Dichloropropene	ug/L	ND	0.50	04/05/17 10:07	
Dibromochloromethane	ug/L	ND	0.50	04/05/17 10:07	
Methylene Chloride	ug/L	ND	5.0	04/05/17 10:07	
Tetrachloroethene	ug/L	ND	0.50	04/05/17 10:07	
trans-1,2-Dichloroethene	ug/L	ND	0.50	04/05/17 10:07	
trans-1,3-Dichloropropene	ug/L	ND	0.50	04/05/17 10:07	
Trichloroethene	ug/L	ND	0.50	04/05/17 10:07	
Trichlorofluoromethane	ug/L	ND	0.50	04/05/17 10:07	
Vinyl chloride	ug/L	ND	0.50	04/05/17 10:07	
1,2-Dichloroethane-d4 (S)	%	101	70-130	04/05/17 10:07	
4-Bromofluorobenzene (S)	%	95	70-130	04/05/17 10:07	
Toluene-d8 (S)	%	100	70-130	04/05/17 10:07	

LABORATORY CONTROL SAMPLE: 435228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	40.8	102	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	38.4	96	75-125	
1,1,2-Trichloroethane	ug/L	40	38.5	96	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

LABORATORY CONTROL SAMPLE: 435228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	39.3	98	71-131	
1,1-Dichloroethene	ug/L	40	38.3	96	74-126	
1,2-Dichlorobenzene	ug/L	40	39.2	98	75-125	
1,2-Dichloroethane	ug/L	40	39.6	99	64-141	
1,2-Dichloropropane	ug/L	40	39.9	100	73-127	
1,3-Dichlorobenzene	ug/L	40	39.5	99	75-125	
1,4-Dichlorobenzene	ug/L	40	37.5	94	75-125	
Bromodichloromethane	ug/L	40	40.5	101	70-134	
Bromoform	ug/L	40	40.0	100	68-130	
Bromomethane	ug/L	40	41.9	105	30-150	
Carbon tetrachloride	ug/L	40	41.4	104	66-135	
Chlorobenzene	ug/L	40	39.5	99	75-125	
Chloroethane	ug/L	40	38.8	97	55-150	
Chloroform	ug/L	40	40.7	102	72-131	
Chloromethane	ug/L	40	36.8	92	54-132	
cis-1,2-Dichloroethene	ug/L	40	40.2	101	75-125	
cis-1,3-Dichloropropene	ug/L	40	41.8	104	74-130	
Dibromochloromethane	ug/L	40	43.2	108	70-132	
Methylene Chloride	ug/L	40	39.2	98	68-125	
Tetrachloroethene	ug/L	40	40.0	100	75-130	
trans-1,2-Dichloroethene	ug/L	40	39.7	99	75-125	
trans-1,3-Dichloropropene	ug/L	40	39.9	100	69-137	
Trichloroethene	ug/L	40	42.7	107	75-125	
Trichlorofluoromethane	ug/L	40	42.2	105	59-140	
Vinyl chloride	ug/L	40	39.3	98	68-132	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			105	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435229 435230

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		1285102039 Result	Spike Conc.	Spike Conc.	Result							
1,1,1-Trichloroethane	ug/L	ND	800	800	834	845	104	106	63-142	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	800	800	790	816	99	102	75-125	3	30	
1,1,2-Trichloroethane	ug/L	ND	800	800	784	791	98	99	75-132	1	30	
1,1-Dichloroethane	ug/L	ND	800	800	818	823	102	103	75-126	1	30	
1,1-Dichloroethene	ug/L	ND	800	800	752	759	94	95	75-125	1	30	
1,2-Dichlorobenzene	ug/L	ND	800	800	778	817	97	102	75-125	5	30	
1,2-Dichloroethane	ug/L	ND	800	800	805	813	101	102	75-137	1	30	
1,2-Dichloropropane	ug/L	ND	800	800	806	816	101	102	74-131	1	30	
1,3-Dichlorobenzene	ug/L	ND	800	800	789	828	99	104	75-126	5	30	
1,4-Dichlorobenzene	ug/L	ND	800	800	743	776	93	97	73-125	4	30	
Bromodichloromethane	ug/L	ND	800	800	826	834	103	104	65-137	1	30	
Bromoform	ug/L	ND	800	800	804	829	100	104	60-147	3	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435229		435230		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1285102039 Result	MS Spike Conc.	MSD Spike Conc.									
Bromomethane	ug/L	ND	800	800	790	821	99	103	30-150	4	30		
Carbon tetrachloride	ug/L	ND	800	800	847	861	106	108	45-150	2	30		
Chlorobenzene	ug/L	ND	800	800	804	799	100	100	75-125	1	30		
Chloroethane	ug/L	ND	800	800	788	801	99	100	66-145	2	30		
Chloroform	ug/L	ND	800	800	830	832	104	104	74-128	0	30		
Chloromethane	ug/L	ND	800	800	726	740	91	92	51-150	2	30		
cis-1,2-Dichloroethene	ug/L	1120	800	800	1940	1930	103	101	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	800	800	845	857	106	107	75-129	1	30		
Dibromochloromethane	ug/L	ND	800	800	870	883	109	110	66-141	1	30		
Methylene Chloride	ug/L	ND	800	800	804	792	101	99	74-125	1	30		
Tetrachloroethene	ug/L	55.9	800	800	855	894	100	105	75-135	4	30		
trans-1,2-Dichloroethene	ug/L	ND	800	800	817	829	101	103	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	ND	800	800	811	826	101	103	67-139	2	30		
Trichloroethene	ug/L	29.6	800	800	894	893	108	108	75-130	0	30		
Trichlorofluoromethane	ug/L	ND	800	800	855	873	107	109	57-144	2	30		
Vinyl chloride	ug/L	37.8	800	800	823	855	98	102	70-136	4	30		
1,2-Dichloroethane-d4 (S)	%.						97	96	70-130				
4-Bromofluorobenzene (S)	%.						108	105	70-130				
Toluene-d8 (S)	%.						102	99	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

QC Batch: 110037 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1285102012, 1285102013, 1285102014, 1285102015, 1285102016, 1285102017, 1285102018, 1285102019, 1285102020, 1285102021, 1285102022, 1285102023, 1285102024, 1285102025, 1285102026, 1285102027, 1285102029, 1285102033, 1285102034, 1285102035

METHOD BLANK: 435275 Matrix: Water
Associated Lab Samples: 1285102012, 1285102013, 1285102014, 1285102015, 1285102016, 1285102017, 1285102018, 1285102019, 1285102020, 1285102021, 1285102022, 1285102023, 1285102024, 1285102025, 1285102026, 1285102027, 1285102029, 1285102033, 1285102034, 1285102035

