STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by: NuStar Terminals Services, Inc. (dba NuStar) (fka Support Terminals Services, Inc.)	AMENDMENT TO AGREED ORDER NO. DE 07-TC-S DE3938

TO: Mr. Joe Aldridge
Remediation Manager
NuStar Energy L.P.
2330 North Loop 1604 West
San Antonio, TX 78248

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I. INTRODUCTION

Agreed Order No. 07-TC-S DE3938 (Order), entered into by the Department of Ecology (Ecology) and Support Terminals Services, Inc. (aka ST Services) a subsidiary of NuStar Energy L.P. on November 7, 2007, requires that the Support Terminals Services, Inc. complete a Remedial Investigation, implement an Interim Action at the Site, perform a Risk Assessment, and conduct a Feasibility Study in accordance with a stipulated schedule. Support Terminals Services, Inc. is currently doing business as NuStar Terminals Services, Inc. (aka NuStar). Any reference in this Order or Amendment to Support Terminals Services, Inc. applies to NuStar Terminals Services, Inc.

By this Amendment to the Order, Ecology requires NuStar Terminals Services, Inc. to perform an additional interim action at the Site as detailed in the 2011 Interim Action Work Plan attached hereto as Exhibit F.

This Amendment does not attempt to recite all of the provisions of the Order. Provisions of the Order not specifically addressed in this Amendment remain in full force and effect. Format and section numbering of the Order have been maintained to the extent possible.

II. JURISDICTION

This Amendment to the Order is issued pursuant to the authority of RCW 70.105D.050(1) and WAC 173-340-530(8)(b).

V. FINDINGS OF FACT

The Order, Section V. (Findings of Fact), is hereby amended to add the following Findings of Fact. Ecology makes the following findings of fact, without any express or implied admissions of such facts by the PLP:

P. As required by the Agreed Order, the PLP submitted a Final Risk Assessment to Ecology for approval on September 9, 2008. Ecology approved the Final Risk Assessment on July 30, 2009. The Final Risk Assessment concluded that the only unacceptable ecological risk related to Site contaminants was the possible impact on aquatic or benthic organisms due to groundwater entry into the Columbia River. *Baseline Risk Assessment NuStar Vancouver Main Terminal*, Ash Creek Associates, Inc. 9/4/08, Report No. 1126-07.

Q. The PLP initiated the interim action required by the Agreed Order in 2008. The half-acre interim action is located at the primary release area and employs soil vapor extraction in the vadose zone and enhanced bioremediation in the shallow saturated zone.

VI. ECOLOGY DETERMINATIONS

The Order, Section VI. (Ecology Determinations), is hereby amended to add the following determinations:

H. Ecology has determined that additional work, in the form an interim action, is necessary to alleviate a possible impact on aquatic and benthic organisms. The 2011 interim action will take place in the region between the primary release area and the Columbia River and will encompass the existing interim action initiated in 2008.

I. Ecology believes the additional work to be performed as required by this Amendment is in the public interest.

J. Based on all information known to Ecology, Ecology has determined that the additional interim action required by this Amendment is technically necessary to reduce a threat to human health or the environment by substantially reducing one or more pathways for exposure, to correct a problem that may become substantially worse or cost substantially more to address if remedial action is delayed, and to help provide for completion of design of a final cleanup action plan. WAC 173-340-430(1).

VII. WORK TO BE PERFORMED

The Order, Section VII. (Work to be Performed), is hereby amended to replace Section VII.B. with the following:

B. All performance and/or deliverables shall be completed as indicated in Exhibit G, the "Revised Project Schedule." The schedule indicated in Exhibit G (Revised Project Schedule) supersedes the schedule in Exhibit B (Project Schedule). This attachment is an integral and enforceable part of this Order.

The Order, Section VII. (Work to be Performed), is hereby amended to authorize the Interim Action and add the following information and requirements:

E. 2011 Interim Action: Based on the Findings of Fact and Ecology Determinations, it is hereby ordered that the PLP take the following interim remedial action at the Site and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein. These plans are more specifically described in the attached "2011 Interim Action Work Plan" (Exhibit F). This exhibit and its attachments are an integral and enforceable part of this Agreed Order.

1. Location of interim action. The location of the interim action work is illustrated in Figure 10 of the 2011 Interim Action Work Plan. This attachment is an integral and enforceable part of this Order.

2. Scope of Work. The PLP shall implement the 2011 Interim Action Work Plan, attached hereto as Exhibit F. This attachment is an integral and enforceable part of this Order.

Effective date of this Amendment to the Agreed Order: May 23, 2011.

NUSTAR TERMINALS SERVICES, INC.
(dba NuStar)

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STATE OF WASHINGTON,
DEPARTMENT OF ECOLOGY

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EXHIBIT G

REVISED PROJECT SCHEDULE

Deliverables	Due Dates in Calendar Days*
1. Implement interim action as detailed in the 2011 Interim Action Work Plan** (Exhibit F)	Within 45 days of the effective date of the Agreed Order Amendment.
2. Draft Revised Remedial Investigation Report for Ecology review and approval.	By February 28, 2012.
3. Final Revised Remedial Investigation Report.	30 days after receipt of Ecology comments on the draft Remedial Investigation Report.
4. Draft Feasibility Study Report for Ecology review and approval.	March 30, 2012.
4. Final Feasibility Study Report.	30 days after receipt of Ecology comments on the draft Feasibility Study Report.
5. Draft Interim Action Evaluation Report for Ecology review and approval.	March 30, 2012.
6. Final Interim Action Evaluation Report.	30 days after receipt of Ecology comments on the draft Interim Action Evaluation Report.

** An extension to the listed due dates may be granted by Ecology under the terms of the Agreed Order, Section VIII.K. (Extension of Schedule).*

***For this Exhibit G, Revised Project Schedule, "implementation" is defined as executed subcontract agreements for the specific interim action work scope and activities between the selected interim action subcontractors and Ash Creek Associates and/or the PLP.*

2011 Interim Action Work Plan
NuStar Vancouver Facility
Vancouver, Washington

Prepared for:
NuStar Terminals Services, Inc

March 25, 2011
1126-09

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

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2011 Interim Action Work Plan
NuStar Vancouver Facility
Vancouver, Washington

Prepared for:
NuStar Terminals Services, Inc

March 25, 2011
1126-09

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1.0 Introduction

This work plan presents the design for additional 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. The Property is defined as the area within the 2006 NuStar leasehold boundary. Work was performed pursuant to Agreed Order (AO) No. 07-TC-S DE3938 between the Washington State Department of Ecology (Ecology) and NuStar.

A Remedial Investigation (RI) and Feasibility Study (FS) were conducted to collect, develop, and evaluate information sufficient for selecting a cleanup action. The RI report was submitted to Ecology in September 2008. Based on comments received from Ecology in July 2009, a revised RI report was submitted in October 2009 (Ash Creek, 2009a). A Baseline Risk Assessment (RiA) is documented in the *Baseline Risk Assessment Report* submitted to Ecology in September 2008 that provides quantitative potential risk to human health and the environment (Ash Creek, 2008). A draft FS was submitted to Ecology in January 2010 and is currently under review. Ecology has requested additional work prior to approval of the RI/FS.

In 2008, NuStar initiated interim action activities in the primary release area at the Property. The interim action activities included enhanced bioremediation injections and installation and operation of a soil vapor extraction (SVE) system. These activities have successfully reduced the concentrations of chemicals of concern (COC) in the release area and treatment is continuing.

Given that RI/FS work is continuing, the draft FS identified area beyond the current interim action to target for remediation, and interim actions have been successful in the release area, NuStar has elected to complete additional interim action at the Property. The proposed additional interim action includes expansion of the existing SVE system, additional bioremediation injections in the current interim action area, and bioremediation injections in an expanded interim action area.

1.1 Definition of Property

As discussed in the section above, the "Property" refers to the NuStar 2006 leasehold area. Features in this report may be referred to as "off-Property" or "on-Property" when describing physical location relative to the 2006 leasehold boundary. The 2006 leasehold boundary is shown on Figure 2. In 2009, NuStar leased additional property to the north, outside of the 2006 leasehold boundary. The additional property is not located in the area of historical activities relevant to the RI/FS (i.e., solvent handling, etc.), thus is not included in the Property.

1.2 Purpose

The purpose of this interim action work plan is to define the scope and schedule for implementation of interim actions in the target remediation area defined in the draft FS.

1.3 Work Plan Organization

Background information, the RI, RiA, and FS are summarized in Section 2. The locations of the proposed interim actions are discussed in Section 3. The basis for the design of the interim actions is presented in Sections 4 and 5. A project schedule is presented in Section 6. Supporting information, including detailed design drawings for the interim actions, are included in Appendices.

2.0 Background

2.1 Property Location, Description, and History

Location. The Property is located at the Port of Vancouver 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: N45º 38.26', Longitude: W122º 42.20'). The Property is owned by the Port of Vancouver (Port) and leased by NuStar.

Physical Features. Figure 2 is a Property Plan. The Property is roughly rectangular with nominal dimensions of 600 by 1,300 feet and a total area of approximately 17 acres. The Property is on the north shore of the Columbia River. Land on the other sides is industrial land also owned by the Port. The Property 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 Port.

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.

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

The Property ground surface coverage consists of the following (with approximate aerial extent):

- Buildings (35 percent);
- Paved areas (45 percent);

- Tanks (5 percent); and
- Gravel/bare ground (15 percent).

Property History. Historical aerial photographs were reviewed to identify the developmental history of the Property and were presented in the RI report (Ash Creek, 2009a). In summary, the Property was undeveloped into the 1940s. Filling occurred throughout the 1940s and 1950s, and development began about 1960 with Warehouse 9 and several ASTs. Expansion of facilities on the Property occurred periodically between the 1960s and 2000.

2.2 Property Operations

In general, the Property 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 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.

Although a variety of products have been handled at the Property over the years, the historical sampling has identified chlorinated solvents as the chemicals of interest. Historical company records suggest that handling of chlorinated solvents may have ended as early as 1990, but the end date is uncertain. Currently, products such as fertilizer, jet fuel, biodiesel, methanol, and wood preservative are received and transported via ship, pipeline, railcar, and trucks at the Property. Products are also blended, packaged, and stored on the Property.

2.3 Geology and Hydrogeology

This section presents the understanding of the geology and hydrogeology as discussed in the RI (Ash Creek, 2009a).

2.3.1 Geology

The vicinity of the Property is dominated by two primary units: unconsolidated alluvial and catastrophic flood deposits and the Troutdale Formation. Information on the regional geology is summarized below based on SECOR (2001) and AMEC (2005). Information on the Property's geology and hydrogeology was obtained during the remedial investigations (Ash Creek, 2009).

The alluvial and flood deposits are the upper unit and comprise the USA hydrogeologic unit. For consistency with previous reports, this unit is referred to as the USA herein. The thickness of the USA varies, observed to range from 125 to 200 feet thick within the areas investigated at and near the Port. The

unit consists of alluvial deposits of the Columbia River and the catastrophic Missoula Floods. The upper portion 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. The base of the USA is typically identified by the transition to an underlying conglomerate or consolidated/unconsolidated silty, sandy gravel of the Pleistocene Troutdale Formation.

Figure 3 presents a geologic cross-section through the Property. The upper part of the USA that underlies the Property 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 Property and extending south to the Columbia River. Within the upper USA, a silt layer is present on the north and east parts of the Property. At the northern Property boundary, the silt is encountered at depths as shallow as 9 to 10 feet below the ground surface (bgs) and extends to depths of approximately 40 feet bgs. This layer is continuous along the north and east of the Property, forming a low-permeability ridge at the Property boundary. The upper contact of the silt appears to coincide with the historical riverbank. The sand lying above the silt corresponds to the fill observed being placed in aerial photographs from 1948 through 1961.

A silty gravel layer underlies the sandy/silty layers of the upper USA beneath the Property. 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 Property. North of the northern Property boundary (i.e., north of the silt ridge), the shallow geology is predominantly silt. The silty gravel is not observed and a sand layer is found between the silt and underlying sand and gravel. The Troutdale Formation underlies the sand and gravel unit; however, borings installed to depths of up to 140 feet bgs at the Property have not encountered the Troutdale Formation.

2.3.2 Hydrogeology

The regional aquifers follow the regional geology discussed above. The alluvial and catastrophic flood deposits comprise the USA. The USA is unconfined and receives recharge directly from the land surface and/or surface water features. Based on numerous studies conducted in the Port 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 generally 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 the depths of about 55 and 130 feet.

- Deep USA Zone – The Deep Zone includes the lower part of the USA and in some areas, the reworked gravel at the top of the Troutdale Formation.
- TGA – The TGA corresponds to the Troutdale Formation and underlies the USA in the project area. Flow in the TGA is less influenced by regional groundwater pumping and more by regional recharge and discharge influences.

Figure 3 shows an interpretation of the hydrogeologic units at the Property. 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 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. Off-Property to the north, the sand layer beneath the silt layer is hydrogeologically connected to the underlying sand and gravel, so is therefore effectively part of the Intermediate Zone.

A groundwater divide, approximately parallel to the river bank 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 presence of the silt ridge, coupled with the groundwater divide, effectively isolates the most impacted Shallow Zone groundwater at the Property from the influences of pumping from the Shallow or Intermediate Zones north and east of the Property. Furthermore, given that the geologic source of the silt ridge is the former natural river bank, this feature is believed to be continuous well beyond the Property boundaries to the east and west.

Intermediate Zone groundwater flow is currently being evaluated. Transducers were installed in five site Intermediate Zone wells in December 2010. Water elevation data collected from these transducers will be combined with transducer data from other regional wells screened in the Intermediate Zone to prepare regional groundwater flow maps.

The lower reaches of the Columbia River – where the Property is located – are subject to tidal variations as well as seasonal and stage variations due to precipitation and regulation of river flow by dams.

In 1999, an aquifer test was conducted to evaluate hydraulic properties of the Shallow Zone on the Property (SECOR, 1999a). The analysis of data collected during aquifer pumping in the central area of the Property resulted in an estimated Shallow Zone aquifer transmissivity of 0.82 square feet per minute (ft^2/min) to 6.4 ft^2/min and an aquifer storativity of 0.002 to 0.005. The transmissivity of the Intermediate Zone has been estimated by others to range from 200 to 1,250 ft^2/min (Parametrix, 2008).

Deep groundwater is found in the Troutdale Formation which underlies the catastrophic flood deposits and alluvial deposits that make up the USA in the project area. The depth to the top of the Troutdale Formation varies significantly in the project area, and has been encountered at a depth of 98 feet directly north of the Property but is below a depth of 140 feet beneath the Property. The Troutdale Formation contains more fines than the USA and ranges from consolidated to semi-consolidated due to cementation. The differing lithology of the Troutdale Formation results in a transmissivity of the TGA at least an order of magnitude lower than the USA (Parametrix, 2008).

2.3.3 Surface Water and Surface Water Drainage

The Columbia River bounds the Property to the southwest. The Property is situated on the Columbia River flood plain. As described in Section 2.1, the majority of the Property is covered with an impermeable surface (i.e., buildings, asphalt, concrete). Surface water in the terminal area is directed to a permitted stormwater system that is maintained by the Port.

2.3.4 Aquatic and Terrestrial Habitat

The Columbia River is located along the southwest boundary of the Property. Aquatic organisms including anadromous and resident fish species, some of which are threatened or endangered, use parts of the river during various stages in their life cycles. As discussed in Section 2.1, the Property and surrounding area are covered with impermeable surfaces and provide no terrestrial habitat.

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 tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (DCE) in soil, groundwater, and soil vapor. Most of the planned investigation activities were completed between 1980 and 2009. Together, these activities comprise the RI (Ash Creek, 2009a) findings to date summarized in this section.

Land Use. The RI report presents supporting documentation indicating the site is an industrial property as defined by WAC 173-340-200.

Groundwater Use. Groundwater at the Property is not currently used for any purpose. As discussed in Section 2.3.2, a groundwater divide is present in the Shallow Zone groundwater. Groundwater south of the divide has a southerly gradient on much of the Property, is tidally influenced, and discharges to the Columbia River. Groundwater north of the ridge is less tidally influenced and generally flows away from the river. The Intermediate Zone beneath the Property is a productive aquifer that is used regionally for municipal and industrial water supply.

Surface Water. There are no surface waters on the Property. The Columbia River is located adjacent to the Property, to the south. The Columbia River has a variety of uses including serving as an active channel for large commercial ships. The river is not currently used for drinking water in Vancouver or within several miles of the Property and is not likely to be used for drinking water within the foreseeable future. Anadromous and resident fish species use parts of the river during various stages in their life cycles. A number of local American Indian tribes have fishing rights on the Columbia River. The Columbia River is also used for fishing for sport and consumption and for recreational boating.

Chemicals of Potential Concern. A screening of chemical data identified the chemicals of potential concern (COPCs) in soil and groundwater to be chlorinated solvents and associated degradation products. Three COPCs (PCE, TCE, and vinyl chloride [VC]) account for greater than 99.9 percent of potential human health risk based on comparison to screening levels (Ash Creek, 2008). Cis-1,2-DCE is a breakdown product of PCE and TCE and will break down into VC. These four compounds represent the primary human health COPCs. In addition, PCE, TCE, cis-1,2-DCE, 1,1-dichloroethene, 1,1,1-trichloroethane, and 1,1-dichloroethane were identified as COPCs based on screening levels for aquatic organisms.

Extent of COPCs in Soil. A review of soil analytical data indicate that the relatively highest molar concentrations of COPCs in vadose zone soil (<25 feet bgs) are present near location AGP-22 and locations AGP-28/AGP-29. The COPCs in vadose zone soil are predominantly PCE, with lesser concentrations of TCE and cis-1,2-DCE. The extent of total molar chloroethenes in soil is shown on Figure 4.

Extent of COPCs in Shallow Zone Groundwater. Figure 5 shows the extent of COPCs in Shallow Zone groundwater. Shallow-zone COPCs emanating from source areas within the NuStar facility property are limited to within about 100 feet of the Property boundary to the north and up to 300 feet of the Property to the west and east in the Shallow Zone. The river defines the extent of halogenated volatile organic compounds (HVOCs) to the south. It is anticipated that there will be net discharge from the Shallow Zone groundwater to the river.

2.5 Risk Assessment

A baseline RiA was completed in accordance with the requirements for determining cleanup standards under MTCA (Ash Creek, 2008).

Human Health. The baseline human health risk assessment indicated that the potential hazards associated with non-carcinogens or the estimated excess lifetime cancer risks associated with carcinogens were acceptable with the exception of the vapor intrusion pathway and a hypothetical (future) drinking water pathway.

Ecological. The Property is within an industrial area, is generally covered with buildings and pavement, and has little or no habitat, so terrestrial ecological risk is acceptable. Several COPCs are estimated to potentially exceed conservative effects-based concentrations in surface water or sediment at the groundwater/surface water interface.

2.6 Feasibility Study

Based on the results of the RI and risk assessment, an FS was completed in accordance with MTCA. The draft FS report was submitted to Ecology in January 2010 (Ash Creek, 2010b).

Cleanup standards were developed for soil and groundwater as follows.

- Soil – Cleanup levels for soil were developed in accordance with MTCA Method C. Each applicable pathway was considered and cleanup levels protective of groundwater (as a drinking water source) were the controlling cleanup levels. The standard point of compliance for soil cleanup levels to protect groundwater is throughout the site.
- Groundwater – Cleanup levels for groundwater were developed in accordance with MTCA Method B. Groundwater cleanup levels were established to be protective of groundwater as a drinking water source. Cleanup levels protective of air, sediment, and surface water were also evaluated in the development of the groundwater cleanup standard. Groundwater cleanup levels protective of drinking water are presumed to be adequate to protect the air pathway. Two cleanup levels were developed for each COC based on the point of compliance. The first is a cleanup level protective of the drinking water pathway. The second represents the pathway protective of surface water/sediment for each COC (whichever is the lower value). The standard groundwater point of compliance is the saturated zone throughout the site and corresponds to the drinking water pathway cleanup level. For the surface water/sediment protective groundwater cleanup level, the point of compliance is the point where groundwater enters the surface water.

Cleanup alternatives were developed and evaluated in accordance with MTCA requirements. To select a cleanup action that uses permanent solutions to the maximum extent practicable, the groundwater cleanup action alternatives were subjected to a disproportionate cost analysis. Based on a comparative analysis, the groundwater cleanup action alternatives were ranked from most to least permanent, as follows: enhanced bioremediation, reactive treatment wall/enhanced bioremediation, and groundwater extraction/treatment.

Based on the results of the FS, the recommended cleanup action alternative for the site is SVE combined with enhanced bioremediation and monitored natural attenuation (MNA). The current interim action SVE system would be expanded to address the soil above cleanup levels. Enhanced bioremediation would be used to treat groundwater and saturated soil corresponding to the majority of site risk. MNA would be used to address residual concentrations of COC in peripheral areas of soil and groundwater. Groundwater use

restrictions, as part of a restrictive covenant or equivalent, would be implemented. Monitoring would be used to evaluate the concentrations of COC in soil, groundwater, and/or vapor to evaluate the effectiveness of the cleanup action.

2.7 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. Soil vapor, vadose zone soil, saturated zone soil, and groundwater data support that releases occurred in this area. Two interim actions have been conducted at this release area. A summary of each is provided below.

2.7.1 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 chlorinated volatile organic compound (VOC) concentrations within the areas of greatest impact and to complete cleanup of hazardous substances in these areas. The interim action consisted of two components: (1) a re-circulating system to treat groundwater; and (2) vapor extraction to treat soil. The 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 pumped groundwater from extraction wells installed near the river (EX-3 through EX-5), treated the pumped 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). Interim remedial action continued through 2005. The interim action successfully removed HVOC mass at the Property (based on the drop in concentration of HVOCs in some wells), but overall the system was not efficient at addressing the release area.

2.7.2 Interim Action – 2008 through Present: Combined Enhanced Bioremediation and Soil Vapor Extraction

An interim action analysis (Ash Creek, 2006) was completed in accordance with WAC 173-340-430 and WAC 173-340-360 that evaluated a range of potential alternatives for additional interim remedial action. The implemented interim action selected for the release area consisted of SVE in the vadose zone and enhanced anaerobic bioremediation of the saturated zone. The interim action was initiated in April 2008. The interim action activities were conducted in general accordance with the *Release Area Interim Action*

Design (Ash Creek, 2007). The general scope of the interim action consisted of injection of a bioremediation substrate into temporary injection points and installation/operation of an SVE system. The layout of the interim action system is shown on Figure 6, and installation is documented in the *Interim Action Installation Report* (Ash Creek, 2009b). Operation and monitoring of the interim actions is ongoing.

2.7.3 Interim Action Performance Monitoring

Performance monitoring including soil and groundwater sampling was conducted in September and October 2010. These data are reported and evaluated in the *Interim Action Performance Evaluation* report (Ash Creek, 2010c). A copy of the report is included in Appendix A. Based on the performance evaluation, the following conclusions and recommendations have been made regarding the current interim action and anticipated expanded interim action at the Property:

- *Vadose Zone Soil*
    - The interim action SVE system is effectively removing VOC mass from the vadose zone soils. SVE should be effective within the expanded interim action area.
    - NAPL was not observed during the performance evaluation site assessment or during historical site assessment activities. However, elevated VOC concentrations are present in isolated areas of silty vadose zone soil within the existing interim action area. Elevated PCE concentrations exceed the soil saturation limit in some silty soil, indicating that it may be possible that residual NAPL is present in localized areas within the silty soil at the site. The continued operation of the SVE system will address areas of elevated VOC concentrations; however, this will involve operating the SVE system in the 2008 Interim Action area for longer than anticipated at design.
    - The expanded interim action area is not within the former product handling area, so NAPL (or isolated areas of relatively higher VOC concentrations associated with silt layers) is not anticipated to be present in vadose zone soils in the expanded area. Therefore, it is expected that SVE operations in the expanded area will exhibit classic behavior with concentrations that steadily decline to an asymptotically low value within a few years of operation. The duration of required SVE in the expanded area should be less than the current interim action.
- *Groundwater*
    - The 2008 bioremediation injections have effectively decreased VOC concentrations in groundwater. The presence of VOCs in saturated soil within the current interim action area may continue to contribute VOCs to groundwater in the absence of further interim action. Therefore, as part of the expanded interim action, additional treatment should be completed in the source area treated in 2008.

- Nitrates in the interim action area are interfering with the reductive dechlorination of chlorinated solvents and have likely accelerated the use of the bioinjection substrate. Design of the oil injection volumes should account for the higher nitrate levels.
- As discussed in the vadose zone section above, elevated concentrations of VOCs still remain in the subsurface, particularly in silty soils. However, unlike vadose zone soil being treated by SVE, the presence of relatively elevated VOC concentrations in silty soil within the saturated zone is not anticipated to slow the remediation process via enhanced bioremediation, because injected oil creates an anaerobic environment throughout the saturated zone inducing degradation in both finer and coarser grained soils. This is evidenced by the decreasing groundwater concentration trends for PCE in almost every site well.

3.0 Extent of Interim Action

This section discusses the extent of COC in soil and groundwater at the Property warranting further interim action.

3.1 Soil

The discussion of extent presented in this section focuses on vadose zone soil (generally corresponding to a depth of 25 to 30 feet). Although the standard point of compliance for soil (for protection of groundwater) is throughout the soil column, the concentrations of COC present in groundwater make differentiating between COC in saturated soil and groundwater difficult. Furthermore, actions to clean up groundwater will address saturated soil as well, so saturated soil will be addressed together with groundwater. Finally, for other potential soil cleanup levels (i.e., Method C or vapor intrusion), the point of compliance is entirely within the vadose zone.

In the FS, vadose zone soil data from the RI were compared to the cleanup levels developed in the FS. Only PCE and TCE were detected in vadose zone soil above cleanup levels. The extent of vadose zone soil with concentrations of PCE and TCE detected above cleanup levels is shown on Figure 7. The figure shows that the primary area of impact to soil is around Warehouse 13 and extending in a corridor toward the seawall. Figure 7 also shows the area of current interim action in the vadose zone soil. That portion of the vadose zone above cleanup levels that is not currently within the active or historical interim action areas will be targeted for expanded interim action.

3.2 Groundwater

The FS (Ash Creek, 2010b) presented a detailed evaluation of the extent of groundwater warranting active remedial action. A disproportionate cost analysis was used to evaluate the practicability of active groundwater cleanup. Figure 8 shows the extent of practicable active groundwater cleanup at the site as

determined in the FS. Also shown on the figure is the extent of the current interim action in groundwater. The area of practicable active groundwater cleanup is targeted for treatment in the expanded interim action. The interim action performance evaluation (see Section 2.7.3) indicates that further treatment in the source area would be beneficial. The expanded interim action will include additional injection within the source interim action area.

4.0 Design Analysis – Soil Vapor Extraction

The *Interim Action Analysis* (Ash Creek, 2006) and FS (Ash Creek, 2010b) identified SVE as the technology to address VOCs in the vadose soil at the Property. The layout and size of the SVE components is dependent on the surface cover, soil type, depth to groundwater (the thickness of the vadose zone), and horizontal and vertical extent of the target VOCs. The Interim Action Analysis (Ash Creek, 2006) provided detailed evaluation of the design components of the SVE system. In addition, the source area interim action has been operating since September 2008. As discussed in Section 2.7.3, based on the performance of the current interim action SVE system, SVE should be effective in the expanded interim action area.

Based on the prior design analysis and performance of the existing interim action system, a similar design will be used for the interim action expansion. In summary, the well design parameters are:

- Air flow rate of 25 cubic feet per minute (cfm) per extraction well;
- Well spacing of 30 feet;
- Well screen extending from 5 to 25 feet bgs (two wells each with 10-foot screens at each location to better assure uniform flow over full well depth); and
- Ground surface covered with pavement.

A total of 17 vapor extraction locations are required to cover the expanded treatment area, as shown on Figure 9. The wells will be configured into five groupings with three to four well locations per group. Each group will be connected to a single branch connecting to a header pipe through a valve. Between the existing and new wells, there will be a total of 10 branches (each with three to four well locations) for a total of 34 well locations.

Blower. In general, the existing blower is suitable for operating both the existing and expanded SVE system, although operation would be conducted on a rotating basis with only a portion of the branches operating at any one time. However, the under-rail crossing for the piping is at capacity, so two blowers will be used, one on each side of the railroad. Because eight of the 10 branches are on the south side of the tracks, the existing blower will be relocated to the south side of the tracks and connected to those eight branches. A new, lower-capacity blower will be installed in the existing treatment area.

Piping Selection. Piping has been sized for ease of installation and so that the pressure drop (friction losses) through the pipe is less than one inch of water per 100 feet of pipe. Friction losses were estimated from the friction loss equation for turbulent air flow in a pipe ($\Delta P = 0.109136 Q^{1.9} / d^{5.02}$, where ΔP is the pressure drop over 100 feet of pipe, Q is the flow rate in cubic feet per minute, and d is the pipe diameter in inches). Well diameters were set at not more than 2 inches to allow installation using direct-push techniques. Pipe diameters are maintained over the length of each branch to simplify installation and reduce the potential for vacuum leaks at pipe junctions.

The selected piping diameters are:

Location	Diameter (inches)
At each vapor extraction well	2
Each manifold zone (3 or 4 wells)	4
Main header	8

The piping will consist of Schedule 80 PVC to resist damage from heavy traffic and during installation. The concentrations of vapors in the operating airflow are not expected to adversely affect the PVC material during the operating life of the system.

Vapor Treatment. Activated carbon will be used to remove VOCs from the air stream prior to discharge into the atmosphere (other removal technologies, such as catalytic or thermal oxidation, are complicated by the concentrations of chlorinated solvent hydrocarbons, which would produce hydrochloric acid as a byproduct of the oxidation). The existing carbon vessels (two 1,500-pound vapor carbon vessels) will be relocated to the south side of the railroad with the existing blower. These vessels are sized to accommodate the required air flow and to reasonably limit the frequency of carbon replacement. Two vapor carbon vessels are present in series to allow full saturation of the lead carbon prior to replacement. Vapor monitoring will continue to be conducted before, between, and after the carbon vessels to verify efficient use of the carbon but also compliance with discharge limitations. The existing carbon vessels accommodate the design flow rate of up to 450 cfm with a head loss of less than 5 inches of water each.

Carbon treatment will not be installed on the new, lower-capacity blower to be installed at the existing treatment system. Based on recent monitoring, concentrations of emissions at potential exposure points are estimated to be at or below acceptable risk-based concentrations for industrial receptors.

Based on the performance of the existing interim action system, the initial carbon usage rate is expected to be not greater than 3,000 pounds of carbon in 60 days (50 pounds per day). This rate is expected to drop to 15 pounds per day (3,000 pounds in six months) within three months of startup, and will likely remain at similar levels until the higher concentrations in the silt lenses are depleted. Usage for vapors extracted from the expanded interim action area is expected to continue to decrease with time.

Expected Operation Period. In general, soil conditions in the vadose zone of the expanded interim action area are similar to the current interim action area and concentrations of VOCs are lower. The soils consist primarily of sand with occasional silt layers. However, the soils in the expanded interim action area also include some gravel and concrete debris, and there appears to be fewer silt layers relative to the existing interim action area. Therefore, the operation period for the SVE system in the expanded interim action area is expected to be shorter than for the existing interim action area. To date, the SVE system in the existing interim action area has operated for approximately 2.5 years, and except for the a few silt layers, cleanup of the vadose zone is essentially complete. It is expected that cleanup of the expanded interim action area should require on the order of 2 years of operational time. Accounting for on/off cycling of various branches, the total operation time in the expanded area is expected to be approximately 3 years.

System Design. The design for the SVE system is included in Appendix B.

5.0 Design Analysis – Enhanced Bioremediation

The *Interim Action Analysis* (Ash Creek, 2006) and FS (Ash Creek, 2010b) identified *in situ* enhanced bioremediation (anaerobic reductive dechlorination) as the technology to address volatile organics in the groundwater and saturated soil of the Shallow Zone treatment area (from the top of the groundwater table to a nominal depth of 45 to 50 feet). The Interim Action Analysis (Ash Creek, 2006) provided detailed evaluation of the design components of the enhanced bioremediation system. In addition, the source area interim action has been operating since May 2008. As discussed in Section 2.7.3, based on the performance of the current interim action system, enhanced bioremediation should be effective in the expanded interim action area, though the presence of nitrate across the treatment area does increase the mass of bioremediation substrate needed to reach the intended effectiveness.

Based on the prior design analysis and performance of the existing interim action system, the same process will be used for the interim action expansion. The following discusses the conditions within the expanded interim action area (see Figure 8) to support the injection strategy.

Soil Profile. The saturated zone soil in the expanded interim action area is generally characterized by a medium sand (with occasional lenses of silty sand or silt) that extends from the top of the water table (a nominal depth of 25 feet) to the bottom of the shallow aquifer. At 40 to 50 feet bgs, a layer of silt and silty gravel separate the overlying medium sand (Shallow Zone) from an underlying gravel unit (Intermediate Zone). Figure 3 shows a cross section through the vicinity of the treatment area. Aquifer testing completed during previous work at the Facility indicates a hydraulic conductivity on the order of 0.01 cm/sec for the shallow aquifer.

Chemical Profile. Within the expanded interim action area, PCE concentrations ranged from non-detect to 4 milligrams per kilogram (mg/kg) in the soil, and 0.01 to 9.8 mg/L in groundwater. TCE concentrations

ranged from non-detect to 0.57 mg/kg in soil, and non-detect to 4.1 mg/L in groundwater. The relatively highest concentrations of PCE and TCE in the saturated zone were found at depths of between 35 and 45 feet bgs.

Selected Injection Substrate and Quantity. The selected injection substrate for the interim action expansion is an emulsified oil substrate manufactured by EOS Remediation, Inc., of Raleigh, North Carolina. The EOS® electron donor consists of a blend of fast- and slow-release electron donors in a micro-emulsion form with uniform droplets significantly smaller than soil pore spaces. EOS® is an emulsified oil product that includes easily 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 EOS vendor estimates a default lifetime of 5 years for their product. This default value is used to estimate the quantity of product needed, so assuming a longer lifetime is conservative (i.e., results in a greater estimate of product needed). Actual product lifetime is typically less than five years. Based on data collected to evaluate the performance of the injections in the source area interim action (see Appendix A), those initial injections may be nearing completion after approximately 2.5 years, but this may be partially the result of higher than expected nitrate levels. Accounting for these higher nitrate levels, the expected lifetime of the EOS substrate is on the order of 3 years.

This product was selected over the previously used whole-oil substrate based on recent groundwater monitoring that has demonstrated nitrate concentrations higher than levels detected prior to the previous interim action. Nitrate concentrations were detected in October 2010 up to 990 mg/L in monitoring well MP-1 with an average of 320 mg/L, compared to an average of 140 mg/L from 2007 data. Based on an evaluation using vendor application models, the EOS product provides overall better results under these changed conditions.

The total volume of substrate to be injected was estimated using the vendor-supplied calculation tool that accounts for both the stoichiometric hydrogen demand of the chemicals (from both the targeted contaminants such as PCE and interfering compounds such as nitrates and sulfates) and the physical limitations of the soil matrix. Appendix C includes the calculation of the amount of substrate to be injected. A total of 92,000 pounds (210 drums) of EOS substrate will be injected for the expanded interim action.

Injection Strategy. To distribute the EOS substrate evenly throughout the proposed treatment area, the injections are generally spaced equidistantly with alternate rows offset by half of the spacing. Outside the source area, the spacing was set at 25 feet (based on an estimated 50-foot zone of potential impact and a factor of safety of two, as described in the Department of Defense ESTCP *Protocol for Enhanced In Situ Bioremediation Using Emulsified Edible Oil;* DOD, 2006). To provide more continuous coverage in the

source area (the area of the current interim action), the spacing between points is reduced by half (to a distance of 12.5 feet). To prevent the substrate injection from potentially impacting the adjacent surface water, injections will not be done within 100 feet of the riverbank (based on the above estimated 50-foot zone of potential impact and a factor of safety of two). The corresponding layout, accommodating obstructions and the overlap between the standard injection spacing and the source area injections, results in a total of 155 injection points. Specifically, there are 46 injection points in the source area and 109 injection points outside of the source area. The layout of the proposed injections is shown on Figure 10 and is presented in the design drawings in Appendix D.

In general, substrate will be injected in the saturated zone over the depth range corresponding to the Shallow Zone. Actual injection depths will be determined at the time of injection. The upper limit will correspond to the top of the water table as determined by the depth to groundwater in monitoring wells within the injection area (generally expected to be on the order of 30 feet). The lower limit is determined by the depth to the silty gravel layer separating the Shallow and Intermediate Zones on the property. Based on prior probe work, the lower limit depth will vary from 42 to 55 feet with most injections being in the 45- to 50-foot depth range. For planning purposes, the injection depths have been assumed to be between 30 to 50 feet, except that injections nearest the river have been assumed to be between 30 to 55 feet.

Delivery Method. The injection points will be completed using direct-push technology. An injection probe tip will be advanced to the pre-designated depth at each injection location, withdrawn in 5-foot intervals, and emulsified oil will be injected through the drill stem via an air diaphragm pump. This process is repeated until the full depth of the injection boring is complete.

Solution Preparation/Injection Volume. The EOS® emulsified oil concentrate will be diluted with water obtained from the municipal water supply and dechlorinated using a purpose-specific commercial additive (such as sodium thiosulfate). Injections outside the source area will be diluted at a ratio of approximately 10 to 1, and injections within the source area will be diluted at a ratio of 20 to 1 (such that at the spacing discussed above, the same mass of substrate will be delivered per unit treated volume). The total solution volume will be approximately 147,000 gallons. Two 1,000-gallon polyethylene tanks will be used to allow mixing and injection to be performed simultaneously. Mixing of the solution will be accomplished by combining the EOS® concentrate with water and stirring with a recirculation pump.

Injection Rate. For the typical injection point outside the source area, approximately 240 gallons of prepared emulsified solution will be injected per 5-foot vertical zone, for a total of approximately 960 gallons of solution injected per location. The source-area injections will receive approximately 230 gallons of solution per 5-foot zone (but at a higher dilution of water to substrate of 20:1), increasing the potential for the solution to directly contact soil with higher relative source area concentrations. For the injection locations nearest the river, the injection thickness is slightly larger (up to about 25 feet) but the lower concentrations of VOCs and nitrates in this area require less substrate mass. Each of these points will receive the same

total volume per injection of 960 gallons (though at 190 gallons per 5-foot zone). In the event that the target depth cannot be achieved because of equipment refusal, the solution will be evenly distributed over the depth range of 25 feet to the actual depth achieved. The initial targeted injection rate is 10 to 20 gallons per minute. The required net injection pressure depends on several factors such as losses in the piping, hydraulic conductivity of the soil, and static water pressure at the injection depth. At the injection depths, the soils consist predominantly of sand so short circuiting along the drill string is anticipated to be minimal.

Abandonment. The injection borings will be abandoned in accordance with OWRD regulations and procedures. The abandonment procedure will consist of pressure-grouting the injection from the bottom up with a high-solids bentonite slurry pumped through a tremie pipe/probe rod set at the bottom of the hole.

Expected Performance Results. The enhanced bioremediation technology is capable of complete destruction of the target compounds (chlorinated VOCs). This has been demonstrated in both laboratory and field applications. The ability to achieve complete destruction depends on a number of factors such as presence of appropriate bacteria, presence of nutrients, ability to achieve and maintain anaerobic conditions, and presence of competing electron acceptors. Usually, the primary factor affecting the ability to achieve complete destruction is the ability to effectively mix the aqueous phase dissolved target compounds with the biosubstrate. Higher concentrations of VOCs in silt layers may not have sufficient contact with the substrate within the effective lifetime of the substrate for complete destruction. These pockets of remaining VOCs can then act as a source for some level of rebound of dissolved phase concentrations of VOCs. For the existing interim action injections in the source area, the average total molar concentration of chlorinated VOCs within the injection area has been reduced by approximately 80 percent (see Appendix A). Complete destruction was not achieved (although further reduction is still possible) likely because of the higher than expected nitrates and because of relatively higher concentrations of VOCs remaining in silt layers within the treatment zone. The presence of higher concentrations in silt zones was anticipated and additional injection within the source area was expected to be required. The proposed injection strategy should be effective in establishing an anaerobic environment in the targeted saturated zone that will be suitable for bioremediating the VOCs present within *both* the finer and courser grained soils in the saturated zone. Given the performance to date, consideration of the higher nitrate levels, and distribution of VOCs, it is expected that average reductions in chlorinated VOCs within the treatment area should be on the order of 90 percent, with nearly complete destruction possible outside of the source area.

6.0 Schedule

To minimize the interference of the two operations intended for the treatment area (installation of the SVE wells and piping in the vadose zone and the bioremediation injection in the saturated zone), the bioremediation injection effort would be completed first – an effort that is expected to have a duration of 16 to 32 days, depending on the achievable injection rate. These injections could begin within 3 weeks of a notice to proceed (based on the vendor's estimate of needed lead-time to deliver the product). The injection

schedule would need to be coordinated with Facility personnel as the work will be completed within areas of terminal operations and in the vicinity of area roadways and rail spurs.

The installation of the SVE system components would generally follow the bioremediation injections, though the work can overlap with the SVE drilling and pipe installations being done in areas where the bioremediation injections are complete. The SVE system expansion is expected to take two to four weeks to install.

7.0 References

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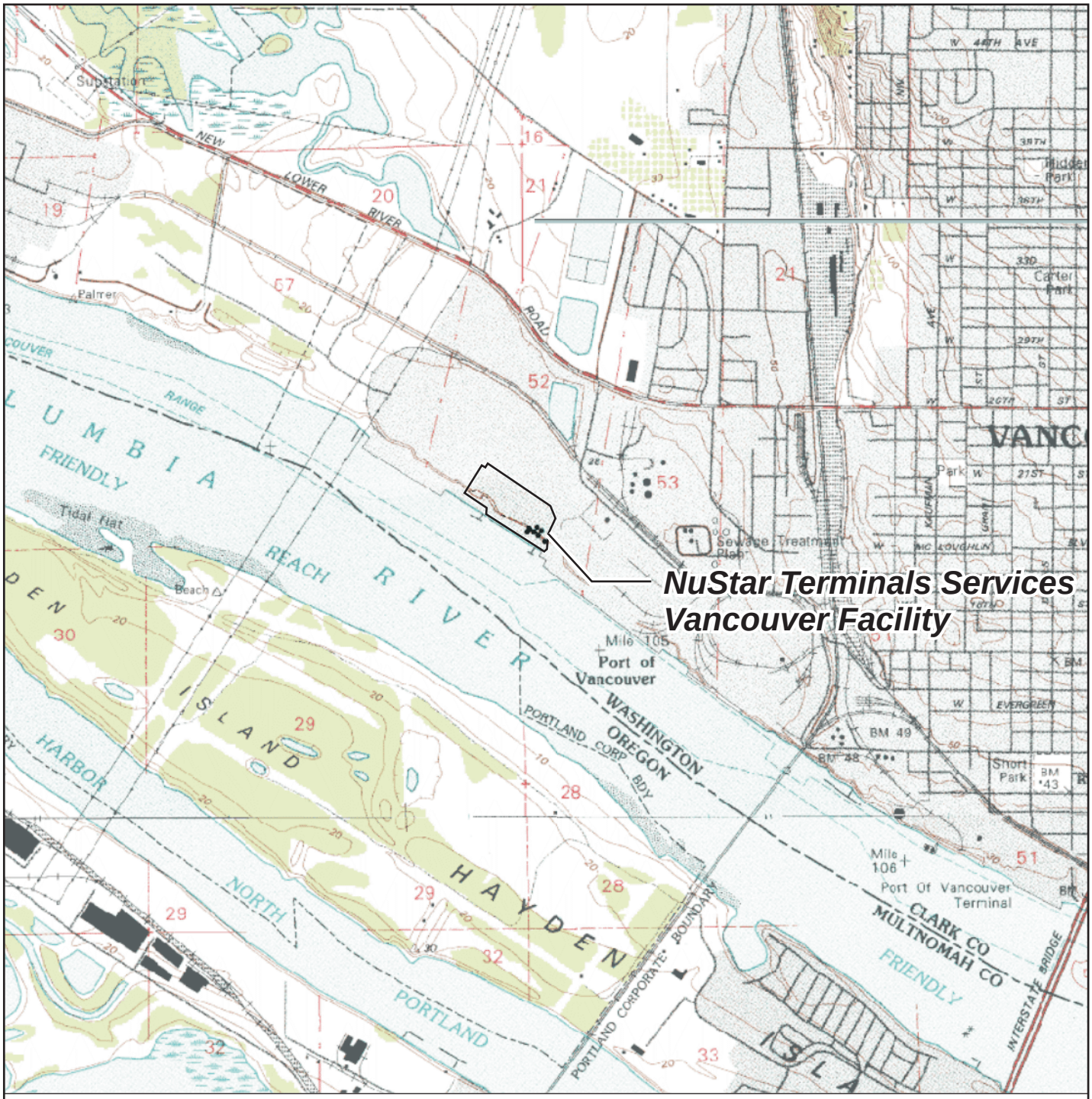
SECOR International, Inc., 2001. *Final Remedial Investigation Report, Vancouver Terminal, Port of Vancouver Terminal No. 2, Vancouver, Washington*. October 19, 2001.



NOTES: 1) Base map prepared from USGS 7.5-minute quadrangles as provided by Topozone.
2) Property defined based on 2006 leasehold boundary.

0 2000 4000
Scale in Feet

N

Property Location Map

2010 Interim Action Work Plan
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

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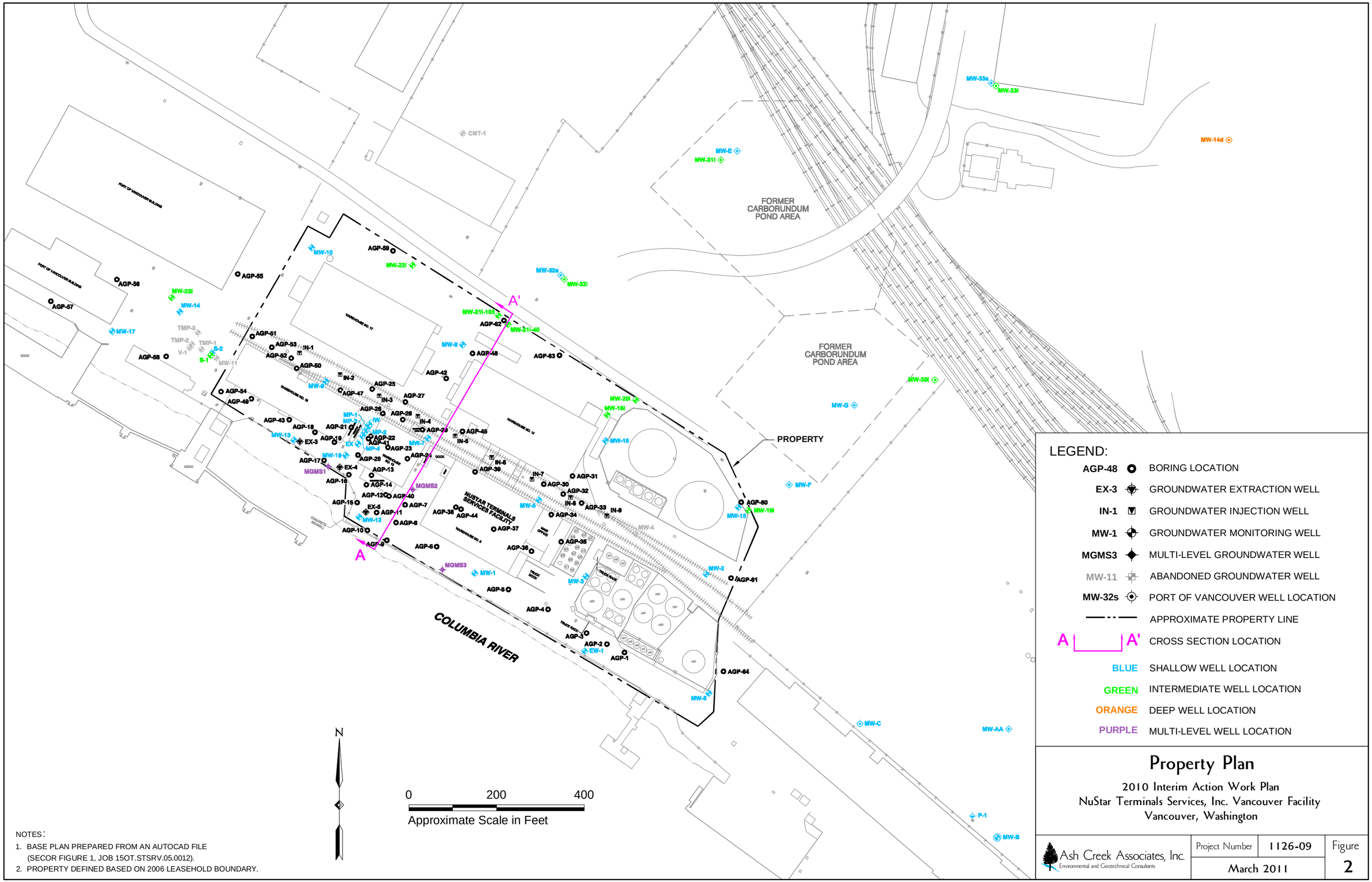

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. PROPERTY DEFINED BASED ON 2006 LEASEHOLD BOUNDARY.

LEGEND:

AGP-48	BORING LOCATION
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
A — A'	CROSS SECTION LOCATION
BLUE	SHALLOW WELL LOCATION
GREEN	INTERMEDIATE WELL LOCATION
ORANGE	DEEP WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Property Plan

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NuStar Terminals Services, Inc. Vancouver Facility
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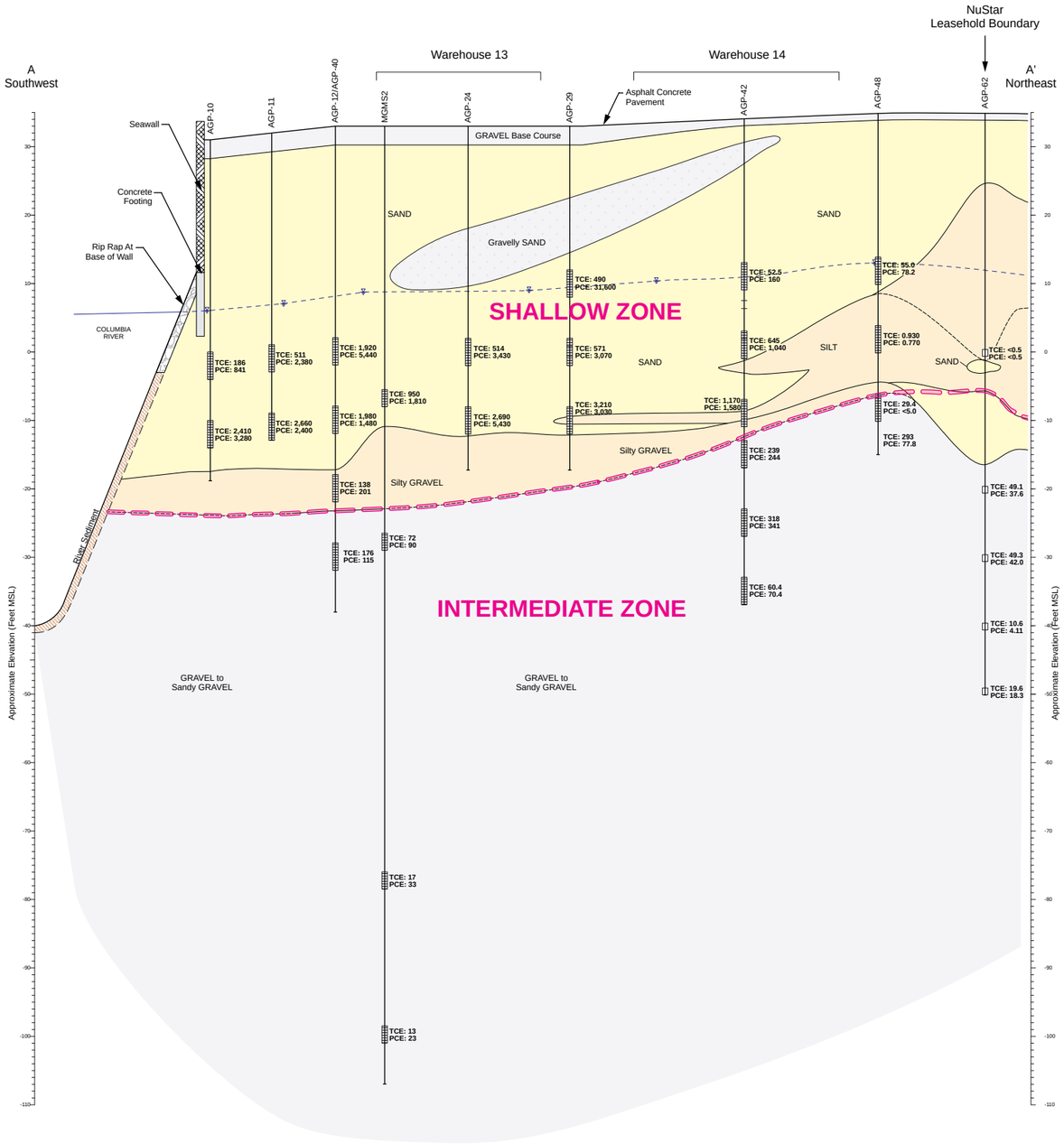
Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
March 2011		2



Legend:

- Borehole
- Water Level (At Time of Drilling)
- TCE: 176 / PCE: 115 — Trichloroethene (TCE) Concentration in µg/L; Tetrachloroethene (PCE) Concentration in µg/L
- Screened Interval
- Depth Discrete Sample Location
- Approximate Boundary Between Shallow and Intermediate Zone

NOTE: Mean Sea Level (MSL) referenced to NGVD29/47 Datum.