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	04/06/17 10:10	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	04/06/17 10:10	
1,1,2-Trichloroethane	ug/L	ND	0.50	04/06/17 10:10	
1,1-Dichloroethane	ug/L	ND	0.50	04/06/17 10:10	
1,1-Dichloroethene	ug/L	ND	0.50	04/06/17 10:10	
1,2-Dichlorobenzene	ug/L	ND	0.50	04/06/17 10:10	
1,2-Dichloroethane	ug/L	ND	0.50	04/06/17 10:10	
1,2-Dichloropropane	ug/L	ND	0.50	04/06/17 10:10	
1,3-Dichlorobenzene	ug/L	ND	0.50	04/06/17 10:10	
1,4-Dichlorobenzene	ug/L	ND	0.50	04/06/17 10:10	
Bromodichloromethane	ug/L	ND	0.50	04/06/17 10:10	
Bromoform	ug/L	ND	0.50	04/06/17 10:10	
Bromomethane	ug/L	ND	20.0	04/06/17 10:10	
Carbon tetrachloride	ug/L	ND	0.50	04/06/17 10:10	
Chlorobenzene	ug/L	ND	0.50	04/06/17 10:10	
Chloroethane	ug/L	ND	2.0	04/06/17 10:10	
Chloroform	ug/L	ND	0.50	04/06/17 10:10	
Chloromethane	ug/L	ND	0.50	04/06/17 10:10	
cis-1,2-Dichloroethene	ug/L	ND	0.50	04/06/17 10:10	
cis-1,3-Dichloropropene	ug/L	ND	0.50	04/06/17 10:10	
Dibromochloromethane	ug/L	ND	0.50	04/06/17 10:10	
Methylene Chloride	ug/L	ND	5.0	04/06/17 10:10	
Tetrachloroethene	ug/L	ND	0.50	04/06/17 10:10	
trans-1,2-Dichloroethene	ug/L	ND	0.50	04/06/17 10:10	
trans-1,3-Dichloropropene	ug/L	ND	0.50	04/06/17 10:10	
Trichloroethene	ug/L	ND	0.50	04/06/17 10:10	
Trichlorofluoromethane	ug/L	ND	0.50	04/06/17 10:10	
Vinyl chloride	ug/L	ND	0.50	04/06/17 10:10	
1,2-Dichloroethane-d4 (S)	%	102	70-130	04/06/17 10:10	
4-Bromofluorobenzene (S)	%	94	70-130	04/06/17 10:10	
Toluene-d8 (S)	%	102	70-130	04/06/17 10:10	

LABORATORY CONTROL SAMPLE: 435276

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	42.5	106	67-138	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

LABORATORY CONTROL SAMPLE: 435276

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,2,2-Tetrachloroethane	ug/L	40	36.7	92	75-125	
1,1,2-Trichloroethane	ug/L	40	38.3	96	75-126	
1,1-Dichloroethane	ug/L	40	40.6	102	71-131	
1,1-Dichloroethene	ug/L	40	40.5	101	74-126	
1,2-Dichlorobenzene	ug/L	40	41.2	103	75-125	
1,2-Dichloroethane	ug/L	40	40.1	100	64-141	
1,2-Dichloropropane	ug/L	40	41.8	105	73-127	
1,3-Dichlorobenzene	ug/L	40	43.3	108	75-125	
1,4-Dichlorobenzene	ug/L	40	40.7	102	75-125	
Bromodichloromethane	ug/L	40	42.6	106	70-134	
Bromoform	ug/L	40	38.3	96	68-130	
Bromomethane	ug/L	40	31.4	78	30-150	
Carbon tetrachloride	ug/L	40	44.2	110	66-135	
Chlorobenzene	ug/L	40	41.3	103	75-125	
Chloroethane	ug/L	40	40.5	101	55-150	
Chloroform	ug/L	40	41.7	104	72-131	
Chloromethane	ug/L	40	36.4	91	54-132	
cis-1,2-Dichloroethene	ug/L	40	41.3	103	75-125	
cis-1,3-Dichloropropene	ug/L	40	43.1	108	74-130	
Dibromochloromethane	ug/L	40	43.6	109	70-132	
Methylene Chloride	ug/L	40	40.3	101	68-125	
Tetrachloroethene	ug/L	40	43.0	108	75-130	
trans-1,2-Dichloroethene	ug/L	40	40.7	102	75-125	
trans-1,3-Dichloropropene	ug/L	40	40.6	101	69-137	
Trichloroethene	ug/L	40	43.6	109	75-125	
Trichlorofluoromethane	ug/L	40	46.2	115	59-140	
Vinyl chloride	ug/L	40	41.4	104	68-132	
1,2-Dichloroethane-d4 (S)	%			93	70-130	
4-Bromofluorobenzene (S)	%			107	70-130	
Toluene-d8 (S)	%			102	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435277 435278

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		1285102013 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1-Trichloroethane	ug/L	ND	40	40	41.5	41.7	104	104	63-142	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	37.9	38.0	95	95	75-125	0	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	39.1	38.1	98	95	75-132	3	30	
1,1-Dichloroethane	ug/L	ND	40	40	40.0	39.7	100	99	75-126	1	30	
1,1-Dichloroethene	ug/L	ND	40	40	38.0	38.3	95	96	75-125	1	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	39.9	40.5	100	101	75-125	2	30	
1,2-Dichloroethane	ug/L	ND	40	40	40.3	39.9	101	100	75-137	1	30	
1,2-Dichloropropane	ug/L	ND	40	40	40.7	40.3	102	101	74-131	1	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	41.2	41.1	103	103	75-126	0	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	38.3	38.4	95	96	73-125	0	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435277		435278		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1285102013 Result	MS Spike Conc.	MSD Spike Conc.									
Bromodichloromethane	ug/L	ND	40	40	41.5	41.5	104	104	65-137	0	30		
Bromoform	ug/L	ND	40	40	38.2	38.0	96	95	60-147	1	30		
Bromomethane	ug/L	ND	40	40	25.7	31.3	64	78	30-150	20	30		
Carbon tetrachloride	ug/L	ND	40	40	42.1	42.2	105	105	45-150	0	30		
Chlorobenzene	ug/L	ND	40	40	39.6	40.0	99	100	75-125	1	30		
Chloroethane	ug/L	ND	40	40	40.2	40.4	101	101	66-145	0	30		
Chloroform	ug/L	ND	40	40	41.2	41.1	103	103	74-128	0	30		
Chloromethane	ug/L	ND	40	40	33.6	33.4	84	84	51-150	1	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	40.9	40.6	102	101	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	41.1	40.7	103	102	75-129	1	30		
Dibromochloromethane	ug/L	ND	40	40	43.5	42.4	109	106	66-141	2	30		
Methylene Chloride	ug/L	ND	40	40	39.5	39.9	99	100	74-125	1	30		
Tetrachloroethene	ug/L	ND	40	40	40.0	40.5	100	101	75-135	1	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	39.9	39.9	100	100	75-125	0	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	39.7	38.8	99	97	67-139	2	30		
Trichloroethene	ug/L	ND	40	40	41.9	41.8	105	105	75-130	0	30		
Trichlorofluoromethane	ug/L	ND	40	40	43.8	39.0	110	98	57-144	12	30		
Vinyl chloride	ug/L	ND	40	40	39.4	40.5	98	101	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%						96	95	70-130				
4-Bromofluorobenzene (S)	%						106	104	70-130				
Toluene-d8 (S)	%						101	101	70-130				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

QC Batch: 110090 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1285102036, 1285102037, 1285102038, 1285102050, 1285102051, 1285102052

METHOD BLANK: 435455 Matrix: Water
Associated Lab Samples: 1285102036, 1285102037, 1285102038, 1285102050, 1285102051, 1285102052

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	04/05/17 18:47	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	04/05/17 18:47	
1,1,2-Trichloroethane	ug/L	ND	0.50	04/05/17 18:47	
1,1-Dichloroethane	ug/L	ND	0.50	04/05/17 18:47	
1,1-Dichloroethene	ug/L	ND	0.50	04/05/17 18:47	
1,2-Dichlorobenzene	ug/L	ND	0.50	04/05/17 18:47	
1,2-Dichloroethane	ug/L	ND	0.50	04/05/17 18:47	
1,2-Dichloropropane	ug/L	ND	0.50	04/05/17 18:47	
1,3-Dichlorobenzene	ug/L	ND	0.50	04/05/17 18:47	
1,4-Dichlorobenzene	ug/L	ND	0.50	04/05/17 18:47	
Bromodichloromethane	ug/L	ND	0.50	04/05/17 18:47	
Bromoform	ug/L	ND	0.50	04/05/17 18:47	
Bromomethane	ug/L	ND	20.0	04/05/17 18:47	
Carbon tetrachloride	ug/L	ND	0.50	04/05/17 18:47	
Chlorobenzene	ug/L	ND	0.50	04/05/17 18:47	
Chloroethane	ug/L	ND	2.0	04/05/17 18:47	
Chloroform	ug/L	ND	0.50	04/05/17 18:47	
Chloromethane	ug/L	ND	0.50	04/05/17 18:47	
cis-1,2-Dichloroethene	ug/L	ND	0.50	04/05/17 18:47	
cis-1,3-Dichloropropene	ug/L	ND	0.50	04/05/17 18:47	
Dibromochloromethane	ug/L	ND	0.50	04/05/17 18:47	
Methylene Chloride	ug/L	ND	5.0	04/05/17 18:47	
Tetrachloroethene	ug/L	ND	0.50	04/05/17 18:47	
trans-1,2-Dichloroethene	ug/L	ND	0.50	04/05/17 18:47	
trans-1,3-Dichloropropene	ug/L	ND	0.50	04/05/17 18:47	
Trichloroethene	ug/L	ND	0.50	04/05/17 18:47	
Trichlorofluoromethane	ug/L	ND	0.50	04/05/17 18:47	
Vinyl chloride	ug/L	ND	0.50	04/05/17 18:47	
1,2-Dichloroethane-d4 (S)	%	102	70-130	04/05/17 18:47	
4-Bromofluorobenzene (S)	%	93	70-130	04/05/17 18:47	
Toluene-d8 (S)	%	101	70-130	04/05/17 18:47	

LABORATORY CONTROL SAMPLE: 435456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	41.8	104	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	38.8	97	75-125	
1,1,2-Trichloroethane	ug/L	40	39.6	99	75-126	
1,1-Dichloroethane	ug/L	40	40.2	100	71-131	
1,1-Dichloroethene	ug/L	40	38.9	97	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

LABORATORY CONTROL SAMPLE: 435456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	40.9	102	75-125	
1,2-Dichloroethane	ug/L	40	40.8	102	64-141	
1,2-Dichloropropane	ug/L	40	41.4	104	73-127	
1,3-Dichlorobenzene	ug/L	40	43.0	107	75-125	
1,4-Dichlorobenzene	ug/L	40	39.3	98	75-125	
Bromodichloromethane	ug/L	40	41.6	104	70-134	
Bromoform	ug/L	40	38.6	97	68-130	
Bromomethane	ug/L	40	40.6	101	30-150	
Carbon tetrachloride	ug/L	40	42.5	106	66-135	
Chlorobenzene	ug/L	40	40.9	102	75-125	
Chloroethane	ug/L	40	40.4	101	55-150	
Chloroform	ug/L	40	41.7	104	72-131	
Chloromethane	ug/L	40	36.3	91	54-132	
cis-1,2-Dichloroethene	ug/L	40	40.4	101	75-125	
cis-1,3-Dichloropropene	ug/L	40	42.1	105	74-130	
Dibromochloromethane	ug/L	40	42.9	107	70-132	
Methylene Chloride	ug/L	40	40.0	100	68-125	
Tetrachloroethene	ug/L	40	42.9	107	75-130	
trans-1,2-Dichloroethene	ug/L	40	40.7	102	75-125	
trans-1,3-Dichloropropene	ug/L	40	40.2	100	69-137	
Trichloroethene	ug/L	40	43.2	108	75-125	
Trichlorofluoromethane	ug/L	40	44.0	110	59-140	
Vinyl chloride	ug/L	40	39.1	98	68-132	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			106	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435457 435458

Parameter	Units	1285106002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	Result	MSD Result	% Rec	% Rec					
1,1,1-Trichloroethane	ug/L	<0.14	40	40	43.5	43.5	109	109	63-142	0	30		
1,1,2,2-Tetrachloroethane	ug/L	<0.12	40	40	40.5	38.6	101	97	75-125	5	30		
1,1,2-Trichloroethane	ug/L	<0.15	40	40	40.8	39.5	102	99	75-132	3	30		
1,1-Dichloroethane	ug/L	<0.12	40	40	41.9	41.5	105	104	75-126	1	30		
1,1-Dichloroethene	ug/L	<0.18	40	40	40.4	40.3	101	101	75-125	0	30		
1,2-Dichlorobenzene	ug/L	<0.11	40	40	42.3	41.9	106	105	75-125	1	30		
1,2-Dichloroethane	ug/L	<0.10	40	40	41.9	41.1	105	103	75-137	2	30		
1,2-Dichloropropane	ug/L	<0.13	40	40	42.8	42.1	107	105	74-131	2	30		
1,3-Dichlorobenzene	ug/L	<0.20	40	40	44.5	43.2	111	108	75-126	3	30		
1,4-Dichlorobenzene	ug/L	<0.12	40	40	41.0	40.5	103	101	73-125	1	30		
Bromodichloromethane	ug/L	<0.098	40	40	42.7	41.9	107	105	65-137	2	30		
Bromoform	ug/L	<0.18	40	40	39.8	38.2	100	96	60-147	4	30		
Bromomethane	ug/L	<0.25	40	40	43.6	46.1	109	115	30-150	6	30		
Carbon tetrachloride	ug/L	<0.12	40	40	43.8	43.9	110	110	45-150	0	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Parameter	Units	1285106002		435457		435458		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chlorobenzene	ug/L	<0.14	40	40	42.3	41.1	106	103	75-125	3	30		
Chloroethane	ug/L	<0.27	40	40	41.6	41.2	104	103	66-145	1	30		
Chloroform	ug/L	<0.098	40	40	43.1	42.6	108	106	74-128	1	30		
Chloromethane	ug/L	<0.15	40	40	38.2	38.1	96	95	51-150	0	30		
cis-1,2-Dichloroethene	ug/L	<0.19	40	40	41.6	41.7	104	104	75-125	0	30		
cis-1,3-Dichloropropene	ug/L	<0.081	40	40	42.5	42.5	106	106	75-129	0	30		
Dibromochloromethane	ug/L	<0.13	40	40	44.7	43.6	112	109	66-141	2	30		
Methylene Chloride	ug/L	<0.11	40	40	40.3	41.5	101	104	74-125	3	30		
Tetrachloroethene	ug/L	<0.12	40	40	43.6	42.8	109	107	75-135	2	30		
trans-1,2-Dichloroethene	ug/L	<0.11	40	40	41.6	40.8	104	102	75-125	2	30		
trans-1,3-Dichloropropene	ug/L	<0.089	40	40	40.7	40.5	102	101	67-139	1	30		
Trichloroethene	ug/L	<0.11	40	40	43.7	43.3	109	108	75-130	1	30		
Trichlorofluoromethane	ug/L	<0.12	40	40	40.8	44.3	102	111	57-144	8	30		
Vinyl chloride	ug/L	<0.20	40	40	40.4	40.0	101	100	70-136	1	30		
1,2-Dichloroethane-d4 (S)	%						97	97	70-130				
4-Bromofluorobenzene (S)	%						107	105	70-130				
Toluene-d8 (S)	%						102	102	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

QC Batch: 110196 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1285102007, 1285102011, 1285102031, 1285102032, 1285102040, 1285102041, 1285102042, 1285102043, 1285102044, 1285102045, 1285102046, 1285102047, 1285102048, 1285102053

METHOD BLANK: 435849 Matrix: Water
Associated Lab Samples: 1285102007, 1285102011, 1285102031, 1285102032, 1285102040, 1285102041, 1285102042, 1285102043, 1285102044, 1285102045, 1285102046, 1285102047, 1285102048, 1285102053