GEOLOGIC DESCRIPTIONS:

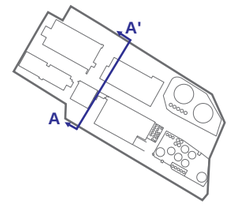
SAND: Sands, ranging in color from reddish brown to dark brown to gray. Fine to very coarse grained. Poorly graded to well graded and poorly sorted to well sorted. Primarily basaltic and micaceous. Found with trace clays and gravels, and/or thin silt layers.

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.

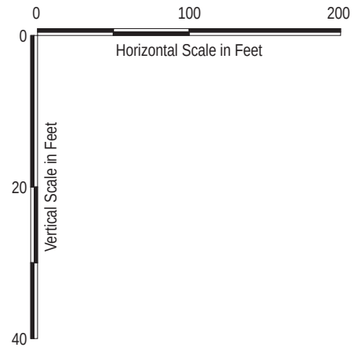
Gravelly SANDS: Gravelly sand to sand with gravel. Color ranging from reds to brown or black. Fine to coarse sands that are poorly graded to well graded. Clasts are well rounded to angular, up to six inches in diameter. Basaltic and micaceous with trace silts.

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



Cross Section Location



Geologic Cross-Section A-A'

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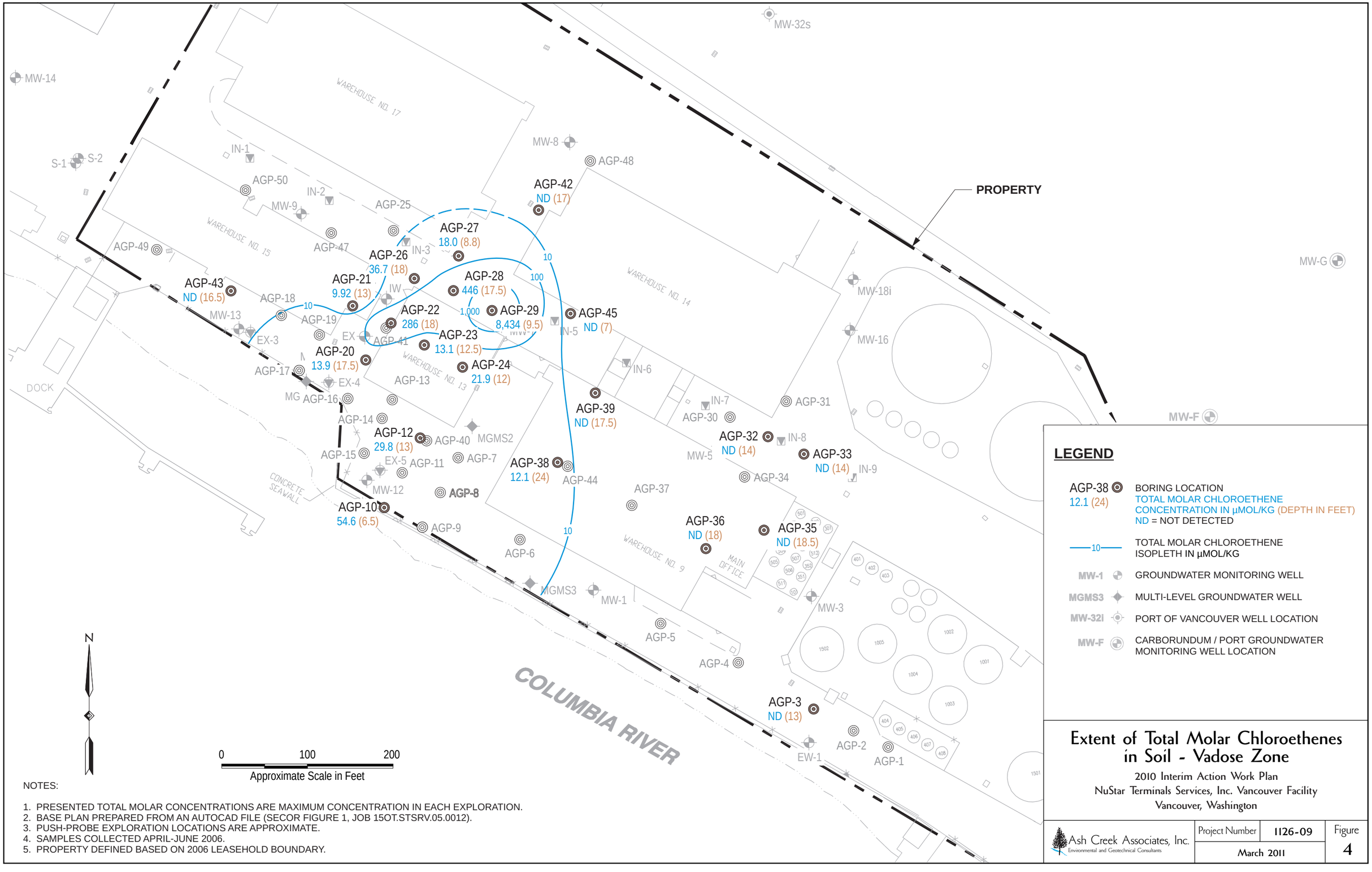
Figure 3



NOTES:

1. PRESENTED TOTAL MOLAR CONCENTRATIONS ARE MAXIMUM CONCENTRATION IN EACH EXPLORATION.
2. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
3. PUSH-PROBE EXPLORATION LOCATIONS ARE APPROXIMATE.
4. SAMPLES COLLECTED APRIL-JUNE 2006.
5. PROPERTY DEFINED BASED ON 2006 LEASEHOLD BOUNDARY.

LEGEND

- AGP-38 / 12.1 (24) — BORING LOCATION; TOTAL MOLAR CHLOROETHENE CONCENTRATION IN µMOL/KG (DEPTH IN FEET); ND = NOT DETECTED
- 10 — TOTAL MOLAR CHLOROETHENE ISOPLETH IN µMOL/KG
- MW-1 — GROUNDWATER MONITORING WELL
- MGMS3 — MULTI-LEVEL GROUNDWATER WELL
- MW-32I — PORT OF VANCOUVER WELL LOCATION
- MW-F — CARBORUNDUM / PORT GROUNDWATER MONITORING WELL LOCATION

Extent of Total Molar Chloroethenes in Soil - Vadose Zone

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EXTENT OF COPCS IN SHALLOW ZONE GROUNDWATER FROM REMEDIAL INVESTIGATION REPORT

PROPERTY

FORMER CARBORUNDUM POND AREA

FORMER CARBORUNDUM POND AREA

NUSTAR TERMINALS SERVICES FACILITY

COLUMBIA RIVER

POINT OF VANCOUVER BUILDING

POINT OF VANCOUVER BUILDING

WAREHOUSE NO. 17

WAREHOUSE NO. 16

WAREHOUSE NO. 14

WAREHOUSE NO. 9

MAIN OFFICE

TRUCK SCALE

TRUCK RACK

DOCK

CONCRETE BUNKERS

N

0 200 400

Approximate Scale in Feet

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. PROPERTY DEFINED BASED ON 2006 LEASEHOLD BOUNDARY.
3. HVOCs = HALOGENATED VOLATILE ORGANIC COMPOUNDS
4. COPCs = CHEMICALS OF POTENTIAL CONCERN

LEGEND:

- AGP-48 — BORING LOCATION
- 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

- GROUNDWATER CHEMISTRY - ND HVOCs
- GROUNDWATER CHEMISTRY - HVOCs DETECTED BELOW METHOD A LEVELS
- GROUNDWATER CHEMISTRY - HVOCs DETECTED ABOVE METHOD A LEVELS

Extent of COPCs in Shallow Zone Groundwater

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Figure 5

SOIL VAPOR EXTRACTION SYSTEM
(SEE FIGURES 7 and 8)

ELECTRICAL SERVICE INSTALLED
FROM EXISTING BUILDING SERVICE

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

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

VADOSE SOIL INTERIM
ACTION AREA

GROUNDWATER/SATURATED SOIL
INTERIM ACTION AREA

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

IN-1 IN-2 IN-3 IN-4 IN-5

MW-9 MW-13 MW-19 MW-7 MW-12

EX-3 EX-4 EX-5

MGMS1 MGMS2

VE-5-1 VE-5-2 VE-5-3 VE-4-1 VE-4-2 VE-4-3 VE-4-4 VE-3-1 VE-3-2 VE-3-3 VE-3-4 VE-2-1 VE-2-2 VE-2-3 VE-1-1 VE-1-2 VE-1-3 VE-1-4

IP-1 IP-2 IP-3 IP-4 IP-5 IP-6 IP-7 IP-8 IP-9 IP-10 IP-11 IP-12 IP-13 IP-14 IP-15 IP-16 IP-17 IP-18 IP-19 IP-20 IP-21 IP-22 IP-23 IP-24 IP-25 IP-26 IP-27 IP-28 IP-29 IP-30 IP-31 IP-32 IP-33 IP-34 IP-35 IP-36 IP-37 IP-38

IW MP-1 MP-2 MP-3 MP-4

WAREHOUSE NO. 15

WAREHOUSE NO. 13

COVERED AREA

EXISTING CONCRETE PAD

ELECTRICAL PANEL

EXISTING ASPHALT PAVEMENT

EDGE OF PAVEMENT

HYDRANT

MH

OVERHEAD DOOR (TYP)

BUILDING COLUMN (TYP.)

RAMP

DOCK

NUSTAR TERMINALS SERVICES FACILITY

COLUMBIA RIVER

N

0 40 80

Approximate Scale in Feet

LEGEND:

VE-1-2	●	VAPOR EXTRACTION WELL LOCATION (2008-PRESENT)
IP-1	◎	INJECTION POINT LOCATION (2008-PRESENT)
	◎	VAPOR EXTRACTION WELL (2000-2005)
EX-3	✦	GROUNDWATER EXTRACTION WELL (2000-2005)
IN-1	▼	GROUNDWATER INJECTION WELL (2000-2005)
AGP-11	▲	PUSH-PROBE LOCATION
MW-1	◔	GROUNDWATER MONITORING WELL
MGMS3	✦	MULTI-LEVEL GROUNDWATER WELL

UTILITY LEGEND:

- ELECTRICAL
- STORM SEWER
- WATER
- MH ○ MANHOLE

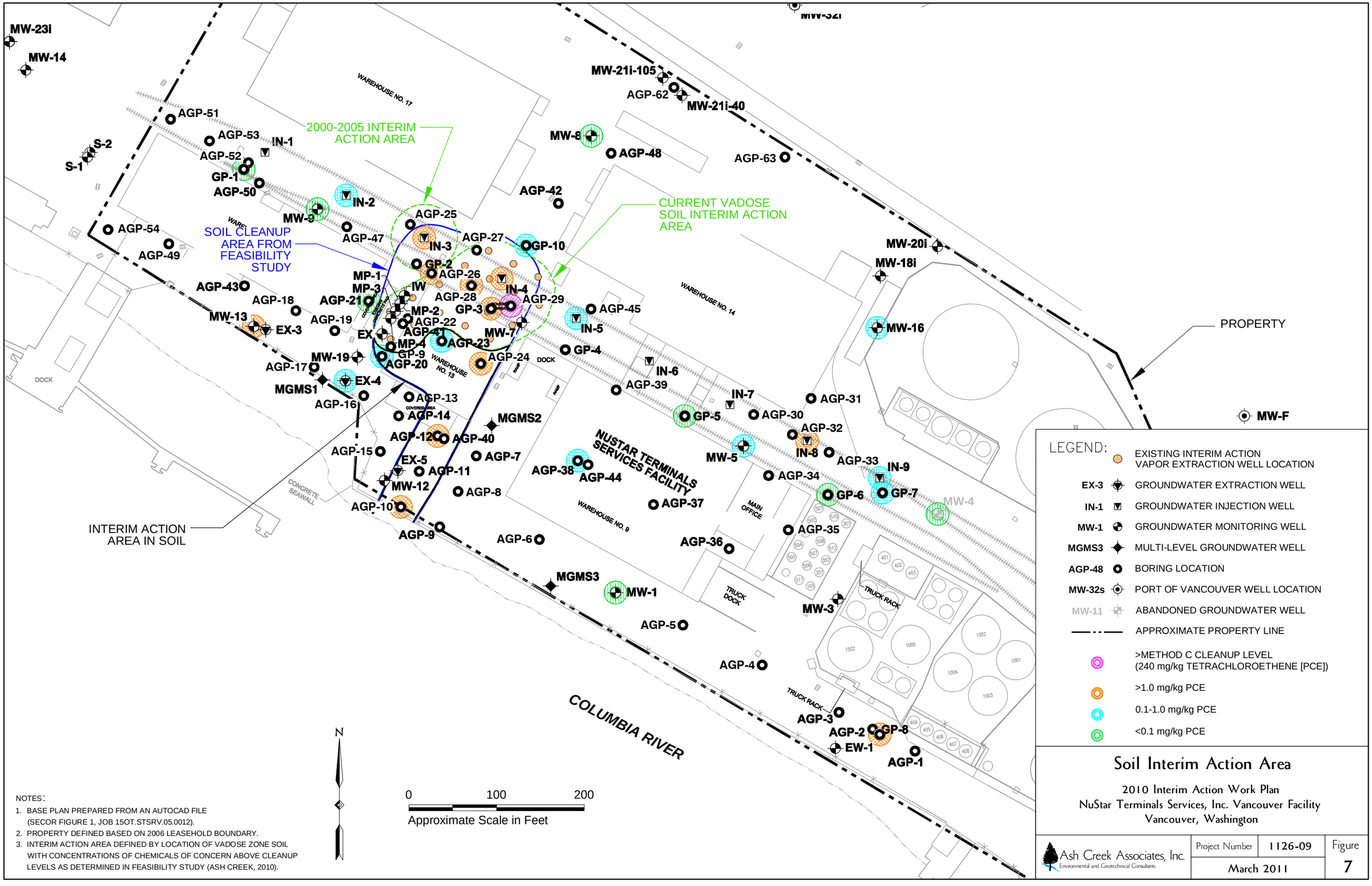
NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.

Former and Existing Interim Action

2010 Interim Action Work Plan
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
March 2011		6



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. PROPERTY DEFINED BASED ON 2006 LEASEHOLD BOUNDARY.
3. INTERIM ACTION AREA DEFINED BY LOCATION OF VADOSE ZONE SOIL WITH CONCENTRATIONS OF CHEMICALS OF CONCERN ABOVE CLEANUP LEVELS AS DETERMINED IN FEASIBILITY STUDY (ASH CREEK, 2010).

LEGEND:

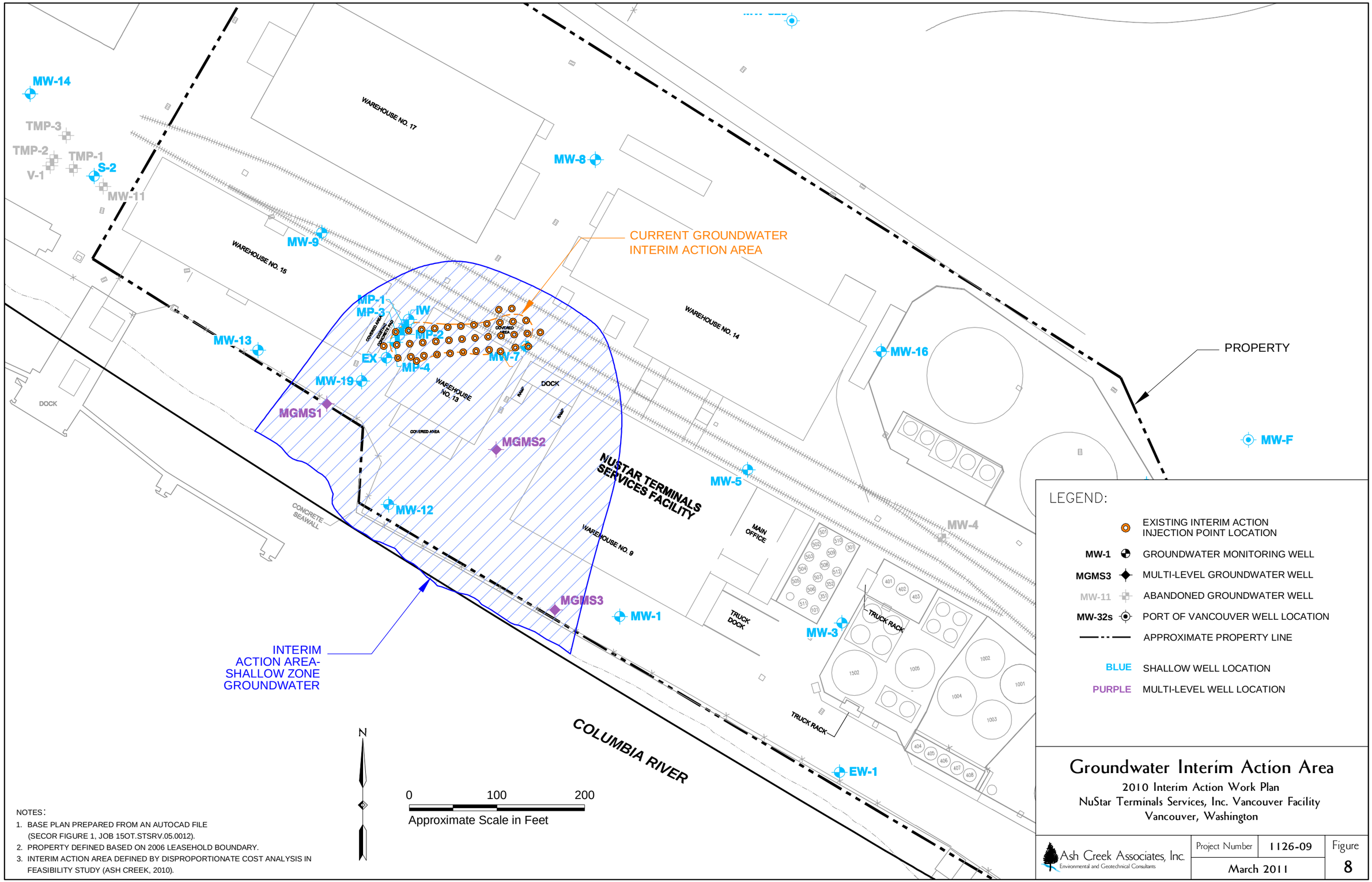
- EXISTING INTERIM ACTION VAPOR EXTRACTION WELL LOCATION
- EX-3 GROUNDWATER EXTRACTION WELL
- IN-1 GROUNDWATER INJECTION WELL
- MW-1 GROUNDWATER MONITORING WELL
- MGMS3 MULTI-LEVEL GROUNDWATER WELL
- AGP-48 BORING LOCATION
- MW-32s PORT OF VANCOUVER WELL LOCATION
- MW-11 ABANDONED GROUNDWATER WELL
- APPROXIMATE PROPERTY LINE
- >METHOD C CLEANUP LEVEL (240 mg/kg TETRACHLOROETHENE [PCE])
- >1.0 mg/kg PCE
- 0.1-1.0 mg/kg PCE
- <0.1 mg/kg PCE

Soil Interim Action Area

2010 Interim Action Work Plan
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
March 2011		7



NOTES:

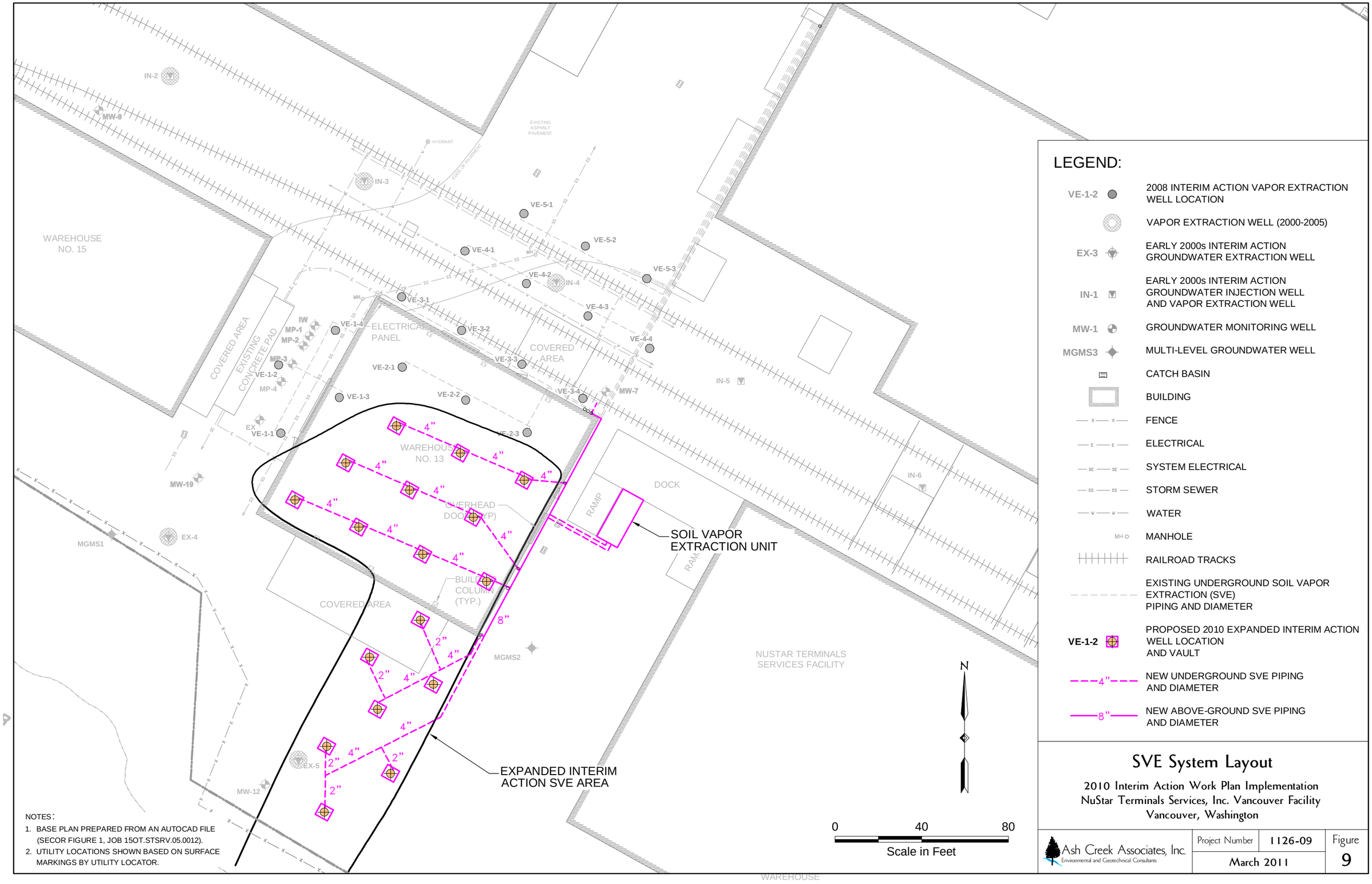
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. PROPERTY DEFINED BASED ON 2006 LEASEHOLD BOUNDARY.
3. INTERIM ACTION AREA DEFINED BY DISPROPORTIONATE COST ANALYSIS IN FEASIBILITY STUDY (ASH CREEK, 2010).

Groundwater Interim Action Area

2010 Interim Action Work Plan
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
March 2011		8



NOTES:

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

LEGEND:

- VE-1-2 — 2008 INTERIM ACTION VAPOR EXTRACTION WELL LOCATION
- VAPOR EXTRACTION WELL (2000-2005)
- EX-3 — EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- IN-1 — EARLY 2000s INTERIM ACTION GROUNDWATER INJECTION WELL AND VAPOR EXTRACTION WELL
- MW-1 — GROUNDWATER MONITORING WELL
- MGMS3 — MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MH — MANHOLE
- RAILROAD TRACKS
- EXISTING UNDERGROUND SOIL VAPOR EXTRACTION (SVE) PIPING AND DIAMETER
- VE-1-2 — PROPOSED 2010 EXPANDED INTERIM ACTION WELL LOCATION AND VAULT
- 4" — NEW UNDERGROUND SVE PIPING AND DIAMETER
- 8" — NEW ABOVE-GROUND SVE PIPING AND DIAMETER

SVE System Layout

2010 Interim Action Work Plan Implementation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
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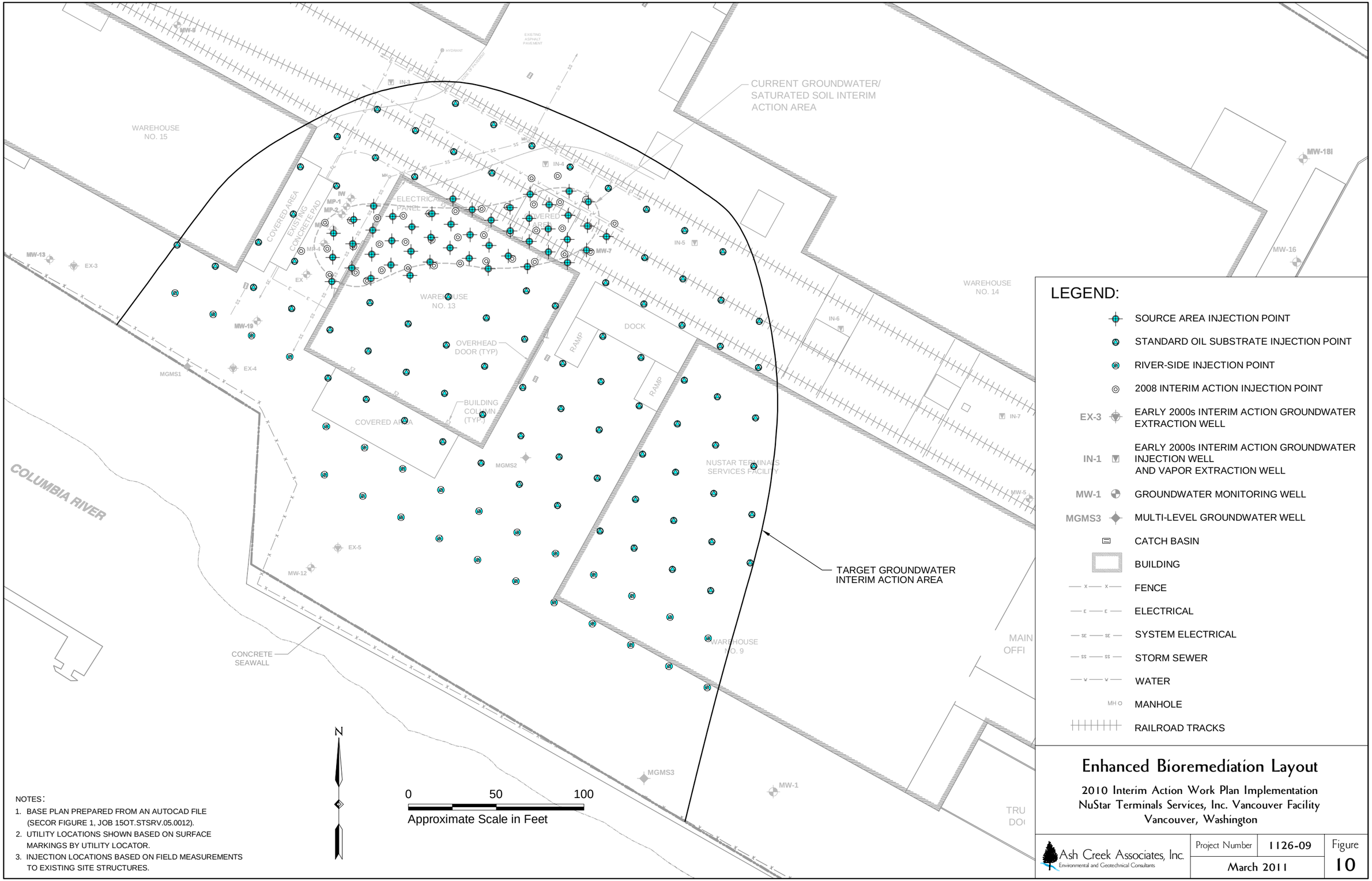

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.
3. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.

LEGEND:

- SOURCE AREA INJECTION POINT
- STANDARD OIL SUBSTRATE INJECTION POINT
- RIVER-SIDE 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 Layout

2010 Interim Action Work Plan Implementation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
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Appendix A

Interim Action Performance Evaluation Report

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Appendices

1.0 Introduction

An Interim Action (IA) was implemented at the NuStar Terminal Services, Inc. (NuStar) bulk storage terminal at the Port of Vancouver Terminal No. 2, located at 2565 NW Harborside Drive in Vancouver, Washington (Property) in April 2008. The IA included soil vapor extraction (SVE) to address the vadose zone, and bioremediation injections to address saturated soil and groundwater. Ash Creek Associates Inc. (Ash Creek) conducted soil and groundwater sampling in the IA area in October 2010, to assess the progress of the actions. This Interim Action Performance Evaluation report presents the results of the recent sampling and an evaluation of IA monitoring data at the Property. A Property location map is provided as Figure 1. Work was performed pursuant to Agreed Order (AO) No. 07-TC-S DE3938 between Washington State Department of Ecology (Ecology) and NuStar.

Consistent with previous project reports, the term "Property" as used herein refers to the NuStar leasehold area as of 2006. The term "Site" is defined to include the area where a hazardous substance from a release at the Property has "come to be located."

1.1 Purpose

The work was completed to assess current soil and groundwater conditions in the primary source area (as defined in the Revised Remedial Investigation [RI]; Ash Creek, 2009) in order to evaluate the progress of the current IA. The data from this investigation are also intended to provide information to support design of an expanded IA at the Property.

1.2 Report Organization

This Interim Action Performance Evaluation Report includes the following main topics:

- Section 2 summarizes the background of the Property, including a site description, a summary of the previous source area investigation and a description of the current IA at the Site.
- Section 3 summarizes the scope of work of the IA performance evaluation.
- Section 4 summarizes the results.
- Section 5 presents an interpretation of the results and provides a summary of conclusions and associated recommendations.

Detailed field methods and sampling procedures are presented in Appendix A. Appendix B includes the boring logs for each of the direct-push explorations completed during the recent investigation. Summaries of current and historical analytical data are provided in Appendix C. The laboratory data quality assurance review and laboratory analytical reports are included in Appendix D.

2.0 Background

This section briefly discusses the site setting, previous source area investigations, and the current IA at the Property. Additional detail is provided in the *Revised Remedial Investigation* (Ash Creek, 2009) and the *Expanded Interim Action Work Plan* (Ash Creek, 2011).

2.1 Site Description

The Property is located at the Port of Vancouver 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: N45º 38.26', Longitude: W122º 42.20'). The Property is owned by the Port of Vancouver (Port) and leased by NuStar. Figure 2 is a Property Plan. The Property is roughly rectangular with nominal dimensions of 600 by 1,300 feet and a total area of approximately 17 acres. The Property is on the north shore of the Columbia River, located between river mile 104 and 105. Land to the north, east, and west is industrial land also owned by the Port. The Property 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 Port.

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.

Although a variety of products have been handled at the Property over the years, the historical sampling and the RI identified chlorinated solvents as the chemicals of interest. Tetrachloroethene (PCE), trichloroethene (TCE), methylene chloride (MC), and 1,1,1-trichloroethane (TCA) were handled by several companies prior to 1976, but the start date is uncertain. The records suggest that handling of chlorinated solvents may have ended as early as 1990, but the end date is uncertain. Currently, products such as jet fuel, methanol, sodium hydroxide, and calcium chloride are received and transported via ship, pipeline, railcar, and trucks at the Property. Products are also blended, packaged, and stored on the Property.

2.2 Source Area Evaluation

The RI included a comprehensive site investigation on the Property to: (1) assess the results of previous interim cleanup actions at the Site; (2) collect sufficient data to determine whether further IA was needed, and if so, evaluate and select the appropriate action(s); and (3) provide additional data for a Feasibility Study (FS) for the final action for the Site. The investigation activities included the completion of 49 push-probe explorations across the Property. Soil and/or grab-groundwater samples were collected from these explorations for laboratory analysis. A total of 71 soil samples and 126 groundwater samples were submitted to the laboratory to analyze for the presence of halogenated volatile organic compounds

(HVOCs). Results of these investigations are provided in detail in the Site Investigation Data Summary Report (Ash Creek, 2006a) that was incorporated into the RI (Ash Creek, 2009a).

2.3 Description of Current Interim Action

An IA was implemented to address the release area at the Property while the RI and FS were being completed. The objective of the IA is to reduce threats to human health and the environment from chemicals within the source area. An analysis of IA alternatives was completed to select the appropriate action (Ash Creek, 2006b). Based on the results of the IA analysis, enhanced anaerobic bioremediation and SVE were selected for IA and described in detail in a design report (Ash Creek, 2007). Ecology approved the design report in a letter dated January 10, 2008. Ash Creek submitted a comment response letter to Ecology on May 7, 2008 (Ash Creek, 2008c) addressing comments and questions that Ecology had provided in the approval letter.

The IA was initiated in April 2008. The IA was focused in the area with relatively higher concentrations of volatile organic compounds (VOCs) that may be acting as an ongoing source to vapor and groundwater. The general scope of the IA consisted of installation of temporary injection points, injection of a bioremediation substrate, installation of SVE wells and associated trenching/pipe installation, and installation and startup of the SVE system. The enhanced bioremediation locations are shown on Figure 3 and the SVE system layout is shown on Figure 4. Pursuant to the AO, Ash Creek submitted the *Interim Action Installation Report* to Ecology on May 5, 2009 (Ash Creek, 2009). The extent of the vadose zone and groundwater IA cleanup areas are shown on Figure 5.

3.0 Interim Action Performance Monitoring

The following sections summarize the IA evaluation activities, including SVE monitoring and soil and groundwater confirmation sampling.

3.1 SVE Evaluation

The SVE system was started on September 17, 2008. Startup monitoring of the system was conducted on September 18, 2008. Routine monitoring of the SVE system has been conducted on a monthly basis since startup.

3.1.1 SVE Monitoring

The monthly monitoring consists of effluent vapor sampling before and after carbon treatment, and photoionization detector (PID) monitoring at each of the influent branches. The PID measurements collected each month are listed in Table 1. Vapor measurements made with the PID are used to assess the

relative distribution of VOCs present in the five influent branches and the system effluent (pre-, mid-, and post-carbon treatment; Figure 6).

3.1.2 Analytical Results

During the monthly SVE monitoring events, vapor samples are collected into Summa™ canisters, both pre-carbon (influent) and post-carbon (effluent), and are submitted to TestAmerica Laboratories in Los Angeles, California, for analysis of VOCs by method TO-15. Table 2 presents the analytical results of the system effluent sampling. Effluent sampling laboratory analytical reports were previously provided in the *Interim Action Installation Report* (Ash Creek, 2009) and in subsequent semi-annual groundwater monitoring reports. The laboratory analytical reports that were received after the last reporting period (first semi-annual period 2010) are provided in Appendix D.

3.2 Confirmation Sampling

Soil and groundwater sampling were conducted in the primary source area to evaluate the progress of the IA. The soil and groundwater sampling results are also being used to design an expanded IA at the Property.

3.2.1 Sample Locations

Sampling was focused within the IA zone of influence, particularly in those areas where soil and groundwater concentrations were the most elevated during the pre-IA (2006) site investigation. Borings CB-1, CB-2 and CB-4 were located within close proximity to historical borings AGP-28, AGP-29 and AGP-22, respectively, as shown on Figure 3. Soil and groundwater samples were collected from these borings at similar depths to soil and groundwater samples collected during the 2006 site investigation. The location of CB-3 was selected to evaluate the "center" of the soil and groundwater IA areas and was not located in a previously investigated area. In addition to the confirmation sampling, soil samples were collected at additional depths where elevated PID readings were identified during field screening. The depths of the 2006 and 2010 soil and groundwater samples are summarized in Tables 3 and 4, respectively.

3.2.2 Drilling, Sampling, and Field Screening

The field methods and sampling procedures for the completed field work are presented in Appendix A and summarized herein. On September 20 and 21, 2010, four borings (CB-1 through CB-4) were completed using a direct-push rig to a depth of 50 feet below ground surface (bgs). Continuous soil cores were extracted and soil conditions were logged in general accordance with ASTM 2487/2488. The continuous cores were retrieved using a 5-foot soil sampler. Each soil core was field screened for VOCs using a PID at nominal 2.5-foot intervals (half of each soil core). Boring logs are presented in Appendix B, and include a

description of the encountered lithology, field screening results for each sample interval, and sample information. Soil samples were collected in accordance with EPA Method 5035.

3.2.3 Selection of Samples for Chemical Analysis

The following sections summarize the selection of samples for chemical analysis and a summary of analytical parameters by media.

3.2.3.1 Soil

Soil samples were selected for chemical analyses in accordance with the following criteria:

- Soil samples that were collected at the approximate location and depth of samples from the 2006 event were submitted for laboratory analysis.
- Samples with elevated PID readings during field screening that were not assessed according to the bullet above, were also submitted for laboratory analysis.

The selected soil samples were submitted to the analytical laboratory for analysis of VOCs by EPA Method 8260.

3.2.3.2 Groundwater

During the 2006 groundwater investigation event, groundwater samples were collected from borings AGP-22, AGP-28 and AGP-29 at depths of 25, 35 and 45 feet bgs. Samples were collected in temporary wells with 4-foot screened intervals, with the bottom of the screen being set at the referenced well depth (25 feet, 35 feet, etc.). As discussed in Section 3.2.1, groundwater samples were collected at the same locations and depths during the 2010 groundwater investigation. During the 2010 site investigation, the depth to groundwater was approximately 30 feet bgs, so it was not possible to collect groundwater samples at 25 feet bgs. Groundwater samples were collected in borings CB-1 through CB-4 at 35 feet bgs and 45 feet bgs. The well screens in these boreholes were consistent with the 2006 event.

A total of eight groundwater samples collected from four soil borings were submitted to the analytical laboratory for VOC analysis by EPA Method 8260B.

Additionally, groundwater samples were collected from monitoring wells MW-9, MGMS2-40, and soil boring CB-3 (at 45 feet bgs) to evaluate conditions for bioremediation. Monitoring wells MW-9 and MGMS2-40 were selected to evaluate groundwater conditions both upgradient and downgradient from the source area, respectively, and outside of the (understood) area of influence of the current groundwater IA (see Figure 3). Boring CB-3 was selected to evaluate indicators of bioremediation within the IA area. Groundwater samples collected from MW-9, MGMS2-40, and CB-3 were submitted to the laboratory for the following analyses:

Analysis	Analytical Method
Total Organic Carbon	415.2/5310C
Potassium, Iron and Manganese	EPA 6010B
Ammonia	EPA 350.1
Chloride, Nitrate, Nitrite, Sulfate	EPA 300.0
Methane, Ethane, Ethene	RSK 175
Orthophosphate	SM 4500P
HVOCs	8260

Additionally, groundwater samples were collected in monitoring wells MW-12, MW-19 and MGMS1-40 for analysis of Nitrates by EPA Method 300.0. Groundwater samples from boring CB-3, located within the IA cleanup area, were also analyzed for the following bioremediation parameters:

Analysis	Analytical Method
Metabolic Acids	WCAS SOP 4130
Carbon Dioxide	SM 4500-CO2 D

As part of the third quarter 2010 groundwater monitoring event conducted concurrently with the 2010 site investigation, monitoring wells MW-7, EX, and MP-1 were sampled for parameters used to evaluate the anaerobic degradation of chlorinated solvents. The groundwater samples were analyzed for the following analyses:

Analysis	Analytical Method
HVOCs	8260
Total Organic Carbon	415.2/5310C
Methane, Ethane, Ethene	RSK 175

4.0 Performance Monitoring Results

A summary of SVE monitoring and confirmation soil and groundwater monitoring results are provided in the sections below.

4.1 SVE Evaluation Results

The system has removed approximately 1,860 pounds of VOCs since startup in September 2008, as shown on Figure 5 and in Table 5. Based on the pre-carbon effluent sampling results (Table 2), over 99 percent of VOCs removed by the system were chlorinated ethene compounds. The mass removal rate at startup was 59 pounds per day (lbs/day), and within three months the mass removal rate had fallen to 2.4 lbs/day.

Since then, the mass removal rate has been relatively steady with most values between 0.8 and 2.1 lbs/day and the average at 1.8 lbs/day. In the most recent sample (August 2010), the mass removal rate was 1.8 lbs/day.

4.2 Soil Confirmation Sampling Results

The following sections summarize the field screening and laboratory analytical results associated with the soil sampling event.

4.2.1 PID Results

PID measurements for each exploration are presented on boring logs in Appendix B and in Table 6. PID measurements greater than 5.0 parts per million (ppm) were observed in each of the explorations and typically correlated with the reported concentrations in the associated soil and groundwater samples, as shown in Tables 3 and 4.

4.2.2 Laboratory Analytical Results

Using the criteria listed in Section 3.2.3.1, 14 soil samples were submitted to the analytical laboratory for analysis. Eleven of these samples were collected from the vadose zone (depths of less than 30 feet bgs) and three samples were collected from the saturated soil (depths between 30 and 45 feet bgs). Soil analytical results are summarized in Appendix C and in Table 3. The laboratory analytical reports and a data quality assurance review are included in Appendix D.

4.3 Groundwater Results

A total of eight groundwater samples were collected and submitted to the analytical laboratory for analysis. Groundwater analytical data tables are included in Appendix C and in Tables 4 and 7. Detected VOCs included chloroethenes (PCE, TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride [VC]) and chloroethanes (1,1,1-TCA, 1,1-DCA and 1,2-dichloroethane [1,2-DCA]). The laboratory analytical reports and a data quality assurance review are included in Appendix D.

5.0 Interim Action Performance Evaluation

5.1 Vadose Zone Soil

Vadose zone soil is being treated with SVE. The overall performance of the SVE system was evaluated using multiple lines of evidence as follows:

- PID monitoring of vadose zone soil samples;

- Concentration changes in vadose zone soil samples; and
- Mass removal by the SVE system.

PID Monitoring of Vadose Zone Soil Samples. PID measurements from before and after the IA provide a qualitative evaluation of the performance of the SVE system in removing VOCs from the vadose zone soil. Table 6 lists the PID measurements for the pre- and post-IA soil samples. In the pre-IA borings, 26 of 35 samples (74 percent) had measureable PID readings. In the post-IA borings, 11 of 44 samples (25 percent) had measureable PID readings. A comparison of boring log pairs from before and after implementation of the IA is provided on Figure 7. The logs include soil type information and PID measurements, and indicate that the majority of the 2010 VOC detections occur only in silty soils or soils with a silty component. These data semi-quantitatively indicate a substantial reduction in VOCs in soil within the vadose zone.

VOC Concentrations in Vadose Zone Soil Samples. Evaluation of VOC concentration reductions is difficult because there is extreme variability in soil concentrations over very short distances. This can be further complicated if non-aqueous phase liquid (NAPL) is present. To assess the potential presence of NAPL, the saturation limit was estimated from the three-phase partitioning equation (Model Toxics Control Act Equation 747-1). Concentrations above the saturation limit are suggestive of the presence of NAPL. The saturation limit concentration of PCE is approximately 200,000 micrograms per kilogram (µg/kg), so concentrations above that are indicative of potential NAPL. The results suggest that NAPL may be present in soil within the source area, especially within silt layers or silty zones.

Whether or not NAPL is present, pockets of relatively elevated VOC concentrations were identified in silts or silty zones within the vadose zone in the source area. Soil samples collected from the same soil core will have greatly different concentrations if one sample has a NAPL drop and the other does not, or if one sample has elevated concentrations of VOCs trapped in silt and the other does not. The presence of NAPL, or areas of higher concentrations of VOCs, presents a further complication when evaluating the progress of SVE. As the SVE system removes vapors surrounding areas of higher concentrations of VOCs (or NAPL), the mass of VOCs remaining decreases, but the concentration in soil will remain relatively high. This can even result in an apparent increase in concentration after treatment if the after-treatment sample has a NAPL droplet but the before-treatment sample does not. Therefore, to assess the general performance of the SVE system using soil concentrations, only soil data from the vadose zone that is not indicative of NAPL were evaluated

Excluding sample pairs where at least one sample was indicative of NAPL, the following lists the before and after concentration data from vadose zone soil (from Table 3) together with an evaluation of concentration reduction.

Sample Pair	Date	PCE in µg/kg	TCE in µg/kg
AGP-22-18/ CB-4 (18)	2006	41,700	2,180
	2010	2,000	<5
AGP-28-17.5/CB-1(17.5)	2006	65,200	1,870
	2010	10,000	93
AGP-29-18/CB-2 (18)	2006	14,900	<93
	2010	19	<5
AGP-29-28/CB-2 (28)	2006	821	<102
	2010	15	<5
2006 Average		30,600	2,020
2010 Average		3,010	48
Percent Reduction		90 percent	98 percent

PCE and TCE are summarized here as they represent over 99 percent of the VOC mass at the Site. These results suggest that, except for areas of higher concentrations of VOCs associated with silt layers, the SVE system has reduced soil VOC concentrations 90 percent or more during the two years of operation.

SVE System Mass Removal. As discussed in Section 4.1, approximately 1,900 pounds of VOCs have been removed by the SVE system. Initially, the system exhibited behavior consistent with most SVE systems where high mass removal rates at startup rapidly decrease. However, unlike most systems where the mass removal rate continues to decline toward an asymptotically low value, the mass removal rate since shortly after startup has been essentially constant. This result is consistent with the prior results for PID monitoring and soil concentrations. The PID monitoring indicates that remaining VOCs in the treatment area are associated with silt layers. A review of the 2010 performance evaluation boring logs provided on Figure 7 indicates that approximately 78 percent of the vadose zone in the source area consists of sands and approximately 22 percent consists of silts. With an approximate 90-percent reduction in PCE and 98-percent reduction in TCE observed in sandy soils between the 2006 and 2010 site assessments, this would suggest that at least 70 percent of the PCE mass and 74 percent of the TCE mass has been removed from the vadose zone to date. Mass removal is also occurring in silts, yet at a lower rate than in sands, so it is anticipated that the percent VOC mass removed form the Site is even higher than 70 to 74 percent.

Because of the higher concentrations in silt zones, the rate of volatilization from areas of elevated concentrations, and the rate of diffusion into larger soil voids, will move towards an equilibrium state with the mass removal by the SVE system. Until the higher concentrations in the silt are exhausted, they will continue to contribute mass at a roughly constant rate. As discussed in the paragraph above, there is a limited amount of silty soil present in the vadose zone in which VOCs are concentrated. The SVE system has removed mass from the coarser-grained soils in the vadose zone and continues to remove mass from

the fine-grained soils. An observed continuing decrease in the mass removal rate will be the indicator that these sources are exhausted and the source area vadose zone soils are approaching cleanup.

Summary of SVE System Performance. Based on the above discussion, the SVE system is effectively removing VOCs from the vadose zone soil, summarized as follows:

- Except for higher concentrations of VOCs located within silt layers, the SVE system has removed at least 90 percent of the VOCs present in the vadose zone.
- The system is removing VOCs from remaining higher concentration pockets at an approximately constant rate of 2 lbs/day (equivalent of over 50 gallons per year).

5.2 Groundwater and Saturated Soil

5.2.1 VOCs in Groundwater

The average concentrations of VOCs in the groundwater IA area were compared between the 2006 and 2010 groundwater sampling events (Table 4). The average mass-based concentration (µgL) of PCE decreased by 85 percent between the 2006 and 2010 groundwater investigations. The concentrations of successive degradation products of PCE (sequentially TCE, cis-1,2-dichloroethene [cDCE], and VC) also decreased, bu o a lesser extent than PCE (79 percent, 45 percent, and 48 percent, respectively). Concentrations of degradation products of PCE measured during individual monitoring events can vary as these concentrations reflect the net conditions of generation of these products from breakdown of the parent compound less the destruction of the compounds into subsequent products. It is also not unusual to observe temporary increases in the concentrations of degradation products. Overall, the best indicator of effective reduction of chlorinated ethenes is a decrease in the total molar concentration of PCE, TCE, total DCE (cis-1,2 DCE, trans-1,2 DCE and 1,1-DCE) and VC combined. The average total molar ethenes in the IA area decreased by 77 percent between the 2006 and 2010 groundwater investigations.

The reduction in total VOCs was relatively steady for the two-year period from May 2008 through April 2010. Monitoring well MW-7, located on the eastern edge of the groundwater IA area, has averaged approximately 35 percent reduction per quarter in molar ethenes during that period. Only one quarter during that period exhibited an increase in total concentration (September 2009). A similar increase was observed in September 2010. The data suggest that the oil is reaching the end of its effective life.

5.2.2 VOCs in Saturated Soils

Three of the 2006/2010 soil sample pairs were collected in saturated soils or in seasonally saturated soils. In each of these samples pairs, VOC concentrations in saturated soil either stayed the same or increased between 2006 and 2010. As discussed in Section 5.1, elevated concentrations of VOCs still remain in the

subsurface, particularly in silty soils. If material is adsorbed to silts located in saturated soils, then this could potentially contribute ongoing VOC concentrations to groundwater, so further IA is warranted.

5.2.3 Bioremediation Parameters

Groundwater samples from five monitoring wells and one boring (MP-1, MW-7, MW-9, MGMS2-40, EX, and CB-3) were collected for analysis of bioremediation parameters. The samples were analyzed for iron, manganese, potassium, nitrogen compounds (nitrate, nitrite, and ammonia), sulfate, total organic carbon, orthophosphate, chloride, dissolved gases (methane, ethane, ethene, and carbon dioxide), and volatile fatty acids (acetic, butyric, lactic, and propionic acids). These analytes, in conjunction with the VOC analysis and field measurements of dissolved oxygen and oxidation-reduction potential, were used to evaluate the condition of the groundwater environment with regards to sustaining the intended bioremediation process.