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	04/06/17 19:38	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	04/06/17 19:38	
1,1,2-Trichloroethane	ug/L	ND	0.50	04/06/17 19:38	
1,1-Dichloroethane	ug/L	ND	0.50	04/06/17 19:38	
1,1-Dichloroethene	ug/L	ND	0.50	04/06/17 19:38	
1,2-Dichlorobenzene	ug/L	ND	0.50	04/06/17 19:38	
1,2-Dichloroethane	ug/L	ND	0.50	04/06/17 19:38	
1,2-Dichloropropane	ug/L	ND	0.50	04/06/17 19:38	
1,3-Dichlorobenzene	ug/L	ND	0.50	04/06/17 19:38	
1,4-Dichlorobenzene	ug/L	ND	0.50	04/06/17 19:38	
Bromodichloromethane	ug/L	ND	0.50	04/06/17 19:38	
Bromoform	ug/L	ND	0.50	04/06/17 19:38	
Bromomethane	ug/L	ND	20.0	04/06/17 19:38	
Carbon tetrachloride	ug/L	ND	0.50	04/06/17 19:38	
Chlorobenzene	ug/L	ND	0.50	04/06/17 19:38	
Chloroethane	ug/L	ND	2.0	04/06/17 19:38	
Chloroform	ug/L	ND	0.50	04/06/17 19:38	
Chloromethane	ug/L	ND	0.50	04/06/17 19:38	
cis-1,2-Dichloroethene	ug/L	ND	0.50	04/06/17 19:38	
cis-1,3-Dichloropropene	ug/L	ND	0.50	04/06/17 19:38	
Dibromochloromethane	ug/L	ND	0.50	04/06/17 19:38	
Methylene Chloride	ug/L	ND	5.0	04/06/17 19:38	
Tetrachloroethene	ug/L	ND	0.50	04/06/17 19:38	
trans-1,2-Dichloroethene	ug/L	ND	0.50	04/06/17 19:38	
trans-1,3-Dichloropropene	ug/L	ND	0.50	04/06/17 19:38	
Trichloroethene	ug/L	ND	0.50	04/06/17 19:38	
Trichlorofluoromethane	ug/L	ND	0.50	04/06/17 19:38	
Vinyl chloride	ug/L	ND	0.50	04/06/17 19:38	
1,2-Dichloroethane-d4 (S)	%	100	70-130	04/06/17 19:38	
4-Bromofluorobenzene (S)	%	92	70-130	04/06/17 19:38	
Toluene-d8 (S)	%	100	70-130	04/06/17 19:38	

LABORATORY CONTROL SAMPLE: 435850

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	42.3	106	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	35.5	89	75-125	
1,1,2-Trichloroethane	ug/L	40	37.6	94	75-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

LABORATORY CONTROL SAMPLE: 435850

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	40	40.6	102	71-131	
1,1-Dichloroethene	ug/L	40	39.7	99	74-126	
1,2-Dichlorobenzene	ug/L	40	41.7	104	75-125	
1,2-Dichloroethane	ug/L	40	40.1	100	64-141	
1,2-Dichloropropane	ug/L	40	41.3	103	73-127	
1,3-Dichlorobenzene	ug/L	40	44.5	111	75-125	
1,4-Dichlorobenzene	ug/L	40	40.8	102	75-125	
Bromodichloromethane	ug/L	40	41.3	103	70-134	
Bromoform	ug/L	40	36.4	91	68-130	
Bromomethane	ug/L	40	38.1	95	30-150	
Carbon tetrachloride	ug/L	40	43.3	108	66-135	
Chlorobenzene	ug/L	40	41.1	103	75-125	
Chloroethane	ug/L	40	42.4	106	55-150	
Chloroform	ug/L	40	41.6	104	72-131	
Chloromethane	ug/L	40	35.7	89	54-132	
cis-1,2-Dichloroethene	ug/L	40	40.6	102	75-125	
cis-1,3-Dichloropropene	ug/L	40	41.5	104	74-130	
Dibromochloromethane	ug/L	40	41.5	104	70-132	
Methylene Chloride	ug/L	40	39.9	100	68-125	
Tetrachloroethene	ug/L	40	42.7	107	75-130	
trans-1,2-Dichloroethene	ug/L	40	40.5	101	75-125	
trans-1,3-Dichloropropene	ug/L	40	38.6	97	69-137	
Trichloroethene	ug/L	40	43.0	108	75-125	
Trichlorofluoromethane	ug/L	40	42.2	106	59-140	
Vinyl chloride	ug/L	40	42.1	105	68-132	
1,2-Dichloroethane-d4 (S)	%			94	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			102	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435860 435861

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		1285107001 Result	Spike Conc.	Spike Conc.	Result							
1,1,1-Trichloroethane	ug/L	ND	40	40	42.4	42.1	106	105	63-142	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	36.9	38.5	92	96	75-125	4	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	38.0	39.0	95	97	75-132	2	30	
1,1-Dichloroethane	ug/L	ND	40	40	41.5	40.7	104	102	75-126	2	30	
1,1-Dichloroethene	ug/L	ND	40	40	40.7	40.4	101	100	75-125	1	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	42.0	40.9	105	102	75-125	3	30	
1,2-Dichloroethane	ug/L	ND	40	40	40.3	40.4	101	101	75-137	0	30	
1,2-Dichloropropane	ug/L	ND	40	40	41.8	41.4	105	103	74-131	1	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	44.2	43.2	111	108	75-126	2	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	40.8	39.3	102	98	73-125	4	30	
Bromodichloromethane	ug/L	ND	40	40	42.2	41.4	106	103	65-137	2	30	
Bromoform	ug/L	ND	40	40	37.0	38.5	93	96	60-147	4	30	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435860												435861	
Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual	
		1285107001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Bromomethane	ug/L	ND	40	40	40.2	42.6	101	106	30-150	6	30		
Carbon tetrachloride	ug/L	ND	40	40	43.6	42.6	109	107	45-150	2	30		
Chlorobenzene	ug/L	ND	40	40	41.2	41.1	103	103	75-125	0	30		
Chloroethane	ug/L	ND	40	40	42.5	42.2	106	105	66-145	1	30		
Chloroform	ug/L	ND	40	40	42.9	42.7	106	106	74-128	0	30		
Chloromethane	ug/L	ND	40	40	37.4	37.1	93	93	51-150	1	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	41.5	40.9	104	102	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	41.5	41.1	104	103	75-129	1	30		
Dibromochloromethane	ug/L	ND	40	40	42.6	42.7	106	107	66-141	0	30		
Methylene Chloride	ug/L	ND	40	40	40.4	40.6	101	101	74-125	0	30		
Tetrachloroethene	ug/L	45.6	40	40	89.4	88.1	109	106	75-135	1	30	E	
trans-1,2-Dichloroethene	ug/L	ND	40	40	41.7	40.2	104	101	75-125	3	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	39.0	39.9	97	100	67-139	2	30		
Trichloroethene	ug/L	ND	40	40	43.5	43.2	108	107	75-130	1	30		
Trichlorofluoromethane	ug/L	ND	40	40	46.2	45.6	116	114	57-144	1	30		
Vinyl chloride	ug/L	ND	40	40	42.4	41.3	106	103	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%.						94	96	70-130				
4-Bromofluorobenzene (S)	%.						105	105	70-130				
Toluene-d8 (S)	%.						102	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

QC Batch: 110295 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1285102005, 1285102012, 1285102016, 1285102019, 1285102020, 1285102021, 1285102022, 1285102023

METHOD BLANK: 436223 Matrix: Water
Associated Lab Samples: 1285102005, 1285102012, 1285102016, 1285102019, 1285102020, 1285102021, 1285102022, 1285102023