There is evidence from this sampling that the reductive dechlorination of chlorinated VOCs is continuing. This evidence includes the following:

- Observed decreases in chloroethene concentrations;
- Elevated concentrations of chloride in and down-gradient of the treatment area (chloride is a by-product of the dechlorination); and
- Elevated concentrations of methane and carbon dioxide within the treatment area.

However, the low concentrations of total organic carbon and volatile fatty acids (which were all non-detect) suggest that the initial bioremediation substrate injection (completed in May 2008) has nearly been fully utilized. The lack of these markers of substrate concentration is consistent with the concentrations of nitrate found in groundwater. The original injections were designed based on nitrate sample results from prior to May 2007, with concentrations ranging from 60 milligrams per liter (mg/L) to 240 mg/L (an average of 140 mg/L in the sampled wells). Since then, concentrations of nitrate within the area of interest have ranged from 43 mg/L to 990 mg/L (an average of 320 mg/L in the most recent sampling of vicinity wells). Although nitrogen compounds are necessary for cellular growth, excessive concentrations can interfere with the degradation of the target compounds and result in faster breakdown of the bioremediation substrate.

Based on these observations, a higher concentration of substrate material may be required for subsequent injections. The specific product used and the volume needed for such a subsequent injection will need to account for the high nitrate concentrations.

Summary of Bioremediation Performance. Based on the above discussion, the bioremediation substrate injections are effectively removing VOCs from the groundwater, summarized as follows:

- The bioremediation injections have resulted in a 77 percent decrease in total molar ethene concentrations within the treatment area since prior to the interim action.

- The bioremediation parameter data suggest that the current bioremediation substrate may be reaching the end of its effective life.
- The effectiveness of the bioremediation was reduced by the presence of nitrate in the groundwater.

5.3 Conclusions and Recommendations

Based on this performance evaluation, the following conclusions and recommendations have been made regarding the current IA and anticipated expanded IA at the Site.

5.3.1 Soil

- The SVE system is effectively removing VOC mass from the vadose zone soils. SVE should be effective within the expanded IA area.
- Elevated concentrations of VOCs are present in isolated areas in silty soil. While the total mass remaining in the silty soil is not known, it is estimated that at least 70 to 74 percent of VOC mass—primarily comprised of chlorinated ethenes--has been removed from the vadose zone to date. The continued operation of the SVE system will help to reduce areas of elevated VOC concentrations; however, this will involve operating the SVE system for longer than anticipated at design.
- The expanded SVE area (i.e., the 2011 IA) is not within the former product handling area, so NAPL is not anticipated to be present in vadose zone soils in the expanded IA area. Therefore, it is expected that SVE operations in this area will exhibit classic behavior with concentrations that steadily decline to an asymptotically low value within a few years of operation. The duration of required SVE in this area should be less than the current IA.

5.3.2 Groundwater

- The 2008 bioremediation injections have effectively decreased VOC concentrations in groundwater. The presence of VOCs in saturated soil may continue to contribute VOCs to groundwater in the absence of further IA. Therefore, as part of the 2011 Interim Action, additional enhanced bioremediation should be conducted in the source area where treatment was initiated in 2008.
- Elevated nitrates in the IA area are interfering with the reductive dechlorination of chlorinated solvents and have likely accelerated the consumption of the bioinjection substrate. Design calculations of oil injection volumes accounted for the higher nitrate levels.

6.0 References

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Table 1
SVE Monitoring Results
NuStar Vancouver Facility
Vancouver, Washington

Date	Branch 1		Branch 2		Branch 3		Branch 4		Branch 5		Pre Carbon		Post Carbon 1		Post Carbon 2	
	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure
9/18/2008	339	-14.0	932	-13.0	801	-13.0	432	-14.0	445	-15.0	623	NM	0.0	NM	0.0	NM
10/15/2008	81	-19.0	445	-14.0	383	-14.0	103	-18.0	112	-19.0	184.8	-33.0	186.9	NM	81.7	NM
10/24/2008	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/5/2008	4.1	-15.0	13.7	-14.0	33.1	-14.0	9.7	-16.0	19.7	-16.0	49.1	-27.0	0.3	17.0	0.0	6.0
11/20/2008	NA	-17.0	NA	-17.0	NA	-17.0	NA	-17.0	NA	-18.0	38.8	-30.0	1.5	16.0	2.2	NM
12/18/2008	1.4	-17.0	1.7	-17.0	1.8	-17.0	0.9	-18.0	3.2	-19.0	32.8	-27.0	6.0	16.0	0.0	6.0
1/2/2008	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/23/2009	12.8	-11.0	24.2	-11.0	28.7	-11.0	10.9	-11.0	9.0	-11.0	22.6	-20	29.4	19.0	0.0	7.0
1/27/2009	NM	-16.0	NM	-16.0	NM	-16.0	--	--	--	--	NM	-26	NM	NM	NM	NM
2/5/2009	NM	-17.0	NM	-17.0	NM	-17.0	--	--	--	--	NM	-25	33.2	NM	0.0	NM
2/20/2009	11.9	-16.0	15.2	-16.0	19.1	-16.0	--	--	--	--	17.5	-26	34.6	17.0	0.0	7.5
3/27/2009	3.5	-18.0	8.3	-18.0	4.9	-18.0	--	--	--	--	18.9	-28	22.6	18.5	6.2	7.2
4/3/2009	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4/27/2009	9.0	-18.0	16.8	-18.0	15.9	-18.0	16.9	-19.0	15.4	-20.0	25.4	-24	0.2	16	0.2	7.0
4/27/2009	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5/27/2009	--	--	5.7	-18.5	5.0	-18.0	5.0	-18.0	--	--	16.3	-29.5	0.4	26	0.2	7.0
6/26/2009	--	--	6.6	-18.5	9.2	-18.0	1.0	-18.5	--	--	22.3	-30	10.8	15.5	0.0	6.5
7/31/2009	--	--	32.2	-17.0	27.8	-17.0	27.3	-18.0	--	--	20.5	-29	16.4	16.5	0.0	7.0
8/28/2009	--	--	35.6	-16.0	35.2	-16.0	32.0	-16.0	--	--	19.1	-28	13.8	16.0	1.1	7.1
9/3/2009	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/09/09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/29/2009	25.5	-13.5	51.6	-12.5	61.3	-12.0	--	--	--	--	148.0	-24.5	12.5	18.0	0.0	7.0
10/27/2009	16.6	-14.0	39.9	-14.0	30.3	-13.5	--	--	--	--	17.7	-25	9.1	18.0	0.0	7.8
10/27/09.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/30/2009	--	--	95.4	-21.0	85.7	-22.0	59.6	-21.0	--	--	66.1	-33	5.6	17.0	0.0	6.0
12/30/2009	--	--	88.5	-17.0	91.7	-18.0	86.5	-18.0	--	--	50.8	-28.5	4.3	17.0	0.2	7.4
1/12/2010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/22/2010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/27/2010	--	--	45.6	-22.0	49.2	-22.0	39.9	-23.0	--	--	29.0	-31.0	0.0	16.5	0.0	6.9
2/12/2010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/25/2010	--	--	0.0	-21.0	0.1	-22.0	0.8	-22.0	--	--	37.8	-30.0	0.5	16.0	0.0	10
3/25/2010	--	--	21.0	-22.0	24.9	-21.0	24.2	-20.0	--	--	16.9	-32.0	0.0	14.0	0.0	6.4
4/29/2010	--	--	23.0	-22.0	19.1	-22.0	20.3	-22.5	--	--	15.2	-32.0	4.5	14.5	0.0	6.7
5/25/2010	--	--	11.8	-22.0	27.8	-22.0	23.6	-23.0	--	--	28.9	-32.0	19.3	15.0	0.0	6.5
6/29/2010	--	--	22.0	-21.0	22.3	-22.0	20.6	-22.0	--	--	15.0	-32.0	29.3	15.0	0.2	7.0
7/29/2010	--	--	26.6	-21.0	24.6	-21.0	14.9	-22.0	--	--	16.0	-33.0	13.2	15.0	1.0	6.4
8/25/2010	--	--	20.6	-18.0	23.6	-18.0	19.4	-19.0	--	--	15.8	-29.0	0.0	16.0	0.0	16.0

Notes:

1. PID readings in parts per million (ppm), calibrated to 100 ppm isobutylene.
2. Pressure readings in inches of water, measured with magnahelic gauge.
3. NM = Not measured.
4. -- = Not available; branch not in use or no measurement collected during the site visit.
5. NA = Not available; photoionization detector (PID) malfunction.

Table 2
Soil Vapor System Analytical Results
NuStar Terminals Services, Inc.
Vancouver, Washington

Sampling Location	Sample ID	Date	Chloroform	1,3-Dichlorobenzene	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methanol	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	1,1,2-Trichloro-1,2,2-trifluoroethane	Total Xylenes
			Concentrations in µg/m^3													
Effluent - pre-Carbon	SVE_091808	9/18/2008	<5,400	<2,600	<4,500	<4,400	<4,400	<4,400	--	<3,800	1,700,000	<4,100	14,000	55,000	<8,400	<4,800
Effluent - pre-Carbon	System_In_101508 Canister 9301B	10/15/2008	<1,600	<3,800	<1,300	<1,300	<1,300	<1,300	--	<1,100	150,000	<1,200	<1,700	7,700	<2,500	<1,400
Effluent - post-Carbon	System_Out_101508 Canister 12204	10/15/2008	<410	<1,000	<340	<340	<340	<340	--	<290	60,000	<320	<460	3,200	<650	<370
Carbon change-out 10/24/08																
Effluent - pre-Carbon	063299 - Pre Carbon 112008	11/20/2008	<810	<2,000	<670	<660	<660	<660	--	<570	85,000	<620	<900	4,100	<1,300	<720
Effluent - post-Carbon	12541 - Post Carbon 112008	11/20/2008	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	17	23	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Pre Carbon 121808	12/18/2008	<360	<900	<300	<300	<300	<300	--	<260	69,000	<280	530	3,400	<570	<320
Effluent - post-Carbon	Post Carbon 121808	12/18/2008	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	12	<14	<7.5	16	<11	<15	<8.7
Effluent - pre-Carbon	SVE Effluent Pre-Carbon	1/23/2009	<400	<980	<330	<320	<320	<320	--	<280	68,000	<310	<450	1,800	<630	<350
Effluent - post-Carbon	SVE Effluent Post-Carbon	1/23/2009	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	12	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Pre Carbon 022009	2/20/2009	<270	<680	<230	<220	<220	<220	--	<200	53,000	<210	<310	2,100	<430	<240
Effluent - post-Carbon	Post Carbon 022009	2/20/2009	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	15	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Pre Carbon 032709	3/27/2009	<9.8	<24	<8.1	16	190	<7.9	--	8.7	67,000	<7.5	490	2,500	<15	<8.7
Effluent - post-Carbon	Post Carbon 032709	3/27/2009	12	<24	38	44	1,100	28	--	8.9	54	<7.5	7,200	19,000	34	<8.7
System shutdown on 3/27/09 in anticipation of carbon change-out on 4/3/09																
Effluent - pre-Carbon	Pre Carbon 042709	4/27/2009	<390	<950	<320	<310	<310	<310	--	<280	79,000	<300	<430	1,900	<610	<340
Effluent - post-Carbon	Post Carbon 042709	4/27/2009	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	<7.0	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	PSE0888-01 - Pre Carbon 052709	5/27/2009	<280	<690	<230	<230	<230	<230	--	<200	49,000	<220	380	1,700	<440	<250
Effluent - post-Carbon	PSE0888-02 - Post Carbon 052709	5/27/2009	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	9.7	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	PRE Carbon 062609	6/26/2009	<240	<600	<200	<200	<200	<200	--	<170	55,000	<190	390	2,000	<380	<220
Effluent - post-Carbon	POST Carbon 062609	6/26/2009	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	8.2	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	PRECARBON 073109	7/31/2009	<46	<110	<38	<37	280	<37	--	38	47,000	<36	540	2,800	<72	<41
Effluent - post-Carbon	POSTCARBON 073109	7/31/2009	<9.8	<23	<8.1	20	<7.9	<7.9	--	12	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Precarbon 082809	8/28/2009	<98	<240	<81	<79	<79	<79	--	<69	33,000	<75	300	2,100	<150	<87
Effluent - post-Carbon	Post Carbon 082809	8/28/2009	<26	<65	33	38	1,100	<21	--	<19	<36	28	1,500	260	<41	55
Effluent - pre-Carbon	PRECARBON 090209	9/2/2009	<240	<600	<200	<200	250	<200	<330	<170	37,000	<190	320	2,000	<380	<260
Lead carbon change-out September 8, 2009. Order of lead and lag carbon switched.																
Effluent - pre-Carbon	Precarbon 092909	9/29/2009	<220	<530	<180	<180	400	<180	<730	<150	49,000	<170	250	2,300	<340	<190
Effluent - post-Carbon	Post Carbon 092909	9/29/2009	<9.8	<24	<8.1	<7.9	<7.9	<7.9	40	81	<14	8.4	<11	<11	<15	<8.7
Effluent - pre-Carbon	PRECARBON 102709	10/27/2009	<98	<240	<81	<79	240	<79	<13	<69	48,000	<75	280	1,900	<150	<87
Effluent - post-Carbon	POSTCARBON 102709	10/27/2009	<9.8	<24	<8.1	<7.9	14	<7.9	<1.3	8.8	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Precarbon 113009	11/30/2009	<1,300	<3,200	<1,100	<1,100	<1,100	<1,100	<170	<920	170,000	4,100	<1,400	4,000	<2,000	<1,200
Effluent - post-Carbon	Postcarbon 113009	11/30/2009	<9.8	<24	<8.1	17	110	<7.9	<1.3	7.9	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Precarbon-123009	12/30/2009	<1,600	<4,000	<1,300	<1,300	<1,300	<1,300	<220	<1,100	130,000	1,900	<1,800	3,800	<2,500	<1,400
Effluent - post-Carbon	Postcarbon-123009	12/30/2009	<9.8	<24	<8.1	22	190	<7.9	<1.3	16 B	51	<7.5	16	13	<15	<8.7
Carbon change-out January 22, 2010.																
Effluent - pre-Carbon	Pre Carbon-012710	1/27/2010	<980	<2,400	<810	<790	<790	<790	<130	<690	60,000	1,200	<1,100	1,800	<1,500	<870
Effluent - post-Carbon	Post Carbon-012710	1/27/2010	<9.8	<24	<8.1	<7.9	<7.9	<7.9	<1.3	<7.0	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Pre Carbon 022510	2/25/2010	<460	<1,100	<380	<370	<370	<370	<1,000	<330	62,000	<350	<510	1,800	<720	<480
Effluent - post-Carbon	Post Carbon 022510	2/25/2010	<9.8	<24	<8.1	<7.9	<7.9	<7.9	<33	<6.9	<14	<7.5	<11	22	<15	<8.7
Effluent - pre-Carbon	Pre Carbon 032510	3/25/2010	<290	<700	<240	<230	<230	<230	<38	<200	49,000	<220	<320	1,700	<450	<250
Effluent - post-Carbon	Post Carbon 032510	3/25/2010	<9.8	<24	<8.1	<7.9	<7.9	<7.9	<1.3	17	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Pre Carbon 042910	4/29/2010	<410	<1,000	<340	<340	<340	<340	--	<290	49,000	<320	<460	1,900	<650	<370
Effluent - post-Carbon	Post Carbon 042910	4/29/2010	<9.8	240	<8.1	<7.9	<7.9	<7.9	--	8.4	<14	13	<11	<11	<15	<8.7
Effluent - pre-Carbon	PRECARBON_052510	5/25/2010	<400	<990	<330	<330	<330	<330	--	<290	66,000	<310	<450	1,800	<630	<360
Effluent - post-Carbon	POSTCARBON_052510	5/25/2010	<9.8	56	<8.1	<7.9	<7.9	<7.9	--	8.0	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	PreCarbon_062910	6/29/2010	<350	<850	<290	<280	<280	<280	--	<250	58,000	<270	<390	1,400	<540	<310
Effluent - post-Carbon	PostCarbon_062910	6/29/2010	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	8.3	<14	<7.5	<11	<11	<15	<8.7
Effluent - pre-Carbon	Pre Carbon-072910	7/29/2010	<560	<1,400	<460	<450	<450	<450	--	<400	62,000	<430	<620	1,900	<880	<500
Effluent - post-Carbon	Post Carbon-072910	7/29/2010	<20	<50	40	42	1700	<16	--	<14	140	<16	1,500	1,500	<32	<18
Effluent - pre-Carbon	Pre Carbon 082510	8/25/2010	<500	<1200	<410	<400	200 J	<400	--	<350	55,000	<380	<550	1,800	<780	<440
Effluent - post-Carbon	Post Carbon 082510	8/25/2010	<9.8	<24	<8.1	<7.9	<7.9	<7.9	--	<6.9	<14	<7.5	<11	<11	<15	<8.7
Carbon change-out August 19, 2010.																

Notes:

1. µg/m^3 = Micrograms per cubic meter.
2. Samples analyzed by Modified EPA Method TO-15.
3. Only analytes detected in at least one sample are presented in this table.
4. -- = not analyzed
6. J = Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL).

Table 3
Soil Comparison Table - 2006 and 2010 Investigations
NuStar Vancouver Facility

Sample I.D.	Collect Date	Sample Depth (feet)	PID Reading ppm	Soil Type	Tetrachloroethene (µg/kg)	Trichloroethene (µg/kg)	cis-1,2 Dichloroethene (µg/kg)
Sample Pairs for Comparison							
AGP-22-18	5/2/2006	18	8	silt	**41,700**	**2,180**	<184
CB-4 (18)	9/21/2010	18	<5	sand	**2,000**	<5	<5
AGP-22-38.5	5/2/2006	38.5	23	silt	**26,400**	**4,090**	**261**
CB-4 (38.5)	9/21/2010	38.5	17.8	silty sand	**26,000**	**2,000**	**1,300**
AGP-28-9	5/3/2006	9	853	silt	**59,300**	**536**	<218
CB-1(9)	9/20/2010	9	756	silt/fine sand	**6,700,000**	<4,000	<40
AGP-28-17.5	5/3/2006	17.5	68	silty sand	**65,200**	**1,870**	<403
CB-1(17.5)	9/20/2010	17.5	11.9	silty sand	**10,000**	**93**	<30
AGP-28-37.5	5/3/2006	37.5	<5	sand	**262**	<96.4	<96.4
CB-1(37.5)	9/20/2010	37.5	5.4	sand	**200**	**69**	**34**
AGP-29-9.5	5/4/2006	9.5	384	silt	**1,320,000**	<4,780	<4,780
CB-2 (9.5)	9/20/2010	9	1613	silt	**130,000**	<40	<40
AGP-29-18	5/4/2006	18	12	silt	**14,900**	<93	<93
CB-2 (18)	9/20/2010	18	<5	sand/silt lenses	**19**	<5	<5
AGP-29-28	5/4/2006	28	24	gravelly silt	**821**	<102	<102
CB-2 (28)	9/20/2010	28	<5	sand	**15**	<5	<5
AGP-29-42	5/4/2006	42	12	sandy silt/silt	**4,140**	**1,330**	**198**
CB-2 (42)	9/20/2010	42	11.4	sandy silt	**42,000**	**4,700**	**1,900**
Samples in New Locations							
CB-3 (9)	9/21/2010	9	1,101	silt	**1,800**	**6.9**	<5
CB-3(18)	9/21/2010	18	21.3	sand	**24,000**	**180**	<40
CB-3 (29)	9/21/2010	29	48	silt lense at 29 feet	**34,000**	**720**	**230**
CB-4 (28)	9/21/2010	28	7.4	sand	**80**	<5	<5
CB-1(29.5)	9/20/2010	29.5	286	silty sand	**160,000**	<40	<40

Notes:

Shaded indicates soil samples collected in saturated soils.

1. µg/kg = micrograms per kilogram
2. ppm = parts per million

Table 4
Groundwater Comparison Table - 2006 and 2010 Investigations
NuStar Vancouver Facility

Sample I.D.	Collect Date	Screened Interval (feet bgs)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2 Dichloroethene (µg/L)	trans-1,2 Dichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Total DCE (µg/L)	Vinyl Chloride (µg/L)	Total Molar Ethenes (µmol/L)
Sample Pairs for Comparison										
AGP-22-35	5/2/2006	31-35	**2,050**	**328**	**102**	<10	<10	**102**	<10	**15.9**
CB-4 (35)	9/21/2010	31-35	**680**	**170**	**110**	**6.4**	<4.0	**116.4**	<4.0	**6.60**
AGP-22-45	5/2/2006	41-45	**31,200**	**11,500**	**1,360**	<250	<250	**1,360**	<250	**289.7**
CB-4(45)	9/21/2010	41-45	**3,300**	**820**	**1,200**	**22**	<15	**1,222**	**100**	**40.4**
AGP-28-35	5/3/2006	31-35	**1,590**	**288**	**26.1**	<5.0	<5.0	**26.1**	<5.0	**12.1**
CB-1 (35)	9/20/2010	31-35	**650**	**170**	**46**	<2.5	<2.5	**46**	<2.5	**5.7**
AGP-28-45	5/3/2006	41-45	**4,360**	**2,710**	**2,570**	**34.0**	**75.5**	**2,679.5**	**88.0**	**76.0**
CB-1 (45)	9/20/2010	41-45	**1,400**	**1,700**	**1,400**	**20**	**53**	**1,473**	**40**	**37.2**
AGP-29-35	5/4/2006	31-35	**3,070**	**571**	**93.6**	<10	<10	**93.6**	<10	**23.8**
CB-2 (35)	9/20/2010	31-35	**62**	**16**	**35**	<0.50	<0.5	**35**	**0.66**	**0.87**
AGP-29-45	5/4/2006	41-45	**3,030**	**3,210**	**1,640**	**19.0**	**96.6**	**1,756**	<10	**60.8**
CB-2 (45)	9/21/2010	41-45	**500**	**1,000**	**770**	**8.2**	**23**	**801.2**	**39**	**19.52**
CB-2 (45) Dup	9/21/2010	41-45	**1,400**	**1,800**	**950**	**11**	**36**	**997**	**61**	**33.41**
Groundwater Samples in New Location										
CB-3 (35)	9/21/2010	31-35	**940**	**240**	**220**	<4.0	<4.0	**220**	<4.0	**9.77**
CB-3 (45)	9/21/2010	41-45	**690**	**270**	**280**	**5.8**	**4.5**	**290.3**	**26**	**9.63**
		2006 Average	7,550	3,101	965	27	86	1,003	88	80
		2010 Average	1,140	648	530	13	31	550	46	18
		Percent Decrease	85%	79%	45%	51%	64%	45%	48%	77%

Notes:
µmol/L= micromole per liter
µg/L = microgram per liter
bgs= below ground surface

Table 5
VOC Mass Removal
NuStar Terminals Services, Inc.
Vancouver, Washington

Sample Date	Post-Blower Pressure (in H_20)	Air Flow Rate [1] (cfm)	Total VOCs (mg/m^3)	VOC Removal (lb/day)
9/18/2008	28.0	370	1,769	58.8
10/15/2008	33.0	370	158	5.2
11/20/2008	27.0	370	89	3.0
12/18/2008	27.0	370	73	2.4
1/23/2009	30.0	235	70	1.5
2/20/2009	29.0	180	55	0.9
3/27/2009	29.0	240	70	1.5
4/27/2009	29.0	270	81	2.0
5/27/2009	29.0	270	51	1.2
6/26/2009	25.5	285	57	1.5
7/31/2009	25.5	306	51	1.4
8/28/2009	27.0	253	35	0.8
9/29/2009	27.0	260	52	1.2
10/27/2009	29.0	252	50	1.1
11/30/2009	27.0	300	178	4.8
12/30/2009	28.0	270	136	3.3
1/27/2010	26.0	290	63	1.6
2/25/2010	26.0	300	64	1.7
3/25/2010	24.0	325	51	1.5
4/29/2010	24.0	330	51	1.5
5/25/2010	24.0	342	68	2.1
6/29/2010	24.0	350	59	1.9
7/29/2010	25.0	360	64	2.1
8/25/2010	24.0	360	57	1.8

Date	Activity	VOC Removal Rate (lb/day)	Days of Operation	Approximate VOCs Removed (lbs)	Approximate Cumulative VOCs Removed (lbs)
9/17/2008	Startup	58.8	1	59	59
9/18/2008	Sample	20.0	27	540	600
10/15/2008	Sample	4.10	36	150	750
11/20/2008	Sample	2.69	28	75	830
12/18/2008	Sample	1.95	36	70	900
1/23/2009	Sample	1.18	27	32	930
2/20/2009	Sample	1.20	35	42	970
3/27/2009	Sample	1.74	31	54	1020
4/27/2009	Sample	1.60	30	48	1070
5/27/2009	Sample	1.36	30	41	1110
6/26/2009	Sample	1.43	35	50	1160
7/31/2009	Sample	0.8	35	28	1190
8/28/2009	Sample	1.2	32	39	1230
9/29/2009	Sample	1.1	32	37	1270
10/27/2009	Sample	4.8	28	134	1400
11/30/2009	Sample	3.3	14	46	1450
12/30/2009*	Sample	1.6	31	50	1500
1/27/2010	Sample	1.7	29	49	1550
2/25/2010	Sample	1.5	28	42	1590
3/25/2010	Sample	1.5	35	53	1640
4/29/2010	Sample	2.1	26	54.6	1690
5/25/2010	Sample	1.9	33	62.7	1750
6/29/2010	Sample	2.1	30	63	1810
7/29/2010	Sample	1.8	27	48.6	1860
8/25/2010	Sample				

Notes:
1. Air flow rate read from system gauge.
2. cfm = Cubic feet per minute
3. mg/m3 = Milligrams per cubic meter
4. lb/day = Pounds per day
5. lbs = Pounds
6. The system shut down twice during this monitoring period due to high water levels in the knockout drum. The days of operation reflects the number of days the system was understood to be out of operation.

Table 6
Summary of PID Measurements
NuStar Terminals Services, Inc.
Vancouver, Washington

Sample ID	Depth (feet bgs)	PID Measurement (ppm)	Sample ID	Depth (feet bgs)	PID Measurement (ppm)
Pre-Interim Action Borings (2006)			**Post Interim Action Borings (2010)**		
AGP-22	2	<5	**CB-4**	5	<5
	4	<5		7.5	<5
	9	<5		10	<5
	10.5	<5		12.5	<5
	13	9		15	<5
	14	7		17.5	<5
	16.5	12		20	<5
	18	8		22.5	<5
	19.5	34		25	<5
	20.5	17		27.5	7.4
	22.5	<5			
	24	12			
AGP-28	3.5	9	**CB-1**	5.5	<5
	7	152		7.5	<5
	8.5	295		8.5	<5
	9.5	853		9.5	756
	13	150		12.5	<5
	14.5	95		15	<5
	18	68		17.5	12
	19.5	84		19.5	<5
	22	84		22.5	<5
				25	<5
				27.5	<5
				29.5	286
AGP-29	3	<5	**CB-2**	5	<5
	4.5	<5		7.5	9
	7	<5		10	1,613
	8	<5		12.5	220
	9	63		15	<5
	9.5	384		20	<5
	11.5	16		22.5	<5
	13	113		25	<5
	14.5	33		27	<5
	16	123		30	<5
	17.5	12			
	19.5	9			
	20.5	13			
	22	8			
			CB-3	5.5	<5
				7.5	<5
				10	1,101
				12.5	<5
				15	<5
				17.5	21
				20	7
				22.5	<5
				25	<5
				27.5	<5
				28.5	48
				30	<5

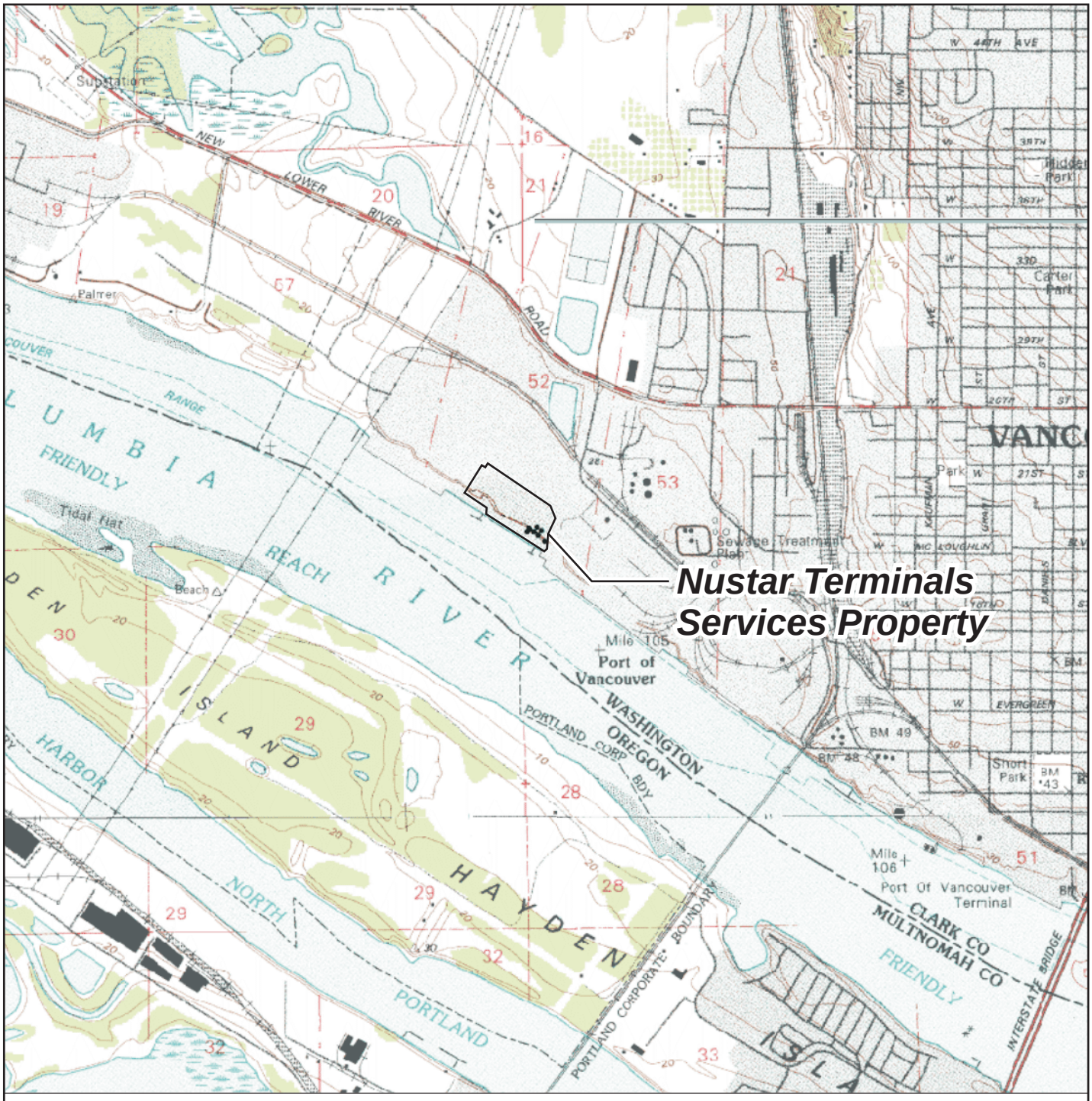
Notes:

1. For comparison, adjacent boring pairs were completed at the same approximate location.
2. bgs= below ground surface.
3. ppm = parts per million; calibrated to 100 ppm isobutylene.

Table 7
Groundwater Analytical Results: Bioremediation Parameters
NuStar Vancouver Facility
Vancouver, Washington

Analyte	Analytical Method	MW-7				EX			MP-1			MW-9	MGMS2-40	CB-3 (35)	MW-12	M-19	MGMS1-40
		3/23/2009	3/16/2010	9/23/2010	9/23/2010 (DUP)	3/23/2009	3/16/2010	9/23/2010	3/23/2009	3/16/2010	9/23/2010	9/21/2010	9/21/2010	9/21/2010	10/19/2010	10/19/2010	10/19/2010
Total Metals (mg/L)																	
Iron	EPA 6010 B	<0.10	0.16	-	-	1.5	1.2	-	<0.10	<0.10	-	<0.10	1.3	320	-	-	-
Manganese	EPA 6010 B	2.5	0.63	-	-	5.7	1.4	-	3.2	0.99	-	3.6	1.6	5.8	-	-	-
Potassium	EPA 6010 B	-	-	-	-	-	-	-	-	-	-	9.9	20	61	-	-	-
Attenuation Chemistry (mg/L)																	
Alkalinity (total, as CaCO3)	SM 2320 B	130	26	-	-	38.0	<1	-	96.0	134	-	-	-	-	-	-	-
Ammonia (as N)	SM 4500-NH3 B/C	11	2.4	-	-	14	3.4	-	35	37	-	1.4	130	89	-	-	-
Nitrate-Nitrogen	EPA 300.0	56	99	-	-	43	89	-	210	990	-	89	560	580	59	19	390
Nitrite-Nitrogen	EPA 300.0	<0.10	<0.50	-	-	0.54	0.71	-	1.2	0.76	-	<0.10	<0.10	2	-	-	-
Sulfate	EPA 300.0	59	19	-	-	24	11	-	91	87	-	49	110	80	-	-	-
Total Organic Carbon	SM 5310 D	6.7	2.6	8.2	-	3.0	2.4	3.6	2.0	2.4	2	2.1	3.7	4.8	-	-	-
Total Phosphate	EPA 365.1	0.10	<0.10	-	-	0.36	0.36	-	<0.050	<0.10	-	-	-	-	-	-	-
Orthophosphate (as P)	SM 4500 P B/E	-	-	-	-	-	-	-	-	-	-	<0.10	<0.10	<0.10	-	-	-
Chloride	EPA 300.0	5.9	3.1	-	-	4.6	1.8	-	6.7	14	-	5.9	20	8.6	-	-	-
Sulfide	SM 4500 S2-D	-	<0.050	-	-	-	<0.050	-	-	<0.050	-	-	-	-	-	-	-
Methane	RSK-175M	0.312	0.149	0.28	0.303	0.346	0.0868	0.0913	0.0111	0.412	0.825	-	-	2.1	-	-	-
Ethane	RSK-175M	-	-	<0.001	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	-
Ethene	RSK-175M	-	<0.001	0.003	0.003	-	<0.001	<0.001	-	0.00247	<0.001	-	-	<0.001	-	-	-
CO2	SM 4500 C	-	-	-	-	-	-	-	-	-	-	-	-	38	-	-	-
Organic Acids (mg/L)																	
Acetic Acid	WCAS SOP 4130	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-
Butyric Acid	WCAS SOP 4130	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-
Lactic Acid	WCAS SOP 4130	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-
Propionic Acid	WCAS SOP 4130	-	-	-	-	-	-	-	-	-	-	-	-	<0.4	-	-	-
Field Parameters																	
Dissolved Oxygen (ppm)	-	0.69	1.37	0.64	0.64	0.47	0.88	0.93	1.05	0.89	0.53	0.51	2.05	-	-	-	-
ORP (mV)	-	-614.5	147.7	-483.4	-483.4	68.8	102.6	-521.6	127.3	83.2	-464	115.1	80.1	-	-	-	-
Chlorinated Ethenes (µg/L)																	
Tetrachloroethene	EPA 8260	3,300	550	750	740	1,400	150	2,400	1,200	1,500	730	140	3,500	940	-	-	-
Trichloroethene	EPA 8260	270	56	110	100	420	33	220	180	400	120	50	1,500	240	-	-	-
cis-1,2 dichloroethene	EPA 8260	420	180	690	700	50	20	90	89	410	41	2	480	220	-	-	-
Vinyl Chloride	EPA 8260	<15	<2.0	4.8	4.1	<5.0	<0.50	1.8	<4	10	<3	<0.50	5.4	<4.0	-	-	-

Notes:
mg/L = milligrams per Liter
µg/L= micrograms per Liter
ORP= Oxidation-Reduction Potential
mV= millivolts
ppm = parts per million
BOLD = Analyte etected above method reporting limit.
DUP=Duplicate sample



NOTES: 1) Base map prepared from USGS 7.5-minute quadrangles as provided by Topozone.
2) Property defined based on 2006 leasehold boundary.

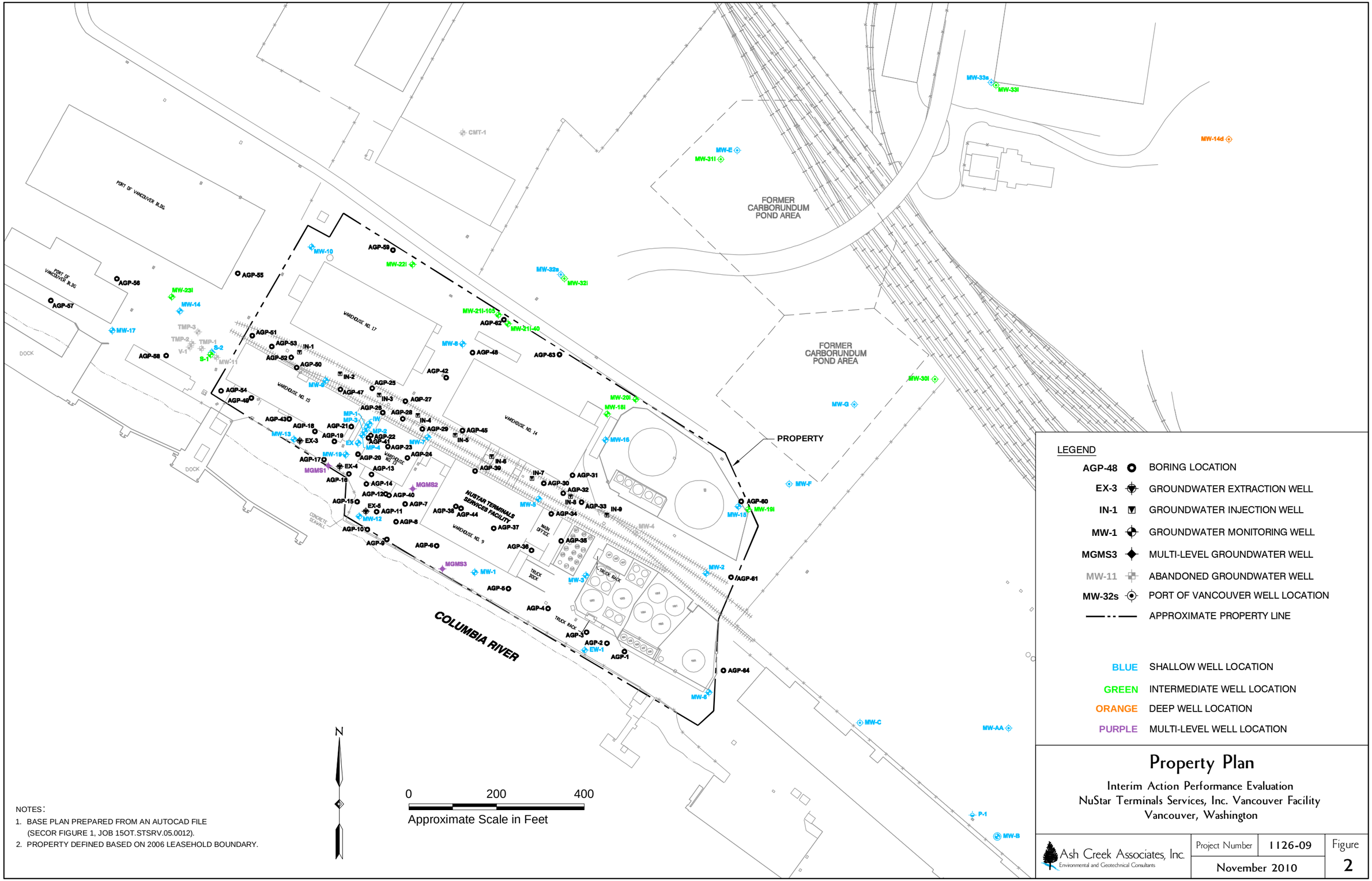
0 2000 4000
Scale in Feet

N

Property and Site Location Map

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number 1126-09	Figure 1
	November 2010	



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. PROPERTY DEFINED BASED ON 2006 LEASEHOLD BOUNDARY.

LEGEND

AGP-48	BORING LOCATION
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

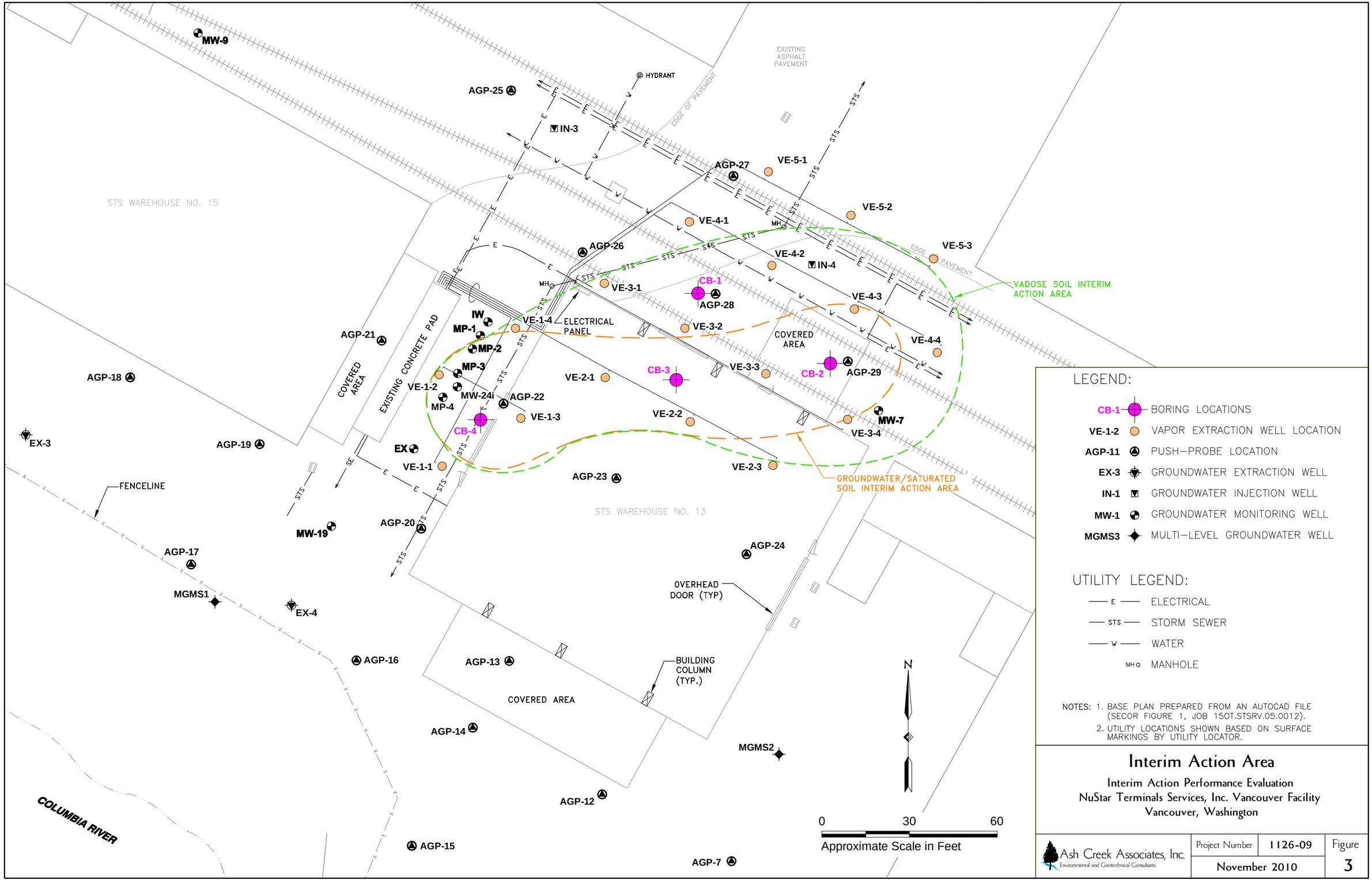
BLUE	SHALLOW WELL LOCATION
GREEN	INTERMEDIATE WELL LOCATION
ORANGE	DEEP WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Property Plan

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
November 2010		2



LEGEND:

- CB-1 — BORING LOCATIONS
- VE-1-2 — VAPOR EXTRACTION WELL LOCATION
- AGP-11 — PUSH-PROBE LOCATION
- EX-3 — GROUNDWATER EXTRACTION WELL
- IN-1 — GROUNDWATER INJECTION WELL
- MW-1 — GROUNDWATER MONITORING WELL
- MGMS3 — MULTI-LEVEL GROUNDWATER WELL

UTILITY LEGEND:

- E — ELECTRICAL
- STS — STORM SEWER
- W — WATER
- MH — MANHOLE

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

Interim Action Area

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
November 2010		3

SOIL VAPOR EXTRACTION SYSTEM
(SEE FIGURES 7 and 8)

ELECTRICAL SERVICE INSTALLED
FROM EXISTING BUILDING SERVICE

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

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

VADOSE SOIL INTERIM
ACTION AREA

GROUNDWATER/SATURATED SOIL
INTERIM ACTION AREA

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

OVERHEAD
DOOR (TYP)

BUILDING
COLUMN
(TYP.)

STS WAREHOUSE
NO. 15

STS WAREHOUSE
NO. 13

COVERED AREA

EXISTING
CONCRETE PAD

ELECTRICAL
PANEL

COVERED
AREA

DOCK

RAMP

RAMP

NUSTAR TERMINALS
SERVICES FACILITY

COLUMBIA RIVER

EXISTING
ASPHALT
PAVEMENT

EDGE OF PAVEMENT

HYDRANT

MH

IN-1 IN-2 IN-3 IN-4 IN-5

MW-9 MW-13 MW-19 MW-7 MW-12

EX-3 EX-4 EX-5

MGMS1 MGMS2

VE-1-1 VE-1-2 VE-1-3 VE-1-4
VE-2-1 VE-2-2 VE-2-3
VE-3-1 VE-3-2 VE-3-3 VE-3-4
VE-4-1 VE-4-2 VE-4-3 VE-4-4
VE-5-1 VE-5-2 VE-5-3

IP-1 IP-2 IP-3 IP-4 IP-5 IP-6 IP-7 IP-8 IP-9 IP-10 IP-11 IP-12 IP-13 IP-14 IP-15 IP-16 IP-17 IP-18 IP-19 IP-20 IP-21 IP-22 IP-23 IP-24 IP-25 IP-26 IP-27 IP-28 IP-29 IP-30 IP-31 IP-32 IP-33 IP-34 IP-35 IP-36 IP-37 IP-38

IW MP-1 MP-2 MP-3 MP-4

N

0 40 80

Approximate Scale in Feet

LEGEND:

VE-1-2	VAPOR EXTRACTION WELL LOCATION
IP-1	INJECTION POINT LOCATION
AGP-11	PUSH–PROBE LOCATION
EX-3	GROUNDWATER EXTRACTION WELL
IN-1	GROUNDWATER INJECTION WELL
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI–LEVEL GROUNDWATER WELL

UTILITY LEGEND:

	ELECTRICAL
SS	STORM SEWER
W	WATER
MH	MANHOLE

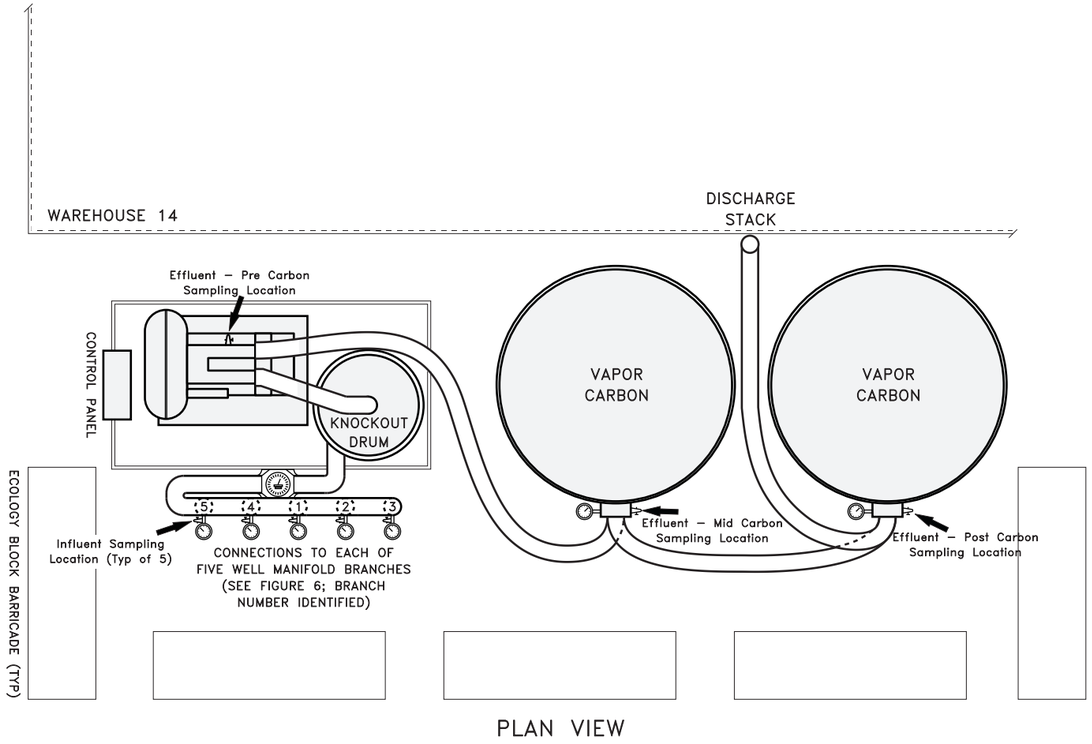
NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.

SVE System Site Plan

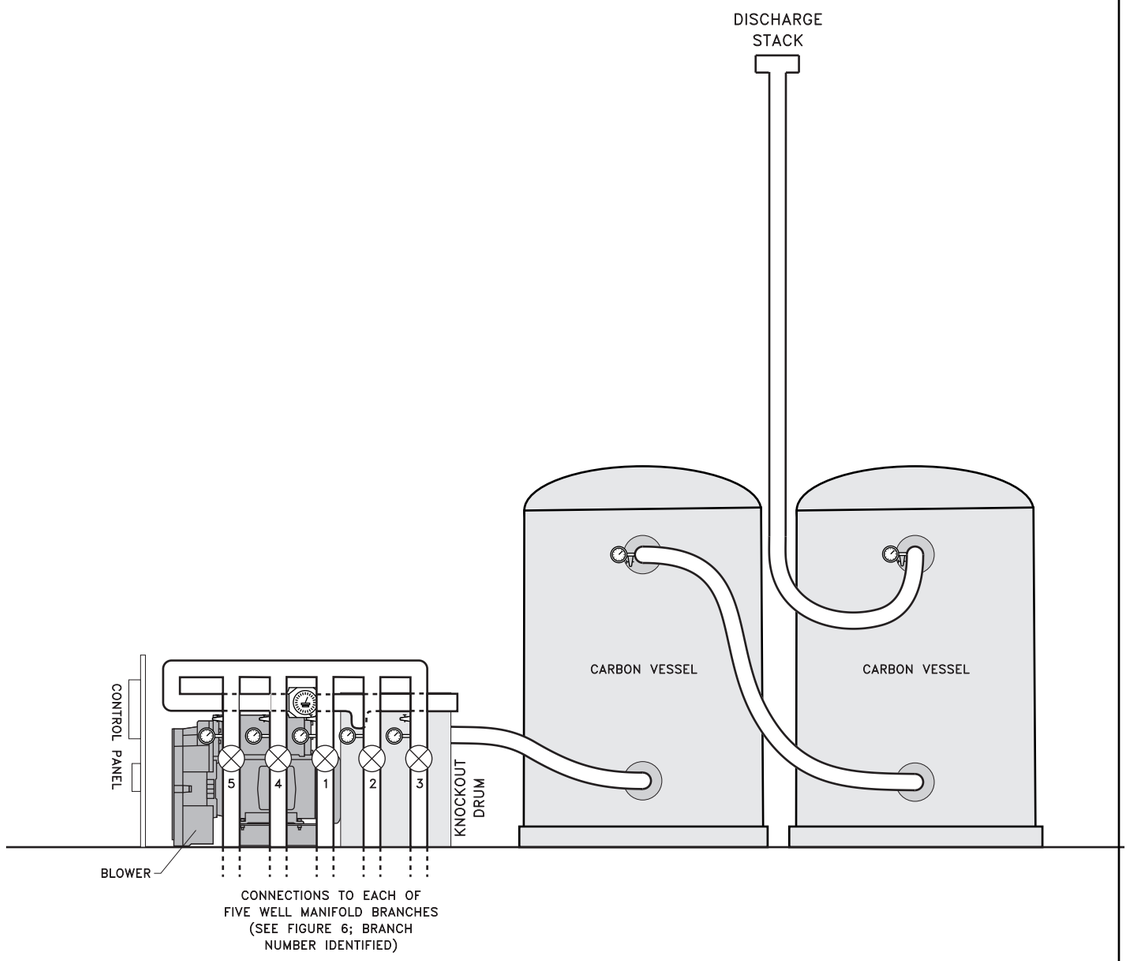
Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

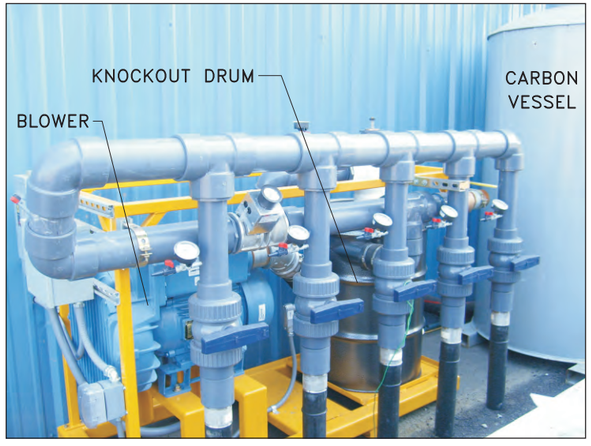
Project Number	1126-09	Figure
November 2010		4



PLAN VIEW



WEST ELEVATION



INSTALLATION PHOTOGRAPHS

Legend:

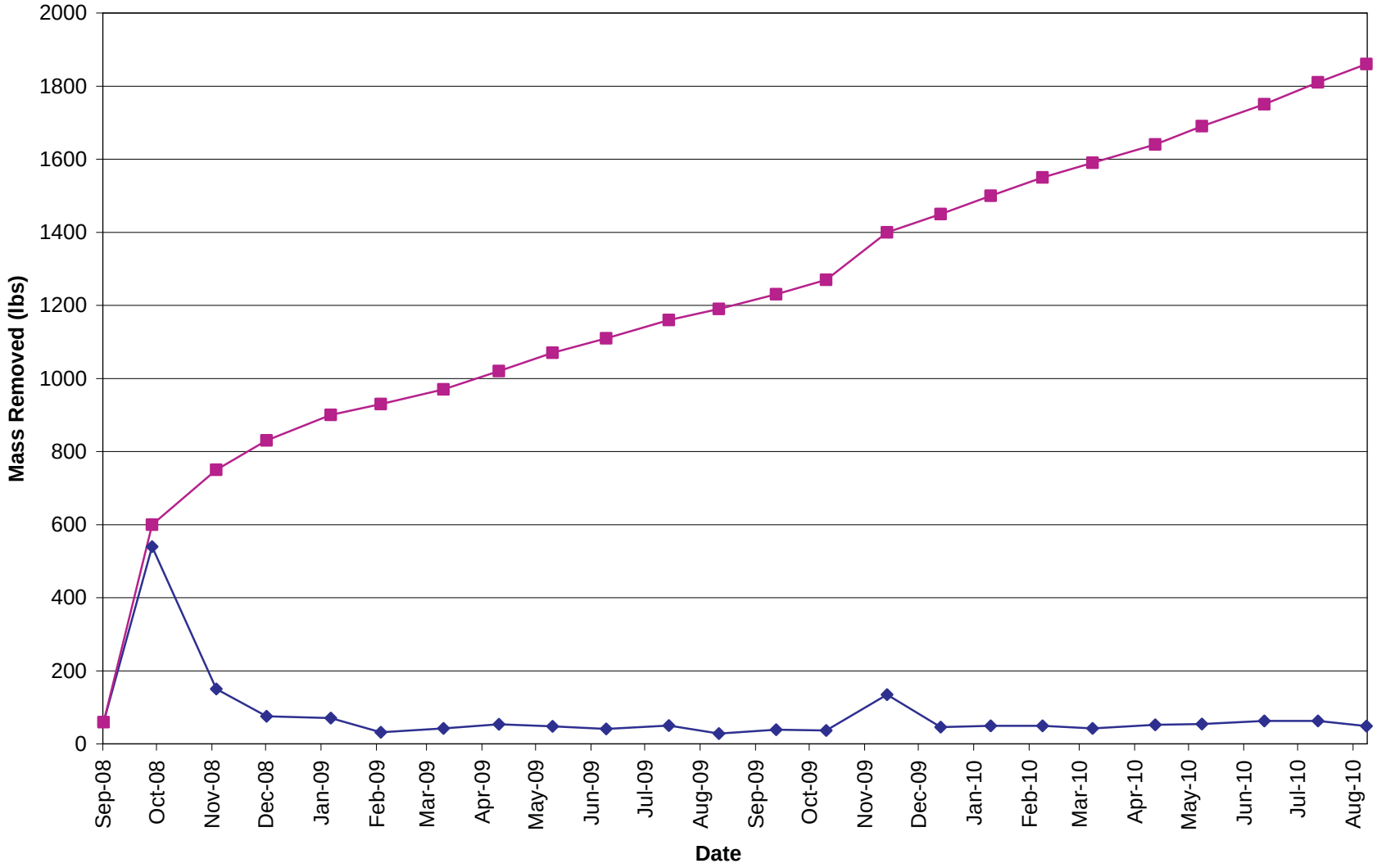
- Sample Port (Sample/PID)
- Pressure Gauge
- Gate Valve
- Flow Meter

SVE System Diagram

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
November 2010		5



Legend:

Approximate Volatile Organic Compounds (VOCs) Removed in Pounds

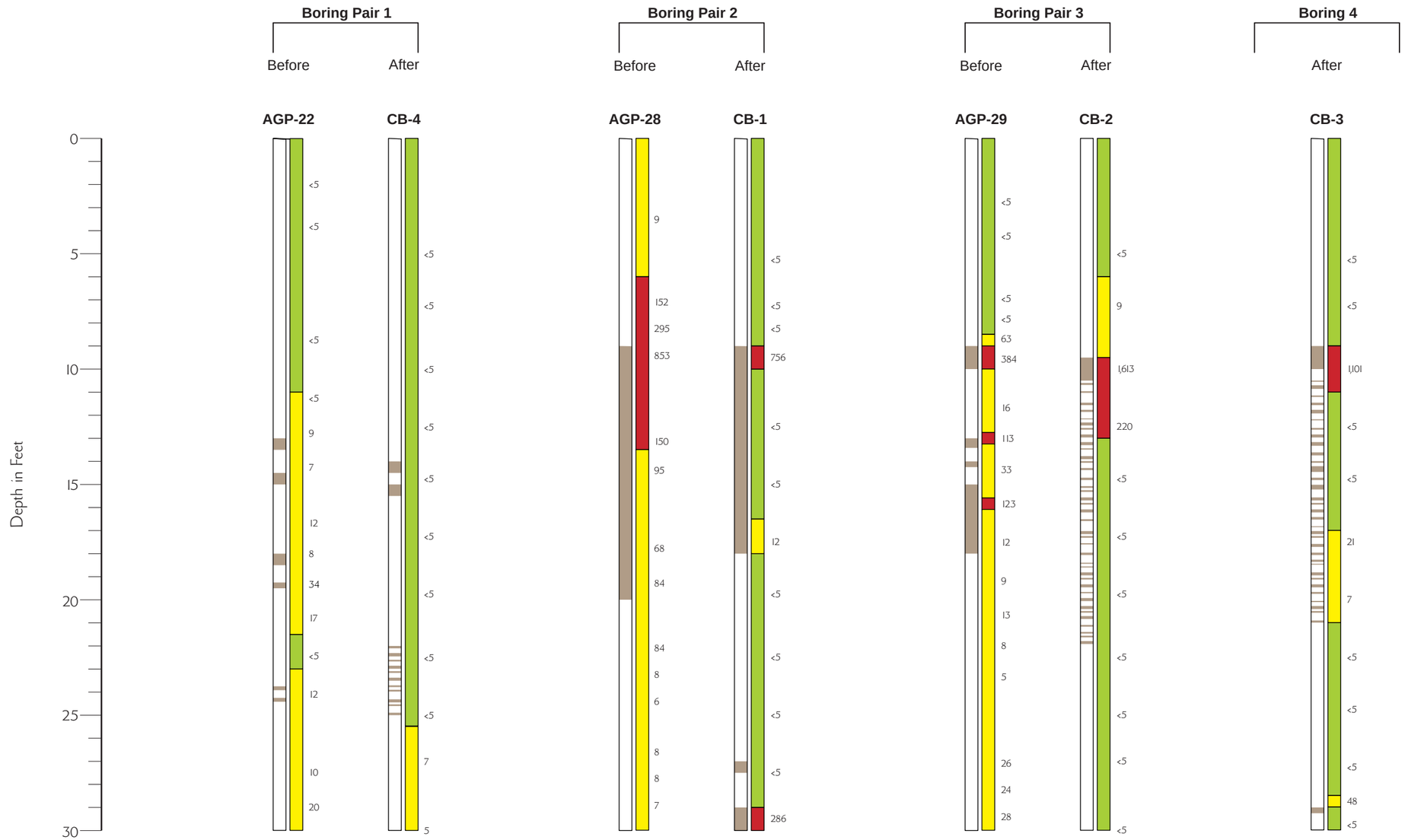
Cumulative VOCs Removed in Pounds

SVE Interim Action VOC Mass Removal

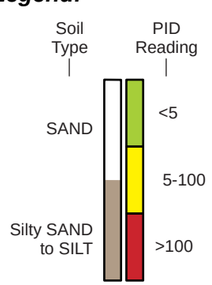
Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
November 2010		6



Legend:



Before = May 2006, Prior to SVE

After = September 2010, After 2 Years of SVE

PID Comparison

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number 1126-09

November 2010

Figure 7

Appendix A

Field Methods and Sampling Procedures

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides instructions for standard field screening. Field screening results are used to aid in the selection of soil samples for chemical analysis. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling operations.

Standard field screening techniques include the use of a photoionization detector (PID) to assess for volatile organic compounds (VOCs), for the presence of separate-phase petroleum hydrocarbons using a sheen test. These methods will not detect all potential contaminants, so selection of screening techniques shall be based on an understanding of the site history. The PID is not compound or concentration-specific, but it can provide a qualitative indication of the presence of VOCs. PID measurements are affected by other field parameters such as temperature and soil moisture. Other field screening methods, such as screening for dense non-aqueous phase liquid (DNAPL) using dye or UV light, are not considered "standard" and will be detailed in the site-specific sampling and analysis plan (SAP).

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- PID with calibration gas (record daily calibration/calibration check in field notes);
- Plastic resealable bags (for PID measurement); and
- Glass jars or stainless steel bowls (for sheen testing).

3. METHODOLOGY

Each soil sample will be field screened for VOCs using a PID and for the presence of separate-phase petroleum hydrocarbons using a sheen test. If the presence of DNAPL is suspected, then screening using dye and UV light may also to be completed. For information regarding screening using dye or UV light, refer to the site specific sampling and analysis plan.

PID lamps come in multiple sizes, typically 9.8, 10.6, and 11.7 electron volts (eV). The eV rating for the lamp must be greater than the ionization potential (in eV) of a compound in order for the PID to detect the compound. For petroleum hydrocarbons, a lamp of at least 9.8 eV should be used. For typical chlorinated alkenes (dichloroethene, trichloroethene, tetrachloroethene, or vinyl chloride.), a lamp of at least 10.6 eV should be used. The compatibility of the lamp size with the site constituents should be verified prior to the field event and will be detailed in the site-specific SAP.

PID Calibration Procedure: The PID used on-site should be calibrated daily or more frequently if needed. Calibration of the PID should be documented in field notes. Calibrations procedures should be conducted according to the manufacturer's instructions. .

<u>PID Screening Procedure:</u>

- Place a representative portion (approximately one ounce) of freshly exposed, uncompacted soil into a clean resealable plastic bag.
- Seal the bag and break up the soil to expose vapors from the soil matrix.
- Allow the bag to sit to reach ambient temperature. Note: Ambient temperature and weather conditions/humidity should be recorded in field notes. Changes in ambient temperature and weather during the field work should also be recorded, as temperature and humidity can affect PID readings.
- Carefully insert the intake port of the PID into the plastic bag.
- Record the PID measurement in the field notes or boring logs.

<u>Sheen Test Procedure:</u>

- Following the PID screen, place approximately one ounce of freshly exposed, uncompacted soil into a clean glass jar or stainless steel bowl.

- Add enough water to cover the sample.
- Observe the water surface for signs of discoloration/sheen and characterize

No Sheen (NS)	No visible sheen on the water surface
Biogenic Film (BF)	Dull, platy/blocky or foamy film.
Slight Sheen (SS)	Light sheen with irregular spread, not rapid. May have small spots of color/iridescence. Majority of water surface not covered by sheen.
Moderate Sheen (MS)	Medium to heavy coverage, some color/iridescence, spread is irregular to flowing. Sheen covering a large portion of water surface.
Heavy Sheen (HS)	Heavy sheen coverage with color/iridescence, spread is rapid, entire water surface covered with sheen. Separate-phase hydrocarbons may be evident during sheen test.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for collection of groundwater samples from monitoring wells applying low flow protocols. Low flow sampling is a method of collecting samples that does not require the removal of large volumes of water and therefore does not overly agitate the water, suspend particles, or potentially aspirate VOCs. Typical flow rates for low flow sampling range from 0.1 L/min to 0.5 L/min depending on site characteristics. The groundwater monitoring activities will consist of measuring water levels, purging and sampling groundwater, and measuring groundwater field parameters. This procedure is applicable during all Ash Creek Associates (ACA) low flow groundwater sampling activities.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Traffic cones, tools, keys, and buckets/drums
- Water quality meter with calibration solutions (record daily calibration/calibration check in field notes)
- Sampling equipment (water level probe, pumps, tubing) and laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by project Health and Safety Plan)

3. METHODOLOGY

Water Levels:

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

Purging:

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

Sample Collection:

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

Low Yield Sampling Procedure:

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

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods used for obtaining soil samples for chemical analysis for volatile organic compounds (VOCs) by EPA Method 5035A. Samples collected using the 5035A protocols are not exposed to the atmosphere after sampling thereby reducing the potential for loss of VOCs during sample transport, handling, and analysis. This procedure assumes the use of the PowerStop Handle sampler with disposable EasyDraw Syringes or Terra Core Samplers. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling activities where the 5035A protocols are employed.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Sampling equipment (PowerStop Handle, disposable EasyDraw Syringes, Terra Core Samplers)
- Laboratory-supplied sample containers (pre-weighed 40ml VOA vials including labels, preservative, stir bars, etc. [number and type as specified by the lab], two ounce jars)
    - Vials used from ACA stock must be weighed to confirm loss of reagents is less than 0.02 grams. Record vial tare weight in field notes. Discard vials with dates over 6 months old.
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by Health and Safety Plan)

3. METHODOLOGY

The project-specific sampling and analysis plan (SAP) will define the specific requirements for 5035A methodology required for a particular site or by a regulatory agency.

Analytical Requirements

- VOCs must be analyzed within 14 days of collection.
- Field preserved samples (e.g., sodium bisulfate or methanol) must be maintained at 4° C.
- Sample collected without preservative (e.g., reagent water) must frozen or analyzed within 48 hours.

Collection of Samples

- When using the PowerStop Handle, clip the syringe into the handle in one of the three 5 gram positions. Use the heavy position for dense clay, the light position for dry sandy soil, and the medium position for all others.
- Using the handle, push the sampler into the soil to collect the sample. Continue pushing until the soil column has forced the plunger in the syringe to the stopping point or filled the sampler.
- Wipe all debris from the outside of the sampler. The soil plug should be flush with the mouth of the sampler. Remove any excess soil that extends beyond the mouth of the sampler.
- Extrude the 5 gram sample into vial and cap vial immediately. Hold vial at an angle when extruding to minimize splashing. Gently swirl vial for 10 seconds to break up soil particles (do not shake).
- When capping the vial, be sure to remove any soil or debris from the threads of the vial.
- Repeat process for each additional vial.
- Fill a two ounce container (to capacity) for percent total solids determination.

Additional Considerations

- Methanol contamination can occur from adjacent activities (e.g., exhaust from running equipment or vehicles, hot tar roofing, facility operations, etc). Collection and analysis of methanol field blank (e.g., additional methanol vial left open during period of sampling) is recommended.
- Acidification of carbonaceous soils with sodium bisulfate can cause effervescence and loss of VOCs.
- Certain volatile compounds such as 2-chloroethylvinyl ether may be lost by acidification.
- Acidification of certain soils with sodium bisulfate may cause the formation of acetone through oxidation of soil waxes and humic material (e.g., organic materials such as roots).

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for oversight of boring installation and soil and grab groundwater sampling using sonic drilling techniques. Subsurface soil cores may be obtained using this system for purposes of determining subsurface soil conditions and for obtaining soil samples for physical and/or chemical evaluation. Grab groundwater samples may be collected using temporary well screens. Groundwater monitoring wells may also be installed using sonic drilling methods to advance the wellbore. This procedure is applicable during Ash Creek Associates (Ash Creek) drilling activities using sonic drilling methods. In addition to the procedures described herein, state and/or local regulations for boring advancement and/or abandonment should be researched to identify requirements specific to the location of the field work for work being conducted outside of the state of Oregon.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Traffic cones, measuring tape, spatula, and buckets/drums
- Sampling equipment (water level probe, pumps, tubing) and laboratory-supplied sample containers (if sample collection for laboratory analysis is desired)
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by project Health and Safety Plan)

3. METHODOLOGY

Coring Procedure (Conducted by Drilling Subcontractor):

Sonic drilling advances a temporary casing while drilling, thereby minimizing communication between strata of different elevations during the drilling process. The sonic drilling technology combines harmonics (vibration) and rotation as the basis for tool advancement, and reduces the volume of IDW created during the completion of the boring. Advancement of the boring is conducted using an inner casing (a 6-inch-diameter core barrel) followed by an outer casing that sleeves over the inner casing. The core barrel advances 5-10 feet into the subsurface, followed by the outer casing. The core barrel is then removed from the borehole and the soil is bagged for preservation (and sampling) or for disposal. The core barrel is put back into the borehole and pushed another 5 to 10 feet. An additional 5- to 10-foot length of outer casing is added to the outer casing that is in the ground and it is advanced to meet the bottom of the core barrel. This process continues until total depth is reached. Soil cores are collected continuously to the full depth of the exploration unless otherwise specified in a project-specific sampling and analysis plan (SAP). Verify that the subcontractor decontaminates the sampling device prior to its initial use and following collection of each soil sample.

Logging and Soil Sample Collection:

The driller will remove the soil core from the sampler into a plastic tube bag by vibrating and moving the sampler so that the full soil core is laid flat within the bag. Inspect the soil core and expose for field screening, description, and placement into sample jars as needed by breaching the side of the sample bag. Soil samples will generally be collected for field screening and possible chemical analysis on two to five foot intervals unless otherwise specified in a project-specific SAP. The sampling interval will be determined in the field based on recovery, soil variability, and evidence of contamination. Complete field screening as

specified in SOP 2.1. Soil samples should be collected using different procedures for volatile or non-volatile analyses, as follows.

- Volatile Analyses. Sampling for volatile organics analysis (VOA) is different than other routine physical or chemical testing because of the potential loss of volatiles during sampling. To limit volatile loss, the soil sample must be obtained as quickly and as directly as possible. If a VOA sample is to be collected as part of a multiple analyte sample, the VOA sample portion will be obtained first. The VOA sample should be obtained from a discrete portion of the entire collected sample and should not be composited or homogenized. Sample bottles should be filled to capacity, with no headspace. Specific procedures for collecting VOA samples using the EPA Method 5035 are discussed in SOP 2.7.
- Other Analyses. Soil samples for non-volatile analyses will be thoroughly homogenized in a stainless steel bowl prior to bottling. Sample homogenizing is accomplished by identifying the selected sample depth interval based on discussions with the Project manager and/or project specific investigation work plan and manually mixing the soil sample from the specified depth interval in the stainless steel bowl with a clean sampling tool until a uniform mixture is achieved. The sample jar should be filled completely.

Any extra soil generated during probing activities will be placed in Department of Transportation (DOT)-approved drums or other project specific storage vessels, based on discussion with the Project Manager.

Grab Groundwater Sample Collection:

Collect grab groundwater samples by installing a temporary well casing in the boring (i.e., 1- to 2-inch PVC well casing with a 4- to 5-foot-long temporary screen). Design of the temporary well casing (including need for filter pack) should be developed based on discussions with the Project Manager and/or project specific investigation work plan. Obtain samples using the methods described in SOP 2.5. Record field parameters (e.g., temperature, conductivity, and pH) prior to sampling. Temporary well well casing should be removed from boring and any other materials added to the boring to support the grab groundwater sampling, such as filter pack or grout drilled out of hole prior to abandonment.

Backfilling the Excavation (Conducted by Drilling Subcontractor):

After sampling activities are completed, abandon each exploration in accordance with regulations and procedures specified for the state in which the work is being conducted. The abandonment procedure typically consists of filling the exploration with granular bentonite and hydrating the bentonite with water. Match the surface completion to the surrounding materials.

Appendix B

Boring Logs

Sample Descriptions

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, and grain size, and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
MAJOR CONSTITUENT with additional remarks; color, moisture, minor constituents, density/consistency.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and push probe explorations is estimated based on visual observation and is presented parenthetically on test pit and push probe exploration logs.

SAND and GRAVEL Density	Standard Penetration Resistance in Blows/Foot
Very loose	0 - 4
Loose	4 - 10
Medium dense	10 - 30
Dense	30 - 50
Very dense	>50

SILT or CLAY Density	Standard Penetration Resistance in Blows/Foot	Approximate Shear Strength in TSF
Very soft	0 - 2	<0.125
Soft	2 - 4	0.125 - 0.25
Medium stiff	4 - 8	0.25 - 0.5
Stiff	8 - 15	0.5 - 1.0
Very Stiff	15 - 30	1.0 - 2.0
Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture.
Sl. Moist	Some perceptible moisture, probably below optimum.
Moist	Probably near optimum moisture content.
Wet	Much perceptible moisture, probably above optimum.

Minor Constituents

	Estimated Percentage
Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Sampling Symbols

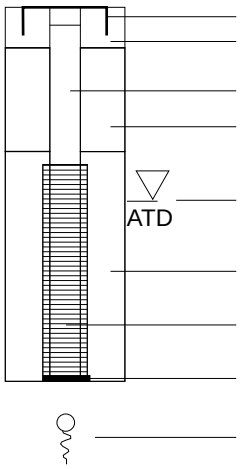
BORING AND PUSH-PROBE SYMBOLS

- Recovery
- No Recovery
- Temporarily Screened Interval
- PID — Photoionization Detector Reading
- W — Water Sample
- Sample Submitted for Chemical Analysis
- NS — No Sheen
- SS — Slight Sheen
- MS — Moderate Sheen
- HS — Heavy Sheen
- BF — Biogenic Film

TEST PIT SOIL SAMPLES

- Grab (Jar)
- Bag
- Shelby Tube

Groundwater Observations and Monitoring Well Construction



Flush Mounted Monument
Concrete Surface Seal
Well Casing
Bentonite Seal
Groundwater Level on Date or (ATD) At Time of Drilling
Sand Pack
Well Screen
End Cap
Groundwater Seepage (Test Pits)

Key to Exploration Logs

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number 1126-09
October 2010

Figure Key

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-1**

Project Number: **1126-09**
Logged By: A. Reese
Date: September 20, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30.5'
Surface Elevation: --

Boring Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
					Asphalt surface (4") over angular base rock (8").
					SAND; brown (10YR 4/3); dry, medium grained, loose.
5			<5		
			<5		
		CB-1-9	<5	NS	Interbedded lenses of SAND/silty SAND from 8-9'.
			756	NS	SILT and fine SAND; pale brown (10YR 6/3), dry to slightly moist, medium stiff.
10					Clayey SILT; brown (10YR 4/3), moist, soft.
			<5		
15			<5		Interbedded sandy SILT lenses.
		CB-1-17.5			Silty SAND, pale brown (10YR 6/3), slightly moist, medium dense.
			12		
					SAND with trace silt; yellowish brown (10YR 5/6), dry to slightly moist, medium dense.
20			<5		
			<5		
25			<5		Clean, medium SAND; light yellowish brown (10YR 6/4), slightly moist, medium stiff.
			<5		6-Inch silty SAND lens; brown (10YR 4/3).
		CB-1-29.5			Fine to medium SAND; brown (10YR 4/3), slightly moist, slightly silty.
			286		
30					Silty SAND; brown (10YR 4/3), moist, medium stiff.
					SAND; gray (10YR 5/1), wet, medium to coarse grained, medium dense.
			<5		
35			<5		
		CB-1-37.5	5		
			<5		Wood debris.

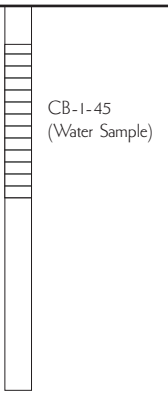
▽ CB-1-35 (Water Sample)

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-1**
Project Number: **1126-09**
Logged By: A. Reese
Date: September 20, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30.5'
Surface Elevation: --

Boring Details and Notes:



Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
45			10		Fine SAND; grayish brown (10YR 4/2), wet, slightly silty, medium dense.
					Sandy SILT; grayish brown (10YR 4/2), wet, stiff.
			12		Fine, rounded GRAVEL in a sandy silt matrix; orange brown (10YR 6/6), wet, medium dense.
			55		
50			5		Bottom of Boring at 50.0' BGS.
55					
60					
65					
70					
75					

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-2**
Project Number: **1126-09**
Logged By: A. Reese
Date: September 20, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30.6'
Surface Elevation: --

Boring Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
					Asphalt surface (4") over angular base rock (8").
					SAND; brown (10YR 4/3); dry to slightly moist, medium grained, loose.
5			<5		
		CB-2-9.5	9		
10			1,613		SILT; brown (10YR 4/3), slightly moist, slightly sandy, medium stiff.
			220		Interbedded SAND/SILT lenses, some oxidized, dry to moist, brown (silt), yellowish brown (sand), and reddish brown (sandy silt).
15		CB-2-18	<5		
			<5		
20			<5		
			<5		SAND; dark yellowish brown (10YR 3/4), dry, loose to medium dense.
25			<5		
			<5		
30			<5		SILT; brown (10YR 4/3), wet, medium stiff.
			23		SAND; brownish gray (10YR 5/2), wet, medium dense.
35			<5		
			<5		
			<5		

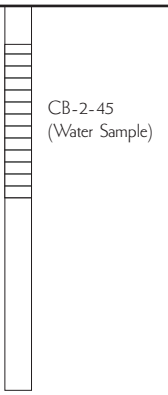
CB-2-35
(Water Sample)

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-2**
Project Number: **1126-09**
Logged By: A. Reese
Date: September 20, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30.6'
Surface Elevation: --

Boring Details and Notes:



Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
45		CB-2-42	11		Sandy SILT; dark brown (10YR 3/3), wet, medium stiff.
			5		SAND, slightly silty, brown (10YR 4/3), wet, medium dense.
			<5		GRAVEL in a sandy silt matrix; brown (10YR 4/3), wet, fine to medium grained, rounded, medium dense.
50			<5		Bottom of Boring at 50.0' BGS.
55					
60					
65					
70					
75					

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-3**
Project Number: **1126-09**
Logged By: A. Reese
Date: September 20, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30'
Surface Elevation: --

Boring Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
					Asphalt surface (4") over angular base rock (8").
					SAND; dark yellowish brown, dry, loose.
5			<5		
		CB-3-9	<5		
10			1,101		SILT; brown (10YR 4/2), slightly moist, medium stiff.
			<5		SAND with interbedded lenses of clean, silty sand; brown to yellowish brown, slightly moist, loose.
15			<5		
		CB-3-18	21		
20			7		
			<5		Becomes clean SAND with trace silt.
25			<5		
		CB-3-29	<5		
			48		Silt lens.
30			<5		Becomes wet.
			<5		
35			<5		SAND (SP); dark brown (10YR 3/3), wet, medium to coarse grained, trace fines, trace fine gravel.
			<5		

CB-3-35
(Water Sample)

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-3**
Project Number: **1126-09**
Logged By: A. Reese
Date: September 20, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30'
Surface Elevation: --

Boring Details and Notes:

Depth, feet	Laboratory Sample ID	PID	Sheen	Lithologic Description
				Becomes fine grained.
		22	NS	3-Inch SILT lens (ML); brown (10YR 4/3), moist to wet, medium stiff, few plastic fines, few very fine sand.
				3-Inch SILT lens (as above).
				Becomes coarse grained SAND.
45				
		<5	NS	Sandy GRAVEL (GW); medium gray (10YR 5/1), wet, medium dense.
50				Bottom of Boring at 50.0' BGS.
55				
60				
65				
70				
75				

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-4**
Project Number: **1126-09**
Logged By: A. Reese
Date: September 21, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30.1'
Surface Elevation: --

Boring Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
	Air Knife				Asphalt surface (6") over angular base rock (6") over sandy GRAVEL (FILL). Cleared with air knife.
					SAND; yellowish brown (10YR 5/6), dry, fine to medium grained, some gravel, loose.
5			<5		
			<5		2-Inch GRAVEL lens.
10			<5		
			<5		4-Inch GRAVEL lens.
					6-Inch SILT lens; brown (10YR 4/3), slightly moist, stiff.
15		CB-4-18	<5		6-Inch SILT lens; brown (10YR 4/3), slightly moist, stiff.
			<5		
20			<5		
			<5		Fine horizontal laminates of silty SAND within a sand matrix from 22-25'.
25		CB-4-28	<5		SAND; reddish brown (5YR 5/6), slightly moist, fine to medium grained, medium dense.
			7		
30			5		Becomes wet.
			<5		Some wood debris.
					Grades to silty SAND.
35		CB-4-38.5	<5		
			18		
			<5		Becomes grayish brown.

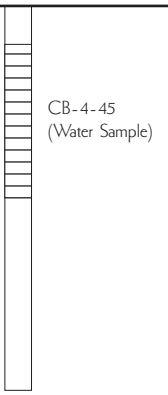
CB-4-35 (Water Sample)

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Interim Action Performance Evaluation
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Boring Number: **CB-4**
Project Number: **1126-09**
Logged By: A. Reese
Date: September 21, 2010
Site Conditions: Overcast, 60°
Drilling Contractor: Major Drilling
Drilling Equipment: Geoprobe 7720DT
Sampler Type: Macro Core
Depth to Water (ATD): 30.1'
Surface Elevation: --

Boring Details and Notes:



Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
45			<5		SILT; dark brown (10YR 4/3), wet, stiff.
			9		Silty GRAVEL; gray (10YR 5/1), wet, dense.
			11		Becomes brown.
50			8		Bottom of Boring at 50.0' BGS.
55					
60					
65					
70					
75					

Appendix C

Current and Historical Analytical Data

Table C-1
2010 Groundwater Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Parameter in µg/L (ppb)																					
		1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2+4-Chlorotoluene
CB-1 (35)	9/20/2010	< 2.5	**6**	< 2.5	< 2.5	**3.2**	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 5.0
CB-1 (45)	9/20/2010	< 5.0	**130**	< 5.0	< 5.0	**260**	**53**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10
CB-2 (35)	9/20/2010	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.0
CB-2 (45)	9/21/2010	< 5.0	72 M	< 5.0	< 5.0	100	23 M	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10
	9/21/10 DUP	< 7.0	110 M	< 7.0	< 7.0	130	36 M	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 15
CB-3 (35)	9/21/2010	< 4.0	8.8	< 4.0	< 4.0	9	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 7.0
CB-3(45)	9/21/2010	--	11	< 3.0	< 3.0	28	4.5	--	--	--	--	--	--	< 3.0	< 3.0	< 3.0	< 3.0	--	< 3.0	--	< 3.0	--	--
CB-4 (35)	9/21/2010	< 4.0	4.4	< 4.0	< 4.0	6.6	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 7.0
CB-4 (45)	9/21/2010	< 15	62	< 15	< 15	41	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 25

Please refer to notes at end of table.

Table C-1
2010 Groundwater Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Parameter in µg/L (ppb)																				
		Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Ethylbenzene	Hexachlorobutadiene	Isopropyl benzene	Methylene Chloride	Naphthalene	n-Butylbenzene
CB-1 (35)	9/20/2010	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 50	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	**46**	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 5.0	< 2.5	< 2.5
CB-1 (45)	9/20/2010	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	**1400**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
CB-2 (35)	9/20/2010	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	35	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0	< 0.50	< 0.50
CB-2 (45)	9/21/2010	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	770	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	9/21/10 DUP	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 150	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	950	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0
CB-3 (35)	9/21/2010	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 70	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	220	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 5.0	< 4.0	< 4.0
CB-3(45)	9/21/2010	--	--	--	< 3.0	< 3.0	< 60	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	280	< 3.0	< 3.0	--	--	--	--	--	< 5.0	--	--
CB-4 (35)	9/21/2010	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 70	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	110	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 5.0	< 4.0	< 4.0
CB-4 (45)	9/21/2010	< 15	< 15	< 15	< 15	< 15	< 250	< 15	< 15	< 15	< 15	< 15	1200	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15

Please refer to notes at end of table.

Table C-1
2010 Groundwater Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Parameter in µg/L (ppb)													
		n-Propylbenzene	O-Xylene	P,M-Xylene	p-Isopropyltoluene	sec-Butylbenzene	Styrene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
CB-1 (35)	9/20/2010	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	**650**	< 2.5	< 2.5	< 2.5	**170**	< 2.5	< 2.5
CB-1 (45)	9/20/2010	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	**1400**	< 5.0	**20**	< 5.0	**1700**	< 5.0	**40**
CB-2 (35)	9/20/2010	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	62	< 0.50	< 0.50	< 0.50	16	< 0.50	0.66
CB-2 (45)	9/21/2010	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	500 M	< 5.0	8.2	< 5.0	1000 M	< 5.0	39 M
	9/21/10 DUP	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0	1400 M	< 7.0	11	< 7.0	1800 M	< 7.0	61 M
CB-3 (35)	9/21/2010	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	940	< 4.0	< 4.0	< 4.0	240	< 4.0	< 4.0
CB-3(45)	9/21/2010	--	--	--	--	--	--	--	690	--	5.8	< 3.0	270	< 3.0	26
CB-4 (35)	9/21/2010	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	680	< 4.0	6.4	< 4.0	170	< 4.0	< 4.0
CB-4 (45)	9/21/2010	< 15	< 15	< 15	< 15	< 15	< 15	< 15	3300	< 15	22	< 15	820	< 15	100

Notes:

1. Concentrations in micrograms per kilogram (µg/Kg) parts per billion (ppb).
2. < = Not detected at corresponding numerical limit.
3. **Bolded** values indicate analyte detected above laboratory method detection limits (MDLs).
4. M = The relative percent difference (RPD) values between the sample and the duplicate were outside of acceptable control limits.
5. -- = Compound not reported or sample not analyzed.

Table C-2
2010 Soil Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Parameter in mg/Kg (ppm)													
			Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Methylene Chloride	trans-1,2-Dichloroethene	1,1-Dichloroethane	2,2-Dichloropropane	cis-1,2-Dichloroethene	Chloroform	Bromochloromethane
CB-1 (9)	9/20/2010	9	<0.040	<0.040	<0.040	<5.0 RL1	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-1 (29.5)	9/20/2010	29.5	<0.040	<0.040	<0.040	<2.0 RL1	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-1 (17.5)	9/20/2010	17.5	<0.030	<0.030	<0.030	<0.600	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
CB-1 (37.5)	9/20/2010	37.5	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	0.0057	<0.005	<0.005	<0.005	0.034	<0.005	<0.005
CB-2 (9.5)	9/20/2010	9.5	<0.040	<0.040	<0.040	<0.800 RL1	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-2 (18)	9/20/2010	18	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (28)	9/20/2010	28	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (42)	9/20/2010	42	<0.040	<0.040	<0.040	<0.800 RL1	<0.040	<0.040	0.062	<0.040	0.049	0.270	<0.040	1.90	<0.040	<0.040
CB-3 (9)	9/21/2010	9	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-3 (18)	9/21/2010	18	<0.040	<0.040	<0.040	<1.0 RL1	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-3 (29)	9/21/2010	29	<0.040	<0.040	<0.040	<0.800 RL1	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.230	<0.040	<0.040
CB-4 (18)	9/21/2010	18	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (28)	9/21/2010	28	<0.005	<0.005	<0.005	<0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (38.5)	9/21/2010	38.5	<0.040	<0.040	<0.040	<0.800	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	1.30	<0.040	<0.040

Please refer to notes at end of table

Table C-2
2010 Soil Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Parameter in mg/Kg (ppm)										
		1,1,1-Trichloroethane	1,1-Dichloropropene	1,2-Dichloroethane	Carbon Tetrachloride	Benzene	Trichloroethene	1,2-Dichloropropane	Bromodichloromethane	Dibromomethane	cis-1,3-Dichloropropene	Toluene
CB-1 (9)	9/20/2010	<0.004	<0.040	<0.040	<0.040	<0.040	<4.0	<0.040	<0.040	<0.040	<0.040	<0.040
CB-1 (29.5)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-1 (17.5)	9/20/2010	<0.030	<0.030	<0.030	<0.030	<0.030	0.093	<0.030	<0.030	<0.030	<0.030	<0.030
CB-1 (37.5)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	0.069	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (9.5)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-2 (18)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (28)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (42)	9/20/2010	0.300	<0.040	<0.040	<0.040	<0.040	4.7	<0.040	<0.040	<0.040	<0.040	<0.040
CB-3 (9)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	0.0069	<0.005	<0.005	<0.005	<0.005	<0.005
CB-3 (18)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	0.180	<0.040	<0.040	<0.040	<0.040	<0.040
CB-3 (29)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	0.720	<0.040	<0.040	<0.040	<0.040	<0.040
CB-4 (18)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (28)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (38.5)	9/21/2010	0.120	<0.040	<0.040	<0.040	<0.040	2.0	<0.040	<0.040	<0.040	<0.040	<0.040

Please refer to notes at end of table

Table C-2
2010 Soil Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Parameter in mg/Kg (ppm)										
		trans-1,3-Dichloropropene	1,1,2-Trichloroethane	1,3-Dichloropropane	Tetrachloroethene	Dibromochloromethane	1,2-Dibromoethane	Chlorobenzene	1,1,1,2-Tetrachloroethane	Ethylbenzene	P,M-Xylene	O-Xylene
CB-1 (9)	9/20/2010	<0.040	<0.040	<0.040	6,700	<0.040	<0.040	<0.040	<0.004	<0.004	<0.040	<0.004
CB-1 (29.5)	9/20/2010	<0.040	<0.040	<0.040	160	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-1 (17.5)	9/20/2010	<0.030	<0.030	<0.030	10	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
CB-1 (37.5)	9/20/2010	<0.005	<0.005	<0.005	0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (9.5)	9/20/2010	<0.040	<0.040	<0.040	130	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-2 (18)	9/20/2010	<0.005	<0.005	<0.005	0.019	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (28)	9/20/2010	<0.005	<0.005	<0.005	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (42)	9/20/2010	<0.040	<0.040	<0.040	42	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-3 (9)	9/21/2010	<0.005	<0.005	<0.005	1.8	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-3 (18)	9/21/2010	<0.040	<0.040	<0.040	24	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-3 (29)	9/21/2010	<0.040	<0.040	<0.040	34	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-4 (18)	9/21/2010	<0.005	<0.005	<0.005	2.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (28)	9/21/2010	<0.005	<0.005	<0.005	0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (38.5)	9/21/2010	<0.040	<0.040	<0.040	26	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040

Please refer to notes at end of table

Table C-2
2010 Soil Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Parameter in mg/Kg (ppm)										
		Styrene	Isopropyl benzene	Bromoform	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	n-Propylbenzene	Bromobenzene	1,3,5-Trimethylbenzene	2+4-Chlorotoluene	tert-Butylbenzene	1,2,4-Trimethylbenzene
CB-1 (9)	9/20/2010	<0.040	<0.040	<0.040	<0.050	<0.040	<0.040	<0.040	<0.040	<0.070	<0.040	<0.040
CB-1 (29.5)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.070	<0.040	<0.040
CB-1 (17.5)	9/20/2010	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.060	<0.030	<0.030
CB-1 (37.5)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (9.5)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.070	<0.040	<0.040
CB-2 (18)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (28)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (42)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.070	<0.040	<0.040
CB-3 (9)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-3 (18)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.080	<0.040	<0.040
CB-3 (29)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.070	<0.040	<0.040
CB-4 (18)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (28)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (38.5)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.080	<0.040	<0.040

Please refer to notes at end of table

Table C-2
2010 Soil Analytical Summary Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Parameter in mg/Kg (ppm)										
		sec-Butylbenzene	p-Isopropyltoluene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	n-Butylbenzene	1,2-Dichlorobenzene	1,2-Dibromo-3-chloropropane	1,2,4-Trichlorobenzene	Hexachlorobutadiene	Naphthalene	1,2,3-Trichlorobenzene
CB-1 (9)	9/20/2010	<0.040	<0.004	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-1 (29.5)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-1 (17.5)	9/20/2010	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
CB-1 (37.5)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (9.5)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-2 (18)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (28)	9/20/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-2 (42)	9/20/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-3 (9)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-3 (18)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-3 (29)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
CB-4 (18)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (28)	9/21/2010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CB-4 (38.5)	9/21/2010	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040

Notes:
1. Concentrations in milligrams per kilogram (mg/Kg) parts per million (ppm).
2. < = Not detected at corresponding numerical limit.
3. **Bolded** values indicate analyte detected above laboratory method detection limits (MDLs).
4. RL1 = The bromomethane reporting limit was raised due to a matrix effect.
5. -- = Compound not reported or sample not analyzed.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter in mg/Kg (ppm)															
				Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromodichloro-methane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chlorodibromo-methane	Chloroethane	2-Chloroethyl vinyl ether	Chloroform	Chloromethane
AGP-03-13	5/10/2006	13	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-10-6.5	4/25/2006	6.5	8260B	--	--	--	<0.359	<0.359	<0.718	<3.59	--	--	--	<1.4	<0.359	--	<1.79	--	<0.359	<3.59
AGP-12-13	4/25/2006	13	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-07-46.5	4/25/2006	46.5	8260B	--	--	--	<0.0967	<0.0967	<0.193	<0.967	--	--	--	<0.387	<0.0967	--	<0.484	--	<0.0967	<0.967
AGP-08-37.5	4/24/2006	37.5	8260B	--	--	--	<0.0918	<0.0918	<0.184	<0.918	--	--	--	<0.367	<0.0918	--	<0.459	--	<0.0918	<0.918
AGP-09-48.5	4/25/2006	48.5	8260B	--	--	--	<0.091	<0.091	<0.184	<0.091	--	--	--	<0.364	<0.0910	--	<0.455	--	<0.0910	<0.910
AGP-10-49.5	4/26/2006	49.5	8260B	--	--	--	<0.0903	<0.0903	<0.181	<0.903	--	--	--	<0.361	<0.0903	--	<0.452	--	<0.0903	<0.903
AGP-11-33	4/26/2006	33	8260B	--	--	--	<0.0904	<0.0904	<0.181	<0.904	--	--	--	<0.361	<0.904	--	<0.452	--	<0.0904	<0.904
AGP-12-34.5	4/25/2006	34.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-12-37.5	4/25/2006	37.5	8260B	--	--	--	<0.657	<0.657	<0.001	<0.006	--	--	--	<0.002	<0.657	--	<0.003	--	<0.657	<6.570
AGP-12-48	4/25/2006	48	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-20-17.5	4/28/2005	17.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-21-13	5/1/2006	13	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-22-18	5/2/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-23-12.5	5/8/2006	12.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-24-12	5/8/2006	12	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-26-18	5/3/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-27-8.75	5/2/2006	8.75	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-28-9	5/3/2006	9	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-28-17.5	5/3/2006	17.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-9.5	5/4/2006	9.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-18	5/4/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-32-14	5/9/2006	14	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-33-14	5/12/2006	14	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-35-18.5	5/15/2006	18.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-36-18	5/16/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-38-24	5/11/2006	24	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-39-17.5	5/16/2006	17.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-42-17	6/19/2006	17	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-43-16.5	6/15/2006	16.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-45-7	6/23/2006	7	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-01-47.5	5/10/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-02-43	5/11/2006	43	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-03-41.5	5/10/2006	41.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-04-38	5/5/2006	38	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-05-34	5/5/2006	34	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-06-48	5/2/2006	48	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-13-37.5	5/1/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-14-49	4/27/2006	49	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-15-42.5	4/26/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-16-37	4/27/2006	37	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-17-39	4/28/2006	39	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-18-37.5	4/28/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-19-42.5	4/28/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-20-43	5/1/2006	43	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-21-32.5	5/1/2006	32.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Please refer to notes at end of table.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter in mg/Kg (ppm)																
				2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoro-methane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropane
AGP-03-13	5/10/2006	13	8260B	--	--	--	--	--	--	--	--	--	<0.0956	--	<0.0956	<0.0956	<0.0956	--	--	--
AGP-10-6.5	4/25/2006	6.5	8260B	--	--	--	<0.359	<0.359	<0.359	<0.359	<0.359	<3.59	<0.359	<0.359	<0.359	<0.359	<0.359	<0.359	--	--
AGP-12-13	4/25/2006	13	8260B	--	--	--	--	--	--	--	--	--	<0.0783	--	<0.0783	<0.0783	<0.0783	--	--	--
AGP-07-46.5	4/25/2006	46.5	8260B	--	--	--	<0.0967	<0.0967	<0.0967	<0.0967	<0.0967	<0.967	<0.0967	--	<0.0967	0.348	<0.0967	<0.0967	--	--
AGP-08-37.5	4/24/2006	37.5	8260B	--	--	--	<0.0918	<0.0918	<0.0918	<0.0918	<0.0918	<0.918	0.367	<0.0918	0.349	22.6	<0.206	<0.0918	--	--
AGP-09-48.5	4/25/2006	48.5	8260B	--	--	--	<0.0910	<0.0910	<0.0910	<0.0910	<0.0910	<0.910	<0.091	<0.0910	<0.091	0.599	<0.091	<0.0910	--	--
AGP-10-49.5	4/26/2006	49.5	8260B	--	--	--	<0.0903	<0.0903	<0.0903	<0.0903	<0.0903	<0.903	<0.0903	<0.0903	<0.0903	0.753	<0.0903	<0.0903	--	--
AGP-11-33	4/26/2006	33	8260B	--	--	--	<0.0904	<0.0904	<0.0904	<0.0904	<0.0904	<0.904	<0.0904	<0.0904	<0.0904	<0.0904	<0.0904	<0.0904	--	--
AGP-12-34.5	4/25/2006	34.5	8260B	--	--	--	--	--	--	--	--	--	<0.148	--	<0.148	0.618 J	<0.148	--	--	--
AGP-12-37.5	4/25/2006	37.5	8260B	--	--	--	<0.657	<0.657	<0.657	<0.657	<0.657	<6.570	8.47	<0.657	5.06	169	<3.52	<0.657	--	--
AGP-12-48	4/25/2006	48	8260B	--	--	--	--	--	--	--	--	--	<0.0927	--	<0.0814	2.11	<0.0814	--	--	--
AGP-20-17.5	4/28/2005	17.5	8260B	--	--	--	--	--	--	--	--	--	<0.107	--	<0.107	<0.107	<0.107	--	--	--
AGP-21-13	5/1/2006	13	8260B	--	--	--	--	--	--	--	--	--	<0.0939	--	<0.0939	<0.0939	<0.0939	--	--	--
AGP-22-18	5/2/2006	18	8260B	--	--	--	--	--	--	--	--	--	<0.184	--	<0.184	<0.184	<0.184	--	--	--
AGP-23-12.5	5/8/2006	12.5	8260B	--	--	--	--	--	--	--	--	--	<0.103	--	<0.103	<0.103	<0.103	--	--	--
AGP-24-12	5/8/2006	12	8260B	--	--	--	--	--	--	--	--	--	<0.0961	--	<0.0961	<0.0961	<0.0961	--	--	--
AGP-26-18	5/3/2006	18	8260B	--	--	--	--	--	--	--	--	--	<0.115	--	<0.115	<0.115	<0.115	--	--	--
AGP-27-8.75	5/2/2006	8.75	8260B	--	--	--	--	--	--	--	--	--	<0.0896	--	<0.0896	<0.0896	<0.0896	--	--	--
AGP-28-9	5/3/2006	9	8260B	--	--	--	--	--	--	--	--	--	<0.218	--	<0.218	<0.218	<0.218	--	--	--
AGP-28-17.5	5/3/2006	17.5	8260B	--	--	--	--	--	--	--	--	--	<0.403	--	<0.403	<0.403	<0.403	--	--	--
AGP-29-9.5	5/4/2006	9.5	8260B	--	--	--	--	--	--	--	--	--	<4.78	--	<4.78	<4.78	<4.78	--	--	--
AGP-29-18	5/4/2006	18	8260B	--	--	--	--	--	--	--	--	--	<0.093	--	<0.093	<0.093	<0.093	--	--	--
AGP-32-14	5/9/2006	14	8260B	--	--	--	--	--	--	--	--	--	<0.0984	--	<0.0984	<0.0984	<0.0984	--	--	--
AGP-33-14	5/12/2006	14	8260B	--	--	--	--	--	--	--	--	--	<0.0952	--	<0.0952	<0.0952	<0.0952	--	--	--
AGP-35-18.5	5/15/2006	18.5	8260B	--	--	--	--	--	--	--	--	--	<0.0953	--	<0.0953	<0.0953	<0.0953	--	--	--
AGP-36-18	5/16/2006	18	8260B	--	--	--	--	--	--	--	--	--	<0.0933	--	<0.0933	<0.0933	<0.0933	--	--	--
AGP-38-24	5/11/2006	24	8260B	--	--	--	--	--	--	--	--	--	<0.109	--	<0.109	<0.109	<0.109	--	--	--
AGP-39-17.5	5/16/2006	17.5	8260B	--	--	--	--	--	--	--	--	--	<0.0964	--	<0.0964	<0.0964	<0.0964	--	--	--
AGP-42-17	6/19/2006	17	8260B	--	--	--	--	--	--	--	--	--	<0.0988	--	<0.0988	<0.0988	<0.0988	--	--	--
AGP-43-16.5	6/15/2006	16.5	8260B	--	--	--	--	--	--	--	--	--	<0.106	--	<0.106	<0.106	<0.106	--	--	--
AGP-45-7	6/23/2006	7	8260B	--	--	--	--	--	--	--	--	--	<0.0994	--	<0.0994	<0.0994	<0.0994	--	--	--
AGP-01-47.5	5/10/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	<0.0906	--	<0.0906	<0.0906	<0.0906	--	--	--
AGP-02-43	5/11/2006	43	8260B	--	--	--	--	--	--	--	--	--	<0.116	--	<0.116	<0.116	<0.116	--	--	--
AGP-03-41.5	5/10/2006	41.5	8260B	--	--	--	--	--	--	--	--	--	<0.135	--	<0.135	<0.135	<0.135	--	--	--
AGP-04-38	5/5/2006	38	8260B	--	--	--	--	--	--	--	--	--	<0.109	--	<0.109	0.135	<0.109	--	--	--
AGP-05-34	5/5/2006	34	8260B	--	--	--	--	--	--	--	--	--	<0.094	--	<0.094	0.496	<0.094	--	--	--
AGP-06-48	5/2/2006	48	8260B	--	--	--	--	--	--	--	--	--	<0.108	--	<0.108	0.23	<0.108	--	--	--
AGP-13-37.5	5/1/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	0.602	--	0.347	22.4	<0.142	--	--	--
AGP-14-49	4/27/2006	49	8260B	--	--	--	--	--	--	--	--	--	<0.0846	--	<0.0846	1.99	<0.0846	--	--	--
AGP-15-42.5	4/26/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	<0.186	--	0.0972	7.4	<0.178	--	--	--
AGP-16-37	4/27/2006	37	8260B	--	--	--	--	--	--	--	--	--	<0.1	--	<0.1	0.294	<0.1	--	--	--
AGP-17-39	4/28/2006	39	8260B	--	--	--	--	--	--	--	--	--	0.732	--	1.25	46	<0.728	--	--	--
AGP-18-37.5	4/28/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	0.276	--	0.106	8.85	<0.183	--	--	--
AGP-19-42.5	4/28/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	<0.184	--	<0.184	5.36	1.84	--	--	--
AGP-20-43	5/1/2006	43	8260B	--	--	--	--	--	--	--	--	--	<0.108	--	<0.108	3.03	<0.108	--	--	--
AGP-21-32.5	5/1/2006	32.5	8260B	--	--	--	--	--	--	--	--	--	<0.093	--	<0.093	<0.093	<0.093	--	--	--