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	04/07/17 11:58	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	04/07/17 11:58	
1,1,2-Trichloroethane	ug/L	ND	0.50	04/07/17 11:58	
1,1-Dichloroethane	ug/L	ND	0.50	04/07/17 11:58	
1,1-Dichloroethene	ug/L	ND	0.50	04/07/17 11:58	
1,2-Dichlorobenzene	ug/L	ND	0.50	04/07/17 11:58	
1,2-Dichloroethane	ug/L	ND	0.50	04/07/17 11:58	
1,2-Dichloropropane	ug/L	ND	0.50	04/07/17 11:58	
1,3-Dichlorobenzene	ug/L	ND	0.50	04/07/17 11:58	
1,4-Dichlorobenzene	ug/L	ND	0.50	04/07/17 11:58	
Bromodichloromethane	ug/L	ND	0.50	04/07/17 11:58	
Bromoform	ug/L	ND	0.50	04/07/17 11:58	
Bromomethane	ug/L	ND	20.0	04/07/17 11:58	
Carbon tetrachloride	ug/L	ND	0.50	04/07/17 11:58	
Chlorobenzene	ug/L	ND	0.50	04/07/17 11:58	
Chloroethane	ug/L	ND	2.0	04/07/17 11:58	
Chloroform	ug/L	ND	0.50	04/07/17 11:58	
Chloromethane	ug/L	ND	2.0	04/07/17 11:58	
cis-1,2-Dichloroethene	ug/L	ND	0.50	04/07/17 11:58	
cis-1,3-Dichloropropene	ug/L	ND	0.50	04/07/17 11:58	
Dibromochloromethane	ug/L	ND	0.50	04/07/17 11:58	
Methylene Chloride	ug/L	ND	5.0	04/07/17 11:58	
Tetrachloroethene	ug/L	ND	0.50	04/07/17 11:58	
trans-1,2-Dichloroethene	ug/L	ND	0.50	04/07/17 11:58	
trans-1,3-Dichloropropene	ug/L	ND	0.50	04/07/17 11:58	
Trichloroethene	ug/L	ND	0.50	04/07/17 11:58	
Trichlorofluoromethane	ug/L	ND	0.50	04/07/17 11:58	
Vinyl chloride	ug/L	ND	0.50	04/07/17 11:58	
1,2-Dichloroethane-d4 (S)	%	103	70-130	04/07/17 11:58	
4-Bromofluorobenzene (S)	%	102	70-130	04/07/17 11:58	
Toluene-d8 (S)	%	101	70-130	04/07/17 11:58	

LABORATORY CONTROL SAMPLE: 436224

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	46.6	116	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	37.4	94	75-125	
1,1,2-Trichloroethane	ug/L	40	37.6	94	75-126	
1,1-Dichloroethane	ug/L	40	44.5	111	71-131	
1,1-Dichloroethene	ug/L	40	46.7	117	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

LABORATORY CONTROL SAMPLE: 436224

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	39.7	99	75-125	
1,2-Dichloroethane	ug/L	40	39.9	100	64-141	
1,2-Dichloropropane	ug/L	40	40.8	102	73-127	
1,3-Dichlorobenzene	ug/L	40	41.6	104	75-125	
1,4-Dichlorobenzene	ug/L	40	39.2	98	75-125	
Bromodichloromethane	ug/L	40	42.7	107	70-134	
Bromoform	ug/L	40	39.5	99	68-130	
Bromomethane	ug/L	40	45.0	113	30-150	
Carbon tetrachloride	ug/L	40	47.0	118	66-135	
Chlorobenzene	ug/L	40	41.8	105	75-125	
Chloroethane	ug/L	40	46.3	116	55-150	
Chloroform	ug/L	40	43.3	108	72-131	
Chloromethane	ug/L	40	45.1	113	54-132	
cis-1,2-Dichloroethene	ug/L	40	42.8	107	75-125	
cis-1,3-Dichloropropene	ug/L	40	42.3	106	74-130	
Dibromochloromethane	ug/L	40	39.0	97	70-132	
Methylene Chloride	ug/L	40	41.2	103	68-125	
Tetrachloroethene	ug/L	40	45.7	114	75-130	
trans-1,2-Dichloroethene	ug/L	40	45.1	113	75-125	
trans-1,3-Dichloropropene	ug/L	40	40.8	102	69-137	
Trichloroethene	ug/L	40	45.0	112	75-125	
Trichlorofluoromethane	ug/L	40	49.6	124	59-140	
Vinyl chloride	ug/L	40	48.8	122	68-132	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 436225 436226

Parameter	Units	1285107007		436225		436226		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
1,1,1-Trichloroethane	ug/L	ND	40	40	41.9	41.3	105	103	63-142	1	30			
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	41.2	41.0	103	102	75-125	1	30			
1,1,2-Trichloroethane	ug/L	ND	40	40	40.5	40.1	101	100	75-132	1	30			
1,1-Dichloroethane	ug/L	ND	40	40	41.8	41.5	104	104	75-126	1	30			
1,1-Dichloroethene	ug/L	ND	40	40	42.8	41.7	107	104	75-125	3	30			
1,2-Dichlorobenzene	ug/L	ND	40	40	40.4	38.8	101	97	75-125	4	30			
1,2-Dichloroethane	ug/L	ND	40	40	41.0	40.4	102	101	75-137	1	30			
1,2-Dichloropropane	ug/L	ND	40	40	40.7	40.1	102	100	74-131	2	30			
1,3-Dichlorobenzene	ug/L	ND	40	40	41.2	40.1	103	100	75-126	3	30			
1,4-Dichlorobenzene	ug/L	ND	40	40	38.5	37.4	96	94	73-125	3	30			
Bromodichloromethane	ug/L	ND	40	40	43.3	42.7	108	107	65-137	1	30			
Bromoform	ug/L	ND	40	40	42.5	42.3	106	106	60-147	1	30			
Bromomethane	ug/L	ND	40	40	42.6	41.4	106	104	30-150	3	30			
Carbon tetrachloride	ug/L	ND	40	40	42.4	41.7	106	104	45-150	2	30			

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 436225		436225		436226		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1285107007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Chlorobenzene	ug/L	ND	40	40	39.8	38.8	100	97	75-125	3	30		
Chloroethane	ug/L	ND	40	40	43.9	41.8	110	105	66-145	5	30		
Chloroform	ug/L	ND	40	40	42.1	41.9	105	105	74-128	1	30		
Chloromethane	ug/L	ND	40	40	40.8	39.9	102	100	51-150	2	30		
cis-1,2-Dichloroethene	ug/L	ND	40	40	41.5	41.3	104	103	75-125	0	30		
cis-1,3-Dichloropropene	ug/L	ND	40	40	42.5	42.2	106	105	75-129	1	30		
Dibromochloromethane	ug/L	ND	40	40	41.8	41.7	104	104	66-141	0	30		
Methylene Chloride	ug/L	ND	40	40	40.6	39.6	101	99	74-125	2	30		
Tetrachloroethene	ug/L	31.8	40	40	72.6	71.8	102	100	75-135	1	30		
trans-1,2-Dichloroethene	ug/L	ND	40	40	40.3	40.7	101	102	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	ND	40	40	43.1	42.0	108	105	67-139	3	30		
Trichloroethene	ug/L	ND	40	40	40.7	41.2	102	103	75-130	1	30		
Trichlorofluoromethane	ug/L	ND	40	40	42.0	41.8	105	104	57-144	0	30		
Vinyl chloride	ug/L	ND	40	40	42.7	42.1	107	105	70-136	1	30		
1,2-Dichloroethane-d4 (S)	%						102	103	70-130				
4-Bromofluorobenzene (S)	%						104	103	70-130				
Toluene-d8 (S)	%						101	102	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

QC Batch: 110381 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1285102007, 1285102032, 1285102041, 1285102045

METHOD BLANK: 436425 Matrix: Water
Associated Lab Samples: 1285102007, 1285102032, 1285102041, 1285102045