Please refer to notes at end of table.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter in mg/Kg (ppm)																
				cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	2,2-Dichloropropane	Di-isopropyl ether	Ethylbenzene	Hexachloro-butadiene	Isopropylbenzene	p-Isopropyltoluene	2-Butanone (MEK)	Methylene Chloride	4-Methyl-2-pentanone (MIBK)	Methyl tert-butyl ether	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane
AGP-03-13	5/10/2006	13	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-10-6.5	4/25/2006	6.5	8260B	<0.359	<0.359	--	--	--	--	--	--	--	<3.590	--	--	--	--	--	<0.359	<0.359
AGP-12-13	4/25/2006	13	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-07-46.5	4/25/2006	46.5	8260B	<0.0967	<0.0967	--	--	--	--	--	--	--	<0.967	--	--	--	--	--	<0.0967	<0.0967
AGP-08-37.5	4/24/2006	37.5	8260B	<0.0918	<0.0918	--	--	--	--	--	--	--	<0.918	--	--	--	--	--	<0.0918	<0.0918
AGP-09-48.5	4/25/2006	48.5	8260B	<0.0910	<0.0910	--	--	--	--	--	--	--	<0.910	--	--	--	--	--	<0.0910	<0.0910
AGP-10-49.5	4/26/2006	49.5	8260B	<0.0903	<0.0903	--	--	--	--	--	--	--	<0.903	--	--	--	--	--	<0.0903	<0.0903
AGP-11-33	4/26/2006	33	8260B	<0.0904	<0.0904	--	--	--	--	--	--	--	<0.904	--	--	--	--	--	--	--
AGP-12-34.5	4/25/2006	34.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-12-37.5	4/25/2006	37.5	8260B	<0.657	<0.657	--	--	--	--	--	--	--	<6.570	--	--	--	--	--	<0.657	<0.657
AGP-12-48	4/25/2006	48	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-20-17.5	4/28/2005	17.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-21-13	5/1/2006	13	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-22-18	5/2/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-23-12.5	5/8/2006	12.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-24-12	5/8/2006	12	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-26-18	5/3/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-27-8.75	5/2/2006	8.75	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-28-9	5/3/2006	9	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-28-17.5	5/3/2006	17.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-9.5	5/4/2006	9.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-18	5/4/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-32-14	5/9/2006	14	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-33-14	5/12/2006	14	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-35-18.5	5/15/2006	18.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-36-18	5/16/2006	18	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-38-24	5/11/2006	24	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-39-17.5	5/16/2006	17.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-42-17	6/19/2006	17	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-43-16.5	6/15/2006	16.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-45-7	6/23/2006	7	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-01-47.5	5/10/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-02-43	5/11/2006	43	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-03-41.5	5/10/2006	41.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-04-38	5/5/2006	38	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-05-34	5/5/2006	34	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-06-48	5/2/2006	48	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-13-37.5	5/1/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-14-49	4/27/2006	49	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-15-42.5	4/26/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-16-37	4/27/2006	37	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-17-39	4/28/2006	39	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-18-37.5	4/28/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-19-42.5	4/28/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-20-43	5/1/2006	43	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-21-32.5	5/1/2006	32.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Please refer to notes at end of table.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter in mg/Kg (ppm)														
				1,1,2-Trichloro-1,2,2-trifluoroethane	Tetrachloro-ethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoro-methane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,2,3-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	Xylenes, Total
AGP-03-13	5/10/2006	13	8260B	--	<0.0956	--	--	--	<0.0956	--	<0.0956	--	--	--	--	--	<0.956	--
AGP-10-6.5	4/25/2006	6.5	8260B	--	3.14	--	--	--	<0.359	--	<0.359	<0.718	--	--	--	--	<3.59	--
AGP-12-13	4/25/2006	13	8260B	--	2.99	--	--	--	<0.0783	--	0.568		--	--	--	--	<0.783	--
AGP-07-46.5	4/25/2006	46.5	8260B	--	11.9	--	--	--	<0.0967	--	2.06	<0.193	--	--	--	--	<0.967	--
AGP-08-37.5	4/24/2006	37.5	8260B	--	0.18	--	--	--	<0.0918	--	0.937	<0.184	--	--	--	--	<0.918	--
AGP-09-48.5	4/25/2006	48.5	8260B	--	12.4	--	--	--	<0.091	--	2.35	<0.182	--	--	--	--	<0.91	--
AGP-10-49.5	4/26/2006	49.5	8260B	--	6.41	--	--	--	<0.0903	--	1.62	<0.181	--	--	--	--	<0.903	--
AGP-11-33	4/26/2006	33	8260B	--	0.958	--	--	--	<0.0904	--	0.219	<0.181	--	--	--	--	<0.904	--
AGP-12-34.5	4/25/2006	34.5	8260B	--	4.170 J	--	--	--	<0.148	--	1.310J		--	--	--	--	<1.48	--
AGP-12-37.5	4/25/2006	37.5	8260B	--	<0.657	--	--	--	<0.657	--	7.82	<0.001	--	--	--	--	25.1	--
AGP-12-48	4/25/2006	48	8260B	--	0.508	--	--	--	<0.0814	--	0.875	--	--	--	--	--	<0.814	--
AGP-20-17.5	4/28/2005	17.5	8260B	--	0.544	--	--	--	<0.107	--	<0.107	--	--	--	--	--	<1.07	--
AGP-21-13	5/1/2006	13	8260B	--	0.0995	--	--	--	<0.0939	--	<0.0939	--	--	--	--	--	<0.939	--
AGP-22-18	5/2/2006	18	8260B	--	41.7	--	--	--	<0.184	--	2.18	--	--	--	--	--	<1.84	--
AGP-23-12.5	5/8/2006	12.5	8260B	--	0.483	--	--	--	<0.103	--	<0.103	--	--	--	--	--	<1.03	--
AGP-24-12	5/8/2006	12	8260B	--	1.93	--	--	--	<0.0961	--	0.144	--	--	--	--	--	<0.961	--
AGP-26-18	5/3/2006	18	8260B	--	4.03	--	--	--	<0.115	--	0.182	--	--	--	--	--	<1.15	--
AGP-27-8.75	5/2/2006	8.75	8260B	--	1.51	--	--	--	<0.0896	--	<0.0896	--	--	--	--	--	<0.896	--
AGP-28-9	5/3/2006	9	8260B	--	59.3	--	--	--	<0.218	--	0.536	--	--	--	--	--	<2.18	--
AGP-28-17.5	5/3/2006	17.5	8260B	--	65.2	--	--	--	<0.403	--	1.87	--	--	--	--	--	<4.03	--
AGP-29-9.5	5/4/2006	9.5	8260B	--	1,320	--	--	--	<4.78	--	<4.78	--	--	--	--	--	<47.8	--
AGP-29-18	5/4/2006	18	8260B	--	14.9	--	--	--	<0.093	--	<0.093	--	--	--	--	--	<0.93	--
AGP-32-14	5/9/2006	14	8260B	--	<0.0984	--	--	--	<0.0984	--	<0.0984	--	--	--	--	--	<0.984	--
AGP-33-14	5/12/2006	14	8260B	--	<0.0952	--	--	--	<0.0952	--	<0.0952	--	--	--	--	--	<0.952	--
AGP-35-18.5	5/15/2006	18.5	8260B	--	<0.0953	--	--	--	<0.0953	--	<0.0953	--	--	--	--	--	<0.953	--
AGP-36-18	5/16/2006	18	8260B	--	<0.0933	--	--	--	<0.0933	--	<0.0933	--	--	--	--	--	<0.933	--
AGP-38-24	5/11/2006	24	8260B	--	0.204	--	--	--	<0.109	--	<0.109	--	--	--	--	--	<1.09	--
AGP-39-17.5	5/16/2006	17.5	8260B	--	<0.0964	--	--	--	<0.0964	--	<0.0964	--	--	--	--	--	<0.964	--
AGP-42-17	6/19/2006	17	8260B	--	<0.0988	--	--	--	<0.0988	--	<0.0988	--	--	--	--	--	<0.988	--
AGP-43-16.5	6/15/2006	16.5	8260B	--	<0.106	--	--	--	<0.106	--	<0.106	--	--	--	--	--	<1.06	--
AGP-45-7	6/23/2006	7	8260B	--	<0.0994	--	--	--	<0.0994	--	<0.0994	--	--	--	--	--	<0.994	--
AGP-01-47.5	5/10/2006	47.5	8260B	--	<0.0906	--	--	--	<0.0906	--	<0.0906	--	--	--	--	--	<0.906	--
AGP-02-43	5/11/2006	43	8260B	--	<0.116	--	--	--	<0.116	--	<0.116	--	--	--	--	--	<1.16	--
AGP-03-41.5	5/10/2006	41.5	8260B	--	<0.135	--	--	--	<0.135	--	<0.135	--	--	--	--	--	<1.35	--
AGP-04-38	5/5/2006	38	8260B	--	<0.109	--	--	--	<0.109	--	<0.109	--	--	--	--	--	<1.09	--
AGP-05-34	5/5/2006	34	8260B	--	0.141	--	--	--	<0.094	--	0.103	--	--	--	--	--	<0.94	--
AGP-06-48	5/2/2006	48	8260B	--	6.05	--	--	--	<0.108	--	0.821	--	--	--	--	--	<1.08	--
AGP-13-37.5	5/1/2006	37.5	8260B	--	0.158	--	--	--	<0.0987	--	1.38	--	--	--	--	--	<0.987	--
AGP-14-49	4/27/2006	49	8260B	--	<0.0846	--	--	--	<0.0846	--	<0.0846	--	--	--	--	--	<0.846	--
AGP-15-42.5	4/26/2006	42.5	8260B	--	5.77	--	--	--	<0.0631	--	2.22	--	--	--	--	--	<0.631	--
AGP-16-37	4/27/2006	37	8260B	--	16.2	--	--	--	<0.1	--	4.15	--	--	--	--	--	<1	--
AGP-17-39	4/28/2006	39	8260B	--	68	--	--	--	<0.201	--	61.2	--	--	--	--	--	<2.01	--
AGP-18-37.5	4/28/2006	37.5	8260B	--	22.8	--	--	--	<0.104	--	11.1	--	--	--	--	--	<1.04	--
AGP-19-42.5	4/28/2006	42.5	8260B	--	61.3	--	--	--	<0.184	--	27.3	--	--	--	--	--	<1.84	--
AGP-20-43	5/1/2006	43	8260B	--	3.52	--	--	--	<0.108	--	2.69	--	--	--	--	--	<1.08	--
AGP-21-32.5	5/1/2006	32.5	8260B	--	0.837	--	--	--	<0.093	--	0.113	--	--	--	--	--	<0.93	--

Please refer to notes at end of table.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter in mg/Kg (ppm)																
				Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromodichloro-methane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chlorodibromo-methane	Chloroethane	2-Chloroethyl vinyl ether	Chloroform	Chloromethane
AGP-21-39	5/1/2006	39	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-21-48	5/1/2006	48	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-22-38.5	5/2/2006	38.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-23-47.5	5/9/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-24-37.5	5/8/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-25-42	5/4/2006	42	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-26-32.5	5/3/2006	32.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-27-28	5/2/2006	28	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-28-37.5	5/3/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-28	5/4/2006	28	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-42	5/4/2006	42	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-30-29	5/9/2006	29	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-31-27.5	5/8/2006	27.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-31-42.5	5/8/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-32-31.5	5/9/2006	31.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-33-49	5/12/2006	49	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-34-27	5/15/2006	27	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-34-42.5	5/15/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-35-37.5	5/15/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-37-28	5/11/2006	28	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-37-38	5/12/2006	38	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-38-46	5/11/2006	46	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-39-47.5	5/16/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-44-45.5	6/23/2006	45.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-44-51.5	6/23/2006	51.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-52-4	6/13/2007	15.5-16	8260B	--	--	<0.0456	--	--	--	--	--	--	--	--	--	--	<0.228	--	<0.228	--
AGP-54-5	6/15/2007	20.5-21	8260B	--	--	<0.0457	--	--	--	--	--	--	--	--	--	--	<0.228	--	<0.228	--
AGP-55-6	6/19/2007	20.5-21	8260B	--	--	<0.0445	--	--	--	--	--	--	--	--	--	--	<0.223	--	<0.223	--
AGP-56-6	6/19/2007	17.5-18	8260B	--	--	<0.0418	--	--	--	--	--	--	--	--	--	--	<0.209	--	<0.209	--
AGP-57-4	6/19/2007	16-16.5	8260B	--	--	<0.0432	--	--	--	--	--	--	--	--	--	--	<0.216	--	<0.216	--
AGP-57-4 DUP	6/19/2007	16-16.5	8260B	--	--	<0.0433	--	--	--	--	--	--	--	--	--	--	<0.217	--	<0.217	--

Please refer to notes at end of table.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter in mg/Kg (ppm)																
				2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoro-methane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropane
AGP-21-39	5/1/2006	39	8260B	--	--	--	--	--	--	--	--	--	<0.419	--	<0.419	<0.419	<0.419	--	--	--
AGP-21-48	5/1/2006	48	8260B	--	--	--	--	--	--	--	--	--	<0.0884	--	<0.0884	0.76	<0.0884	--	--	--
AGP-22-38.5	5/2/2006	38.5	8260B	--	--	--	--	--	--	--	--	--	<0.109	--	<0.109	0.261	<0.109	--	--	--
AGP-23-47.5	5/9/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	0.19	--	0.0977	3.71	<0.0939	--	--	--
AGP-24-37.5	5/8/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	<0.0905	--	<0.0905	0.431	<0.0905	--	--	--
AGP-25-42	5/4/2006	42	8260B	--	--	--	--	--	--	--	--	--	<0.0858	--	<0.0858	0.721	<0.0858	--	--	--
AGP-26-32.5	5/3/2006	32.5	8260B	--	--	--	--	--	--	--	--	--	<0.128	--	<0.128	<0.128	<0.128	--	--	--
AGP-27-28	5/2/2006	28	8260B	--	--	--	--	--	--	--	--	--	<0.124	--	<0.124	<0.124	<0.124	--	--	--
AGP-28-37.5	5/3/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	<0.0964	--	<0.0964	<0.0964	<0.0964	--	--	--
AGP-29-28	5/4/2006	28	8260B	--	--	--	--	--	--	--	--	--	<0.102	--	<0.102	<0.102	<0.102	--	--	--
AGP-29-42	5/4/2006	42	8260B	--	--	--	--	--	--	--	--	--	<0.0951	--	<0.0951	0.198	<0.0951	--	--	--
AGP-30-29	5/9/2006	29	8260B	--	--	--	--	--	--	--	--	--	<0.0925	--	<0.0925	0.242	<0.0925	--	--	--
AGP-31-27.5	5/8/2006	27.5	8260B	--	--	--	--	--	--	--	--	--	<0.0923	--	<0.0923	0.233	<0.0923	--	--	--
AGP-31-42.5	5/8/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	<0.0801	--	<0.0801	<0.0801	<0.0801	--	--	--
AGP-32-31.5	5/9/2006	31.5	8260B	--	--	--	--	--	--	--	--	--	<0.0969	--	<0.0969	1.66	<0.0969	--	--	--
AGP-33-49	5/12/2006	49	8260B	--	--	--	--	--	--	--	--	--	<0.0875	--	<0.0875	<0.0875	<0.0875	--	--	--
AGP-34-27	5/15/2006	27	8260B	--	--	--	--	--	--	--	--	--	<0.0958	--	<0.0958	<0.0958	<0.0958	--	--	--
AGP-34-42.5	5/15/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	<0.0972	--	<0.0972	0.334	<0.0972	--	--	--
AGP-35-37.5	5/15/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	<0.0923	--	<0.0923	<0.0923	<0.0923	--	--	--
AGP-37-28	5/11/2006	28	8260B	--	--	--	--	--	--	--	--	--	<0.132	--	<0.132	1.42	<0.132	--	--	--
AGP-37-38	5/12/2006	38	8260B	--	--	--	--	--	--	--	--	--	<0.105	--	<0.105	2.81	<0.105	--	--	--
AGP-38-46	5/11/2006	46	8260B	--	--	--	--	--	--	--	--	--	<0.474	--	<0.474	2.38	<0.474	--	--	--
AGP-39-47.5	5/16/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	<0.0736	--	<0.0736	0.713	<0.0736	--	--	--
AGP-44-45.5	6/23/2006	45.5	8260B	--	--	--	--	--	--	--	--	--	<0.0913	--	<0.0913	0.46	<0.0913	--	--	--
AGP-44-51.5	6/23/2006	51.5	8260B	--	--	--	--	--	--	--	--	--	<0.0792	--	<0.0792	<0.0792	<0.0792	--	--	--
AGP-52-4	6/13/2007	15.5-16	8260B	--	--	--	--	--	--	--	--	--	<0.228	<0.228	<0.228	<0.228	<0.228	--	--	--
AGP-54-5	6/15/2007	20.5-21	8260B	--	--	--	--	--	--	--	--	--	<0.228	<0.228	<0.228	<0.228	<0.228	--	--	--
AGP-55-6	6/19/2007	20.5-21	8260B	--	--	--	--	--	--	--	--	--	<0.223	<0.223	<0.223	<0.223	<0.223	--	--	--
AGP-56-6	6/19/2007	17.5-18	8260B	--	--	--	--	--	--	--	--	--	<0.209	<0.209	<0.209	<0.209	<0.209	--	--	--
AGP-57-4	6/19/2007	16-16.5	8260B	--	--	--	--	--	--	--	--	--	<0.216	<0.216	<0.216	<0.216	<0.216	--	--	--
AGP-57-4 DUP	6/19/2007	16-16.5	8260B	--	--	--	--	--	--	--	--	--	<0.217	<0.217	<0.217	<0.217	<0.217	--	--	--

Please refer to notes at end of table.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter inmg/Kg (ppm)																
				cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	2,2-Dichloropropane	Di-isopropyl ether	Ethylbenzene	Hexachloro-butadiene	Isopropylbenzene	p-Isopropyltoluene	2-Butanone (MEK)	Methylene Chloride	4-Methyl-2-pentanone (MIBK)	Methyl tert-butyl ether	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane
AGP-21-39	5/1/2006	39	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-21-48	5/1/2006	48	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-22-38.5	5/2/2006	38.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-23-47.5	5/9/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-24-37.5	5/8/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-25-42	5/4/2006	42	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-26-32.5	5/3/2006	32.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-27-28	5/2/2006	28	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-28-37.5	5/3/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-28	5/4/2006	28	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-29-42	5/4/2006	42	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-30-29	5/9/2006	29	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-31-27.5	5/8/2006	27.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-31-42.5	5/8/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-32-31.5	5/9/2006	31.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-33-49	5/12/2006	49	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-34-27	5/15/2006	27	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-34-42.5	5/15/2006	42.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-35-37.5	5/15/2006	37.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-37-28	5/11/2006	28	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-37-38	5/12/2006	38	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-38-46	5/11/2006	46	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-39-47.5	5/16/2006	47.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-44-45.5	6/23/2006	45.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-44-51.5	6/23/2006	51.5	8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP-52-4	6/13/2007	15.5-16	8260B	--	--	--	--	--	--	--	--	<2.28	--	--	--	--	--	--	--	--
AGP-54-5	6/15/2007	20.5-21	8260B	--	--	--	--	--	--	--	--	<2.28	--	--	--	--	--	--	--	--
AGP-55-6	6/19/2007	20.5-21	8260B	--	--	--	--	--	--	--	--	<2.23	--	--	--	--	--	--	--	--
AGP-56-6	6/19/2007	17.5-18	8260B	--	--	--	--	--	--	--	--	<2.09	--	--	--	--	--	--	--	--
AGP-57-4	6/19/2007	16-16.5	8260B	--	--	--	--	--	--	--	--	<2.16	--	--	--	--	--	--	--	--
AGP-57-4 DUP	6/19/2007	16-16.5	8260B	--	--	--	--	--	--	--	--	<2.17	--	--	--	--	--	--	--	--

Please refer to notes at end of table.

Table C-3
Historical Soil Analytical Tables - VOCs
NuStar Terminals Services, Inc. Vancouver Facility

Sample ID	Collection Date	Sample Depth (feet)	Method	Parameter in mg/Kg (ppm)														
				1,1,2-Trichloro-1,2,2-trifluoroethane	Tetrachloro-ethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoro-methane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,2,3-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	Xylenes, Total
AGP-21-39	5/1/2006	39	8260B	--	145	--	--	--	<0.419	--	4.29	--	--	--	--	--	<4.19	--
AGP-21-48	5/1/2006	48	8260B	--	<0.0884	--	--	--	<0.0884	--	0.11	--	--	--	--	--	<0.884	--
AGP-22-38.5	5/2/2006	38.5	8260B	--	26.4	--	--	--	0.476	--	4.09	--	--	--	--	--	<1.09	--
AGP-23-47.5	5/9/2006	47.5	8260B	--	0.192	--	--	--	<0.0939	--	1.95	--	--	--	--	--	<0.939	--
AGP-24-37.5	5/8/2006	37.5	8260B	--	34.8	--	--	--	<0.0905	--	4.43	--	--	--	--	--	<0.905	--
AGP-25-42	5/4/2006	42	8260B	--	2.43	--	--	--	<0.0858	--	0.829	--	--	--	--	--	<0.858	--
AGP-26-32.5	5/3/2006	32.5	8260B	--	0.434	--	--	--	<0.128	--	<0.128	--	--	--	--	--	<1.28	--
AGP-27-28	5/2/2006	28	8260B	--	0.712	--	--	--	<0.124	--	<0.124	--	--	--	--	--	<1.24	--
AGP-28-37.5	5/3/2006	37.5	8260B	--	0.262	--	--	--	<0.0964	--	<0.0964	--	--	--	--	--	<0.964	--
AGP-29-28	5/4/2006	28	8260B	--	0.821	--	--	--	<0.102	--	<0.102	--	--	--	--	--	<1.02	--
AGP-29-42	5/4/2006	42	8260B	--	4.14	--	--	--	<0.0951	--	1.33	--	--	--	--	--	<0.951	--
AGP-30-29	5/9/2006	29	8260B	--	<0.0925	--	--	--	<0.0925	--	<0.0925	--	--	--	--	--	<0.925	--
AGP-31-27.5	5/8/2006	27.5	8260B	--	1.040	--	--	--	<0.0923	--	<0.0923	--	--	--	--	--	<0.923	--
AGP-31-42.5	5/8/2006	42.5	8260B	--	<0.0801	--	--	--	<0.0801	--	<0.0801	--	--	--	--	--	<0.801	--
AGP-32-31.5	5/9/2006	31.5	8260B	--	<0.0969	--	--	--	<0.0969	--	<0.0969	--	--	--	--	--	1.06	--
AGP-33-49	5/12/2006	49	8260B	--	<0.0875	--	--	--	<0.0875	--	<0.0875	--	--	--	--	--	<0.875	--
AGP-34-27	5/15/2006	27	8260B	--	0.383	--	--	--	<0.0958	--	<0.0958	--	--	--	--	--	<0.958	--
AGP-34-42.5	5/15/2006	42.5	8260B	--	0.179	--	--	--	<0.0972	--	<0.0972	--	--	--	--	--	<0.972	--
AGP-35-37.5	5/15/2006	37.5	8260B	--	<0.0923	--	--	--	<0.0923	--	<0.0923	--	--	--	--	--	<0.923	--
AGP-37-28	5/11/2006	28	8260B	--	0.498	--	--	--	<0.132	--	<0.132	--	--	--	--	--	<1.32	--
AGP-37-38	5/12/2006	38	8260B	--	<0.105	--	--	--	<0.105	--	<0.105	--	--	--	--	--	<1.05	--
AGP-38-46	5/11/2006	46	8260B	--	101	--	--	--	<0.474	--	9.51	--	--	--	--	--	<4.74	--
AGP-39-47.5	5/16/2006	47.5	8260B	--	1.04	--	--	--	<0.0736	--	0.542	--	--	--	--	--	<0.736	--
AGP-44-45.5	6/23/2006	45.5	8260B	--	3.47	--	--	--	<0.0913	--	0.657	--	--	--	--	--	<0.913	--
AGP-44-51.5	6/23/2006	51.5	8260B	--	0.207	--	--	--	<0.0792	--	<0.0792	--	--	--	--	--	<0.792	--
AGP-52-4	6/13/2007	15.5-16	8260B	--	<0.228	<0.228	--	--	<0.228	--	<0.228	--	--	--	--	--	<0.228	--
AGP-54-5	6/15/2007	20.5-21	8260B	--	<0.228	<0.228	--	--	<0.228	--	<0.228	--	--	--	--	--	<0.228	--
AGP-55-6	6/19/2007	20.5-21	8260B	--	<0.223	<0.223	--	--	<0.223	--	<0.223	--	--	--	--	--	<0.223	--
AGP-56-6	6/19/2007	17.5-18	8260B	--	<0.209	<0.209	--	--	<0.209	--	<0.209	--	--	--	--	--	<0.209	--
AGP-57-4	6/19/2007	16-16.5	8260B	--	<0.216	<0.216	--	--	<0.216	--	<0.216	--	--	--	--	--	<0.216	--
AGP-57-4 DUP	6/19/2007	16-16.5	8260B	--	<0.217	<0.217	--	--	<0.217	--	<0.217	--	--	--	--	--	<0.217	--

Notes:
1. Concentrations in micrograms per kilogram (mg/Kg) parts per billion (ppm).
2. < = Not detected at corresponding numerical limit.
3. **Bolded** values indicate analyte detected above laboratory method detection limits (MDLs).
4. J = (EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
5. -- = Compound not reported or sample not analyzed.

Table C-4
Historical Depth Discreet Groundwater Analytical Results
Remedial Investigation
NuStar Vancouver Terminal

Sample	Date Collected	Depth (Feet)	Analyte Concentration in µg/L (ppb)																													
			Benzene		Chloroethane		Chloroform		2-Butanone (MEK)		1,1-DCA		1,2-DCA		1,1-DCE		cis-1,2-DCE		trans-1,2-DCE		1,2-DCP		PCE		Toluene		1,1,1-TCA		TCE		Vinyl chloride	
AGP-01-35	5/10/2006	35	--		0.50	U	0.73		--		1.78		8.44		1.59		97.2		1.09		0.50	U	28.8		--		0.5	U	23.2		62.6	
AGP-01-45	5/10/2006	45	--		0.56		0.50	U	--		0.53		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.5	U	--		0.5	U	0.5	U	0.5	U
AGP-02-35	5/11/2006	35	--		0.50	U	0.50	U	--		1.63		2.78		0.50	U	12.6		0.50	U	0.50	U	73.2		--		0.5	U	19.8		0.82	
AGP-02-45	5/11/2006	45	--		7.15		0.50	U	--		2.29		0.50	U	0.50	U	0.75		0.50	U	0.50	U	0.5	U	--		0.5	U	0.5	U	0.5	U
AGP-03-35	5/10/2006	35	--		0.80		0.85		--		6.37		33.6		0.50	U	85.2		1.91		0.93		33.5		--		1.77		16.1		1.83	
AGP-03-45	5/10/2006	45	--		21.2		0.69		--		1.91		1.58		0.50	U	9.59		0.50	U	0.50	U	33.5		--		0.97		10.7		0.5	U
AGP-04-35	5/5/2006	35	--		0.71		2.19		--		10.0		5.07		0.58		183		3.40		2.61		78.6		--		7.13		90.5		2.30	
AGP-04-45	5/5/2006	45	--		41.6		4.30		--		28.7		7.10		1.00	U	231		4.60		3.58		18.8		--		3.90		10.3		7.26	
AGP-05-35	5/5/2006	35	--		0.50	U	0.50	U	--		9.12		0.50	U	0.50	U	26.3		0.50	U	1.48		1.98		--		0.5	U	1.88		13.5	
AGP-05-45	5/5/2006	45	--		12.6		0.50	U	--		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.5	U	--		0.5	U	0.5	U	0.5	U
AGP-06-35	5/2/2006	35	--		5.00	U	5.00	U	--		29.1		5.00	U	10.2		910		10.5		5.00	U	1,490		--		17.2		519		5.20	
AGP-06-45	5/2/2006	45	--		50	U	50	U	--		58.0		50	U	50	U	1,390		50.0	U	50	U	9,710		--		90.0		3,160		50	U
AGP-07-25	4/25/2006	25	--		5.00	U	5.00	U	--		7.80		5.00	U	5.00	U	105		5.00	U	5.00	U	1,380		--		21.7		398		16.5	
AGP-07-35	4/25/2006	35	--		25	U	25	U	--		102		25	U	43.0		1,350		25	U	25	U	3,520		--		73.5		1,450		108	
AGP-07-45	4/25/2006	45	--		25	U	25	U	--		132		25	U	71.0		994		25	U	25	U	9,820		--		248		4,080		25	U
AGP-08-25	4/24/2006	25	--		2.50	U	2.50	U	--		2.50	U	2.5	U	2.50	U	19.4		2.5	U	2.50	U	470		--		11.2		277		2.5	U
AGP-08-35	4/24/2006	35	--		25	U	25	U	--		61.0		25	U	29.5		928		25	U	25	U	3,920		--		63.0		1,380		76.5	
AGP-08-45	4/24/2006	45	--		25	U	25	U	--		104		25	U	57.0		1,290		25	U	25	U	6,800		--		142		2,980		25	U
AGP-09-25	4/24/2006	25	--		0.50	U	0.50	U	--		0.53		0.50	U	0.50	U	0.68		0.50	U	0.50	U	55.1		--		5.31		59.7		0.5	U
AGP-09-35	4/24/2006	35	--		5.00	U	5.00	U	--		5.00	U	5.00	U	5.00	U	61.9		5.00	U	5.00	U	1,200		--		9.50		201		5	U
AGP-09-45	4/25/2006	45	--		25	U	25	U	--		159		25	U	85.5		2,610		27.0		25	U	5,850		--		206		3,010		25	U
AGP-10-35	4/26/2006	35	--		2.50	U	2.50	U	--		7.80		2.50	U	3.70		161		2.50	U	2.50	U	841		--		8.05		186		15.4	
AGP-10-45	4/26/2006	45	--		50	U	50	U	--		540		50	U	130		10,600		57.0		50	U	3,280		--		102		2,410		587	
AGP-11-35	4/26/2006	35	--		10	U	10	U	--		12.0		10	U	10	U	160		10	U	10	U	2,380		--		25.2		511		28.4	
AGP-11-45	4/26/2006	45	--		102		25	U	--		462		25	U	126		8,100		51.5		25	U	2,400		--		155		2,660		400	
AGP-12-35	4/25/2006	35	--		25	U	25	U	--		99.5		25	U	51.0		1,320		25	U	25	U	5,440		--		95.5		1,920		38.0	
AGP-12-45	4/25/2006	45	--		50	U	50	U	--		728		50	U	162		15,500		214		50	U	1,480		--		159		1,980		231	
AGP-40-56	6/15/2006	56	--		1.00	U	1.00	U	--		16.3		1.00	U	5.64		314		6.00		1.00	U	201		--		3.12		138		1.44	
AGP-40-66	6/15/2006	66	--		1.00	U	1.00	U	--		11.3		1.00	U	3.64		211		2.08		1.00	U	176		--		4.24		115		1.56	
AGP-13-35	5/1/2006	35	--		25	U	25	U	--		25	U	25	U	25	U	246		25	U	25	U	3,950		--		81.5		745		25	U
AGP-13-45	5/1/2006	45	--		7.55		2.50	U	--		121		2.50	U	15.8		974		5.85		2.50	U	198		--		11.2		331		77.8	
AGP-14-35	4/27/2006	35	--		25	U	25	U	--		25.5		25	U	25	U	142		25	U	25	U	4,920		--		81.5		950		25	U
AGP-14-45	4/27/2006	45	--		10	U	10	U	--		201		10	U	28.4		2,750		10.4		10	U	54.2		--		10	U	101		198	
AGP-14-55	4/27/2006	55	--		2.50	U	2.50	U	--		15.2		2.50	U	4.80		401		3.35		2.50	U	46.3		--		2.5	U	30.8		5.35	
AGP-15-35	4/26/2006	35	--		25	U	25	U	--		25	U	25	U	25	U	104		25	U	25	U	6,200		--		62.0		1,300		25	U
AGP-15-45	4/26/2006	45	--		10	U	10	U	--		194		10	U	39.2		3,690		10.0		10	U	10.4		--		10	U	10	U	380	
AGP-16-35	4/27/2006	35	--		10	U	10	U	--		20.8		10	U	15.2		132		10	U	10	U	3,610		--		57.2		768		10	U
AGP-16-45	4/27/2006	45	--		25	U	25	U	--		444		25	U	94.5		9,510		86.0		25	U	28.5		--		25	U	30.0		57.5	

Please refer to notes at end of table.

Table C-4
Historical Depth Discreet Groundwater Analytical Results
Remedial Investigation
NuStar Vancouver Terminal

Sample	Date Collected	Depth (Feet)	Analyte Concentration in µg/L (ppb)																													
			Benzene		Chloroethane		Chloroform		2-Butanone (MEK)		1,1-DCA		1,2-DCA		1,1-DCE		cis-1,2-DCE		trans-1,2-DCE		1,2-DCP		PCE		Toluene		1,1,1-TCA		TCE		Vinyl chloride	
AGP-17-35	4/28/2006	35	--		10	U	10	U	--		13.0		10	U	10	U	148		10	U	10	U	2,550		--		10	U	464		10	U
AGP-17-45	4/28/2006	45	--		25	U	25	U	--		378		25	U	62.0		8,910		62.5		25	U	78.5		--		25	U	408		107	
AGP-18-35	4/28/2006	35	--		10	U	10	U	--		17.8		10	U	10	U	208		10	U	10	U	2,630		--		11.0		725		10	U
AGP-18-45	4/28/2006	45	--		13.6		5.00	U	--		105		5.00	U	8.00		1,310		5.00	U	5.00	U	35.4		--		5	U	46.3		17.4	
AGP-19-35	4/28/2006	35	--		25	U	25	U	--		32.5		25	U	25	U	542		25	U	25	U	3,550		--		25	U	920		25	U
AGP-19-45	4/28/2006	45	--		50	U	50	U	--		702		50	U	96.0		13,600		348		50	U	56.0		--		50	U	259		206	
AGP-20-35	5/1/2006	35	--		10	U	10	U	--		10	U	10	U	10	U	37.0		10	U	10	U	2,480		--		28.6		287		10	U
AGP-20-45	5/1/2006	45	--		50	U	50	U	--		803		50	U	163		13,700		100		50	U	590		--		54.0		2,520		138	
AGP-21-35	5/1/2006	35	--		10	U	10	U	--		10	U	10	U	10	U	36.4		10	U	10	U	3,510		--		16.0		551		10	U
AGP-21-45	5/1/2006	45	--		25	U	25	U	--		141		25	U	40.0		2,550		211		25	U	5,650		--		32.0		2,840		1,330	
AGP-22-35	5/2/2006	35	--		10	U	10	U	--		10.0		10	U	10	U	102		10	U	10	U	2,050		--		40.4		328		10	U
AGP-22-45	5/2/2006	45	--		250	U	250	U	--		250	U	250	U	250	U	1,360		250	U	250	U	31,200		--		3,600		11,500		250	U
AGP-41-55	6/19/2006	55	--		10	U	10	U	--		211		10	U	39.8		3,260		25.0		10	U	129		--		10	U	97.2		252	
AGP-41-65	6/19/2006	65	--		0.50	U	0.50	U	--		1.08		0.50	U	0.50	U	19.9		1.48		0.50	U	74.2		--		0.89		20.6		0.5	U
AGP-41-75	6/19/2006	75	--		0.50	U	0.50	U	--		1.88		0.50	U	0.54		33.9		0.88		0.50	U	103		--		1.41		24.9		1.93	
AGP-23-35	5/9/2006	35	--		25	U	25	U	--		25	U	25	U	25	U	112		25	U	25	U	4,690		--		56.0		718		25	U
AGP-23-45	5/9/2006	45	--		10	U	10	U	--		46.4		10	U	21.2		415		10	U	10	U	2,700		--		58.2		1,320		60.0	
AGP-24-35	5/8/2006	35	--		10	U	10	U	--		10	U	10	U	10	U	115		10	U	10	U	3,430		--		22.2		514		10	U
AGP-24-45	5/8/2006	45	--		25	U	25	U	--		143		25	U	59.0		656		25	U	25	U	5,480		--		199		2,690		25	U
AGP-25-35	5/4/2006	35	--		5.00	U	5.00	U	--		5.00	U	5.00	U	5.00	U	21.8		5.00	U	5.00	U	1,620		--		10.2		251		5	U
AGP-25-45	5/4/2006	45	--		25	U	25	U	--		117		25	U	68.5		2,850		60.0		25	U	8,270		--		140		4,120		210	
AGP-26-35	5/3/2006	35	--		5.00	U	5.00	U	--		5.00	U	5.00	U	5.00	U	12.8		5.00	U	5.00	U	1,000		--		11.1		138		5	U
AGP-26-45	5/3/2006	45	--		25	U	25	U	--		644		25	U	121		9,070		148		25	U	2,970		--		84.5		3,100		298	
AGP-27-35	5/2/2006	35	--		2.50	U	2.50	U	--		24.5		2.50	U	3.95		40.0		2.50	U	2.50	U	821		--		22.4		276		2.5	U
AGP-27-45	5/2/2006	45	--		10	U	10	U	--		55.4		10	U	32.4		464		11.6		10	U	3,710		--		90.8		1,930		10	U
AGP-28-25	5/3/2006	25	--		25	U	25	U	--		25	U	25	U	25	U	25	U	25	U	25	U	9,140		--		61.0		670		25	U
AGP-28-35	5/3/2006	35	--		5.00	U	5.00	U	--		9.00		5	U	5.00	U	26.1		5.00	U	5.00	U	1,590		--		19.4		288		5	U
AGP-28-45	5/3/2006	45	--		25	U	25	U	--		367		25	U	75.5		2,570		34.0		25	U	4,360		--		234		2,710		88.0	
AGP-29-25	5/4/2006	25	--		100	U	100	U	--		100	U	100	U	100	U	100	U	100	U	100	U	31,600		--		100	U	490		100	U
AGP-29-35	5/4/2006	35	--		10	U	10	U	--		10	U	10	U	10	U	93.6		10	U	10	U	3,070		--		20.4		571		10	U
AGP-29-45	5/4/2006	45	--		10	U	10	U	--		284		10	U	96.6		1,640		19.0		10	U	3,030		--		434		3,210		10	U
AGP-30-35	5/9/2006	35	--		5.00	U	5.00	U	--		28.0		5.00	U	5.00	U	1,210		10.2		5.00	U	71.9		--		5	U	85.5		375	
AGP-31-35	5/8/2006	35	--		361		1.00	U	--		1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00	U	1	U	--		1	U	1	U	1	U
AGP-31-45	5/8/2006	45	--		1.40		1.00	U	--		7.10		1.00	U	1.04		263		1.06		1.00	U	1	U	--		1	U	1	U	99.5	
AGP-32-35	5/9/2006	35	--		0.76		0.50	U	--		0.50	U	0.50	U	0.50	U	22.1		0.50	U	0.50	U	1	U	--		0.5	U	0.5	U	19.3	
AGP-32-45	5/10/2006	45	--		2.50	U	2.50	U	--		8.00		2.50	U	2.50	U	439		2.50	U	2.50	U	2.5	U	--		2.5	U	2.5	U	125	
AGP-33-35	5/12/2006	35	--		3.69		0.50	U	--		1.16		0.50	U	0.50	U	30.5		0.50	U	0.50	U	15.4		--		0.5	U	3.94		1.51	
AGP-33-45	5/12/2006	45	--		10.0		0.50	U	--		8.67		0.50	U	0.50	U	13.7		0.50	U	0.55		1.61		--		0.5	U	0.5	U	13.7	
AGP-34-35	5/15/2006	35	--		2.50	U	2.50	U	--		4.95		2.50	U	2.50	U	992		7.55		2.50	U	11.3		--		2.5	U	29.0		105	
AGP-34-45	5/15/2006	45	--		5.00	U	5.00	U	--		17.9		5.00	U	5.00	U	1,290		9.80		5.00	U	144		--		5.0	U	72.6		103	
AGP-35-35	5/15/2006	35	--		1.82		0.50	U	--		9.79		0.50	U	0.50	U	41.4		1.19		2.55		0.66		--		0.5	U	1.93		29.2	
AGP-35-45	5/15/2006	45	--		5.00	U	5.00	U	--		24.8		5.00	U	5.00	U	1,180		11.2		5.00	U	43.0		--		5.0	U	27.1		99.7	
AGP-36-25	5/16/2006	25	--		1.00	U	1.00	U	--		4.58		1.00	U	1.00	U	299		6.54		1.66		155		--		1.12		58.6		3.96	
AGP-36-35	5/16/2006	35	--		1.00	U	1.00	U	--		8.98		1.00	U	1.00	U	120		1.00	U	1.72		1.48		--		1.0	U	1.68		150	
AGP-36-45	5/16/2006	45	--		73.2	U	0.50	U	--		0.58		0.50	U	0.50	U	2.37		0.50	U	0.50	U	0.5	U	--		0.5	U	0.5	U	0.58	

Please refer to notes at end of table.

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Remedial Investigation
NuStar Vancouver Terminal

Sample	Date Collected	Depth (Feet)	Analyte Concentration in µg/L (ppb)																													
			Benzene		Chloroethane		Chloroform		2-Butanone (MEK)		1,1-DCA		1,2-DCA		1,1-DCE		cis-1,2-DCE		trans-1,2-DCE		1,2-DCP		PCE		Toluene		1,1,1-TCA		TCE		Vinyl chloride	
AGP-37-35	5/12/2006	35	--		10	U	10	U	--		10.8		10	U	10	U	2,140		20.2		10	U	376		--		10.0	U	116		146	
AGP-37-45	5/12/2006	45	--		10	U	10	U	--		37.0		10	U	11.0		3,850		37.4		10	U	105		--		10.0	U	87.0		620	
AGP-38-35	5/11/2006	35	--		5.00	U	5.00	U	--		7.10		5.00	U	5.00	U	586		8.30		5.00	U	1,120		--		7.10		201		5	U
AGP-38-45	5/11/2006	45	--		10	U	10	U	--		42.2		10	U	16.8		552		13.2		10	U	3,350		--		33.2		887		11.6	
AGP-39-35	5/16/2006	35	--		2.50	U	2.50	U	--		9.60		2.50	U	2.50	U	119		2.50	U	2.50	U	409		--		3.35		98.1		2.5	U
AGP-39-45	5/16/2006	45	--		10	U	10	U	--		134		10	U	52.0		3,510		84.6		10	U	3,280		--		81.2		1,700		60.4	
AGP-42-25	6/19/2006	25	--		1.00	U	1.00	U	--		1.00	U	1.00	U	1.00	U	9.02		1.00	U	1.00	U	160		--		1.42		52.5		1	U
AGP-42-35	6/19/2006	35	--		5.00	U	5.00	U	--		22.9		5.00	U	8.90		198		5.50		5.00	U	1,040		--		19.3		645		5	U
AGP-42-45	6/19/2006	45	--		10	U	10	U	--		33.0		10	U	27.0		334		10	U	10	U	1,580		--		33.4		1,170		10	U
AGP-42-51	6/19/2006	51	--		1.00	U	1.00	U	--		11.8		1.00	U	6.20		141		2.38		1.00	U	244		--		5.48		239		1	U
AGP-42-61	6/19/2006	61	--		1.00	U	1.00	U	--		19.7		1.00	U	9.88		231		2.22		1.00	U	341		--		9.54		318		1	U
AGP-42-71	6/20/2006	71	--		0.50	U	0.50	U	--		3.24		0.50	U	1.44		41.0		0.50	U	0.50	U	70.4		--		1.47		60.4		0.5	U
AGP-43-25	6/20/2006	25	--		0.50	U	0.50	U	--		0.50	U	0.50	U	0.50	U	4.31		0.50	U	0.50	U	32.8		--		0.5	U	15.7		0.5	U
AGP-43-35	6/20/2006	35	--		25	U	25	U	--		25	U	25	U	25	U	142		25	U	25	U	3,840		--		25	U	1,440		25	U
AGP-43-45	6/20/2006	45	--		50	U	50	U	--		114		50	U	72.0		2,410		56.0		50	U	2,420		--		101		12,100		50	U
AGP-43-55	6/21/2006	55	--		0.50	U	0.50	U	--		5.88		0.50	U	1.89		141		2.32		0.50	U	178		--		1.15		101		0.74	
AGP-43-65	6/21/2006	65	--		0.50	U	0.50	U	--		0.51		0.50	U	0.50	U	9.64		0.50	U	0.50	U	30.0		--		0.5	U	13.9		0.5	U
AGP-43-75	6/21/2006	75	--		0.50	U	0.50	U	--		0.70		0.50	U	0.50	U	11.1		0.50	U	0.50	U	69.9		--		0.5	U	25.5		0.5	U
AGP-44-25	6/22/2006	25	--		2.50	U	2.50	U	--		2.6		2.50	U	2.50	U	117		3.55		2.50	U	498		--		6.30		116		2.5	U
AGP-44-35	6/22/2006	35	--		5.00	U	5.00	U	--		5.2		5.00	U	5.00	U	462		12.7		5.00	U	802		--		7.30		167		5	U
AGP-44-45	6/23/2006	45	--		10	U	10	U	--		36.6		10	U	18.4		580		10.0		10	U	3,330		--		29.8		818		10	U
AGP-44-54	6/23/2006	54	--		5.00	U	5.00	U	--		26.7		5.00	U	24.4		450		6.40		5.00	U	1,780		--		19.5		805		5	U
AGP-44-64	6/23/2006	64	--		0.50	U	0.50	U	--		3.26		0.50	U	1.69		65.2		0.99		0.50	U	103		--		1.56		65.6		0.5	U
AGP-45-25	6/26/2006	25	--		2.50	U	2.50	U	--		2.50	U	2.50	U	2.50	U	2.5	U	2.50	U	2.50	U	449		--		2.5	U	13.1		2.5	U
AGP-45-35	6/26/2006	35	--		10	U	10	U	--		13.0		10	U	10	U	105		10	U	10	U	2,580		--		13.0		786		10	U
AGP-45-45	6/26/2006	45	--		5.00	U	5.00	U	--		148		5.00	U	36.1		1,550		37.1		5.00	U	1,350		--		68.7		1,120		44.4	
AGP-45-51	6/26/2006	51	--		2.50	U	2.50	U	--		56.8		2.50	U	24.2		783		14.3		2.50	U	860		--		30.2		764		6.30	
AGP-47-25	6/27/2006	25	--		0.50	U	0.50	U	--		0.50	U	0.50	U	0.50	U	0.5	U	0.50	U	0.50	U	99.1		--		2.26		19.2		0.5	U
AGP-47-35	6/27/2006	35	--		2.50	U	2.50	U	--		2.50	U	2.50	U	2.50	U	8.05		2.50	U	2.50	U	580		--		5.20		106		2.5	U
AGP-47-45	6/27/2006	45	--		25	U	25	U	--		342		25	U	65.0		8,440		208		25	U	1,750		--		41.0		1,860		337	
AGP-47-55	6/28/2006	55	--		5.00	U	5.00	U	--		30.7		5.00	U	9.80		1,120		9.00		5.00	U	49.2		--		5	U	133		53.5	
AGP-48-25	6/28/2006	25	--		0.50	U	0.50	U	--		1.45		0.50	U	0.50	U	26.7		1.13		0.50	U	78.2		--		1.40		55.0		0.5	U
AGP-48-35	6/28/2006	35	--		0.50	U	0.50	U	--		4.02		0.50	U	0.50	U	0.81		0.50	U	0.50	U	0.77		--		0.53		0.93		0.5	U
AGP-48-45	6/28/2006	45	--		5.00	U	5.00	U	--		36.4		5.00	U	21.1		1,600		9.20		5.00	U		U	--		5	U	29.4		5	U
AGP-48-50	6/28/2006	50	--		10	U	10	U	--		57.0		10	U	34.2		2,320		17.6		10	U	77.8		--		10	U	293		10	U
AGP-49-30	6/29/2006	30	--		1.00	U	1.00	U	--		2.64		1.00	U	1.14		7.92		1.00	U	1.00	U	246		--		2.10		192		1	U
AGP-49-35	6/29/2006	35	--		5.00	U	5.00	U	--		9.60		5.00	U	7.20		57.2		5.00	U	5.00	U	1,550		--		15.7		1,070		5	U
AGP-49-45	6/29/2006	45	--		82.4		10	U	--		807		10	U	89.4		10	U	10	U	10	U		U	--		466		3,240		10	U
AGP-49-55	6/29/2006	55	--		0.50	U	0.50	U	--		3.77		0.50	U	1.25		101		3.29		0.50	U	62.2		--		0.92		64.3		0.5	U
AGP-50-25	6/29/2006	25	--		0.50	U	0.50	U	--		0.50	U	0.50	U	0.50	U	0.5	U	0.50	U	0.50	U	18.1		--		0.75		44.8		0.5	U
AGP-50-35	6/29/2006	35	--		1.00	U	1.00	U	--		1.04		1.00	U	1.00	U	7.92		1.00	U	1.00	U	255		--		3.08		176		1	U
AGP-50-45	6/29/2006	45	--		25	U	25	U	--		37.5		25	U	25	U	324		25	U	25	U	2,590		--		80.0		4,360		25	U
AGP-50-55	6/29/2006	55	--		1.00	U	1.00	U	--		5.10		1.00	U	1.84		228		7.04		1.00	U	49.0		--		1	U	84.1		1	U
AGP-51-35	6/13/2007	35	1.00	U	1.00	U	1.00	U	74.2		1.00	U	1.00	U		U	1.78			U	1.00	U	105		1.00	U	2.77		82.9			U
AGP-51-45	6/13/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	109		1.00	U		U	5310		104		50	U	200		1.00	U	1.00	U	2050		128	
AGP-51-55	6/13/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	13.8		1.00	U		U	716		28.4		5.00	U	75.7		1.00	U	1.00	U	324		11.2	
AGP-52-35	6/13/2007	35	1.00	U	1.00	U	7.12		10.0	U	1.00	U	1.00	U		U		U		U	1.00	U	1.52		1.00	U	1.00	U		U		U

Please refer to notes at end of table.

Table C-4
Historical Depth Discreet Groundwater Analytical Results
Remedial Investigation
NuStar Vancouver Terminal

Sample	Date Collected	Depth (Feet)	Analyte Concentration in µg/L (ppb)																																	
			Benzene		Chloroethane		Chloroform		2-Butanone (MEK)		1,1-DCA		1,2-DCA		1,1-DCE		cis-1,2-DCE		trans-1,2-DCE		1,2-DCP		PCE		Toluene		1,1,1-TCA		TCE		Vinyl chloride	
AGP-52-45	6/13/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	170		1.00	U		U	8730		202		50	U	367		1.00	U	1.00	U	1750		372	
AGP-52-55	6/13/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	3.48		1.00	U		U	132		1.55		1.00	U	17.1		1.00	U	1.00	U	35.3		1.41	
AGP-53-35	6/14/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U	15.1		1.00	U	1.00	U	5.72			U
AGP-53-45	6/14/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	117		1.00	U		U	3260		83.20		20	U	775		1.00	U	21.20		1890		39.6	
AGP-53-55	6/14/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	1.05		1.00	U		U	24.1			U	1.00	U	11.5		1.00	U	1.00	U	21.8			U
AGP-54-35	6/15/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U	8.75			U	5.00	U	339		1.00	U	5.2		344			U
AGP-54-35 DUP	6/15/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U	7.8			U	5.00	U	328		1.00	U	5.05		327			U
AGP-54-45	6/18/2007	45	1.00	U	24.9		1.00	U	10.0	U	84.6		1.00	U	1.59		54.8			U	1.00	U		U	1.00	U	15.9		8.95		1.13	
AGP-54-55	6/18/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	4.02		1.00	U		U	98.8			U	1.00	U	14.2		1.00	U	1.00	U	25.8		1.78	
AGP-55-35	6/18/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	13.60		1.00	U		U	276			U	10	U	704		1.00	U	18		1200			U
AGP-56-35	6/19/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	1.00	U	1.00	U		U		U
AGP-57-35	6/19/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	1.00	U	1.00	U		U		U
AGP-57-35 DUP	6/19/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	1.00	U	1.00	U		U		U
AGP-57-45	6/20/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	1.00	U	1.00	U		U		U
AGP-57-55	6/21/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	1.00	U	1.00	U		U		U
AGP-58-35	6/21/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	6.30		1.00	U	5.40		25.2			U	5.00	U	151		1.00	U	9.15		493			U
AGP-58-45	6/22/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	1.00	U	1.00	U		U		U
AGP-59-45	6/22/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	1.31		1.00	U		U	28.7			U	1.00	U	13.6		1.00	U	1.00	U	34.0			U
AGP-59-55	6/22/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	1.06		1.00	U		U	26.4			U	1.00	U	14.0		1.00	U	1.00	U	26.9			U
AGP-59-65	6/22/2007	65	1.00	U	1.00	U	1.00	U	10.0	U	1.61		1.00	U		U	60.6			U	1.00	U	15.4		1.00	U	1.00	U	22.7			U
AGP-60-45	6/25/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.19			U	11.8			U	1.00	U		U	1.00	U	1.00	U	1.60			U
AGP-60-55	6/25/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	2.85		1.00	U		U	47.6			U	1.00	U	2.83		1.00	U	1.00	U	8.10			U
AGP-60-65	6/26/2007	65	1.00	U	1.00	U	1.00	U	10.0	U	1.76		1.00	U		U	25.2			U	1.00	U	4.09		1.00	U	1.00	U	5.76			U
AGP-61-45	6/26/2007	45	1.00	U	1.00	U	1.00	U	10.0	U	1.72		1.00	U		U	18.5			U	1.00	U		U	1.00	U	1.00	U	1.25			U
AGP-61-55	6/26/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	1.15		1.00	U		U	16.0			U	1.00	U		U	1.00	U	1.00	U	2.02			U
AGP-61-55 DUP	6/26/2007	55	1.00	U	1.00	U	1.00	U	10.0	U	1.07		1.00	U		U	14.7			U	1.00	U		U	1.00	U	1.00	U	1.92			U
AGP-61-65	6/26/2007	65	1.00	U	1.00	U	1.00	U	10.0	U	1.00		1.00	U		U	12.7			U	1.00	U		U	1.00	U	1.00	U	2.09			U
AGP-62-35	7/18/2007	35	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U	4.43			U	1.00	U		U	1.00	U	1.00	U		U		U
AGP-62-55	7/18/2007	55	4.09		1.00	U	1.00	U	10.0	U	4.12		1.00	U	2.05		68.8			U	1.00	U	37.4		4.04		1.18		49.1			U
AGP-62-65	7/18/2007	65	7.97		1.00	U	1.00	U	10.0	U	3.52		1.00	U	1.77		54.6			U	1.00	U	42.0		6.89		1.29		49.3			U
AGP-62-75	7/18/2007	75	1.00	U	1.00	U	1.00	U	10.0	U	1.55		1.00	U		U	23.7			U	1.00	U	4.11		1.00	U	1.00	U	10.6			U
AGP-62-85	7/18/2007	85	4.72		1.00	U	1.00	U	10.0	U	1.44		1.00	U		U	20.8			U	1.00	U	18.3		3.66		1.00	U	19.6			U
AGP-63-35	7/19/2007	35	8.02		1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	7.10		1.00	U		U		U
AGP-63-55	7/19/2007	55	4.29		1.00	U	1.00	U	10.0	U	4.81		1.00	U	2.23		96.2			U	1.00	U	31.6		4.95		1.10		45.9			U
AGP-63-65	7/19/2007	65	5.32		1.00	U	1.00	U	10.0	U	2.90		1.00	U	1.41		64.2			U	1.00	U	36.9		4.88		1.00	U	33.7			U
AGP-63-75	7/19/2007	75	6.49		1.00	U	1.00	U	10.0	U	2.28		1.00	U	1.06		44.5			U	1.00	U	20.1		6.91		1.00	U	24.3			U
AGP-63-85	7/19/2007	85	4.42		1.00	U	1.00	U	10.0	U	1.17		1.00	U		U	18.7			U	1.00	U	16.4		4.33		1.00	U	15.6			U
AGP-63-85 DUP	7/19/2007	85	2.62		1.00	U	1.00	U	10.0	U	1.20		1.00	U		U	19.9			U	1.00	U	16.3		2.75		1.00	U	15.6			U
AGP-64-45	7/19/2007	45	7.07		1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	6.36		1.00	U		U		U
AGP-64-55	7/19/2007	55	2.62		1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	3.05		1.00	U		U		U
AGP-64-65	7/19/2007	65	1.00	U	1.00	U	1.00	U	10.0	U	1.00	U	1.00	U		U		U		U	1.00	U		U	1.21		1.00	U		U		U

Notes:

1. HVOCs = Halogenated volatile organic compounds analysis by EPA Method 8260B. Results reported in micrograms per liter (µg/L).
2. U = Not detected at or above the specified laboratory method reporting limit (MRL).
3. DCA = Dichloroethane; DCE = Dichloroethene; DCP = Dichloropropane; PCE = Tetrachloroethene; TCA = Trichloroethane; TCE = Trichloroethene.
4. **Bold** values represent detected values above the method detection limit (MDL).
5. µg/L (ppb) = Micrograms per liter (parts per billion)

Appendix D

Laboratory Data Quality Assurance Review and Laboratory Analytical Reports

Appendix D – Data Quality Review

1.0 Introduction

This appendix documents the results of a quality assurance (QA) review of the analytical data for soil and air samples collected at or in the vicinity of the Site located at the NuStar Vancouver Terminal in Vancouver, Washington. The data reviewed include soil and groundwater analytical data collected on September 20 and 21, 2010, and air sample data collected on July 29, 2010 and August 25, 2010. The soil and groundwater samples were analyzed by Kiff Analytical of Davis, California, and the air samples were analyzed by TestAmerica Laboratory of Beaverton, Oregon. Select analyses were subcontracted by Kiff Analytical to other laboratories as described in Section 2.0.

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 report include:

- Analytical methods;
- Reporting limits;
- Detection limits and estimated concentrations;
- Sample holding times;
- Custody records and sample receipt;
- Spikes, blanks, and surrogates;
- Duplicates; and
- Calibration and internal standard.

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

2.0 Analytical Methods

Chemical analyses on soil samples consisted of the following:

- Volatile Organic Compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B

Chemical analyses on groundwater samples consisted on the following:

- VOCs by EPA Method 8260B (all samples)
- Select groundwater samples were analyzed for the following chemical analyses:

Analysis	Method
Potassium, Iron and Manganese	EPA 6010B
Ammonia	EPA 350.1
Chloride, Nitrate, Nitrite, Sulfate	EPA 300.0
Methane, Ethane, Ethene	RSK 175
Metabolic Acids	WCAS SOP 4130
Orthophosphate	SM 4500P
Metabolic Acids	WCAS SOP 4130
Carbon Dioxide	SM 4500-CO2 D
Total Organic Carbon	415.2/5310C

Chemical analyses on soil vapor/air samples consisted of the following:

- Volatile Organic Compounds (VOCs) by EPA Method TO-15 GC/MS (Med-Level)

3.0 Quality Assurance Objectives and Review Procedures

The general QA objectives for this project were to develop and implement procedures for obtaining, evaluating, and confirming the usability of data of a specified quality for soil and air samples. 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 (COC) 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. Method reporting limits (MRLs) are set by the laboratory and are based on instrumentation abilities, sample matrix, and suggested MRLs by the EPA or the Washington State Department of Ecology (Ecology). In some cases, the MRLs are raised due to high concentrations of analytes in the samples or matrix interferences. MRLs are generally consistent with industry standards and below promulgated regulatory standards when possible (if not raised, as discussed above).

Detection Limits and Estimated Concentrations. The method detection limit (MDL) is the lowest quantity of a substance that can be distinguished from the absence of that substance within a stated confidence limit. The MDL is estimated from the mean of the blank, the standard deviation of the blank, and some confidence factor. A substance detected above the MDL, but below the MRL, is flagged with a "J" qualifier for the

affected sample, indicating that the numerical result is an estimate and the accuracy of the estimate improves as the result approaches the MRL.

Holding Times. Holding times are the length of time a sample can be stored after collection and prior to analysis without potentially affecting the analytical results. Holding times vary with the analyte, sample matrix, and analytical methodology used to quantify the analyte's concentration.

Custody Records and Sample Receipt. COC refers to the document or paper trail showing the seizure, custody, control, transfer, analysis, and disposition of physical and electronic evidence. The sample receipt identifies the condition of samples upon arrival at the analytical laboratory.

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.

Laboratory Control Sample (LCS). An LCS is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control".

Laboratory Control Sample Duplicate (LCSD). In addition, a second LCS is prepared as above and analyzed. This is compared to the initial laboratory control sample to assess the precision of the analytical method (i.e., relative percent difference [RPD]).

Matrix Spike Analyses. A Matrix Spike (MS) and Matrix Spike Duplicate (MSD) analysis involves two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. The RPD between the MS and MSD is calculated.

Laboratory Duplicate. A laboratory duplicate is a second analysis of the quality assurance/quality control (QA/QC) sample, 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 the precision of the analytical method. This comparison can be expressed by the RPD between the original and duplicate sample.

Surrogate Recovery. Surrogates are organic compounds that are similar in chemical composition to the analytes of interest and spiked into environmental and batch QC samples prior to sample preparation and analysis. Surrogate recoveries for environmental samples are used to evaluate matrix interference on a sample-specific basis.

Trip Blanks. The purpose of trip blanks is to assess the sample representativeness by determining whether contaminants have been introduced into the samples while they were handled in the field and in transit.

4.0 QA/QC Review Results

The following subsections document the results of the QA review for the soil and soil vapor sampling events.

4.1 September 20 and 21, 2010 — Soil Sampling Event

The data reviewed includes soil data from samples collected on September 20 and 21, 2010.

Reporting Limits. The bromomethane reporting limit was raised for samples CB-1 (9), CB-1 (29.5), CB-2 (9.5), CB-2 (42), CB-3 (18) and CB-3 (29) due to a matrix effect. The sample data were flagged with an "RL1" qualifier.

Detection Limits and Estimated Concentrations. No estimated values were reported.

Holding Times. Sample analyses were completed within specified holding times.

Custody Records and Sample Receipt. Samples were received consistent with the accompanying COC form.

Method Blanks. No analytes were detected in the method blanks.

LCS. Percent recoveries of the LCS were within control limits for all analytes.

LCSD. RPD were within acceptance limits for all analytes.

MS Analyses. MS and MSD results associated with samples CB-1 (9), CB-1 (29.5), CB-2(42), CB-3 (18), CB-3 (29), and CB-4 (38.5) for the analytes 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, hexachlorobutadiene, and naphthalene were outside of control limits. Since the LCS recoveries were within control limits, the accuracy of the system is considered acceptable, and no data are flagged.

MS and MSD results associated with samples CB-1 (9), CB-1 (17.5), CB-1 (37.5), CB-2 (9.5), CB-2 (18), CB-2 (28), CB-3 (9), CB-4 (18) and CB-4 (28) for the analytes 1,1,1,2-tetrachloroethane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2,4-trimethylbenzene, 1,2-dichlorobenzene, 1,3,5-trimethylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2+4-chlorotoluene, bromobenzene,

chlorobenzene, hexachlorobutadience, isopropyl benzene, naphthalene, styrene, cis-,3-Ddchloropropene, n-butylbenzene, n-proylbenzene, p-isopropyltoluene, sec-butylbenzene, t-1,3-dichloropropene, and tert-butylbenzene were outside of control limits. Since the LCS recoveries were within control limits, no data are flagged.

Laboratory Duplicate. No laboratory duplicate was analyzed.

Surrogate Recovery. Surrogate recoveries were within control limits.

Field Duplicate. No field duplicates were collected during this sampling event.

Trip Blanks. No trip blanks were collected for analysis during this sampling event.

Other QC. Methanol extracts of soil samples were subsampled prior to weighing for determining the soil mass present. From each extract, 100 microliter aliquots were removed. To compensate for this, an adjustment of 0.08g was included in the mass calculation. This scenario applies to samples CB-1 (9), CB-1 (29.5), CB-2 (9.5), CB-2 (42), CB-3 (9), CB-3 (18), CB-3 (290), CB-4 (18) and CB-4 (38.5) by EPA Method 8260B.

4.2 September 20 and 21, 2010 — Groundwater Sampling Event

The data reviewed includes groundwater data from samples collected on September 20 and 21, 2010.

Reporting Limits. No reporting limits were elevated in groundwater samples from this event.

Detection Limits and Estimated Concentrations. No estimated values were reported.

Holding Times. Sample analyses were completed within specified hold times.

Custody Records and Sample Receipt. Samples were received consistent with the accompanying chain-of-custody form.

Method Blanks. No analytes were detected in the method blanks.

LCS. Percent recoveries of the LCS were within control limits for all analytes.

LCSD. No LCSD sample was analyzed in the VOC analysis (Method 8260B). LCSD samples for other analytes and were found to be within control limits.

MS Analyses. The MS sample associated with sample SB-3 (35) for the analyte chloride was within acceptable recovery limits. The MSD results associated with sample CB-3 (35) for the analyte chloride were affected by the analyte concentration present in the un-spiked sample. The results may be biased low. The LCS was within acceptable control limits for this sample; therefore, the results are not flagged.

Laboratory Duplicate. No laboratory duplicate was analyzed.

Surrogate Recovery. Surrogate recoveries were within control limits.

Field Duplicate. A duplicate VOC sample for CB-2(45) was analyzed for VOCs (Method 8260B). The RPD between the sample and duplicate exceeded the control limit of +/- 30 percent for the following analytes: 1,1,1-trichloroethane, 1,1-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride. The sample and duplicate results for these analytes are flagged with an "M" qualifier indicating that the RPD values between the sample and duplicate were outside of acceptable control limits. The laboratory noted that there was not reproducibility between the individual sample bottles collected for sample CB-2(45). The laboratory did not note this discrepancy in any of the other samples; therefore, it was not considered necessary to flag any additional samples.

Field Blanks. Two field blanks were submitted for analysis. No analytes were detected in either of the field blanks.

4.3 July 29 and August 25, 2010 Soil Vapor Extraction Sampling Data

The data reviewed includes soil vapor extraction (SVE) air samples collected on July 29 and August 25, 2010. Samples were analyzed for VOCs using Modified EPA Method TO-15.

Reporting Limits. No elevated MRLs were reported in any of the air samples.

Detection Limits and Estimated Concentrations. Estimated concentrations were reported for target compound hits that were below the reporting limit but greater than the MDL. The estimated concentrations are flagged with a "J" qualifier.

Holding Times. Sample analyses were completed within specified hold times.

Custody Records and Sample Receipt. Samples were received in acceptable condition in accordance with the COC.

Method Blanks. No analytes were identified in the laboratory blank sample above reporting limits.

LCS. Percent recoveries of the LCS were within control limits.

LCSD. During the July 29, 2010 sampling event, hexachlorobutadiene recovery in the LCS was slightly above control limits in the LCSD. During the August 25, 2010 sampling event, acetone recovery in the LCS was slightly below control limits in the LCSD. Acetone and hexachlorobutadiene were not detected in the batch samples. The referenced analytes were within control limits in the LCS and the RPD between the LCS/LCSD were within acceptable limits; therefore, the data were not flagged.

Lab Duplicate. With the exception of the LCSD, a laboratory duplicate was not analyzed with the air sample batches. The RPD between the LCS and LCSD were within acceptable limits for all analytes, indicating that the precision of the sampling system was acceptable.

Surrogate Recovery. Surrogate recoveries were within QC limits.

Field Duplicate. No field duplicates were collected during this sampling event.

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ORELAP#: OR100021

August 13, 2010

Stephanie Bosze
Ash Creek Associates, Inc.
3015 SW First Avenue
Portland, OR 97201

RE: NuStar Vancouver

Enclosed are the results of analyses for samples received by the laboratory on 07/29/10 18:10. The following list is a summary of the Work Orders contained in this report, generated on 08/13/10 15:55.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
PTG0837	NuStar Vancouver	1126-09

TestAmerica Portland

Christina Woodcock For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Post Carbon-072910	PTG0837-01	Air	07/29/10 09:31	07/29/10 18:10
Pre Carbon-072910	PTG0837-02	Air	07/29/10 09:45	07/29/10 18:10

TestAmerica Portland

Christina Woodcock For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTG0837-01 (Post Carbon-072910)			**Air**				**Sampled: 07/29/10 09:31**			
Acetone	EPA TO15	ND	-----	49	ug/m3	2.06x	10H0063	08/04/10 10:15	08/07/10 20:07	
Benzene	"	ND	-----	20	"	"	"	"	"	
Benzyl chloride	"	ND	-----	110	"	"	"	"	"	
Bromodichloromethane	"	ND	-----	28	"	"	"	"	"	
Bromoform	"	ND	-----	43	"	"	"	"	"	
Bromomethane	"	ND	-----	32	"	"	"	"	"	
2-Butanone (MEK)	"	ND	-----	61	"	"	"	"	"	
Carbon disulfide	"	ND	-----	64	"	"	"	"	"	
Carbon tetrachloride	"	ND	-----	26	"	"	"	"	"	
Chlorobenzene	"	ND	-----	19	"	"	"	"	"	
Dibromochloromethane	"	ND	-----	35	"	"	"	"	"	
Chloroethane	"	ND	-----	22	"	"	"	"	"	
Chloroform	"	ND	-----	20	"	"	"	"	"	
Chloromethane	"	ND	-----	17	"	"	"	"	"	
1,2-Dibromoethane (EDB)	"	ND	-----	32	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	25	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	50	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	50	"	"	"	"	"	
Dichlorodifluoromethane	"	ND	-----	31	"	"	"	"	"	
1,1-Dichloroethane	"	**40**	-----	17	"	"	"	"	"	
1,2-Dichloroethane	"	ND	-----	25	"	"	"	"	"	
cis-1,2-Dichloroethene	"	**1700**	-----	16	"	"	"	"	"	
trans-1,2-Dichloroethene	"	ND	-----	16	"	"	"	"	"	
1,1-Dichloroethene	"	**42**	-----	16	"	"	"	"	"	
1,2-Dichloropropane	"	ND	-----	29	"	"	"	"	"	
cis-1,3-Dichloropropene	"	ND	-----	19	"	"	"	"	"	
trans-1,3-Dichloropropene	"	ND	-----	19	"	"	"	"	"	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	"	ND	-----	29	"	"	"	"	"	
Ethylbenzene	"	ND	-----	18	"	"	"	"	"	
4-Ethyltoluene	"	ND	-----	20	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	88	"	"	"	"	"	
2-Hexanone	"	ND	-----	84	"	"	"	"	"	
Methylene chloride	"	ND	-----	14	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	"	ND	-----	84	"	"	"	"	"	
Styrene	"	ND	-----	18	"	"	"	"	"	

TestAmerica Portland

Christina Woodcock For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTG0837-01 (Post Carbon-072910)			**Air**				**Sampled: 07/29/10 09:31**			
1,1,2,2-Tetrachloroethane	EPA TO15	ND	-----	28	ug/m3	2.06x	10H0063	08/04/10 10:15	08/07/10 20:07	
Tetrachloroethene	"	**140**	-----	28	"	"	"	"	"	
Toluene	"	ND	-----	16	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	76	"	"	"	"	"	
1,1,1-Trichloroethane	"	**1500**	-----	22	"	"	"	"	"	
1,1,2-Trichloroethane	"	ND	-----	22	"	"	"	"	"	
Trichloroethene	"	**1500**	-----	22	"	"	"	"	"	
Trichlorofluoromethane	"	ND	-----	23	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane	"	ND	-----	32	"	"	"	"	"	
1,2,4-Trimethylbenzene	"	ND	-----	30	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	-----	41	"	"	"	"	"	
Vinyl acetate	"	ND	-----	150	"	"	"	"	"	
Vinyl chloride	"	ND	-----	21	"	"	"	"	"	
m,p-Xylene	"	ND	-----	36	"	"	"	"	"	
o-Xylene	"	ND	-----	18	"	"	"	"	"	
Xylenes, total	"	ND	-----	18	"	"	"	"	"	
Surrogate(s): 4-Bromofluorobenzene				*92%*		*70 - 130 %*	*1x*			*"*
1,2-Dichloroethane-d4				*111%*		*70 - 130 %*	*"*			*"*
Toluene-d8				*92%*		*70 - 130 %*	*"*			*"*
PTG0837-02 (Pre Carbon-072910)			**Air**				**Sampled: 07/29/10 09:45**			
Acetone	EPA TO15	ND	-----	1400	ug/m3	57.1x	10H0063	08/04/10 10:15	08/07/10 20:45	
Benzene	"	ND	-----	550	"	"	"	"	"	
Benzyl chloride	"	ND	-----	3000	"	"	"	"	"	
Bromodichloromethane	"	ND	-----	770	"	"	"	"	"	
Bromoform	"	ND	-----	1200	"	"	"	"	"	
Bromomethane	"	ND	-----	890	"	"	"	"	"	
2-Butanone (MEK)	"	ND	-----	1700	"	"	"	"	"	
Carbon disulfide	"	ND	-----	1800	"	"	"	"	"	
Carbon tetrachloride	"	ND	-----	720	"	"	"	"	"	
Chlorobenzene	"	ND	-----	530	"	"	"	"	"	
Dibromochloromethane	"	ND	-----	970	"	"	"	"	"	
Chloroethane	"	ND	-----	600	"	"	"	"	"	
Chloroform	"	ND	-----	560	"	"	"	"	"	
Chloromethane	"	ND	-----	470	"	"	"	"	"	
1,2-Dibromoethane (EDB)	"	ND	-----	880	"	"	"	"	"	

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3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTG0837-02 (Pre Carbon-072910)			**Air**				**Sampled: 07/29/10 09:45**			
1,2-Dichlorobenzene	"	ND	-----	690	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	1400	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	1400	"	"	"	"	"	
Dichlorodifluoromethane	"	ND	-----	850	"	"	"	"	"	
1,1-Dichloroethane	"	ND	-----	460	"	"	"	"	"	
1,2-Dichloroethane	"	ND	-----	690	"	"	"	"	"	
cis-1,2-Dichloroethene	"	ND	-----	450	"	"	"	"	"	
trans-1,2-Dichloroethene	"	ND	-----	450	"	"	"	"	"	
1,1-Dichloroethene	"	ND	-----	450	"	"	"	"	"	
1,2-Dichloropropane	"	ND	-----	790	"	"	"	"	"	
cis-1,3-Dichloropropene	"	ND	-----	520	"	"	"	"	"	
trans-1,3-Dichloropropene	"	ND	-----	520	"	"	"	"	"	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	"	ND	-----	800	"	"	"	"	"	
Ethylbenzene	"	ND	-----	500	"	"	"	"	"	
4-Ethyltoluene	"	ND	-----	560	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	2400	"	"	"	"	"	
2-Hexanone	"	ND	-----	2300	"	"	"	"	"	
Methylene chloride	"	ND	-----	400	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	"	ND	-----	2300	"	"	"	"	"	
Styrene	"	ND	-----	490	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	"	ND	-----	780	"	"	"	"	"	
Tetrachloroethene	"	**62000**	-----	780	"	"	"	"	"	
Toluene	"	ND	-----	430	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	2100	"	"	"	"	"	
1,1,1-Trichloroethane	"	ND	-----	620	"	"	"	"	"	
1,1,2-Trichloroethane	"	ND	-----	620	"	"	"	"	"	
Trichloroethene	"	**1900**	-----	610	"	"	"	"	"	
Trichlorofluoromethane	"	ND	-----	640	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane	"	ND	-----	880	"	"	"	"	"	
1,2,4-Trimethylbenzene	"	ND	-----	840	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	-----	1100	"	"	"	"	"	
Vinyl acetate	"	ND	-----	4000	"	"	"	"	"	
Vinyl chloride	"	ND	-----	580	"	"	"	"	"	
m,p-Xylene	"	ND	-----	990	"	"	"	"	"	
o-Xylene	"	ND	-----	500	"	"	"	"	"	

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTG0837-02 (Pre Carbon-072910)			**Air**				**Sampled: 07/29/10 09:45**			
Xylenes, total	EPA TO15	ND	-----	500	ug/m3	57.1x	10H0063	08/04/10 10:15	08/07/10 20:45	
Surrogate(s): 4-Bromofluorobenzene				*94%*		*70 - 130 %*	*1x*			*"*
1,2-Dichloroethane-d4				*94%*		*70 - 130 %*	*"*			*"*
Toluene-d8				*95%*		*70 - 130 %*	*"*			*"*

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3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10H0063 **Air Preparation Method: METHOD-MSMED**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (10H0063-BLK1)								**Extracted: 08/07/10 00:00**						
Acetone	EPA TO15	ND	---	24	ug/m3	1x	--	--	--	--	--	--	08/07/10 14:28	
Benzene	"	ND	---	9.6	"	"	--	--	--	--	--	--	"	
Benzyl chloride	"	ND	---	52	"	"	--	--	--	--	--	--	"	
Bromodichloromethane	"	ND	---	13	"	"	--	--	--	--	--	--	"	
Bromoform	"	ND	---	21	"	"	--	--	--	--	--	--	"	
Bromomethane	"	ND	---	16	"	"	--	--	--	--	--	--	"	
2-Butanone (MEK)	"	ND	---	29	"	"	--	--	--	--	--	--	"	
Carbon disulfide	"	ND	---	31	"	"	--	--	--	--	--	--	"	
Carbon tetrachloride	"	ND	---	13	"	"	--	--	--	--	--	--	"	
Chlorobenzene	"	ND	---	9.2	"	"	--	--	--	--	--	--	"	
Dibromochloromethane	"	ND	---	17	"	"	--	--	--	--	--	--	"	
Chloroethane	"	ND	---	11	"	"	--	--	--	--	--	--	"	
Chloroform	"	ND	---	9.8	"	"	--	--	--	--	--	--	"	
Chloromethane	"	ND	---	8.3	"	"	--	--	--	--	--	--	"	
1,2-Dibromoethane (EDB)	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	---	12	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	---	24	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	---	24	"	"	--	--	--	--	--	--	"	
Dichlorodifluoromethane	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethane	"	ND	---	8.1	"	"	--	--	--	--	--	--	"	
1,2-Dichloroethane	"	ND	---	12	"	"	--	--	--	--	--	--	"	
cis-1,2-Dichloroethene	"	ND	---	7.9	"	"	--	--	--	--	--	--	"	
trans-1,2-Dichloroethene	"	ND	---	7.9	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethene	"	ND	---	7.9	"	"	--	--	--	--	--	--	"	
1,2-Dichloropropane	"	ND	---	14	"	"	--	--	--	--	--	--	"	
cis-1,3-Dichloropropene	"	ND	---	9.1	"	"	--	--	--	--	--	--	"	
trans-1,3-Dichloropropene	"	ND	---	9.1	"	"	--	--	--	--	--	--	"	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	"	ND	---	14	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	8.7	"	"	--	--	--	--	--	--	"	
4-Ethyltoluene	"	ND	---	9.8	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	---	43	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	---	41	"	"	--	--	--	--	--	--	"	
Methylene chloride	"	ND	---	6.9	"	"	--	--	--	--	--	--	"	
4-Methyl-2-pentanone (MIBK)	"	ND	---	41	"	"	--	--	--	--	--	--	"	
Styrene	"	ND	---	8.5	"	"	--	--	--	--	--	--	"	
1,1,2,2-Tetrachloroethane	"	ND	---	14	"	"	--	--	--	--	--	--	"	
Tetrachloroethene	"	ND	---	14	"	"	--	--	--	--	--	--	"	
Toluene	"	ND	---	7.5	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	---	37	"	"	--	--	--	--	--	--	"	

TestAmerica Portland

Christina Woodcock For Darrell Auvil, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10H0063 **Air Preparation Method: METHOD-MSMED**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (10H0063-BLK1)							**Extracted: 08/07/10 00:00**							
1,1,1-Trichloroethane	EPA TO15	ND	---	11	ug/m3	1x	--	--	--	--	--	--	08/07/10 14:28	
1,1,2-Trichloroethane	"	ND	---	11	"	"	--	--	--	--	--	--	"	
Trichloroethene	"	ND	---	11	"	"	--	--	--	--	--	--	"	
Trichlorofluoromethane	"	ND	---	11	"	"	--	--	--	--	--	--	"	
1,1,2-Trichloro-1,2,2-trifluoroethane	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,2,4-Trimethylbenzene	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,3,5-Trimethylbenzene	"	ND	---	20	"	"	--	--	--	--	--	--	"	
Vinyl acetate	"	ND	---	70	"	"	--	--	--	--	--	--	"	
Vinyl chloride	"	ND	---	10	"	"	--	--	--	--	--	--	"	
m,p-Xylene	"	ND	---	17	"	"	--	--	--	--	--	--	"	
o-Xylene	"	ND	---	8.7	"	"	--	--	--	--	--	--	"	
Xylenes, total	"	ND	---	8.7	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 92%*			*Limits: 70-130%*	"							*08/07/10 14:28*	
1,2-Dichloroethane-d4		*99%*			*70-130%*	"							"	
Toluene-d8		*96%*			*70-130%*	"							"	
LCS (10H0063-BS1)							**Extracted: 08/07/10 00:00**							
Acetone	EPA TO15	92.3	---	24	ug/m3	1x	--	125	74%	(70-130)	--	--	08/07/10 12:38	
Benzene	"	137	---	9.6	"	"	--	169	81%	"	--	--	"	
Bromodichloromethane	"	330	---	13	"	"	--	335	98%	"	--	--	"	
Bromomethane	"	211	---	16	"	"	--	194	109%	"	--	--	"	
2-Butanone (MEK)	"	120	---	29	"	"	--	164	73%	"	--	--	"	
Carbon disulfide	"	173	---	31	"	"	--	156	111%	"	--	--	"	
Chlorobenzene	"	208	---	9.2	"	"	--	244	85%	"	--	--	"	
1,4-Dichlorobenzene	"	293	---	24	"	"	--	301	98%	"	--	--	"	
cis-1,2-Dichloroethene	"	177	---	7.9	"	"	--	212	83%	"	--	--	"	
Hexachlorobutadiene	"	519	---	43	"	"	--	491	106%	"	--	--	"	
1,1,2-Trichloroethane	"	249	---	11	"	"	--	273	91%	"	--	--	"	
Trichloroethene	"	259	---	11	"	"	--	269	96%	"	--	--	"	
1,2,4-Trimethylbenzene	"	219	---	15	"	"	--	246	89%	"	--	--	"	
Vinyl chloride	"	104	---	10	"	"	--	128	81%	"	--	--	"	
m,p-Xylene	"	389	---	17	"	"	--	434	89%	"	--	--	"	
o-Xylene	"	199	---	8.7	"	"	--	228	87%	"	--	--	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 94%*			*Limits: 70-130%*	"							*08/07/10 12:38*	
1,2-Dichloroethane-d4		*95%*			*70-130%*	"							"	
Toluene-d8		*95%*			*70-130%*	"							"	

TestAmerica Portland

Christina Woodcock For Darrell Auvil, Project Manager

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ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10H0063 **Air Preparation Method: METHOD-MSMED**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS Dup (10H0063-BSD1)							**Extracted: 08/07/10 00:00**							
Acetone	EPA TO15	103	---	24	ug/m3	1x	--	125	82%	(70-130)	11%	(25)	08/07/10 13:45	
Benzene	"	138	---	9.6	"	"	--	169	81%	"	0.8%	"	"	
Bromodichloromethane	"	340	---	13	"	"	--	335	102%	"	3%	"	"	
Bromomethane	"	226	---	16	"	"	--	194	116%	"	7%	"	"	
2-Butanone (MEK)	"	123	---	29	"	"	--	164	75%	"	3%	"	"	
Carbon disulfide	"	177	---	31	"	"	--	156	114%	"	2%	"	"	
Chlorobenzene	"	202	---	9.2	"	"	--	244	83%	"	3%	"	"	
1,4-Dichlorobenzene	"	312	---	24	"	"	--	301	104%	"	6%	"	"	
cis-1,2-Dichloroethene	"	180	---	7.9	"	"	--	212	85%	"	2%	"	"	
Hexachlorobutadiene	"	647	---	43	"	"	--	491	132%	"	22%	"	"	L5
1,1,2-Trichloroethane	"	264	---	11	"	"	--	273	97%	"	6%	"	"	
Trichloroethene	"	272	---	11	"	"	--	269	101%	"	5%	"	"	
1,2,4-Trimethylbenzene	"	228	---	15	"	"	--	246	93%	"	4%	"	"	
Vinyl chloride	"	123	---	10	"	"	--	128	96%	"	16%	"	"	
m,p-Xylene	"	397	---	17	"	"	--	434	91%	"	2%	"	"	
o-Xylene	"	202	---	8.7	"	"	--	228	89%	"	2%	"	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 94%*			*Limits: 70-130%*	"							*08/07/10 13:45*	
1,2-Dichloroethane-d4		*92%*			*70-130%*	"							"	
Toluene-d8		*99%*			*70-130%*	"							"	

TestAmerica Portland

Christina Woodcock For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126-09	Report Created:
Portland, OR 97201	Project Manager:	Stephanie Bosze	08/13/10 15:55

Notes and Definitions

Report Specific Notes:

L5 - Analyte recovery outside of specified criteria. Individual analyte criteria exceedences allowed for multi-component analyses without disqualification of data per NELAC Standard, DOD QSM and/or AFCEE QAPP.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR/NA - Not Reported / Not Available

dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.

wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.

RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Portland

Christina Woodcock For Darrell Auvil, Project Manager

TestAmerica Los Angeles
3585 Cadillac Ave., Suite A
Costa Mesa, CA 92626
Phone 714-258-8610 Fax 714-258-0921

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PT60837

Client Contact Information	Project Manager: Stephanie Bosze		1 of 1 COCs
Company: Ash Creek	Phone: 503.924.4704 X125	Samples Collected By: D. URQUHART	
Address: 3015 SW First	Email: sbosze@ashcreekassociates.com		
City/State/Zip: Portland, OR 97201	Site Contact:		
Phone: 503.924.4704	LAB Contact:		
FAX:	Analysis Turnaround Time		
Project Name: NuStar Vancouver	Standard (Specify) ✓		
Site: SVE IRAM	Rush (Specify)		
PO # 1126-09			

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	TO-3	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
PostCarbon-072910	7/29/10	929	931	29	5.5	-	E-21	X												
PreCarbon-072910	7/29/10	943	945	28	5.0	-	A-151	X												

Temperature (Fahrenheit)			
	Interior	Ambient	
Start			
Stop			

Pressure (inches of Hg)			
	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:

Samples Shipped by: Douglas Urquhart	Date/Time: 7/29/10 1430	Samples Received by: TAP 7/29/10 @ 16:15	
Samples Relinquished by:	Date/Time: 7/29/10 @ 18:10	Received by: TAP 7/29/10 1810	
Relinquished by:	Date/Time:	Received by:	

Lab Use Only Shipper Name: Opened by: Condition:

TestAmerica Portland

Sample Receiving Checklist

Work Order #: _____ Date/Time Received: 7/29/10 1810

Client Name and Project: Ash Creek NvStar Vancouver

Time Zone:
☐EDT/EST ☐CDT/CST ☐MDT/MST ☒PDT/PST ☐AK ☐OTHER

Unpacking Checks:

Cooler #(s): N/A _____ _____ _____ _____

Temperatures: _____ _____ _____ _____ _____

Digi #1 ☐ Digi #2 ☐ IR Gun ☐ (☐Plastic ☐Glass)

Temperature out of Range:

__Not enough or No Ice
__Ice Melted
__W/in 4 Hrs of collection
__Other:_____

Initials: PS

N/A	Yes	No	
☑	☐	☐	1. If ESI client, were temp blanks received? If no, document on NOD.
☑	☐	☐	2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD.
	☑	☐	3. Chain of Custody present? If no, document on NOD.
	☑	☐	4. Bottles received intact? If no, document on NOD.
	☑	☐	5. Sample is not multiphasic? If no, document on NOD.
	☑	☐	6. Proper Container and preservatives used? If no, document on NOD.
☑	☐	☐	7. pH of all samples checked and meet requirements? If no, document on NOD.
☑	☐	☐	8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
☑	☐	☐	9. HF Dilution required?
	☑	☐	10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding.
	☑	☐	11. Did chain of custody agree with samples received? If no, document on NOD.
	☐	☑	12. Is the "Sampled by" section of the COC completed?
☑	☐	☐	13. Were VOA/Oil Syringe samples without headspace?
☑	☐	☐	14. Were VOA vials preserved? ☐HCl ☐Sodium Thiosulfate ☐Ascorbic Acid
	☐	☑	15. Did samples require preservation with sodium thiosulfate?
☑	☐	☐	16. If yes to #15, was the residual chlorine test negative? If no, document on NOD.
☑	☐	☐	17. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
☑	☐	☐	18. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding.
☑	☐	☐	19. Are analyses with short holding times received in hold?
	☑	☐	20. Was Standard Turn Around (TAT) requested?
	☑	☐	21. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM.

TestAmerica Portland

Sample Receiving Checklist

Work Order #: PTG0837

Login Checks:

Initials: PS

N/A	Yes	No	
	☒	☐	22. Sufficient volume provided for all analysis? If no, document on NOD & contact PM.
☒	☐	☐	23. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM.
	☒	☐	24. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times?
☒	☐	☐	25. Were special log in instructions read and followed?
	☒	☐	26. Were tests logged checked against the COC?
☒	☐	☐	27. Were rush notices printed and delivered?
☒	☐	☐	28. Were short hold notices printed and delivered?
☐	☒	☐	29. Were subcontract COCs printed?
☒	☐	☐	30. Was HF dilution logged?

Labeling and Storage Checks:

Initials: PS

N/A	Yes	No	
☐	☒	☐	31. Were the subcontracted samples/containers put in Sx fridge?
☒	☐	☐	32. Were sample bottles and COC double checked for dissolved/filtered metals?
	☒	☐	33. Did the sample ID, Date, and Time from label match what was logged?
☒	☐	☐	34. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge?
☒	☐	☐	35. Were HF stickers affixed to each container, and containers stored in Sx fridge?
☒	☐	☐	36. Was an NOD for created for noted discrepancies and placed in folder?

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).

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PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

ORELAP#: OR100021

September 10, 2010

Kirsten White
Ash Creek Associates, Inc.
3015 SW First Avenue
Portland, OR 97201

RE: NuStar Vancouver

Enclosed are the results of analyses for samples received by the laboratory on 08/26/10 16:35. The following list is a summary of the Work Orders contained in this report, generated on 09/10/10 16:21.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
PTH0864	NuStar Vancouver	1126

TestAmerica Portland

Darrell Auvil, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Post Carbon 082510	PTH0864-01	Air	08/25/10 12:35	08/26/10 16:35
Pre Carbon 082510	PTH0864-02	Air	08/25/10 12:42	08/26/10 16:35

TestAmerica Portland

Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTH0864-01 (Post Carbon 082510)			**Air**				**Sampled: 08/25/10 12:35**			
Acetone	EPA TO15	ND	-----	24	ug/m3	1x	10I0004	08/31/10 21:35	09/01/10 02:47	
Benzene	"	ND	-----	9.6	"	"	"	"	"	
Benzyl chloride	"	ND	-----	52	"	"	"	"	"	
Bromodichloromethane	"	ND	-----	13	"	"	"	"	"	
Bromoform	"	ND	-----	21	"	"	"	"	"	
Bromomethane	"	ND	-----	16	"	"	"	"	"	
2-Butanone (MEK)	"	ND	-----	29	"	"	"	"	"	
Carbon disulfide	"	ND	-----	31	"	"	"	"	"	
Carbon tetrachloride	"	ND	-----	13	"	"	"	"	"	
Chlorobenzene	"	ND	-----	9.2	"	"	"	"	"	
Dibromochloromethane	"	ND	-----	17	"	"	"	"	"	
Chloroethane	"	ND	-----	11	"	"	"	"	"	
Chloroform	"	ND	-----	9.8	"	"	"	"	"	
Chloromethane	"	ND	-----	8.3	"	"	"	"	"	
1,2-Dibromoethane (EDB)	"	ND	-----	15	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	12	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	24	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	24	"	"	"	"	"	
Dichlorodifluoromethane	"	ND	-----	15	"	"	"	"	"	
1,1-Dichloroethane	"	ND	-----	8.1	"	"	"	"	"	
1,2-Dichloroethane	"	ND	-----	12	"	"	"	"	"	
cis-1,2-Dichloroethene	"	ND	-----	7.9	"	"	"	"	"	
trans-1,2-Dichloroethene	"	ND	-----	7.9	"	"	"	"	"	
1,1-Dichloroethene	"	ND	-----	7.9	"	"	"	"	"	
1,2-Dichloropropane	"	ND	-----	14	"	"	"	"	"	
cis-1,3-Dichloropropene	"	ND	-----	9.1	"	"	"	"	"	
trans-1,3-Dichloropropene	"	ND	-----	9.1	"	"	"	"	"	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	"	ND	-----	14	"	"	"	"	"	
Ethylbenzene	"	ND	-----	8.7	"	"	"	"	"	
4-Ethyltoluene	"	ND	-----	9.8	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	43	"	"	"	"	"	
2-Hexanone	"	ND	-----	41	"	"	"	"	"	
Methylene chloride	"	ND	-----	6.9	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	"	ND	-----	41	"	"	"	"	"	
Styrene	"	ND	-----	8.5	"	"	"	"	"	

TestAmerica Portland

Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTH0864-01 (Post Carbon 082510)			**Air**				**Sampled: 08/25/10 12:35**			
1,1,2,2-Tetrachloroethane	EPA TO15	ND	-----	14	ug/m3	1x	10I0004	08/31/10 21:35	09/01/10 02:47	
Tetrachloroethene	"	ND	-----	14	"	"	"	"	"	
Toluene	"	ND	-----	7.5	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	37	"	"	"	"	"	
1,1,1-Trichloroethane	"	ND	-----	11	"	"	"	"	"	
1,1,2-Trichloroethane	"	ND	-----	11	"	"	"	"	"	
Trichloroethene	"	ND	-----	11	"	"	"	"	"	
Trichlorofluoromethane	"	ND	-----	11	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane	"	ND	-----	15	"	"	"	"	"	
1,2,4-Trimethylbenzene	"	ND	-----	15	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	-----	20	"	"	"	"	"	
Vinyl acetate	"	ND	-----	70	"	"	"	"	"	
Vinyl chloride	"	ND	-----	10	"	"	"	"	"	
m,p-Xylene	"	ND	-----	17	"	"	"	"	"	
o-Xylene	"	ND	-----	8.7	"	"	"	"	"	
Xylenes, total	"	ND	-----	8.7	"	"	"	"	"	
Surrogate(s): 4-Bromofluorobenzene				*111%*		*70 - 130 %*	"			"
1,2-Dichloroethane-d4				*119%*		*70 - 130 %*	"			"
Toluene-d8				*114%*		*70 - 130 %*	"			"
PTH0864-02 (Pre Carbon 082510)			**Air**				**Sampled: 08/25/10 12:42**			
Acetone	EPA TO15	ND	*480*	1200	ug/m3	50.8x	10I0017	08/30/10 18:40	08/31/10 00:50	
Benzene	"	ND	*240*	490	"	"	"	"	"	
Benzyl chloride	"	ND	*530*	2600	"	"	"	"	"	
Bromodichloromethane	"	ND	*340*	680	"	"	"	"	"	
Bromoform	"	ND	*260*	1100	"	"	"	"	"	
Bromomethane	"	ND	*390*	790	"	"	"	"	"	
2-Butanone (MEK)	"	ND	*450*	1500	"	"	"	"	"	
Carbon disulfide	"	ND	*630*	1600	"	"	"	"	"	
Carbon tetrachloride	"	ND	*320*	640	"	"	"	"	"	
Chlorobenzene	"	ND	*120*	470	"	"	"	"	"	
Dibromochloromethane	"	ND	*430*	870	"	"	"	"	"	
Chloroethane	"	ND	*200*	540	"	"	"	"	"	
Chloroform	"	ND	*250*	500	"	"	"	"	"	
Chloromethane	"	ND	*210*	420	"	"	"	"	"	
1,2-Dibromoethane (EDB)	"	ND	*390*	780	"	"	"	"	"	

TestAmerica Portland

Darrell Auvil, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTH0864-02 (Pre Carbon 082510)			**Air**				**Sampled: 08/25/10 12:42**			
1,2-Dichlorobenzene	EPA TO15	ND	*280*	610	ug/m3	50.8x	10I0017	08/30/10 18:40	08/31/10 00:50	
1,3-Dichlorobenzene	"	ND	*240*	1200	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	*310*	1200	"	"	"	"	"	
Dichlorodifluoromethane	"	ND	*250*	750	"	"	"	"	"	
1,1-Dichloroethane	"	ND	*210*	410	"	"	"	"	"	
1,2-Dichloroethane	"	ND	*310*	620	"	"	"	"	"	
cis-1,2-Dichloroethene	"	**200**	*160*	400	"	"	"	"	"	**J**
trans-1,2-Dichloroethene	"	ND	*200*	400	"	"	"	"	"	
1,1-Dichloroethene	"	ND	*200*	400	"	"	"	"	"	
1,2-Dichloropropane	"	ND	*350*	700	"	"	"	"	"	
cis-1,3-Dichloropropene	"	ND	*230*	460	"	"	"	"	"	
trans-1,3-Dichloropropene	"	ND	*230*	460	"	"	"	"	"	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	"	ND	*360*	710	"	"	"	"	"	
Ethylbenzene	"	ND	*220*	440	"	"	"	"	"	
4-Ethyltoluene	"	ND	*250*	500	"	"	"	"	"	
Hexachlorobutadiene	"	ND	*810*	2200	"	"	"	"	"	
2-Hexanone	"	ND	*420*	2100	"	"	"	"	"	
Methylene chloride	"	ND	*180*	350	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	"	ND	*420*	2100	"	"	"	"	"	
Styrene	"	ND	*220*	430	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	"	ND	*350*	700	"	"	"	"	"	
Tetrachloroethene	"	**55000**	*340*	690	"	"	"	"	"	
Toluene	"	ND	*190*	380	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	*940*	1900	"	"	"	"	"	
1,1,1-Trichloroethane	"	ND	*280*	550	"	"	"	"	"	
1,1,2-Trichloroethane	"	ND	*280*	550	"	"	"	"	"	
Trichloroethene	"	**1800**	*270*	550	"	"	"	"	"	
Trichlorofluoromethane	"	ND	*290*	570	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane	"	ND	*390*	780	"	"	"	"	"	
1,2,4-Trimethylbenzene	"	ND	*320*	750	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	*500*	1000	"	"	"	"	"	
Vinyl acetate	"	ND	*1800*	3600	"	"	"	"	"	
Vinyl chloride	"	ND	*260*	520	"	"	"	"	"	
m,p-Xylene	"	ND	*440*	880	"	"	"	"	"	
o-Xylene	"	ND	*220*	440	"	"	"	"	"	

TestAmerica Portland

Darrell Auvil, Project Manager

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BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS

TestAmerica Los Angeles

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTH0864-02 (Pre Carbon 082510)			**Air**			**Sampled: 08/25/10 12:42**				
Xylenes, total	EPA TO15	ND	*220*	440	ug/m3	50.8x	10I0017	08/30/10 18:40	08/31/10 00:50	
Surrogate(s):	*4-Bromofluorobenzene*			*100%*		*70 - 130 %*	*1x*			*"*
	1,2-Dichloroethane-d4			*108%*		*70 - 130 %*	*"*			*"*
	Toluene-d8			*93%*		*70 - 130 %*	*"*			*"*