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	0.50	04/07/17 18:48	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	04/07/17 18:48	
1,1,2-Trichloroethane	ug/L	ND	0.50	04/07/17 18:48	
1,1-Dichloroethane	ug/L	ND	0.50	04/07/17 18:48	
1,1-Dichloroethene	ug/L	ND	0.50	04/07/17 18:48	
1,2-Dichlorobenzene	ug/L	ND	0.50	04/07/17 18:48	
1,2-Dichloroethane	ug/L	ND	0.50	04/07/17 18:48	
1,2-Dichloropropane	ug/L	ND	0.50	04/07/17 18:48	
1,3-Dichlorobenzene	ug/L	ND	0.50	04/07/17 18:48	
1,4-Dichlorobenzene	ug/L	ND	0.50	04/07/17 18:48	
Bromodichloromethane	ug/L	ND	0.50	04/07/17 18:48	
Bromoform	ug/L	ND	0.50	04/07/17 18:48	
Bromomethane	ug/L	ND	20.0	04/07/17 18:48	
Carbon tetrachloride	ug/L	ND	0.50	04/07/17 18:48	
Chlorobenzene	ug/L	ND	0.50	04/07/17 18:48	
Chloroethane	ug/L	ND	2.0	04/07/17 18:48	
Chloroform	ug/L	ND	0.50	04/07/17 18:48	
Chloromethane	ug/L	ND	0.50	04/07/17 18:48	
cis-1,2-Dichloroethene	ug/L	ND	0.50	04/07/17 18:48	
cis-1,3-Dichloropropene	ug/L	ND	0.50	04/07/17 18:48	
Dibromochloromethane	ug/L	ND	0.50	04/07/17 18:48	
Methylene Chloride	ug/L	ND	5.0	04/07/17 18:48	
Tetrachloroethene	ug/L	ND	0.50	04/07/17 18:48	
trans-1,2-Dichloroethene	ug/L	ND	0.50	04/07/17 18:48	
trans-1,3-Dichloropropene	ug/L	ND	0.50	04/07/17 18:48	
Trichloroethene	ug/L	ND	0.50	04/07/17 18:48	
Trichlorofluoromethane	ug/L	ND	0.50	04/07/17 18:48	
Vinyl chloride	ug/L	ND	0.50	04/07/17 18:48	
1,2-Dichloroethane-d4 (S)	%	97	70-130	04/07/17 18:48	
4-Bromofluorobenzene (S)	%	95	70-130	04/07/17 18:48	
Toluene-d8 (S)	%	100	70-130	04/07/17 18:48	

LABORATORY CONTROL SAMPLE: 436426

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	40	43.4	109	67-138	
1,1,2,2-Tetrachloroethane	ug/L	40	36.1	90	75-125	
1,1,2-Trichloroethane	ug/L	40	38.5	96	75-126	
1,1-Dichloroethane	ug/L	40	42.0	105	71-131	
1,1-Dichloroethene	ug/L	40	41.3	103	74-126	

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

LABORATORY CONTROL SAMPLE: 436426

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	40	41.9	105	75-125	
1,2-Dichloroethane	ug/L	40	40.5	101	64-141	
1,2-Dichloropropane	ug/L	40	42.3	106	73-127	
1,3-Dichlorobenzene	ug/L	40	44.6	112	75-125	
1,4-Dichlorobenzene	ug/L	40	41.1	103	75-125	
Bromodichloromethane	ug/L	40	42.4	106	70-134	
Bromoform	ug/L	40	36.3	91	68-130	
Bromomethane	ug/L	40	28.4	71	30-150	
Carbon tetrachloride	ug/L	40	44.1	110	66-135	
Chlorobenzene	ug/L	40	42.2	106	75-125	
Chloroethane	ug/L	40	42.6	106	55-150	
Chloroform	ug/L	40	42.7	107	72-131	
Chloromethane	ug/L	40	35.9	90	54-132	
cis-1,2-Dichloroethene	ug/L	40	42.3	106	75-125	
cis-1,3-Dichloropropene	ug/L	40	42.9	107	74-130	
Dibromochloromethane	ug/L	40	42.6	106	70-132	
Methylene Chloride	ug/L	40	41.5	104	68-125	
Tetrachloroethene	ug/L	40	43.0	107	75-130	
trans-1,2-Dichloroethene	ug/L	40	42.3	106	75-125	
trans-1,3-Dichloropropene	ug/L	40	39.6	99	69-137	
Trichloroethene	ug/L	40	44.1	110	75-125	
Trichlorofluoromethane	ug/L	40	47.8	119	59-140	
Vinyl chloride	ug/L	40	42.5	106	68-132	
1,2-Dichloroethane-d4 (S)	%			95	70-130	
4-Bromofluorobenzene (S)	%			105	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 436427 436428

Parameter	Units	1285044013		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,1,1-Trichloroethane	ug/L	0.0J	40	40	41.9	42.2	105	106	63-142	1	30		
1,1,2,2-Tetrachloroethane	ug/L	0.0J	40	40	35.3	34.8	88	87	75-125	1	30		
1,1,2-Trichloroethane	ug/L	0.0J	40	40	37.1	36.8	93	92	75-132	1	30		
1,1-Dichloroethane	ug/L	0.0J	40	40	40.8	40.9	102	102	75-126	0	30		
1,1-Dichloroethene	ug/L	0.0J	40	40	40.4	38.8	101	97	75-125	4	30		
1,2-Dichlorobenzene	ug/L	0.0J	40	40	40.4	40.7	101	102	75-125	1	30		
1,2-Dichloroethane	ug/L	0.0J	40	40	39.5	39.4	99	99	75-137	0	30		
1,2-Dichloropropane	ug/L	0.0J	40	40	40.7	41.1	102	103	74-131	1	30		
1,3-Dichlorobenzene	ug/L	0.0J	40	40	42.5	42.5	106	106	75-126	0	30		
1,4-Dichlorobenzene	ug/L	0.0J	40	40	39.6	39.8	99	99	73-125	0	30		
Bromodichloromethane	ug/L	0.0J	40	40	41.3	41.5	103	104	65-137	1	30		
Bromoform	ug/L	0.0J	40	40	34.6	35.6	87	89	60-147	3	30		
Bromomethane	ug/L	0.0J	40	40	33.1	38.2	83	96	30-150	15	30		
Carbon tetrachloride	ug/L	0.0J	40	40	43.4	43.9	109	110	45-150	1	30		

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Parameter	Units	1285044013		436427		436428		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chlorobenzene	ug/L	0.0J	40	40	40.5	40.8	101	102	75-125	1	30		
Chloroethane	ug/L	0.0J	40	40	41.7	42.2	104	106	66-145	1	30		
Chloroform	ug/L	0.0J	40	40	41.7	42.0	104	105	74-128	1	30		
Chloromethane	ug/L	0.0J	40	40	36.1	37.6	90	94	51-150	4	30		
cis-1,2-Dichloroethene	ug/L	0.0J	40	40	41.3	41.7	103	104	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	0.0J	40	40	40.4	41.3	101	103	75-129	2	30		
Dibromochloromethane	ug/L	0.0J	40	40	40.7	41.1	102	103	66-141	1	30		
Methylene Chloride	ug/L	0.0J	40	40	40.6	40.3	102	101	74-125	1	30		
Tetrachloroethene	ug/L	0.0J	40	40	40.5	41.4	101	103	75-135	2	30		
trans-1,2-Dichloroethene	ug/L	0.0J	40	40	40.8	40.9	102	102	75-125	0	30		
trans-1,3-Dichloropropene	ug/L	0.0J	40	40	38.0	38.5	95	96	67-139	1	30		
Trichloroethene	ug/L	0.0J	40	40	42.7	42.6	107	106	75-130	0	30		
Trichlorofluoromethane	ug/L	0.0J	40	40	46.0	41.9	115	105	57-144	9	30		
Vinyl chloride	ug/L	0.0J	40	40	42.0	43.4	105	108	70-136	3	30		
1,2-Dichloroethane-d4 (S)	%						94	94	70-130				
4-Bromofluorobenzene (S)	%						106	104	70-130				
Toluene-d8 (S)	%						101	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

QC Batch: 110440 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Med Water
Associated Lab Samples: 1285102012

METHOD BLANK: 436655 Matrix: Water
Associated Lab Samples: 1285102012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/L	ND	0.50	04/10/17 12:49	
1,2-Dichloroethane-d4 (S)	%.	97	70-130	04/10/17 12:49	
4-Bromofluorobenzene (S)	%.	94	70-130	04/10/17 12:49	
Toluene-d8 (S)	%.	101	70-130	04/10/17 12:49	

LABORATORY CONTROL SAMPLE: 436656

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/L	40	41.7	104	75-125	
1,2-Dichloroethane-d4 (S)	%.			94	70-130	
4-Bromofluorobenzene (S)	%.			105	70-130	
Toluene-d8 (S)	%.			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 436657 436658

Parameter	Units	1285128002		436657		436658		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
cis-1,2-Dichloroethene	ug/L	ND	ND	40	40	43.8	44.5	110	111	75-125	2	30		
1,2-Dichloroethane-d4 (S)	%.							95	95	70-130				
4-Bromofluorobenzene (S)	%.							107	105	70-130				
Toluene-d8 (S)	%.							101	101	70-130				

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

QC Batch: 78144

Analysis Method: SM 5310B

QC Batch Method: SM 5310B

Analysis Description: 5310B TOC

Associated Lab Samples: 1285102002, 1285102006, 1285102011, 1285102028, 1285102030, 1285102031, 1285102039, 1285102047

METHOD BLANK: 330565

Matrix: Water

Associated Lab Samples: 1285102002, 1285102006, 1285102011, 1285102028, 1285102030, 1285102031, 1285102039, 1285102047

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	04/10/17 09:27	

LABORATORY CONTROL SAMPLE: 330566

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	31.6	31.0	98	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

QC Batch: 78355 Analysis Method: SM 5310B
QC Batch Method: SM 5310B Analysis Description: 5310B TOC
Associated Lab Samples: 1285102005, 1285102032

METHOD BLANK: 331335 Matrix: Water

Associated Lab Samples: 1285102005, 1285102032

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	04/12/17 18:00	

LABORATORY CONTROL SAMPLE: 331336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	31.6	30.6	97	90-110	

MATRIX SPIKE SAMPLE: 331338

Parameter	Units	2052694002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	7.5	20	28.5	105	75-125	

SAMPLE DUPLICATE: 331337

Parameter	Units	2052694002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	7.5	7.5	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DAV Pace Analytical Services - Davis

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

BATCH QUALIFIERS

Batch: 110023

[1] Field preservation was insufficient for samples 1285102002 and 1285102011. Analysis conducted outside the recognized method holding time.

[2] The recovery of the second source standard used to verify the initial calibration curve for Bromomethane is outside the laboratory's control limits. The Bromomethane result is estimated.

Batch: 110090

[1] The recovery of the second source standard used to verify the initial calibration curve for Bromomethane is outside the laboratory's control limits. The Bromomethane result is estimated.

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

R1 RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1285102002	MW-14	RSK 175	467360		
1285102005	EX	RSK 175	467360		
1285102006	MW-19	RSK 175	467360		
1285102011	MGMS3-40	RSK 175	467360		
1285102028	MW-26	RSK 175	467360		
1285102030	MW-13	RSK 175	467360		
1285102031	MW-24i	RSK 175	467360		
1285102032	MP-1	RSK 175	467360		
1285102047	MGMS1-43	RSK 175	467360		
1285102039	MW-12	RSK 175	467360		
1285102001	MW-23i	EPA 8260B	110023		
1285102002	MW-14	EPA 8260B	110023		
1285102005	EX	EPA 8260B	110023		
1285102005	EX	EPA 8260B	110295		
1285102006	MW-19	EPA 8260B	110023		
1285102011	MGMS3-40	EPA 8260B	110023		
1285102011	MGMS3-40	EPA 8260B	110196		
1285102028	MW-26	EPA 8260B	110023		
1285102030	MW-13	EPA 8260B	110023		
1285102031	MW-24i	EPA 8260B	110023		
1285102031	MW-24i	EPA 8260B	110196		
1285102032	MP-1	EPA 8260B	110196		
1285102032	MP-1	EPA 8260B	110381		
1285102047	MGMS1-43	EPA 8260B	110196		
1285102039	MW-12	EPA 8260B	110023		
1285102003	S-1	EPA 8260B	110023		
1285102004	S-2	EPA 8260B	110023		
1285102007	MW-19 DUP	EPA 8260B	110196		
1285102007	MW-19 DUP	EPA 8260B	110381		
1285102008	MGMS3-132	EPA 8260B	110023		
1285102009	MGMS3-110	EPA 8260B	110023		
1285102010	MGMS3-60	EPA 8260B	110023		
1285102012	MGMS3-40 DUP	EPA 8260B	110037		
1285102012	MGMS3-40 DUP	EPA 8260B	110295		
1285102012	MGMS3-40 DUP	EPA 8260B	110440		
1285102013	MW-24d	EPA 8260B	110037		
1285102014	MW-2	EPA 8260B	110037		
1285102015	MW-15	EPA 8260B	110037		
1285102016	MW-5	EPA 8260B	110037		
1285102016	MW-5	EPA 8260B	110295		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver GWM

Pace Project No.: 1285102

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1285102017	MW-7	EPA 8260B	110037		
1285102018	MW-7 DUP	EPA 8260B	110037		
1285102019	MW-9	EPA 8260B	110037		
1285102019	MW-9	EPA 8260B	110295		
1285102020	MW-19i	EPA 8260B	110037		
1285102020	MW-19i	EPA 8260B	110295		
1285102021	MW-18i	EPA 8260B	110037		
1285102021	MW-18i	EPA 8260B	110295		
1285102022	MW-16	EPA 8260B	110037		
1285102022	MW-16	EPA 8260B	110295		
1285102023	MW-3	EPA 8260B	110037		
1285102023	MW-3	EPA 8260B	110295		
1285102024	MW-21i-40	EPA 8260B	110037		
1285102025	MW-21i-105	EPA 8260B	110037		
1285102026	MW-22i	EPA 8260B	110037		
1285102027	MW-25i	EPA 8260B	110037		
1285102029	MW-17	EPA 8260B	110037		
1285102033	MW-8	EPA 8260B	110037		
1285102034	MW-20i	EPA 8260B	110037		
1285102035	MW-10	EPA 8260B	110037		
1285102036	MW-1	EPA 8260B	110090		
1285102037	EW-1	EPA 8260B	110090		
1285102038	MW-6	EPA 8260B	110090		
1285102040	MW-12 DUP	EPA 8260B	110196		
1285102041	MGMS2-40	EPA 8260B	110196		
1285102041	MGMS2-40	EPA 8260B	110381		
1285102042	MGMS2-110	EPA 8260B	110196		
1285102043	MGMS2-60	EPA 8260B	110196		
1285102044	MGMS2-132	EPA 8260B	110196		
1285102045	MGMS1-132	EPA 8260B	110196		
1285102045	MGMS1-132	EPA 8260B	110381		
1285102046	MGMS1-60	EPA 8260B	110196		
1285102048	Equipment Blank	EPA 8260B	110196		
1285102049	Field Blank	EPA 8260B	110023		
1285102050	Field Blank	EPA 8260B	110090		
1285102051	Field Blank	EPA 8260B	110090		
1285102052	Field Blank	EPA 8260B	110090		
1285102053	Field Blank	EPA 8260B	110196		
1285102002	MW-14	SM 5310B	78144		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver GWM
Pace Project No.: 1285102