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10I0004 **Air Preparation Method: METHOD-MSMED**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (10I0004-BLK1)							**Extracted: 08/31/10 15:40**							
Acetone	EPA TO15	ND	---	24	ug/m3	1x	--	--	--	--	--	--	08/31/10 20:59	
Benzene	"	ND	---	9.6	"	"	--	--	--	--	--	--	"	
Benzyl chloride	"	ND	---	52	"	"	--	--	--	--	--	--	"	
Bromodichloromethane	"	ND	---	13	"	"	--	--	--	--	--	--	"	
Bromoform	"	ND	---	21	"	"	--	--	--	--	--	--	"	
Bromomethane	"	ND	---	16	"	"	--	--	--	--	--	--	"	
2-Butanone (MEK)	"	ND	---	29	"	"	--	--	--	--	--	--	"	
Carbon disulfide	"	ND	---	31	"	"	--	--	--	--	--	--	"	
Carbon tetrachloride	"	ND	---	13	"	"	--	--	--	--	--	--	"	
Chlorobenzene	"	ND	---	9.2	"	"	--	--	--	--	--	--	"	
Dibromochloromethane	"	ND	---	17	"	"	--	--	--	--	--	--	"	
Chloroethane	"	ND	---	11	"	"	--	--	--	--	--	--	"	
Chloroform	"	ND	---	9.8	"	"	--	--	--	--	--	--	"	
Chloromethane	"	ND	---	8.3	"	"	--	--	--	--	--	--	"	
1,2-Dibromoethane (EDB)	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	---	12	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	---	24	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	---	24	"	"	--	--	--	--	--	--	"	
Dichlorodifluoromethane	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethane	"	ND	---	8.1	"	"	--	--	--	--	--	--	"	
1,2-Dichloroethane	"	ND	---	12	"	"	--	--	--	--	--	--	"	
cis-1,2-Dichloroethene	"	ND	---	7.9	"	"	--	--	--	--	--	--	"	
trans-1,2-Dichloroethene	"	ND	---	7.9	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethene	"	ND	---	7.9	"	"	--	--	--	--	--	--	"	
1,2-Dichloropropane	"	ND	---	14	"	"	--	--	--	--	--	--	"	
cis-1,3-Dichloropropene	"	ND	---	9.1	"	"	--	--	--	--	--	--	"	
trans-1,3-Dichloropropene	"	ND	---	9.1	"	"	--	--	--	--	--	--	"	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	"	ND	---	14	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	8.7	"	"	--	--	--	--	--	--	"	
4-Ethyltoluene	"	ND	---	9.8	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	---	43	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	---	41	"	"	--	--	--	--	--	--	"	
Methylene chloride	"	ND	---	6.9	"	"	--	--	--	--	--	--	"	
4-Methyl-2-pentanone (MIBK)	"	ND	---	41	"	"	--	--	--	--	--	--	"	
Styrene	"	ND	---	8.5	"	"	--	--	--	--	--	--	"	
1,1,2,2-Tetrachloroethane	"	ND	---	14	"	"	--	--	--	--	--	--	"	
Tetrachloroethene	"	ND	---	14	"	"	--	--	--	--	--	--	"	
Toluene	"	ND	---	7.5	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	---	37	"	"	--	--	--	--	--	--	"	

TestAmerica Portland

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ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10I0004 **Air Preparation Method: METHOD-MSMED**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (10I0004-BLK1)							**Extracted: 08/31/10 15:40**							
1,1,1-Trichloroethane	EPA TO15	ND	---	11	ug/m3	1x	--	--	--	--	--	--	08/31/10 20:59	
1,1,2-Trichloroethane	"	ND	---	11	"	"	--	--	--	--	--	--	"	
Trichloroethene	"	ND	---	11	"	"	--	--	--	--	--	--	"	
Trichlorofluoromethane	"	ND	---	11	"	"	--	--	--	--	--	--	"	
1,1,2-Trichloro-1,2,2-trifluoroethane	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,2,4-Trimethylbenzene	"	ND	---	15	"	"	--	--	--	--	--	--	"	
1,3,5-Trimethylbenzene	"	ND	---	20	"	"	--	--	--	--	--	--	"	
Vinyl acetate	"	ND	---	70	"	"	--	--	--	--	--	--	"	
Vinyl chloride	"	ND	---	10	"	"	--	--	--	--	--	--	"	
m,p-Xylene	"	ND	---	17	"	"	--	--	--	--	--	--	"	
o-Xylene	"	ND	---	8.7	"	"	--	--	--	--	--	--	"	
Xylenes, total	"	ND	---	8.7	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 115%*			*Limits: 70-130%*	"							*08/31/10 20:59*	
1,2-Dichloroethane-d4		*111%*			*70-130%*	"							"	
Toluene-d8		*95%*			*70-130%*	"							"	
LCS (10I0004-BS1)							**Extracted: 08/31/10 15:40**							
Acetone	EPA TO15	87.8	---	24	ug/m3	1x	--	125	70%	(70-130)	--	--	08/31/10 19:06	
Benzene	"	137	---	9.6	"	"	--	169	81%	"	--	--	"	
Bromodichloromethane	"	308	---	13	"	"	--	335	92%	"	--	--	"	
Bromomethane	"	202	---	16	"	"	--	194	104%	"	--	--	"	
2-Butanone (MEK)	"	136	---	29	"	"	--	164	83%	"	--	--	"	
Carbon disulfide	"	154	---	31	"	"	--	156	99%	"	--	--	"	
Chlorobenzene	"	194	---	9.2	"	"	--	244	79%	"	--	--	"	
1,4-Dichlorobenzene	"	282	---	24	"	"	--	301	94%	"	--	--	"	
cis-1,2-Dichloroethene	"	186	---	7.9	"	"	--	212	88%	"	--	--	"	
Hexachlorobutadiene	"	522	---	43	"	"	--	491	106%	"	--	--	"	
1,1,2-Trichloroethane	"	239	---	11	"	"	--	273	88%	"	--	--	"	
Trichloroethene	"	235	---	11	"	"	--	269	87%	"	--	--	"	
1,2,4-Trimethylbenzene	"	262	---	15	"	"	--	246	107%	"	--	--	"	
Vinyl chloride	"	117	---	10	"	"	--	128	92%	"	--	--	"	
m,p-Xylene	"	399	---	17	"	"	--	434	92%	"	--	--	"	
o-Xylene	"	188	---	8.7	"	"	--	228	82%	"	--	--	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 115%*			*Limits: 70-130%*	"							*08/31/10 19:06*	
1,2-Dichloroethane-d4		*112%*			*70-130%*	"							"	
Toluene-d8		*97%*			*70-130%*	"							"	

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10I0004 **Air Preparation Method: METHOD-MSMED**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS Dup (10I0004-BSD1)							**Extracted: 08/31/10 15:40**							
Acetone	EPA TO15	92.9	---	24	ug/m3	1x	--	125	74%	(70-130)	6%	(25)	08/31/10 19:44	
Benzene	"	135	---	9.6	"	"	--	169	79%	"	2%	"	"	
Bromodichloromethane	"	298	---	13	"	"	--	335	89%	"	3%	"	"	
Bromomethane	"	196	---	16	"	"	--	194	101%	"	3%	"	"	
2-Butanone (MEK)	"	138	---	29	"	"	--	164	84%	"	1%	"	"	
Carbon disulfide	"	148	---	31	"	"	--	156	95%	"	4%	"	"	
Chlorobenzene	"	191	---	9.2	"	"	--	244	78%	"	1%	"	"	
1,4-Dichlorobenzene	"	278	---	24	"	"	--	301	92%	"	1%	"	"	
cis-1,2-Dichloroethene	"	183	---	7.9	"	"	--	212	86%	"	2%	"	"	
Hexachlorobutadiene	"	522	---	43	"	"	--	491	106%	"	0.008%	"	"	
1,1,2-Trichloroethane	"	230	---	11	"	"	--	273	84%	"	4%	"	"	
Trichloroethene	"	228	---	11	"	"	--	269	85%	"	3%	"	"	
1,2,4-Trimethylbenzene	"	255	---	15	"	"	--	246	104%	"	3%	"	"	
Vinyl chloride	"	103	---	10	"	"	--	128	80%	"	13%	"	"	
m,p-Xylene	"	394	---	17	"	"	--	434	91%	"	1%	"	"	
o-Xylene	"	187	---	8.7	"	"	--	228	82%	"	0.3%	"	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 116%*			*Limits: 70-130%*	"							*08/31/10 19:44*	
1,2-Dichloroethane-d4		*107%*			*70-130%*	"							"	
Toluene-d8		*95%*			*70-130%*	"							"	

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Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10I0017 **Air Preparation Method: METHOD-MSLOW**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (10I0017-BLK1)								**Extracted: 08/30/10 15:44**						
Acetone	EPA TO15	ND	9.5	24	ug/m3	1x	--	--	--	--	--	--	08/30/10 19:10	
Benzene	"	ND	4.8	9.6	"	"	--	--	--	--	--	--	"	
Benzyl chloride	"	ND	10	52	"	"	--	--	--	--	--	--	"	
Bromodichloromethane	"	ND	6.7	13	"	"	--	--	--	--	--	--	"	
Bromoform	"	ND	5.2	21	"	"	--	--	--	--	--	--	"	
Bromomethane	"	ND	7.8	16	"	"	--	--	--	--	--	--	"	
2-Butanone (MEK)	"	ND	8.8	29	"	"	--	--	--	--	--	--	"	
Carbon disulfide	"	ND	12	31	"	"	--	--	--	--	--	--	"	
Carbon tetrachloride	"	ND	6.3	13	"	"	--	--	--	--	--	--	"	
Chlorobenzene	"	ND	2.3	9.2	"	"	--	--	--	--	--	--	"	
Dibromochloromethane	"	ND	8.5	17	"	"	--	--	--	--	--	--	"	
Chloroethane	"	ND	4.0	11	"	"	--	--	--	--	--	--	"	
Chloroform	"	ND	4.9	9.8	"	"	--	--	--	--	--	--	"	
Chloromethane	"	ND	4.1	8.3	"	"	--	--	--	--	--	--	"	
1,2-Dibromoethane (EDB)	"	ND	7.7	15	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	5.4	12	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	4.8	24	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	6.0	24	"	"	--	--	--	--	--	--	"	
Dichlorodifluoromethane	"	ND	4.9	15	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethane	"	ND	4.0	8.1	"	"	--	--	--	--	--	--	"	
1,2-Dichloroethane	"	ND	6.1	12	"	"	--	--	--	--	--	--	"	
cis-1,2-Dichloroethene	"	ND	3.2	7.9	"	"	--	--	--	--	--	--	"	
trans-1,2-Dichloroethene	"	ND	4.0	7.9	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethene	"	ND	4.0	7.9	"	"	--	--	--	--	--	--	"	
1,2-Dichloropropane	"	ND	6.9	14	"	"	--	--	--	--	--	--	"	
cis-1,3-Dichloropropene	"	ND	4.5	9.1	"	"	--	--	--	--	--	--	"	
trans-1,3-Dichloropropene	"	ND	4.5	9.1	"	"	--	--	--	--	--	--	"	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	"	ND	7.0	14	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	4.3	8.7	"	"	--	--	--	--	--	--	"	
4-Ethyltoluene	"	ND	4.9	9.8	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	16	43	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	8.2	41	"	"	--	--	--	--	--	--	"	
Methylene chloride	"	ND	3.5	6.9	"	"	--	--	--	--	--	--	"	
4-Methyl-2-pentanone (MIBK)	"	ND	8.2	41	"	"	--	--	--	--	--	--	"	
Styrene	"	ND	4.3	8.5	"	"	--	--	--	--	--	--	"	
1,1,2,2-Tetrachloroethane	"	ND	6.9	14	"	"	--	--	--	--	--	--	"	
Tetrachloroethene	"	ND	6.8	14	"	"	--	--	--	--	--	--	"	
Toluene	"	ND	3.8	7.5	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	19	37	"	"	--	--	--	--	--	--	"	

TestAmerica Portland

Darrell Auvil, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10I0017 **Air Preparation Method: METHOD-MSLOW**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (10I0017-BLK1)							**Extracted: 08/30/10 15:44**							
1,1,1-Trichloroethane	EPA TO15	ND	5.5	11	ug/m3	1x	--	--	--	--	--	--	08/30/10 19:10	
1,1,2-Trichloroethane	"	ND	5.5	11	"	"	--	--	--	--	--	--	"	
Trichloroethene	"	ND	5.4	11	"	"	--	--	--	--	--	--	"	
Trichlorofluoromethane	"	ND	5.6	11	"	"	--	--	--	--	--	--	"	
1,1,2-Trichloro-1,2,2-trifluoroethane	"	ND	7.7	15	"	"	--	--	--	--	--	--	"	
1,2,4-Trimethylbenzene	"	ND	6.4	15	"	"	--	--	--	--	--	--	"	
1,3,5-Trimethylbenzene	"	ND	9.8	20	"	"	--	--	--	--	--	--	"	
Vinyl acetate	"	ND	35	70	"	"	--	--	--	--	--	--	"	
Vinyl chloride	"	ND	5.1	10	"	"	--	--	--	--	--	--	"	
m,p-Xylene	"	ND	8.7	17	"	"	--	--	--	--	--	--	"	
o-Xylene	"	ND	4.3	8.7	"	"	--	--	--	--	--	--	"	
Xylenes, total	"	ND	4.3	8.7	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 103%*			*Limits: 70-130%*	"							*08/30/10 19:10*	
1,2-Dichloroethane-d4		*101%*			*70-130%*	"							"	
Toluene-d8		*112%*			*70-130%*	"							"	
LCS (10I0017-BS1)							**Extracted: 08/30/10 15:44**							
Acetone	EPA TO15	88.1	9.5	24	ug/m3	1x	--	125	71%	(70-130)	--	--	08/30/10 17:37	
Benzene	"	137	4.8	9.6	"	"	--	169	81%	"	--	--	"	
Bromodichloromethane	"	310	6.7	13	"	"	--	335	93%	"	--	--	"	
Bromomethane	"	183	7.8	16	"	"	--	194	94%	"	--	--	"	
2-Butanone (MEK)	"	126	8.8	29	"	"	--	164	77%	"	--	--	"	
Carbon disulfide	"	157	12	31	"	"	--	156	101%	"	--	--	"	
Chlorobenzene	"	200	2.3	9.2	"	"	--	244	82%	"	--	--	"	
1,4-Dichlorobenzene	"	292	6.0	24	"	"	--	301	97%	"	--	--	"	
cis-1,2-Dichloroethene	"	177	3.2	7.9	"	"	--	212	84%	"	--	--	"	
Hexachlorobutadiene	"	530	16	43	"	"	--	491	108%	"	--	--	"	
1,1,2-Trichloroethane	"	235	5.5	11	"	"	--	273	86%	"	--	--	"	
Trichloroethene	"	239	5.4	11	"	"	--	269	89%	"	--	--	"	
1,2,4-Trimethylbenzene	"	247	6.4	15	"	"	--	246	100%	"	--	--	"	
Vinyl chloride	"	115	5.1	10	"	"	--	128	90%	"	--	--	"	
m,p-Xylene	"	402	8.7	17	"	"	--	434	93%	"	--	--	"	
o-Xylene	"	188	4.3	8.7	"	"	--	228	82%	"	--	--	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 107%*			*Limits: 70-130%*	"							*08/30/10 17:37*	
1,2-Dichloroethane-d4		*99%*			*70-130%*	"							"	
Toluene-d8		*93%*			*70-130%*	"							"	

TestAmerica Portland

Darrell Auvil, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

EPA TO15 (Med-level) - Volatile Organic Compounds by GC/MS - Laboratory Quality Control Results

TestAmerica Los Angeles

QC Batch: 10I0017 **Air Preparation Method: METHOD-MSLOW**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS Dup (10I0017-BSD1)							**Extracted: 08/30/10 15:44**							
Acetone	EPA TO15	81.0	9.5	24	ug/m3	1x	--	125	65%	(70-130)	8%	(25)	08/30/10 18:15	L5
Benzene	"	135	4.8	9.6	"	"	--	169	80%	"	1%	"	"	
Bromodichloromethane	"	306	6.7	13	"	"	--	335	91%	"	1%	"	"	
Bromomethane	"	186	7.8	16	"	"	--	194	96%	"	2%	"	"	
2-Butanone (MEK)	"	121	8.8	29	"	"	--	164	74%	"	4%	"	"	
Carbon disulfide	"	153	12	31	"	"	--	156	98%	"	3%	"	"	
Chlorobenzene	"	198	2.3	9.2	"	"	--	244	81%	"	1%	"	"	
1,4-Dichlorobenzene	"	300	6.0	24	"	"	--	301	100%	"	3%	"	"	
cis-1,2-Dichloroethene	"	176	3.2	7.9	"	"	--	212	83%	"	0.7%	"	"	
Hexachlorobutadiene	"	532	16	43	"	"	--	491	108%	"	0.4%	"	"	
1,1,2-Trichloroethane	"	231	5.5	11	"	"	--	273	85%	"	2%	"	"	
Trichloroethene	"	242	5.4	11	"	"	--	269	90%	"	1%	"	"	
1,2,4-Trimethylbenzene	"	266	6.4	15	"	"	--	246	108%	"	8%	"	"	
Vinyl chloride	"	114	5.1	10	"	"	--	128	89%	"	1%	"	"	
m,p-Xylene	"	402	8.7	17	"	"	--	434	93%	"	0.04%	"	"	
o-Xylene	"	194	4.3	8.7	"	"	--	228	85%	"	3%	"	"	
Surrogate(s): 4-Bromofluorobenzene		*Recovery: 108%*			*Limits: 70-130%*	"							*08/30/10 18:15*	
1,2-Dichloroethane-d4		*101%*			*70-130%*	"							*"*	
Toluene-d8		*94%*			*70-130%*	"							*"*	

TestAmerica Portland

Darrell Auvil, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**NuStar Vancouver**	
3015 SW First Avenue	Project Number:	1126	Report Created:
Portland, OR 97201	Project Manager:	Kirsten White	09/10/10 16:21

Notes and Definitions

Report Specific Notes:

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

L5 - Analyte recovery outside of specified criteria. Individual analyte criteria exceedences allowed for multi-component analyses without disqualification of data per NELAC Standard, DOD QSM and/or AFCEE QAPP.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR/NA - Not Reported / Not Available

dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.

wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.

RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Portland

Darrell Auvil, Project Manager

CERTIFICATION SUMMARY

Subcontracted Laboratories

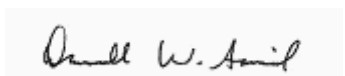
TestAmerica Los Angeles

3585 Cadillac Ave, Suite A - Costa Mesa, CA 92626

Method Performed: EPA TO15

Samples: PTH0864-01, PTH0864-02

TestAmerica Portland



Darrell Auvil, Project Manager

TestAmerica Los Angeles
3585 Cadillac Ave., Suite A
Costa Mesa, CA 92626
Phone 714-258-8610 Fax 714-258-0921

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PTH0869

Client Contact Information	Project Manager: Stephanie Bosze		1 of 1 COCs
Company: ASH CREEK	Phone: 503 924 4704 ext. 125	Samples Collected By: DU	
Address: 3015 SW 1st	Email: sbosze@ashcreekassociates.com		
City/State/Zip PORTLAND OR 97201	Site Contact:		
Phone: 503.924.4704	LAB Contact:		
FAX:	Analysis Turnaround Time		
Project Name: NuStar Vane. SVE	Standard (Specify) ✓		
Site: 1126	Rush (Specify)		
PO #			

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	TO-3	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
POST CARBON 082510	8/25/10	1233	1235	>30	6.0	—	9302BB	X												
PRE CARBON 082510	↓	1240	1242	>30	5.5	—	9233B	X												

Temperature (Fahrenheit)			
	Interior	Ambient	
Start			
Stop			

Pressure (inches of Hg)			
	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:

Samples Shipped by: Douglas Urquhart	Date/Time: 8/25/10 1640	Samples Received by: Chris Clough / ACA	
Samples Relinquished by: Chris Clough / ACA	Date/Time: 8/26/10 @ 12:45	Received by:	
Relinquished by:	Date/Time: 8/26/10 @ 16:35	Received by: 8/26/10	1635

Lab Use Only Shipper Name: Opened by: Condition:

TestAmerica Portland

Sample Receiving Checklist

Work Order #: PTH0864 Date/Time Received: 8/26/10 1635

Client Name and Project: Ash Creek NuStar Vancouver

Time Zone:
☐EDT/EST ☐CDT/CST ☐MDT/MST ☑PDT/PST ☐AK ☐OTHER

Unpacking Checks:

Cooler #(s): 1 _____ _____ _____ _____

Temperatures: _____ _____ _____ _____ _____

Digi #1 Digi #2 IR Gun
☐ ☐ ☐ (☐Plastic ☐Glass)

Temperature out of Range:
__Not enough or No Ice
__Ice Melted
__W/in 4 Hrs of collection
__Other:_____

Initials: JM

N/A	Yes	No	
☑	☐	☐	1. If ESI client, were temp blanks received? If no, document on NOD.
☑	☐	☐	2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD.
	☑	☐	3. Chain of Custody present? If no, document on NOD.
	☑	☐	4. Bottles received intact? If no, document on NOD.
	☑	☐	5. Sample is not multiphasic? If no, document on NOD.
	☑	☐	6. Proper Container and preservatives used? If no, document on NOD.
☑	☐	☐	7. pH of all samples checked and meet requirements? If no, document on NOD.
☑	☐	☐	8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
☑	☐	☐	9. HF Dilution required?
	☑	☐	10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding.
	☑	☐	11. Did chain of custody agree with samples received? If no, document on NOD.
	☑	☐	12. Is the "Sampled by" section of the COC completed?
☑	☐	☐	13. Were VOA/Oil Syringe samples without headspace?
☑	☐	☐	14. Were VOA vials preserved? ☐HCl ☐Sodium Thiosulfate ☐Ascorbic Acid
	☐	☑	15. Did samples require preservation with sodium thiosulfate?
☑	☐	☐	16. If yes to #15, was the residual chlorine test negative? If no, document on NOD.
☑	☐	☐	17. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
☑	☐	☐	18. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding.
☑	☐	☐	19. Are analyses with short holding times received in hold?
	☑	☐	20. Was Standard Turn Around (TAT) requested?
	☑	☐	21. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM.

TestAmerica Portland

Sample Receiving Checklist

Work Order #: PTH0864

Login Checks:

Initials: MK

N/A	Yes	No	
	X	☐	22. Sufficient volume provided for all analysis? If no, document on NOD & contact PM.
X	☐	☐	23. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM.
	X	☐	24. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times?
X	☐	☐	25. Were special log in instructions read and followed?
	X	☐	26. Were tests logged checked against the COC?
X	☐	☐	27. Were rush notices printed and delivered?
X	☐	☐	28. Were short hold notices printed and delivered?
☐	X	☐	29. Were subcontract COCs printed?
X	☐	☐	30. Was HF dilution logged?

Labeling and Storage Checks:

Initials: MK

N/A	Yes	No	
☐	X	☐	31. Were the subcontracted samples/containers put in Sx fridge?
X	☐	☐	32. Were sample bottles and COC double checked for dissolved/filtered metals?
	X	☐	33. Did the sample ID, Date, and Time from label match what was logged?
X	☐	☐	34. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge?
X	☐	☐	35. Were HF stickers affixed to each container, and containers stored in Sx fridge?
X	☐	☐	36. Was an NOD for created for noted discrepancies and placed in folder?

on shelf → NO Refrigeration needed

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).

KIFF Analytical LLC

Report Number : 74643
Date : 10/06/2010

Laboratory Results

Stephanie Bosze
Ash Creek Assoc.
3015 SW First Avenue
Portland, OR 97201-4707

Subject : 2 Water Samples
Project Name : 3Q10 NUSTAR VANCOUVER GWM
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Dear Ms. Bosze,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 74643
Date : 10/06/2010

Subject : 2 Water Samples
Project Name : 3Q10 NUSTAR VANCOUVER GWM
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Case Narrative

Matrix Spike/Matrix Spike Duplicate results associated with samples MGMS2-40 and MW-9 for the analyte Chloride were affected by the analyte concentration present in the un-spiked sample.

A version of this report was previously issued on 09/24/10. This revised version replaces that report.

KIFF Analytical LLC

Report Number : 74643
Date : 10/06/2010

Project Name : **3Q10 NUSTAR VANCOUVER GWM**
Project Number : **E3WR-0028**

Sample : **MGMS2-40** Matrix : Water Lab Number : 74643-01
Sample Date :09/21/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Chloride	**20**	5.0	mg/L	EPA 300.0	09/22/10 19:13
Nitrate as N	**560**	20	mg/L	EPA 300.0	09/23/10 08:20
Nitrite as N	< 0.10	0.10	mg/L	EPA 300.0	09/23/10 11:10
Sulfate	**110**	5.0	mg/L	EPA 300.0	09/22/10 19:13

Sample : **MW-9** Matrix : Water Lab Number : 74643-02
Sample Date :09/21/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Chloride	**5.9**	0.50	mg/L	EPA 300.0	09/23/10 10:00
Nitrate as N	**89**	10	mg/L	EPA 300.0	09/23/10 08:53
Nitrite as N	< 0.10	0.10	mg/L	EPA 300.0	09/22/10 19:47
Sulfate	**49**	1.0	mg/L	EPA 300.0	09/24/10 12:30

Report Number : 74643

QC Report : Method Blank Data

Date : 10/06/2010

Project Name : **3Q10 NUSTAR VANCOUVER GWM**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Chloride	< 0.50	0.50	mg/L	EPA 300.0	09/23/2010
Nitrite as N	< 0.10	0.10	mg/L	EPA 300.0	09/23/2010
Sulfate	< 0.50	0.50	mg/L	EPA 300.0	09/23/2010
Sulfate	< 0.50	0.50	mg/L	EPA 300.0	09/24/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 74643

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/06/2010

Project Name : **3Q10 NUSTAR VANCOUVER GWM**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Chloride														
	74567-01	46	2.50	2.50	48.7	48.1	mg/L	EPA 300.0	9/22/10	90.7	**65.6**	1.30	85.0-115	10
Nitrite as N														
	74567-01	< 0.10	0.500	0.500	0.463	0.442	mg/L	EPA 300.0	9/22/10	92.6	88.3	4.76	85.0-115	10
Nitrate as N														
	74567-01	< 0.10	0.500	0.500	0.465	0.465	mg/L	EPA 300.0	9/22/10	93.0	93.0	0.0925	85.0-115	10
Sulfate														
	74567-01	28	2.50	2.50	30.4	29.9	mg/L	EPA 300.0	9/22/10	104	85.7	1.49	85.0-115	10
Sulfate														
	74663-04	20	2.50	2.50	22.2	22.3	mg/L	EPA 300.0	9/24/10	96.5	100	0.447	85.0-115	10

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 74643

QC Report : Laboratory Control Sample (LCS)

Date : 10/06/2010

Project Name : **3Q10 NUSTAR VANCOUVER GWM**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Chloride	2.50	mg/L	EPA 300.0	9/22/10	97.6	85.0-115
Nitrite as N	0.500	mg/L	EPA 300.0	9/22/10	94.6	85.0-115
Nitrate as N	0.500	mg/L	EPA 300.0	9/22/10	92.6	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	9/22/10	113	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	9/24/10	93.4	85.0-115

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 74643

Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): SBOSZE@ASHCREEKASSOCIATES.COM

California EDF Report? ☐ Yes ☐ No

Company / Address: ASH CREEK / 3015 SW FIRST AVE, PORTLAND

Sampling Company Log Code:

Phone Number: (503) 924-4704

Global ID:

Fax Number:

EDF Deliverable To (Email Address): SBOSZE@ASHCREEKASSOCIATES.COM

Project #:

P.O. #: 4501259182

Bill to: RENEE ROBINSON, ~~SAME~~ NUSTAR ENERGY, L.P.

Project Name: 3Q10 NUSTAR VANCOUVER GWM

Sampler Print Name: MICHAEL WHITSON

Sampler Signature:

Project Address:

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: Sleeve	Container: Poly	Container: Glass	Container: Tedlar	Container:	Preservative: HCl	Preservative: HNO_3	Preservative: None	Preservative:	Preservative:	Matrix: Water	Matrix: Soil	Matrix: Air
MGMS2-40	09-21	1400			1						X			X		
MW-9	09-21	1610			1						X			X		

Analysis Request

PLEASE CIRCLE METHOD

MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	CAM 17 Metals (EPA 200.7 / 6010)	5 Waste Oil Metals (Cd,Cr,Ni,Pb,Zn) (EPA 200.7 / 6010)	Mercury (EPA 245.1 / 7470 / 7471)	Total Lead (EPA 200.7 / 6010)	W.E.T. Lead (STLC)	CHLORIDE, NITRATE, NITRITE, SULFATE (EPA 300.0)			
																X				
																X				

TAT: ☐ 12 hr ☐ 24 hr ☒ 48hr ☐ 72hr ☐ 1 wk

For Lab Use Only

Relinquished by:	Date	Time	Received by:
MICHAEL WHITSON	09-21	1630	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	092210	1040	

Remarks: SHORT HOLD TIME FOR ANIONS

For Lab Use Only: Sample Receipt

Temp °C	Initials	Date	Time	Therm. ID #	Coolant Present
2.4	KT	092210	1040	IR5	(Yes) / No

Distribution: White - Lab; Pink - Originator
Rev: 061708

KIFF Analytical LLC

SAMPLE RECEIPT CHECKLIST

RECEIVER: KT Initials

SRG#: 74643 Date: 092210

Project ID: 3Q10 NuStar Vancouver GWM

Method of Receipt: ☐ Courier ☐ Over-the-counter ☒ Shipper

COC Inspection

Is COC present?	☒ Yes	☐ No	
Custody seals on shipping container?	☐ Intact	☐ Broken	☒ Not present ☐ N/A
Is COC Signed by Relinquisher? ☒ Yes ☐ No Dated?	☒ Yes	☐ No	
Is sampler name legibly indicated on COC?	☒ Yes	☐ No	
Is analysis or hold requested for all samples	☒ Yes	☐ No	
Is the turnaround time indicated on COC?	☒ Yes	☐ No	
Is COC free of whiteout and uninitialed cross-outs?	☒ Yes	☐ No, Whiteout	☐ No, Cross-outs

Sample Inspection

Coolant Present: ☒ Yes ☐ No (includes water)

Temperature °C 2.4 Therm. ID# TR5 Initial KT Date/Time 092210 1040 ☐ N/A

Are there custody seals on sample containers?	☐ Intact	☐ Broken	☒ Not present
Do containers match COC? ☒ Yes ☐ No ☐ No, COC lists absent sample(s)		☐ No, Extra sample(s) present	
Are there samples matrices other than soil, water, air or carbon?	☐ Yes	☒ No	
Are any sample containers broken, leaking or damaged?	☐ Yes	☒ No	
Are preservatives indicated? ☐ Yes, on sample containers	☐ Yes, on COC	☐ Not indicated	☒ N/A
Are preservatives correct for analyses requested?	☐ Yes	☐ No	☒ N/A
Are samples within holding time for analyses requested?	☒ Yes	☐ No	
Are the correct sample containers used for the analyses requested?	☒ Yes	☐ No	
Is there sufficient sample to perform testing?	☒ Yes	☐ No	
Does any sample contain product, have strong odor or are otherwise suspected to be hot?		☐ Yes	☒ No

Receipt Details

Matrix H2O	Container type Poly	# of containers received 2
Matrix	Container type	# of containers received
Matrix	Container type	# of containers received

Date and Time Sample Put into Temp Storage Date: 092210 Time: 1040

Quicklog

Are the Sample ID's indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If Sample ID's are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Is the Project ID indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If project ID is listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Are the sample collection dates indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection dates are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Are the sample collection times indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection times are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	

COMMENTS:

KIFF Analytical LLC

Report Number : 75032
Date : 10/26/2010

Laboratory Results

Stephanie Bosze
Ash Creek Assoc.
3015 SW First Avenue
Portland, OR 97201-4707

Subject : 3 Water Samples
Project Name : IA Confirmation Sampling
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Dear Ms. Bosze,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 75032
Date : 10/26/2010

Subject : 3 Water Samples
Project Name : IA Confirmation Sampling
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Case Narrative

Matrix Spike/Matrix Spike Duplicate results associated with samples MGMSI-40, MW-12 and MW-19 for the analyte Nitrate as N were affected by the analyte concentration present in the un-spiked sample. Recoveries were calculated using data points beyond the calibration range.

KIFF Analytical LLC

Report Number : 75032

Date : 10/26/2010

Project Name : **IA Confirmation Sampling**

Project Number : **E3WR-0028**

Sample : **MW-12** Matrix : Water Lab Number : 75032-01

Sample Date :10/19/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	**59**	5.0	mg/L	EPA 300.0	10/20/10 23:45

Sample : **MW-19** Matrix : Water Lab Number : 75032-02

Sample Date :10/19/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	**300**	10	mg/L	EPA 300.0	10/21/10 00:13

Sample : **MGMSI-40** Matrix : Water Lab Number : 75032-03

Sample Date :10/19/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Nitrate as N	**390**	50	mg/L	EPA 300.0	10/21/10 00:41

Report Number : 75032

Date : 10/26/2010

QC Report : Method Blank Data

Project Name : **IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Nitrate as N	< 0.10	0.10	mg/L	EPA 300.0	10/20/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 75032

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/26/2010

Project Name : **IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Nitrate as N														
	75032-01	43	0.500	0.500	45.8	45.6	mg/L	EPA 300.0	10/20/10	**622**	**595**	0.291	85.0-115	10

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 75032

QC Report : Laboratory Control Sample (LCS)

Date : 10/26/2010

Project Name : **IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Nitrate as N	0.500	mg/L	EPA 300.0	10/20/10	93.6	85.0-115

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 75032

Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Stephanie Bosz	California EDF Report? ☐ Yes ☐ No
Company / Address: Ash Creek	Sampling Company Log Code:
Phone Number: 503-924-4704 x125	Global ID:
Fax Number: 503-943-6257	EDF Deliverable To (Email Address):
Project #: 1126-09 / P.O. #: 1126-09	Bill to: NuStar
Project Name: JA Confirmation Sampling	Sampler Signature: Stephanie Bosz
Project Address: Port of Vancouver Vancouver, WA	

Sample Designation	Sampling: Date	Sampling: Time	Container: 40 ml VOA	Container: Sleeve	Container: Poly	Container: Glass	Container: Tedlar	Preservative: HCl	Preservative: HNO_3	Preservative: None	Matrix: Water	Matrix: Soil	Matrix: Air	For Lab Use Only
MW-12	10.19.10	1542			X					X	X			01
MW-9	10.19.10	1655			X					X	X			02
MGMS1-40	10.19.10	~~1655~~ 17:39			X					X	X			03

Analysis Request

MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	circle method: CAM 17 Metals (EPA 200.7 / 6010)	circle method: 5 Waste Oil Metals (Cd,Cr,Ni,Pb,Zn) (EPA 200.7 / 6010)	circle method: Mercury (EPA 245.1 / 7470 / 7471)	circle method: Total Lead (EPA 200.7 / 6010)	W.E.T. Lead (STLC)	Nitrate EPA 300			
																X			
																X			
																X			

TAT: ☐ 12 hr ☐ 24 hr ☐ 48hr ☐ 72hr ☒ wk

Relinquished by:	Date	Time	Received by:
Stephanie Bosz	10.19.10	18:30	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	102010	1014	Eurofins Analytical

Remarks: 48 hr. hold time.

For Lab Use Only: Sample Receipt

Temp °C	Initials	Date	Time	Therm. ID #	Coolant Present
					Yes / No

Distribution: White - Lab; Pink - Originator
Rev: 031308

KIFF Analytical LLC

SAMPLE RECEIPT CHECKLIST

RECEIVER: Initials

SRG#: 75032 Date: 102010

Project ID: IA Confirmation Sampling

Method of Receipt: ☐ Courier ☐ Over-the-counter ☒ Shipper

COC Inspection

Is COC present?	☒ Yes	☐ No		
Custody seals on shipping container?	☐ Intact	☐ Broken	☒ Not present	☐ N/A
Is COC Signed by Relinquisher? ☒ Yes ☐ No	Dated? ☒ Yes	☐ No		
Is sampler name legibly indicated on COC?	☐ Yes	☒ No		
Is analysis or hold requested for all samples	☒ Yes	☐ No		
Is the turnaround time indicated on COC?	☒ Yes	☐ No		
Is COC free of whiteout and uninitialed cross-outs?	☐ Yes	☐ No, Whiteout	☒ No, Cross-outs	

Sample Inspection

Coolant Present: ☒ Yes ☐ No (includes water)

Temperature °C 0.2 Therm. ID# IR-5 Initial EGJ Date/Time 102010 1012 ☐ N/A

Are there custody seals on sample containers?	☐ Intact	☐ Broken	☐ Not present	
Do containers match COC? ☒ Yes ☐ No ☐ No, COC lists absent sample(s)		☐ No, Extra sample(s) present		
Are there samples matrices other than soil, water, air or carbon?	☐ Yes	☒ No		
Are any sample containers broken, leaking or damaged?	☐ Yes	☒ No		
Are preservatives indicated? ☐ Yes, on sample containers	☐ Yes, on COC	☐ Not indicated	☒ N/A	
Are preservatives correct for analyses requested?	☐ Yes	☐ No	☒ N/A	
Are samples within holding time for analyses requested?	☒ Yes	☐ No		
Are the correct sample containers used for the analyses requested?	☒ Yes	☐ No		
Is there sufficient sample to perform testing?	☒ Yes	☐ No		

Does any sample contain product, have strong odor or are otherwise suspected to be hot? ☐ Yes ☒ No

Receipt Details

Matrix WA	Container type Poly	# of containers received 3
Matrix	Container type	# of containers received
Matrix	Container type	# of containers received

Date and Time Sample Put into Temp Storage Date: 102010 Time: 1014

Quicklog

Are the Sample ID's indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If Sample ID's are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Is the Project ID indicated:	☒ On COC	☐ On sample container(s)	☐ On Both	☐ Not indicated
If project ID is listed on both COC and containers, do they all match?	☐ Yes	☐ No	☒ N/A	
Are the sample collection dates indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection dates are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Are the sample collection times indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection times are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	

COMMENTS: Project Name - not sure If "IA" or "JA."

EGJ 102010 1014

O:\old_ed\samprec\Forms\Sample Receipt Checklist rev 051409.doc

KIFF Analytical LLC

Report Number : 74644
Date : 10/14/2010

Laboratory Results

Stephanie Bosze
Ash Creek Assoc.
3015 SW First Avenue
Portland, OR 97201-4707

Subject : 11 Water Samples
Project Name : NuStar Vancouver
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Dear Ms. Bosze,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 74644
Date : 10/14/2010

Subject : 11 Water Samples
Project Name : NuStar Vancouver
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Case Narrative

A version of this report was previously issued on 09/30/2010. This revised version replaces that report.

California Laboratory Services and Exova (West Coast/Bodycoat) provided analytical testing associated with these samples, but these labs are not accredited by the National Environmental Laboratory Accreditation Program (NELAP).

Matrix Spike/Matrix Spike Duplicate results associated with sample CB-3 (35) for the analyte Chloride were affected by the analyte concentration present in the un-spiked sample.

Napthalene results on QC Report: Matrix/Matrix Spike Duplicate page 33 are the result of carry-over from the preceeding sample analysis and are not reflected in the sample data.

Repeat analysis by EPA Method 8260B yielded inconsistent results for sample CB-2 (45). Data reported is associated with the client specified Matrix Spike/Matrix Spike Duplicate.

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-1 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-01

Matrix : Water Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 2.5	2.5	ug/L	09/29/10 03:25
Chloromethane	< 2.5	2.5	ug/L	09/29/10 03:25
Vinyl Chloride	< 2.5	2.5	ug/L	09/29/10 03:25
Bromomethane	< 50	50	ug/L	09/29/10 03:25
Chloroethane	< 2.5	2.5	ug/L	09/29/10 03:25
Trichlorofluoromethane	< 2.5	2.5	ug/L	09/29/10 03:25
1,1-Dichloroethene	< 2.5	2.5	ug/L	09/29/10 03:25
Methylene Chloride	< 5.0	5.0	ug/L	09/29/10 03:25
trans-1,2-Dichloroethene	< 2.5	2.5	ug/L	09/29/10 03:25
1,1-Dichloroethane	**3.2**	2.5	ug/L	09/29/10 03:25
2,2-Dichloropropane	< 2.5	2.5	ug/L	09/29/10 03:25
cis-1,2-Dichloroethene	**46**	2.5	ug/L	09/29/10 03:25
Chloroform	< 2.5	2.5	ug/L	09/29/10 03:25
Bromochloromethane	< 2.5	2.5	ug/L	09/29/10 03:25
1,1,1-Trichloroethane	**6.0**	2.5	ug/L	09/29/10 03:25
1,1-Dichloropropene	< 2.5	2.5	ug/L	09/29/10 03:25
1,2-Dichloroethane	< 2.5	2.5	ug/L	09/29/10 03:25
Carbon Tetrachloride	< 2.5	2.5	ug/L	09/29/10 03:25
Benzene	< 2.5	2.5	ug/L	09/29/10 03:25
Trichloroethene	**170**	2.5	ug/L	09/29/10 03:25
1,2-Dichloropropane	< 2.5	2.5	ug/L	09/29/10 03:25
Bromodichloromethane	< 2.5	2.5	ug/L	09/29/10 03:25
Dibromomethane	< 2.5	2.5	ug/L	09/29/10 03:25
cis-1,3-Dichloropropene	< 2.5	2.5	ug/L	09/29/10 03:25
Toluene	< 2.5	2.5	ug/L	09/29/10 03:25
trans-1,3-Dichloropropene	< 2.5	2.5	ug/L	09/29/10 03:25
1,1,2-Trichloroethane	< 2.5	2.5	ug/L	09/29/10 03:25
1,3-Dichloropropane	< 2.5	2.5	ug/L	09/29/10 03:25
Tetrachloroethene	**650**	2.5	ug/L	09/29/10 03:25
Dibromochloromethane	< 2.5	2.5	ug/L	09/29/10 03:25
1,2-Dibromoethane	< 2.5	2.5	ug/L	09/29/10 03:25
Chlorobenzene	< 2.5	2.5	ug/L	09/29/10 03:25
1,1,1,2-Tetrachloroethane	< 2.5	2.5	ug/L	09/29/10 03:25
Ethylbenzene	< 2.5	2.5	ug/L	09/29/10 03:25

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-1 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-01

Matrix : Water Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 2.5	2.5	ug/L	09/29/10 03:25
O-Xylene	< 2.5	2.5	ug/L	09/29/10 03:25
Styrene	< 2.5	2.5	ug/L	09/29/10 03:25
Isopropyl benzene	< 2.5	2.5	ug/L	09/29/10 03:25
Bromoform	< 2.5	2.5	ug/L	09/29/10 03:25
1,1,2,2-Tetrachloroethane	< 2.5	2.5	ug/L	09/29/10 03:25
1,2,3-Trichloropropane	< 2.5	2.5	ug/L	09/29/10 03:25
n-Propylbenzene	< 2.5	2.5	ug/L	09/29/10 03:25
Bromobenzene	< 2.5	2.5	ug/L	09/29/10 03:25
1,3,5-Trimethylbenzene	< 2.5	2.5	ug/L	09/29/10 03:25
2+4-Chlorotoluene	< 5.0	5.0	ug/L	09/29/10 03:25
tert-Butylbenzene	< 2.5	2.5	ug/L	09/29/10 03:25
1,2,4-Trimethylbenzene	< 2.5	2.5	ug/L	09/29/10 03:25
sec-Butylbenzene	< 2.5	2.5	ug/L	09/29/10 03:25
p-Isopropyltoluene	< 2.5	2.5	ug/L	09/29/10 03:25
1,3-Dichlorobenzene	< 2.5	2.5	ug/L	09/29/10 03:25
1,4-Dichlorobenzene	< 2.5	2.5	ug/L	09/29/10 03:25
n-Butylbenzene	< 2.5	2.5	ug/L	09/29/10 03:25
1,2-Dichlorobenzene	< 2.5	2.5	ug/L	09/29/10 03:25
1,2-Dibromo-3-chloropropane	< 2.5	2.5	ug/L	09/29/10 03:25
1,2,4-Trichlorobenzene	< 2.5	2.5	ug/L	09/29/10 03:25
Hexachlorobutadiene	< 2.5	2.5	ug/L	09/29/10 03:25
Naphthalene	< 2.5	2.5	ug/L	09/29/10 03:25
1,2,3-Trichlorobenzene	< 2.5	2.5	ug/L	09/29/10 03:25
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	09/29/10 03:25
4-Bromofluorobenzene (Surr)	99.7		% Recovery	09/29/10 03:25
Toluene - d8 (Surr)	99.5		% Recovery	09/29/10 03:25

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-1 (45)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-02

Matrix : Water Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 5.0	5.0	ug/L	09/29/10 03:59
Chloromethane	< 5.0	5.0	ug/L	09/29/10 03:59
Vinyl Chloride	**40**	5.0	ug/L	09/29/10 03:59
Bromomethane	< 100	100	ug/L	09/29/10 03:59
Chloroethane	< 5.0	5.0	ug/L	09/29/10 03:59
Trichlorofluoromethane	< 5.0	5.0	ug/L	09/29/10 03:59
1,1-Dichloroethene	**53**	5.0	ug/L	09/29/10 03:59
Methylene Chloride	< 5.0	5.0	ug/L	09/29/10 03:59
trans-1,2-Dichloroethene	**20**	5.0	ug/L	09/29/10 03:59
1,1-Dichloroethane	**260**	5.0	ug/L	09/29/10 03:59
2,2-Dichloropropane	< 5.0	5.0	ug/L	09/29/10 03:59
cis-1,2-Dichloroethene	**1400**	5.0	ug/L	09/29/10 03:59
Chloroform	< 5.0	5.0	ug/L	09/29/10 03:59
Bromochloromethane	< 5.0	5.0	ug/L	09/29/10 03:59
1,1,1-Trichloroethane	**130**	5.0	ug/L	09/29/10 03:59
1,1-Dichloropropene	< 5.0	5.0	ug/L	09/29/10 03:59
1,2-Dichloroethane	< 5.0	5.0	ug/L	09/29/10 03:59
Carbon Tetrachloride	< 5.0	5.0	ug/L	09/29/10 03:59
Benzene	< 5.0	5.0	ug/L	09/29/10 03:59
Trichloroethene	**1700**	5.0	ug/L	09/29/10 03:59
1,2-Dichloropropane	< 5.0	5.0	ug/L	09/29/10 03:59
Bromodichloromethane	< 5.0	5.0	ug/L	09/29/10 03:59
Dibromomethane	< 5.0	5.0	ug/L	09/29/10 03:59
cis-1,3-Dichloropropene	< 5.0	5.0	ug/L	09/29/10 03:59
Toluene	< 5.0	5.0	ug/L	09/29/10 03:59
trans-1,3-Dichloropropene	< 5.0	5.0	ug/L	09/29/10 03:59
1,1,2-Trichloroethane	< 5.0	5.0	ug/L	09/29/10 03:59
1,3-Dichloropropane	< 5.0	5.0	ug/L	09/29/10 03:59
Tetrachloroethene	**1400**	5.0	ug/L	09/29/10 03:59
Dibromochloromethane	< 5.0	5.0	ug/L	09/29/10 03:59
1,2-Dibromoethane	< 5.0	5.0	ug/L	09/29/10 03:59
Chlorobenzene	< 5.0	5.0	ug/L	09/29/10 03:59
1,1,1,2-Tetrachloroethane	< 5.0	5.0	ug/L	09/29/10 03:59
Ethylbenzene	< 5.0	5.0	ug/L	09/29/10 03:59

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-1 (45)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-02

Matrix : Water Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 5.0	5.0	ug/L	09/29/10 03:59
O-Xylene	< 5.0	5.0	ug/L	09/29/10 03:59
Styrene	< 5.0	5.0	ug/L	09/29/10 03:59
Isopropyl benzene	< 5.0	5.0	ug/L	09/29/10 03:59
Bromoform	< 5.0	5.0	ug/L	09/29/10 03:59
1,1,2,2-Tetrachloroethane	< 5.0	5.0	ug/L	09/29/10 03:59
1,2,3-Trichloropropane	< 5.0	5.0	ug/L	09/29/10 03:59
n-Propylbenzene	< 5.0	5.0	ug/L	09/29/10 03:59
Bromobenzene	< 5.0	5.0	ug/L	09/29/10 03:59
1,3,5-Trimethylbenzene	< 5.0	5.0	ug/L	09/29/10 03:59
2+4-Chlorotoluene	< 10	10	ug/L	09/29/10 03:59
tert-Butylbenzene	< 5.0	5.0	ug/L	09/29/10 03:59
1,2,4-Trimethylbenzene	< 5.0	5.0	ug/L	09/29/10 03:59
sec-Butylbenzene	< 5.0	5.0	ug/L	09/29/10 03:59
p-Isopropyltoluene	< 5.0	5.0	ug/L	09/29/10 03:59
1,3-Dichlorobenzene	< 5.0	5.0	ug/L	09/29/10 03:59
1,4-Dichlorobenzene	< 5.0	5.0	ug/L	09/29/10 03:59
n-Butylbenzene	< 5.0	5.0	ug/L	09/29/10 03:59
1,2-Dichlorobenzene	< 5.0	5.0	ug/L	09/29/10 03:59
1,2-Dibromo-3-chloropropane	< 5.0	5.0	ug/L	09/29/10 03:59
1,2,4-Trichlorobenzene	< 5.0	5.0	ug/L	09/29/10 03:59
Hexachlorobutadiene	< 5.0	5.0	ug/L	09/29/10 03:59
Naphthalene	< 5.0	5.0	ug/L	09/29/10 03:59
1,2,3-Trichlorobenzene	< 5.0	5.0	ug/L	09/29/10 03:59
1,2-Dichloroethane-d4 (Surr)	100		% Recovery	09/29/10 03:59
4-Bromofluorobenzene (Surr)	98.2		% Recovery	09/29/10 03:59
Toluene - d8 (Surr)	99.3		% Recovery	09/29/10 03:59

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-2 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-03

Matrix : Water Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.50	0.50	ug/L	09/28/10 22:39
Chloromethane	< 0.50	0.50	ug/L	09/28/10 22:39
Vinyl Chloride	**0.66**	0.50	ug/L	09/28/10 22:39
Bromomethane	< 20	20	ug/L	09/28/10 22:39
Chloroethane	< 0.50	0.50	ug/L	09/28/10 22:39
Trichlorofluoromethane	< 0.50	0.50	ug/L	09/28/10 22:39
1,1-Dichloroethene	< 0.50	0.50	ug/L	09/28/10 22:39
Methylene Chloride	< 5.0	5.0	ug/L	09/28/10 22:39
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	09/28/10 22:39
1,1-Dichloroethane	< 0.50	0.50	ug/L	09/28/10 22:39
2,2-Dichloropropane	< 0.50	0.50	ug/L	09/28/10 22:39
cis-1,2-Dichloroethene	**35**	0.50	ug/L	09/28/10 22:39
Chloroform	< 0.50	0.50	ug/L	09/28/10 22:39
Bromochloromethane	< 0.50	0.50	ug/L	09/28/10 22:39
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	09/28/10 22:39
1,1-Dichloropropene	< 0.50	0.50	ug/L	09/28/10 22:39
1,2-Dichloroethane	< 0.50	0.50	ug/L	09/28/10 22:39
Carbon Tetrachloride	< 0.50	0.50	ug/L	09/28/10 22:39
Benzene	< 0.50	0.50	ug/L	09/28/10 22:39
Trichloroethene	**16**	0.50	ug/L	09/28/10 22:39
1,2-Dichloropropane	< 0.50	0.50	ug/L	09/28/10 22:39
Bromodichloromethane	< 0.50	0.50	ug/L	09/28/10 22:39
Dibromomethane	< 0.50	0.50	ug/L	09/28/10 22:39
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/28/10 22:39
Toluene	< 0.50	0.50	ug/L	09/28/10 22:39
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/28/10 22:39
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	09/28/10 22:39
1,3-Dichloropropane	< 0.50	0.50	ug/L	09/28/10 22:39
Tetrachloroethene	**62**	0.50	ug/L	09/28/10 22:39
Dibromochloromethane	< 0.50	0.50	ug/L	09/28/10 22:39
1,2-Dibromoethane	< 0.50	0.50	ug/L	09/28/10 22:39
Chlorobenzene	< 0.50	0.50	ug/L	09/28/10 22:39
1,1,1,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/28/10 22:39
Ethylbenzene	< 0.50	0.50	ug/L	09/28/10 22:39

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-2 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-03