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1285102005	EX	SM 5310B	78355		
1285102006	MW-19	SM 5310B	78144		
1285102011	MGMS3-40	SM 5310B	78144		
1285102028	MW-26	SM 5310B	78144		
1285102030	MW-13	SM 5310B	78144		
1285102031	MW-24i	SM 5310B	78144		
1285102032	MP-1	SM 5310B	78355		
1285102047	MGMS1-43	SM 5310B	78144		
1285102039	MW-12	SM 5310B	78144		

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2795 2nd Street, Suite 300
 Davis, CA 95618
 Lab: 530.297.4800
 Fax: 530.297.4802

SRG # / Lab No. 1285102

Page 3 of 5

Project Contact (Hardcopy or PDF To):
 Stephanie Bosze

Company / Address: Apex Companies
 3015 SW 1st Ave., Portland, OR 97201

Phone Number: 503-924-4704 ext. 1925

Fax Number: 503-924-4707

Project #: 320001126-20

P.O. #:
 Apex Companies

Project Name: NuStar Vancouver GWM

Project Address:
 Sampler Name & Signature: Kyle Kline

Global ID:
 EDD Deliverable To (Email Address): Ssalisbury@apexcos.com

Bill to:
 Apex Companies

California EDF Report? Yes No
 CRA EQUIS Required Yes No
 XLS Report Required Yes No

Chain-of-Custody Record and Analysis Request

Analysis Request

Other: Please Specify

TAT

12 hr

24 hr

48hr

72hr

1 wk

For Lab Use Only

Sample Designation	Sampling		Container				Preservative			Matrix			TAT	
	Date	Time	40 ml VOA	Poly	250 ml Glass	Tedlar	HCl	HNO ₃	H ₂ SO ₄	None	Water	Soil		Air
MW-25i	3/29/2017	1000	3				3				X			X
MW-26	3/29/2017	0915	7				3	2	2		X			X
MW-17	3/29/2017	0847	3				3				X			X
MW-13	3/30/2017	1525	7				3	2	2		X			X
MW-24i	3/30/2017	1448	7				3	2	2		X			X
MP-1	3/30/2017	1356	7				3	2	2		X			X
MW-8	3/30/2017	1307	3				3				X			X
MW-20i	3/30/2017	1200	3				3				X			X
MW-10	3/30/2017	1127	3				3				X			X
MW-1	3/30/2017	1052	3				3				X			X
EW-1	3/30/2017	1318	3				3				X			X
MW-6	3/30/2017	0828	3				3				X			X

Volatle Halocarbons (EPA 8260B)

HOLD

TOC

Methane, Ethane, Ethene

Relinquished by: *Kyle Kline*
 Date: 4/13/17
 Time: 900
 Received by: *Pete Analytical*
 Date:
 Time:
 Received by Laboratory:
 Date:
 Time:
 Received by Laboratory:

Remarks:
 MS/MSD is from well MW-12 (extra bottles labeled as MW-12 MS/MSD)

For Lab Use Only: Sample Receipt			
Temp °C	Initials	Date	Therm. ID #

Coolant Present
 Yes / No



2795 2nd Street, Suite 300
 Davis, CA 95618
 Lab: 530.297.4800
 Fax: 530.297.4802

Project Contact (Hardcopy or PDF To):
 Stephanie Bosze
 Company / Address: Apex Companies
 3015 SW 1st Ave., Portland, OR 97201

Phone Number:
 503-924-4704 ext. 1925
 Fax Number:
 503-924-4707

Project #:
 320001126-20

P.O. #:
 NuStar Vancouver GWM

Project Address:

California EDF Report?
 Yes No
 CRA EQUIS Required
 Yes No
 XLS Report Required
 Yes No

Global ID:
 EDD Deliverable To (Email Address):
 Ssalisbury@apexcos.com
 Bill to:
 Apex Companies
 Sampler Name & Signature: Kyle Kline

SRG # / Lab No. 1285102 Page 5 of 5

Chain-of-Custody Record and Analysis Request

Sample Designation	Date	Time	Sampling			Container			Preservative			Matrix			Analysis Request Other: Please Specify	TAT	
			40 ml VOA	Sieve	250 ml Glass	Tedlar	1 L	HCl	HNO ₃	H ₂ SO ₄	None	Water	Soil	Air			
Equipment Blank	3/30/2017	1540	3					3					X			X	
Field Blank	3/27/2017	1550	3					3					X			X	
Field Blank	3/28/2017	1630	3					3					X			X	
Field Blank	3/29/2017	1540	3					3					X			X	
Field Blank	3/30/2017	1540	3					3					X			X	
Field Blank	3/31/2017	1000	3					3					X			X	
Trip Blank	--	--	5														

0219
 050/049
 051/050
 052/051
 053/052
 054/053
 055/054
 056/055
 057/056

Relinquished by:	Date	Time	Received by:	Time	Remarks:
<i>Kyle Kline</i>	4/13/17	900	<i>WJG</i>	040417 053	MS/MSD is from well MW-12 (extra bottles labeled as MW-12 MS/MSD)
Relinquished by:	Date	Time	Received by:	Time	
Relinquished by:	Date	Time	Received by:	Time	

For Lab Use Only: Sample Receipt			
Temp °C	Initials	Date	Therm. ID #

Sample Condition Upon Receipt

Client Name: Apex Companies

Project #: **WO#: 1285102**



Courier: Fed Ex UPS USPS Client
 Commercial Pace OnTrac Other: _____

Tracking Number: 8099 9440 4243
7784 0547 2125

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermom. Used: DA1434 DA2285 Type of Ice: Wet Blue Dry Ice None Samples on ice, cooling process has begun

Cooler Temp Read(°C): 3.0/3.4 Cooler Temp Corrected(°C): 3.5/3.9 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: _____ Date and Initials of Person Examining Contents: [Signature]

Chain of Custody Present?	Chain of Custody Filled Out?	Chain of Custody Relinquished?	Sampler Name and/or Signature on COC?	Samples Arrived within Hold Time?	Short Hold Time Analysis (<72 hr)?	Rush Turn Around Time Requested?	Sufficient Volume?	Correct Containers Used?	-Pace Containers Used?	Containers Intact?	Filtered Volume Received for Dissolved Tests?	Sample Labels Match COC?	-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	All containers needing acid/base preservation have been checked?	All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	Headspace in VOA Vials (>6mm)?	Trip Blank Present?	Trip Blank Custody Seals Present?	Pace Trip Blank Lot # (if purchased):	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
<p>Comments:</p> <ol style="list-style-type: none"> The date on the coc for sample 11 states 2/28/17. However, the date for sample 12 (MIMS 3-40 dup) is 3/28/17 along with the containers for both samples. SR will log it in as 3/28/17 until further clarification. There are no unpreserved containers. (all HCl preserved per the labels) or H₂SO₄ preservat The coc states unpreserved cont. for samples 2, 5, 6, 11, 28, 30, 31, 32, 39, 47. Note if sediment is visible in the dissolved container. Sample 54 has 5 HCl preservat conts; sample 6 has a date of 3/28/17 along with sample 7 on the labels. SR will log it in per the labels and not the coc for samples 54 and 7 information for 040417 Initial when completed: _____ Lot # of added preservative: _____ Samples 28, 31, 33, 41, 47 Sample 7 has a date of 2/28/17 per the coc. Sample 6 has a date of 3/28 along with the labels for both samples. SR will log it in per the labels until further clarification. Sample 54 will be logged in with a date of 3/27/17 and as on (TOD). Sample 37 has a time of 1020 on cont.s. 																				

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____

Date/Time: _____ Field Data Required? Yes No

Comments/Resolution: _____

Project Manager Review: Scott Fees

Date: 4/4/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)