Matrix : Water Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 1.0	1.0	ug/L	09/28/10 22:39
O-Xylene	< 0.50	0.50	ug/L	09/28/10 22:39
Styrene	< 0.50	0.50	ug/L	09/28/10 22:39
Isopropyl benzene	< 0.50	0.50	ug/L	09/28/10 22:39
Bromoform	< 0.50	0.50	ug/L	09/28/10 22:39
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/28/10 22:39
1,2,3-Trichloropropane	< 0.50	0.50	ug/L	09/28/10 22:39
n-Propylbenzene	< 0.50	0.50	ug/L	09/28/10 22:39
Bromobenzene	< 0.50	0.50	ug/L	09/28/10 22:39
1,3,5-Trimethylbenzene	< 0.50	0.50	ug/L	09/28/10 22:39
2+4-Chlorotoluene	< 1.0	1.0	ug/L	09/28/10 22:39
tert-Butylbenzene	< 0.50	0.50	ug/L	09/28/10 22:39
1,2,4-Trimethylbenzene	< 0.50	0.50	ug/L	09/28/10 22:39
sec-Butylbenzene	< 0.50	0.50	ug/L	09/28/10 22:39
p-Isopropyltoluene	< 0.50	0.50	ug/L	09/28/10 22:39
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	09/28/10 22:39
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	09/28/10 22:39
n-Butylbenzene	< 0.50	0.50	ug/L	09/28/10 22:39
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	09/28/10 22:39
1,2-Dibromo-3-chloropropane	< 0.50	0.50	ug/L	09/28/10 22:39
1,2,4-Trichlorobenzene	< 0.50	0.50	ug/L	09/28/10 22:39
Hexachlorobutadiene	< 0.50	0.50	ug/L	09/28/10 22:39
Naphthalene	< 0.50	0.50	ug/L	09/29/10 10:29
1,2,3-Trichlorobenzene	< 0.50	0.50	ug/L	09/28/10 22:39
1,2-Dichloroethane-d4 (Surr)	97.8		% Recovery	09/28/10 22:39
4-Bromofluorobenzene (Surr)	98.5		% Recovery	09/28/10 22:39
Toluene - d8 (Surr)	98.8		% Recovery	09/28/10 22:39

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-2 (45)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-04

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 5.0	5.0	ug/L	09/29/10 05:11
Chloromethane	< 5.0	5.0	ug/L	09/29/10 05:11
Vinyl Chloride	**39**	5.0	ug/L	09/29/10 05:11
Bromomethane	< 100	100	ug/L	09/29/10 05:11
Chloroethane	< 5.0	5.0	ug/L	09/29/10 05:11
Trichlorofluoromethane	< 5.0	5.0	ug/L	09/29/10 05:11
1,1-Dichloroethene	**23**	5.0	ug/L	09/29/10 05:11
Methylene Chloride	< 5.0	5.0	ug/L	09/29/10 05:11
trans-1,2-Dichloroethene	**8.2**	5.0	ug/L	09/29/10 05:11
1,1-Dichloroethane	**100**	5.0	ug/L	09/29/10 05:11
2,2-Dichloropropane	< 5.0	5.0	ug/L	09/29/10 05:11
cis-1,2-Dichloroethene	**770**	5.0	ug/L	09/29/10 05:11
Chloroform	< 5.0	5.0	ug/L	09/29/10 05:11
Bromochloromethane	< 5.0	5.0	ug/L	09/29/10 05:11
1,1,1-Trichloroethane	**72**	5.0	ug/L	09/29/10 05:11
1,1-Dichloropropene	< 5.0	5.0	ug/L	09/29/10 05:11
1,2-Dichloroethane	< 5.0	5.0	ug/L	09/29/10 05:11
Carbon Tetrachloride	< 5.0	5.0	ug/L	09/29/10 05:11
Benzene	< 5.0	5.0	ug/L	09/29/10 05:11
Trichloroethene	**1000**	5.0	ug/L	09/29/10 05:11
1,2-Dichloropropane	< 5.0	5.0	ug/L	09/29/10 05:11
Bromodichloromethane	< 5.0	5.0	ug/L	09/29/10 05:11
Dibromomethane	< 5.0	5.0	ug/L	09/29/10 05:11
cis-1,3-Dichloropropene	< 5.0	5.0	ug/L	09/29/10 05:11
Toluene	< 5.0	5.0	ug/L	09/29/10 05:11
trans-1,3-Dichloropropene	< 5.0	5.0	ug/L	09/29/10 05:11
1,1,2-Trichloroethane	< 5.0	5.0	ug/L	09/29/10 05:11
1,3-Dichloropropane	< 5.0	5.0	ug/L	09/29/10 05:11
Tetrachloroethene	**500**	5.0	ug/L	09/29/10 05:11
Dibromochloromethane	< 5.0	5.0	ug/L	09/29/10 05:11
1,2-Dibromoethane	< 5.0	5.0	ug/L	09/29/10 05:11
Chlorobenzene	< 5.0	5.0	ug/L	09/29/10 05:11
1,1,1,2-Tetrachloroethane	< 5.0	5.0	ug/L	09/29/10 05:11
Ethylbenzene	< 5.0	5.0	ug/L	09/29/10 05:11

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-2 (45)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-04

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 5.0	5.0	ug/L	09/29/10 05:11
O-Xylene	< 5.0	5.0	ug/L	09/29/10 05:11
Styrene	< 5.0	5.0	ug/L	09/29/10 05:11
Isopropyl benzene	< 5.0	5.0	ug/L	09/29/10 05:11
Bromoform	< 5.0	5.0	ug/L	09/29/10 05:11
1,1,2,2-Tetrachloroethane	< 5.0	5.0	ug/L	09/29/10 05:11
1,2,3-Trichloropropane	< 5.0	5.0	ug/L	09/29/10 05:11
n-Propylbenzene	< 5.0	5.0	ug/L	09/29/10 05:11
Bromobenzene	< 5.0	5.0	ug/L	09/29/10 05:11
1,3,5-Trimethylbenzene	< 5.0	5.0	ug/L	09/29/10 05:11
2+4-Chlorotoluene	< 10	10	ug/L	09/29/10 05:11
tert-Butylbenzene	< 5.0	5.0	ug/L	09/29/10 05:11
1,2,4-Trimethylbenzene	< 5.0	5.0	ug/L	09/29/10 05:11
sec-Butylbenzene	< 5.0	5.0	ug/L	09/29/10 05:11
p-Isopropyltoluene	< 5.0	5.0	ug/L	09/29/10 05:11
1,3-Dichlorobenzene	< 5.0	5.0	ug/L	09/29/10 05:11
1,4-Dichlorobenzene	< 5.0	5.0	ug/L	09/29/10 05:11
n-Butylbenzene	< 5.0	5.0	ug/L	09/29/10 05:11
1,2-Dichlorobenzene	< 5.0	5.0	ug/L	09/29/10 05:11
1,2-Dibromo-3-chloropropane	< 5.0	5.0	ug/L	09/29/10 05:11
1,2,4-Trichlorobenzene	< 5.0	5.0	ug/L	09/29/10 05:11
Hexachlorobutadiene	< 5.0	5.0	ug/L	09/29/10 05:11
Naphthalene	< 5.0	5.0	ug/L	09/29/10 05:11
1,2,3-Trichlorobenzene	< 5.0	5.0	ug/L	09/29/10 05:11
1,2-Dichloroethane-d4 (Surr)	98.8		% Recovery	09/29/10 05:11
4-Bromofluorobenzene (Surr)	99.7		% Recovery	09/29/10 05:11
Toluene - d8 (Surr)	99.1		% Recovery	09/29/10 05:11

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-2 (45) DUP**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-05

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 7.0	7.0	ug/L	09/29/10 05:45
Chloromethane	< 7.0	7.0	ug/L	09/29/10 05:45
Vinyl Chloride	**61**	7.0	ug/L	09/29/10 05:45
Bromomethane	< 150	150	ug/L	09/29/10 05:45
Chloroethane	< 7.0	7.0	ug/L	09/29/10 05:45
Trichlorofluoromethane	< 7.0	7.0	ug/L	09/29/10 05:45
1,1-Dichloroethene	**36**	7.0	ug/L	09/29/10 05:45
Methylene Chloride	< 7.0	7.0	ug/L	09/29/10 05:45
trans-1,2-Dichloroethene	**11**	7.0	ug/L	09/29/10 05:45
1,1-Dichloroethane	**130**	7.0	ug/L	09/29/10 05:45
2,2-Dichloropropane	< 7.0	7.0	ug/L	09/29/10 05:45
cis-1,2-Dichloroethene	**950**	7.0	ug/L	09/29/10 05:45
Chloroform	< 7.0	7.0	ug/L	09/29/10 05:45
Bromochloromethane	< 7.0	7.0	ug/L	09/29/10 05:45
1,1,1-Trichloroethane	**110**	7.0	ug/L	09/29/10 05:45
1,1-Dichloropropene	< 7.0	7.0	ug/L	09/29/10 05:45
1,2-Dichloroethane	< 7.0	7.0	ug/L	09/29/10 05:45
Carbon Tetrachloride	< 7.0	7.0	ug/L	09/29/10 05:45
Benzene	< 7.0	7.0	ug/L	09/29/10 05:45
Trichloroethene	**1800**	7.0	ug/L	09/29/10 05:45
1,2-Dichloropropane	< 7.0	7.0	ug/L	09/29/10 05:45
Bromodichloromethane	< 7.0	7.0	ug/L	09/29/10 05:45
Dibromomethane	< 7.0	7.0	ug/L	09/29/10 05:45
cis-1,3-Dichloropropene	< 7.0	7.0	ug/L	09/29/10 05:45
Toluene	< 7.0	7.0	ug/L	09/29/10 05:45
trans-1,3-Dichloropropene	< 7.0	7.0	ug/L	09/29/10 05:45
1,1,2-Trichloroethane	< 7.0	7.0	ug/L	09/29/10 05:45
1,3-Dichloropropane	< 7.0	7.0	ug/L	09/29/10 05:45
Tetrachloroethene	**1400**	7.0	ug/L	09/29/10 05:45
Dibromochloromethane	< 7.0	7.0	ug/L	09/29/10 05:45
1,2-Dibromoethane	< 7.0	7.0	ug/L	09/29/10 05:45
Chlorobenzene	< 7.0	7.0	ug/L	09/29/10 05:45
1,1,1,2-Tetrachloroethane	< 7.0	7.0	ug/L	09/29/10 05:45
Ethylbenzene	< 7.0	7.0	ug/L	09/29/10 05:45

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-2 (45) DUP**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-05

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 7.0	7.0	ug/L	09/29/10 05:45
O-Xylene	< 7.0	7.0	ug/L	09/29/10 05:45
Styrene	< 7.0	7.0	ug/L	09/29/10 05:45
Isopropyl benzene	< 7.0	7.0	ug/L	09/29/10 05:45
Bromoform	< 7.0	7.0	ug/L	09/29/10 05:45
1,1,2,2-Tetrachloroethane	< 7.0	7.0	ug/L	09/29/10 05:45
1,2,3-Trichloropropane	< 7.0	7.0	ug/L	09/29/10 05:45
n-Propylbenzene	< 7.0	7.0	ug/L	09/29/10 05:45
Bromobenzene	< 7.0	7.0	ug/L	09/29/10 05:45
1,3,5-Trimethylbenzene	< 7.0	7.0	ug/L	09/29/10 05:45
2+4-Chlorotoluene	< 15	15	ug/L	09/29/10 05:45
tert-Butylbenzene	< 7.0	7.0	ug/L	09/29/10 05:45
1,2,4-Trimethylbenzene	< 7.0	7.0	ug/L	09/29/10 05:45
sec-Butylbenzene	< 7.0	7.0	ug/L	09/29/10 05:45
p-Isopropyltoluene	< 7.0	7.0	ug/L	09/29/10 05:45
1,3-Dichlorobenzene	< 7.0	7.0	ug/L	09/29/10 05:45
1,4-Dichlorobenzene	< 7.0	7.0	ug/L	09/29/10 05:45
n-Butylbenzene	< 7.0	7.0	ug/L	09/29/10 05:45
1,2-Dichlorobenzene	< 7.0	7.0	ug/L	09/29/10 05:45
1,2-Dibromo-3-chloropropane	< 7.0	7.0	ug/L	09/29/10 05:45
1,2,4-Trichlorobenzene	< 7.0	7.0	ug/L	09/29/10 05:45
Hexachlorobutadiene	< 7.0	7.0	ug/L	09/29/10 05:45
Naphthalene	< 7.0	7.0	ug/L	09/29/10 05:45
1,2,3-Trichlorobenzene	< 7.0	7.0	ug/L	09/29/10 05:45
1,2-Dichloroethane-d4 (Surr)	97.2		% Recovery	09/29/10 05:45
4-Bromofluorobenzene (Surr)	99.4		% Recovery	09/29/10 05:45
Toluene - d8 (Surr)	99.0		% Recovery	09/29/10 05:45

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-4 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-06

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 4.0	4.0	ug/L	09/29/10 02:48
Chloromethane	< 4.0	4.0	ug/L	09/29/10 02:48
Vinyl Chloride	< 4.0	4.0	ug/L	09/29/10 02:48
Bromomethane	< 70	70	ug/L	09/29/10 02:48
Chloroethane	< 4.0	4.0	ug/L	09/29/10 02:48
Trichlorofluoromethane	< 4.0	4.0	ug/L	09/29/10 02:48
1,1-Dichloroethene	< 4.0	4.0	ug/L	09/29/10 02:48
Methylene Chloride	< 5.0	5.0	ug/L	09/29/10 02:48
trans-1,2-Dichloroethene	**6.4**	4.0	ug/L	09/29/10 02:48
1,1-Dichloroethane	**6.6**	4.0	ug/L	09/29/10 02:48
2,2-Dichloropropane	< 4.0	4.0	ug/L	09/29/10 02:48
cis-1,2-Dichloroethene	**110**	4.0	ug/L	09/29/10 02:48
Chloroform	< 4.0	4.0	ug/L	09/29/10 02:48
Bromochloromethane	< 4.0	4.0	ug/L	09/29/10 02:48
1,1,1-Trichloroethane	**4.4**	4.0	ug/L	09/29/10 02:48
1,1-Dichloropropene	< 4.0	4.0	ug/L	09/29/10 02:48
1,2-Dichloroethane	< 4.0	4.0	ug/L	09/29/10 02:48
Carbon Tetrachloride	< 4.0	4.0	ug/L	09/29/10 02:48
Benzene	< 4.0	4.0	ug/L	09/29/10 02:48
Trichloroethene	**170**	4.0	ug/L	09/29/10 02:48
1,2-Dichloropropane	< 4.0	4.0	ug/L	09/29/10 02:48
Bromodichloromethane	< 4.0	4.0	ug/L	09/29/10 02:48
Dibromomethane	< 4.0	4.0	ug/L	09/29/10 02:48
cis-1,3-Dichloropropene	< 4.0	4.0	ug/L	09/29/10 02:48
Toluene	< 4.0	4.0	ug/L	09/29/10 02:48
trans-1,3-Dichloropropene	< 4.0	4.0	ug/L	09/29/10 02:48
1,1,2-Trichloroethane	< 4.0	4.0	ug/L	09/29/10 02:48
1,3-Dichloropropane	< 4.0	4.0	ug/L	09/29/10 02:48
Tetrachloroethene	**680**	4.0	ug/L	09/29/10 02:48
Dibromochloromethane	< 4.0	4.0	ug/L	09/29/10 02:48
1,2-Dibromoethane	< 4.0	4.0	ug/L	09/29/10 02:48
Chlorobenzene	< 4.0	4.0	ug/L	09/29/10 02:48
1,1,1,2-Tetrachloroethane	< 4.0	4.0	ug/L	09/29/10 02:48
Ethylbenzene	< 4.0	4.0	ug/L	09/29/10 02:48

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-4 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-06

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 4.0	4.0	ug/L	09/29/10 02:48
O-Xylene	< 4.0	4.0	ug/L	09/29/10 02:48
Styrene	< 4.0	4.0	ug/L	09/29/10 02:48
Isopropyl benzene	< 4.0	4.0	ug/L	09/29/10 02:48
Bromoform	< 4.0	4.0	ug/L	09/29/10 02:48
1,1,2,2-Tetrachloroethane	< 4.0	4.0	ug/L	09/29/10 02:48
1,2,3-Trichloropropane	< 4.0	4.0	ug/L	09/29/10 02:48
n-Propylbenzene	< 4.0	4.0	ug/L	09/29/10 02:48
Bromobenzene	< 4.0	4.0	ug/L	09/29/10 02:48
1,3,5-Trimethylbenzene	< 4.0	4.0	ug/L	09/29/10 02:48
2+4-Chlorotoluene	< 7.0	7.0	ug/L	09/29/10 02:48
tert-Butylbenzene	< 4.0	4.0	ug/L	09/29/10 02:48
1,2,4-Trimethylbenzene	< 4.0	4.0	ug/L	09/29/10 02:48
sec-Butylbenzene	< 4.0	4.0	ug/L	09/29/10 02:48
p-Isopropyltoluene	< 4.0	4.0	ug/L	09/29/10 02:48
1,3-Dichlorobenzene	< 4.0	4.0	ug/L	09/29/10 02:48
1,4-Dichlorobenzene	< 4.0	4.0	ug/L	09/29/10 02:48
n-Butylbenzene	< 4.0	4.0	ug/L	09/29/10 02:48
1,2-Dichlorobenzene	< 4.0	4.0	ug/L	09/29/10 02:48
1,2-Dibromo-3-chloropropane	< 4.0	4.0	ug/L	09/29/10 02:48
1,2,4-Trichlorobenzene	< 4.0	4.0	ug/L	09/29/10 02:48
Hexachlorobutadiene	< 4.0	4.0	ug/L	09/29/10 02:48
Naphthalene	< 4.0	4.0	ug/L	09/29/10 02:48
1,2,3-Trichlorobenzene	< 4.0	4.0	ug/L	09/29/10 02:48
1,2-Dichloroethane-d4 (Surr)	96.7		% Recovery	09/29/10 02:48
4-Bromofluorobenzene (Surr)	97.4		% Recovery	09/29/10 02:48
Toluene - d8 (Surr)	98.5		% Recovery	09/29/10 02:48

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-4 (45)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-07

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 15	15	ug/L	09/29/10 04:34
Chloromethane	< 15	15	ug/L	09/29/10 04:34
Vinyl Chloride	**100**	15	ug/L	09/29/10 04:34
Bromomethane	< 250	250	ug/L	09/29/10 04:34
Chloroethane	< 15	15	ug/L	09/29/10 04:34
Trichlorofluoromethane	< 15	15	ug/L	09/29/10 04:34
1,1-Dichloroethene	< 15	15	ug/L	09/29/10 04:34
Methylene Chloride	< 15	15	ug/L	09/29/10 04:34
trans-1,2-Dichloroethene	**22**	15	ug/L	09/29/10 04:34
1,1-Dichloroethane	**41**	15	ug/L	09/29/10 04:34
2,2-Dichloropropane	< 15	15	ug/L	09/29/10 04:34
cis-1,2-Dichloroethene	**1200**	15	ug/L	09/29/10 04:34
Chloroform	< 15	15	ug/L	09/29/10 04:34
Bromochloromethane	< 15	15	ug/L	09/29/10 04:34
1,1,1-Trichloroethane	**62**	15	ug/L	09/29/10 04:34
1,1-Dichloropropene	< 15	15	ug/L	09/29/10 04:34
1,2-Dichloroethane	< 15	15	ug/L	09/29/10 04:34
Carbon Tetrachloride	< 15	15	ug/L	09/29/10 04:34
Benzene	< 15	15	ug/L	09/29/10 04:34
Trichloroethene	**820**	15	ug/L	09/29/10 04:34
1,2-Dichloropropane	< 15	15	ug/L	09/29/10 04:34
Bromodichloromethane	< 15	15	ug/L	09/29/10 04:34
Dibromomethane	< 15	15	ug/L	09/29/10 04:34
cis-1,3-Dichloropropene	< 15	15	ug/L	09/29/10 04:34
Toluene	< 15	15	ug/L	09/29/10 04:34
trans-1,3-Dichloropropene	< 15	15	ug/L	09/29/10 04:34
1,1,2-Trichloroethane	< 15	15	ug/L	09/29/10 04:34
1,3-Dichloropropane	< 15	15	ug/L	09/29/10 04:34
Tetrachloroethene	**3300**	15	ug/L	09/29/10 04:34
Dibromochloromethane	< 15	15	ug/L	09/29/10 04:34
1,2-Dibromoethane	< 15	15	ug/L	09/29/10 04:34
Chlorobenzene	< 15	15	ug/L	09/29/10 04:34
1,1,1,2-Tetrachloroethane	< 15	15	ug/L	09/29/10 04:34
Ethylbenzene	< 15	15	ug/L	09/29/10 04:34

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-4 (45)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-07

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 15	15	ug/L	09/29/10 04:34
O-Xylene	< 15	15	ug/L	09/29/10 04:34
Styrene	< 15	15	ug/L	09/29/10 04:34
Isopropyl benzene	< 15	15	ug/L	09/29/10 04:34
Bromoform	< 15	15	ug/L	09/29/10 04:34
1,1,2,2-Tetrachloroethane	< 15	15	ug/L	09/29/10 04:34
1,2,3-Trichloropropane	< 15	15	ug/L	09/29/10 04:34
n-Propylbenzene	< 15	15	ug/L	09/29/10 04:34
Bromobenzene	< 15	15	ug/L	09/29/10 04:34
1,3,5-Trimethylbenzene	< 15	15	ug/L	09/29/10 04:34
2+4-Chlorotoluene	< 25	25	ug/L	09/29/10 04:34
tert-Butylbenzene	< 15	15	ug/L	09/29/10 04:34
1,2,4-Trimethylbenzene	< 15	15	ug/L	09/29/10 04:34
sec-Butylbenzene	< 15	15	ug/L	09/29/10 04:34
p-Isopropyltoluene	< 15	15	ug/L	09/29/10 04:34
1,3-Dichlorobenzene	< 15	15	ug/L	09/29/10 04:34
1,4-Dichlorobenzene	< 15	15	ug/L	09/29/10 04:34
n-Butylbenzene	< 15	15	ug/L	09/29/10 04:34
1,2-Dichlorobenzene	< 15	15	ug/L	09/29/10 04:34
1,2-Dibromo-3-chloropropane	< 15	15	ug/L	09/29/10 04:34
1,2,4-Trichlorobenzene	< 15	15	ug/L	09/29/10 04:34
Hexachlorobutadiene	< 15	15	ug/L	09/29/10 04:34
Naphthalene	< 15	15	ug/L	09/29/10 04:34
1,2,3-Trichlorobenzene	< 15	15	ug/L	09/29/10 04:34
1,2-Dichloroethane-d4 (Surr)	99.6		% Recovery	09/29/10 04:34
4-Bromofluorobenzene (Surr)	102		% Recovery	09/29/10 04:34
Toluene - d8 (Surr)	99.8		% Recovery	09/29/10 04:34

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **Field Blank**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-08

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.50	0.50	ug/L	09/29/10 01:36
Chloromethane	< 0.50	0.50	ug/L	09/29/10 01:36
Vinyl Chloride	< 0.50	0.50	ug/L	09/29/10 01:36
Bromomethane	< 20	20	ug/L	09/29/10 01:36
Chloroethane	< 0.50	0.50	ug/L	09/29/10 01:36
Trichlorofluoromethane	< 0.50	0.50	ug/L	09/29/10 01:36
1,1-Dichloroethene	< 0.50	0.50	ug/L	09/29/10 01:36
Methylene Chloride	< 5.0	5.0	ug/L	09/29/10 01:36
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	09/29/10 01:36
1,1-Dichloroethane	< 0.50	0.50	ug/L	09/29/10 01:36
2,2-Dichloropropane	< 0.50	0.50	ug/L	09/29/10 01:36
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	09/29/10 01:36
Chloroform	< 0.50	0.50	ug/L	09/29/10 01:36
Bromochloromethane	< 0.50	0.50	ug/L	09/29/10 01:36
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	09/29/10 01:36
1,1-Dichloropropene	< 0.50	0.50	ug/L	09/29/10 01:36
1,2-Dichloroethane	< 0.50	0.50	ug/L	09/29/10 01:36
Carbon Tetrachloride	< 0.50	0.50	ug/L	09/29/10 01:36
Benzene	< 0.50	0.50	ug/L	09/29/10 01:36
Trichloroethene	< 0.50	0.50	ug/L	09/29/10 01:36
1,2-Dichloropropane	< 0.50	0.50	ug/L	09/29/10 01:36
Bromodichloromethane	< 0.50	0.50	ug/L	09/29/10 01:36
Dibromomethane	< 0.50	0.50	ug/L	09/29/10 01:36
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/29/10 01:36
Toluene	< 0.50	0.50	ug/L	09/29/10 01:36
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/29/10 01:36
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	09/29/10 01:36
1,3-Dichloropropane	< 0.50	0.50	ug/L	09/29/10 01:36
Tetrachloroethene	< 0.50	0.50	ug/L	09/29/10 01:36
Dibromochloromethane	< 0.50	0.50	ug/L	09/29/10 01:36
1,2-Dibromoethane	< 0.50	0.50	ug/L	09/29/10 01:36
Chlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:36
1,1,1,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/29/10 01:36
Ethylbenzene	< 0.50	0.50	ug/L	09/29/10 01:36

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **Field Blank**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-08

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 1.0	1.0	ug/L	09/29/10 01:36
O-Xylene	< 0.50	0.50	ug/L	09/29/10 01:36
Styrene	< 0.50	0.50	ug/L	09/29/10 01:36
Isopropyl benzene	< 0.50	0.50	ug/L	09/29/10 01:36
Bromoform	< 0.50	0.50	ug/L	09/29/10 01:36
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/29/10 01:36
1,2,3-Trichloropropane	< 0.50	0.50	ug/L	09/29/10 01:36
n-Propylbenzene	< 0.50	0.50	ug/L	09/29/10 01:36
Bromobenzene	< 0.50	0.50	ug/L	09/29/10 01:36
1,3,5-Trimethylbenzene	< 0.50	0.50	ug/L	09/29/10 01:36
2+4-Chlorotoluene	< 1.0	1.0	ug/L	09/29/10 01:36
tert-Butylbenzene	< 0.50	0.50	ug/L	09/29/10 01:36
1,2,4-Trimethylbenzene	< 0.50	0.50	ug/L	09/29/10 01:36
sec-Butylbenzene	< 0.50	0.50	ug/L	09/29/10 01:36
p-Isopropyltoluene	< 0.50	0.50	ug/L	09/29/10 01:36
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:36
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:36
n-Butylbenzene	< 0.50	0.50	ug/L	09/29/10 01:36
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:36
1,2-Dibromo-3-chloropropane	< 0.50	0.50	ug/L	09/29/10 01:36
1,2,4-Trichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:36
Hexachlorobutadiene	< 0.50	0.50	ug/L	09/29/10 01:36
Naphthalene	< 0.50	0.50	ug/L	09/29/10 01:36
1,2,3-Trichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:36
1,2-Dichloroethane-d4 (Surr)	97.7		% Recovery	09/29/10 01:36
4-Bromofluorobenzene (Surr)	97.7		% Recovery	09/29/10 01:36
Toluene - d8 (Surr)	99.2		% Recovery	09/29/10 01:36

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **Field Blank #2**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-09

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.50	0.50	ug/L	09/23/10 16:17
Chloromethane	< 0.50	0.50	ug/L	09/23/10 16:17
Vinyl Chloride	< 0.50	0.50	ug/L	09/23/10 16:17
Bromomethane	< 20	20	ug/L	09/23/10 16:17
Chloroethane	< 0.50	0.50	ug/L	09/23/10 16:17
Trichlorofluoromethane	< 0.50	0.50	ug/L	09/23/10 16:17
1,1-Dichloroethene	< 0.50	0.50	ug/L	09/23/10 16:17
Methylene Chloride	< 5.0	5.0	ug/L	09/23/10 16:17
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	09/23/10 16:17
1,1-Dichloroethane	< 0.50	0.50	ug/L	09/23/10 16:17
2,2-Dichloropropane	< 0.50	0.50	ug/L	09/23/10 16:17
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	09/23/10 16:17
Chloroform	< 0.50	0.50	ug/L	09/23/10 16:17
Bromochloromethane	< 0.50	0.50	ug/L	09/23/10 16:17
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	09/23/10 16:17
1,1-Dichloropropene	< 0.50	0.50	ug/L	09/23/10 16:17
1,2-Dichloroethane	< 0.50	0.50	ug/L	09/23/10 16:17
Carbon Tetrachloride	< 0.50	0.50	ug/L	09/23/10 16:17
Benzene	< 0.50	0.50	ug/L	09/23/10 16:17
Trichloroethene	< 0.50	0.50	ug/L	09/23/10 16:17
1,2-Dichloropropane	< 0.50	0.50	ug/L	09/23/10 16:17
Bromodichloromethane	< 0.50	0.50	ug/L	09/23/10 16:17
Dibromomethane	< 0.50	0.50	ug/L	09/23/10 16:17
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/23/10 16:17
Toluene	< 0.50	0.50	ug/L	09/23/10 16:17
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/23/10 16:17
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	09/23/10 16:17
1,3-Dichloropropane	< 0.50	0.50	ug/L	09/23/10 16:17
Tetrachloroethene	< 0.50	0.50	ug/L	09/23/10 16:17
Dibromochloromethane	< 0.50	0.50	ug/L	09/23/10 16:17
1,2-Dibromoethane	< 0.50	0.50	ug/L	09/23/10 16:17
Chlorobenzene	< 0.50	0.50	ug/L	09/23/10 16:17
1,1,1,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/23/10 16:17
Ethylbenzene	< 0.50	0.50	ug/L	09/23/10 16:17

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **Field Blank #2**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-09

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 1.0	1.0	ug/L	09/23/10 16:17
O-Xylene	< 0.50	0.50	ug/L	09/23/10 16:17
Styrene	< 0.50	0.50	ug/L	09/23/10 16:17
Isopropyl benzene	< 0.50	0.50	ug/L	09/23/10 16:17
Bromoform	< 0.50	0.50	ug/L	09/23/10 16:17
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/29/10 02:14
1,2,3-Trichloropropane	< 0.50	0.50	ug/L	09/23/10 16:17
n-Propylbenzene	< 0.50	0.50	ug/L	09/23/10 16:17
Bromobenzene	< 0.50	0.50	ug/L	09/23/10 16:17
1,3,5-Trimethylbenzene	< 0.50	0.50	ug/L	09/23/10 16:17
2+4-Chlorotoluene	< 1.0	1.0	ug/L	09/23/10 16:17
tert-Butylbenzene	< 0.50	0.50	ug/L	09/23/10 16:17
1,2,4-Trimethylbenzene	< 0.50	0.50	ug/L	09/23/10 16:17
sec-Butylbenzene	< 0.50	0.50	ug/L	09/23/10 16:17
p-Isopropyltoluene	< 0.50	0.50	ug/L	09/23/10 16:17
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	09/23/10 16:17
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	09/23/10 16:17
n-Butylbenzene	< 0.50	0.50	ug/L	09/23/10 16:17
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	09/23/10 16:17
1,2-Dibromo-3-chloropropane	< 0.50	0.50	ug/L	09/23/10 16:17
1,2,4-Trichlorobenzene	< 0.50	0.50	ug/L	09/23/10 16:17
Hexachlorobutadiene	< 0.50	0.50	ug/L	09/23/10 16:17
Naphthalene	< 0.50	0.50	ug/L	09/23/10 16:17
1,2,3-Trichlorobenzene	< 0.50	0.50	ug/L	09/23/10 16:17
1,2-Dichloroethane-d4 (Surr)	99.9		% Recovery	09/23/10 16:17
4-Bromofluorobenzene (Surr)	98.1		% Recovery	09/23/10 16:17
Toluene - d8 (Surr)	98.8		% Recovery	09/23/10 16:17

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-3 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-10

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 4.0	4.0	ug/L	09/29/10 01:37
Chloromethane	< 4.0	4.0	ug/L	09/29/10 01:37
Vinyl Chloride	< 4.0	4.0	ug/L	09/29/10 01:37
Bromomethane	< 70	70	ug/L	09/29/10 01:37
Chloroethane	< 4.0	4.0	ug/L	09/29/10 01:37
Trichlorofluoromethane	< 4.0	4.0	ug/L	09/29/10 01:37
1,1-Dichloroethene	< 4.0	4.0	ug/L	09/29/10 01:37
Methylene Chloride	< 5.0	5.0	ug/L	09/29/10 01:37
trans-1,2-Dichloroethene	< 4.0	4.0	ug/L	09/29/10 01:37
1,1-Dichloroethane	**9.0**	4.0	ug/L	09/29/10 01:37
2,2-Dichloropropane	< 4.0	4.0	ug/L	09/29/10 01:37
cis-1,2-Dichloroethene	**220**	4.0	ug/L	09/29/10 01:37
Chloroform	< 4.0	4.0	ug/L	09/29/10 01:37
Bromochloromethane	< 4.0	4.0	ug/L	09/29/10 01:37
1,1,1-Trichloroethane	**8.8**	4.0	ug/L	09/29/10 01:37
1,1-Dichloropropene	< 4.0	4.0	ug/L	09/29/10 01:37
1,2-Dichloroethane	< 4.0	4.0	ug/L	09/29/10 01:37
Carbon Tetrachloride	< 4.0	4.0	ug/L	09/29/10 01:37
Benzene	< 4.0	4.0	ug/L	09/29/10 01:37
Trichloroethene	**240**	4.0	ug/L	09/29/10 01:37
1,2-Dichloropropane	< 4.0	4.0	ug/L	09/29/10 01:37
Bromodichloromethane	< 4.0	4.0	ug/L	09/29/10 01:37
Dibromomethane	< 4.0	4.0	ug/L	09/29/10 01:37
cis-1,3-Dichloropropene	< 4.0	4.0	ug/L	09/29/10 01:37
Toluene	< 4.0	4.0	ug/L	09/29/10 01:37
trans-1,3-Dichloropropene	< 4.0	4.0	ug/L	09/29/10 01:37
1,1,2-Trichloroethane	< 4.0	4.0	ug/L	09/29/10 01:37
1,3-Dichloropropane	< 4.0	4.0	ug/L	09/29/10 01:37
Tetrachloroethene	**940**	4.0	ug/L	09/29/10 01:37
Dibromochloromethane	< 4.0	4.0	ug/L	09/29/10 01:37
1,2-Dibromoethane	< 4.0	4.0	ug/L	09/29/10 01:37
Chlorobenzene	< 4.0	4.0	ug/L	09/29/10 01:37
1,1,1,2-Tetrachloroethane	< 4.0	4.0	ug/L	09/29/10 01:37
Ethylbenzene	< 4.0	4.0	ug/L	09/29/10 01:37

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **CB-3 (35)**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-10

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 4.0	4.0	ug/L	09/29/10 01:37
O-Xylene	< 4.0	4.0	ug/L	09/29/10 01:37
Styrene	< 4.0	4.0	ug/L	09/29/10 01:37
Isopropyl benzene	< 4.0	4.0	ug/L	09/29/10 01:37
Bromoform	< 4.0	4.0	ug/L	09/29/10 01:37
1,1,2,2-Tetrachloroethane	< 4.0	4.0	ug/L	09/29/10 01:37
1,2,3-Trichloropropane	< 4.0	4.0	ug/L	09/29/10 01:37
n-Propylbenzene	< 4.0	4.0	ug/L	09/29/10 01:37
Bromobenzene	< 4.0	4.0	ug/L	09/29/10 01:37
1,3,5-Trimethylbenzene	< 4.0	4.0	ug/L	09/29/10 01:37
2+4-Chlorotoluene	< 7.0	7.0	ug/L	09/29/10 01:37
tert-Butylbenzene	< 4.0	4.0	ug/L	09/29/10 01:37
1,2,4-Trimethylbenzene	< 4.0	4.0	ug/L	09/29/10 01:37
sec-Butylbenzene	< 4.0	4.0	ug/L	09/29/10 01:37
p-Isopropyltoluene	< 4.0	4.0	ug/L	09/29/10 01:37
1,3-Dichlorobenzene	< 4.0	4.0	ug/L	09/29/10 01:37
1,4-Dichlorobenzene	< 4.0	4.0	ug/L	09/29/10 01:37
n-Butylbenzene	< 4.0	4.0	ug/L	09/29/10 01:37
1,2-Dichlorobenzene	< 4.0	4.0	ug/L	09/29/10 01:37
1,2-Dibromo-3-chloropropane	< 4.0	4.0	ug/L	09/29/10 01:37
1,2,4-Trichlorobenzene	< 4.0	4.0	ug/L	09/29/10 01:37
Hexachlorobutadiene	< 4.0	4.0	ug/L	09/29/10 01:37
Naphthalene	< 4.0	4.0	ug/L	09/29/10 01:37
1,2,3-Trichlorobenzene	< 4.0	4.0	ug/L	09/29/10 01:37
1,2-Dichloroethane-d4 (Surr)	105		% Recovery	09/29/10 01:37
4-Bromofluorobenzene (Surr)	99.1		% Recovery	09/29/10 01:37
Toluene - d8 (Surr)	100		% Recovery	09/29/10 01:37

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **TRIP BLANK**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-11

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.50	0.50	ug/L	09/29/10 01:03
Chloromethane	< 0.50	0.50	ug/L	09/29/10 01:03
Vinyl Chloride	< 0.50	0.50	ug/L	09/29/10 01:03
Bromomethane	< 20	20	ug/L	09/29/10 01:03
Chloroethane	< 0.50	0.50	ug/L	09/29/10 01:03
Trichlorofluoromethane	< 0.50	0.50	ug/L	09/29/10 01:03
1,1-Dichloroethene	< 0.50	0.50	ug/L	09/29/10 01:03
Methylene Chloride	< 5.0	5.0	ug/L	09/29/10 01:03
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	09/29/10 01:03
1,1-Dichloroethane	< 0.50	0.50	ug/L	09/29/10 01:03
2,2-Dichloropropane	< 0.50	0.50	ug/L	09/29/10 01:03
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	09/29/10 01:03
Chloroform	< 0.50	0.50	ug/L	09/29/10 01:03
Bromochloromethane	< 0.50	0.50	ug/L	09/29/10 01:03
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	09/29/10 01:03
1,1-Dichloropropene	< 0.50	0.50	ug/L	09/29/10 01:03
1,2-Dichloroethane	< 0.50	0.50	ug/L	09/29/10 01:03
Carbon Tetrachloride	< 0.50	0.50	ug/L	09/29/10 01:03
Benzene	< 0.50	0.50	ug/L	09/29/10 01:03
Trichloroethene	< 0.50	0.50	ug/L	09/29/10 01:03
1,2-Dichloropropane	< 0.50	0.50	ug/L	09/29/10 01:03
Bromodichloromethane	< 0.50	0.50	ug/L	09/29/10 01:03
Dibromomethane	< 0.50	0.50	ug/L	09/29/10 01:03
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/29/10 01:03
Toluene	< 0.50	0.50	ug/L	09/29/10 01:03
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	09/29/10 01:03
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	09/29/10 01:03
1,3-Dichloropropane	< 0.50	0.50	ug/L	09/29/10 01:03
Tetrachloroethene	< 0.50	0.50	ug/L	09/29/10 01:03
Dibromochloromethane	< 0.50	0.50	ug/L	09/29/10 01:03
1,2-Dibromoethane	< 0.50	0.50	ug/L	09/29/10 01:03
Chlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:03
1,1,1,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/29/10 01:03
Ethylbenzene	< 0.50	0.50	ug/L	09/29/10 01:03

KIFF Analytical LLC

Report Number : 74644

Date : 10/14/2010

Sample : **TRIP BLANK**

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028** Lab Number : 74644-11

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 1.0	1.0	ug/L	09/29/10 01:03
O-Xylene	< 0.50	0.50	ug/L	09/29/10 01:03
Styrene	< 0.50	0.50	ug/L	09/29/10 01:03
Isopropyl benzene	< 0.50	0.50	ug/L	09/29/10 01:03
Bromoform	< 0.50	0.50	ug/L	09/29/10 01:03
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	09/29/10 01:03
1,2,3-Trichloropropane	< 0.50	0.50	ug/L	09/29/10 01:03
n-Propylbenzene	< 0.50	0.50	ug/L	09/29/10 01:03
Bromobenzene	< 0.50	0.50	ug/L	09/29/10 01:03
1,3,5-Trimethylbenzene	< 0.50	0.50	ug/L	09/29/10 01:03
2+4-Chlorotoluene	< 1.0	1.0	ug/L	09/29/10 01:03
tert-Butylbenzene	< 0.50	0.50	ug/L	09/29/10 01:03
1,2,4-Trimethylbenzene	< 0.50	0.50	ug/L	09/29/10 01:03
sec-Butylbenzene	< 0.50	0.50	ug/L	09/29/10 01:03
p-Isopropyltoluene	< 0.50	0.50	ug/L	09/29/10 01:03
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:03
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:03
n-Butylbenzene	< 0.50	0.50	ug/L	09/29/10 01:03
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:03
1,2-Dibromo-3-chloropropane	< 0.50	0.50	ug/L	09/29/10 01:03
1,2,4-Trichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:03
Hexachlorobutadiene	< 0.50	0.50	ug/L	09/29/10 01:03
Naphthalene	< 0.50	0.50	ug/L	09/29/10 01:03
1,2,3-Trichlorobenzene	< 0.50	0.50	ug/L	09/29/10 01:03
1,2-Dichloroethane-d4 (Surr)	102		% Recovery	09/29/10 01:03
4-Bromofluorobenzene (Surr)	98.8		% Recovery	09/29/10 01:03
Toluene - d8 (Surr)	100		% Recovery	09/29/10 01:03

KIFF Analytical LLC

Report Number : 74644
Date : 10/14/2010

Project Name : **NuStar Vancouver**
Project Number : **E3WR-0028**

Sample : **CB-3 (35)** Matrix : Water Lab Number : 74644-10
Sample Date :09/21/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date/Time Analyzed
Chloride	**8.6**	1.0	mg/L	EPA 300.0	09/22/10 20:20
Nitrate as NO3	**580**	44	mg/L	EPA 300.0	09/23/10 09:27
Nitrite as NO2	**2.0**	0.50	mg/L	EPA 300.0	09/22/10 20:20
Sulfate	**80**	1.0	mg/L	EPA 300.0	09/24/10 12:02
Iron	**320**	0.10	mg/L	EPA 6010B	09/29/10 11:09
Manganese	**5.8**	0.0050	mg/L	EPA 6010B	09/29/10 11:09
Potassium	**61**	0.50	mg/L	EPA 6010B	09/29/10 11:09

Report Number : 74644

Date : 10/14/2010

QC Report : Method Blank Data

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Iron	< 0.10	0.10	mg/L	EPA 6010B	09/29/2010
Manganese	< 0.0050	0.0050	mg/L	EPA 6010B	09/29/2010
Potassium	< 0.50	0.50	mg/L	EPA 6010B	09/29/2010
Dichlorodifluoromethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Chloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Vinyl Chloride	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Bromomethane	< 20	20	ug/L	EPA 8260B	09/28/2010
Chloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Trichlorofluoromethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,1-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Methylene Chloride	< 5.0	5.0	ug/L	EPA 8260B	09/28/2010
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,1-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
2,2-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Chloroform	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Bromochloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,1-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Carbon Tetrachloride	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Benzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Bromodichloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Dibromomethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Toluene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,3-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Dibromochloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Chlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,1,1,2-Tetrachloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
P,M-Xylene	< 1.0	1.0	ug/L	EPA 8260B	09/28/2010
O-Xylene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Styrene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Isopropyl benzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Bromoform	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2,3-Trichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
n-Propylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Bromobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,3,5-Trimethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
2+4-Chlorotoluene	< 1.0	1.0	ug/L	EPA 8260B	09/28/2010
tert-Butylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2,4-Trimethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
sec-Butylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
p-Isopropyltoluene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
n-Butylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2-Dibromo-3-chloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2,4-Trichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Hexachlorobutadiene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
Naphthalene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2,3-Trichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/28/2010
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	09/28/2010
4-Bromofluorobenzene (Surr)	100		%	EPA 8260B	09/28/2010
Toluene - d8 (Surr)	99.3		%	EPA 8260B	09/28/2010

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 74644

Date : 10/14/2010

QC Report : Method Blank Data

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Dichlorodifluoromethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Chloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Vinyl Chloride	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Bromomethane	< 20	20	ug/L	EPA 8260B	09/23/2010
Chloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Trichlorofluoromethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,1-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Methylene Chloride	< 5.0	5.0	ug/L	EPA 8260B	09/23/2010
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,1-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
2,2-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Chloroform	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Bromochloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,1-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Carbon Tetrachloride	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Benzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Bromodichloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Dibromomethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Toluene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,3-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Dibromochloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Chlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,1,1,2-Tetrachloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
P,M-Xylene	< 1.0	1.0	ug/L	EPA 8260B	09/23/2010
O-Xylene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Styrene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Isopropyl benzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Bromoform	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2,3-Trichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
n-Propylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Bromobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,3,5-Trimethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
2+4-Chlorotoluene	< 1.0	1.0	ug/L	EPA 8260B	09/23/2010
tert-Butylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2,4-Trimethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
sec-Butylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
p-Isopropyltoluene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
n-Butylbenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2-Dibromo-3-chloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2,4-Trichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Hexachlorobutadiene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
Naphthalene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2,3-Trichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/23/2010
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	09/23/2010
4-Bromofluorobenzene (Surr)	102		%	EPA 8260B	09/23/2010
Toluene - d8 (Surr)	95.9		%	EPA 8260B	09/23/2010

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 74644

Date : 10/14/2010

QC Report : Method Blank Data

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Chloride	< 0.50	0.50	mg/L	EPA 300.0	09/23/2010
Nitrite as NO2	< 0.50	0.50	mg/L	EPA 300.0	09/23/2010
Nitrate as NO3	< 0.50	0.50	mg/L	EPA 300.0	09/23/2010
Sulfate	< 0.50	0.50	mg/L	EPA 300.0	09/24/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Iron														
	74669-02	0.53	0.400	0.400	0.951	0.927	mg/L	EPA 6010B	9/29/10	104	98.5	2.54	75-125	20
Manganese														
	74669-02	0.55	0.400	0.400	0.943	0.926	mg/L	EPA 6010B	9/29/10	97.8	93.4	1.87	75-125	20
Potassium														
	74669-02	1.3	4.00	4.00	5.42	5.37	mg/L	EPA 6010B	9/29/10	103	102	1.02	75-125	20
1,1,1,2-Tetrachloroethane														
	74644-03	<0.50	39.4	39.9	42.5	42.3	ug/L	EPA 8260B	9/28/10	108	106	1.80	70.0-130	25
1,1,1-Trichloroethane														
	74644-03	<0.50	39.4	39.9	41.3	41.7	ug/L	EPA 8260B	9/28/10	105	104	0.387	70.0-130	25
1,1,2,2-Tetrachloroethane														
	74644-03	<0.50	39.4	39.9	40.8	41.4	ug/L	EPA 8260B	9/28/10	104	104	0.0850	80-121	25
1,1,2-Trichloroethane														
	74644-03	<0.50	39.4	39.9	39.1	40.2	ug/L	EPA 8260B	9/28/10	99.4	101	1.26	70.0-130	25
1,1-Dichloroethane														
	74644-03	<0.50	39.4	39.9	39.9	40.5	ug/L	EPA 8260B	9/28/10	101	101	0.193	76.5-120	25
1,1-Dichloroethene														
	74644-03	<0.50	39.4	39.9	41.8	42.2	ug/L	EPA 8260B	9/28/10	106	106	0.296	69.6-124	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,1-Dichloropropene														
	74644-03	<0.50	39.4	39.9	39.6	40.1	ug/L	EPA 8260B	9/28/10	101	100	0.0635	70.0-130	25
1,2,3-Trichlorobenzene														
	74644-03	<0.50	39.4	39.9	38.6	39.2	ug/L	EPA 8260B	9/28/10	98.1	98.3	0.206	70.0-130	25
1,2,3-Trichloropropane														
	74644-03	<0.50	39.4	39.9	38.1	40.1	ug/L	EPA 8260B	9/28/10	96.9	100	3.51	70.0-130	25
1,2,4-Trichlorobenzene														
	74644-03	<0.50	39.4	39.9	38.9	39.1	ug/L	EPA 8260B	9/28/10	98.8	98.1	0.741	70.0-130	25
1,2,4-Trimethylbenzene														
	74644-03	<0.50	39.4	39.9	41.8	41.5	ug/L	EPA 8260B	9/28/10	106	104	2.17	70.0-130	25
1,2-Dibromoethane														
	74644-03	<0.50	39.4	39.9	35.5	37.1	ug/L	EPA 8260B	9/28/10	90.2	92.9	2.89	80-120	25
1,2-Dichlorobenzene														
	74644-03	<0.50	39.4	39.9	38.2	38.8	ug/L	EPA 8260B	9/28/10	97.0	97.2	0.232	80-120	25
1,2-Dichloroethane														
	74644-03	<0.50	39.4	39.9	38.6	39.1	ug/L	EPA 8260B	9/28/10	98.0	97.9	0.0252	75.7-122	25
1,2-Dichloropropane														
	74644-03	<0.50	39.4	39.9	39.8	39.9	ug/L	EPA 8260B	9/28/10	101	99.9	1.12	80-120	25
1,2-dibromo-3-chloropropane														
	74644-03	<0.50	39.4	39.9	39.8	41.5	ug/L	EPA 8260B	9/28/10	101	104	2.85	70.0-130	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,3,5-Trimethylbenzene														
	74644-03	<0.50	39.4	39.9	41.9	41.5	ug/L	EPA 8260B	9/28/10	106	104	2.26	70.0-130	25
1,3-Dichlorobenzene														
	74644-03	<0.50	39.4	39.9	41.2	40.9	ug/L	EPA 8260B	9/28/10	105	102	2.14	79.3-120	25
1,3-Dichloropropane														
	74644-03	<0.50	39.4	39.9	38.6	39.2	ug/L	EPA 8260B	9/28/10	98.1	98.3	0.201	70.0-130	25
1,4-Dichlorobenzene														
	74644-03	<0.50	39.4	39.9	37.9	38.6	ug/L	EPA 8260B	9/28/10	96.4	96.6	0.204	80-120	25
2+4-Chlorotoluene														
	74644-03	<1.0	78.7	79.8	81.2	81.1	ug/L	EPA 8260B	9/28/10	103	102	1.52	70.0-130	25
2,2-Dichloropropane														
	74644-03	<0.50	39.4	39.9	38.7	39.0	ug/L	EPA 8260B	9/28/10	98.2	97.7	0.495	65.6-145	25
Benzene														
	74644-03	<0.50	39.4	39.9	39.6	39.9	ug/L	EPA 8260B	9/28/10	100	100	0.570	80-120	25
Bromobenzene														
	74644-03	<0.50	39.4	39.9	39.8	39.4	ug/L	EPA 8260B	9/28/10	101	98.6	2.40	70.0-130	25
Bromochloromethane														
	74644-03	<0.50	39.4	39.9	39.2	39.5	ug/L	EPA 8260B	9/28/10	99.6	98.9	0.739	70.0-130	25
Bromodichloromethane														
	74644-03	<0.50	39.4	39.9	40.2	40.9	ug/L	EPA 8260B	9/28/10	102	102	0.537	70.0-130	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Bromoform														
	74644-03	<0.50	39.4	39.9	44.0	45.0	ug/L	EPA 8260B	9/28/10	112	113	0.867	73.0-142	25
Bromomethane														
	74644-03	<20	197	200	220	226	ug/L	EPA 8260B	9/28/10	112	113	1.07	33.5-140	25
Carbon Tetrachloride														
	74644-03	<0.50	39.4	39.9	41.8	42.7	ug/L	EPA 8260B	9/28/10	106	107	0.585	70.0-130	25
Chlorobenzene														
	74644-03	<0.50	39.4	39.9	40.0	39.8	ug/L	EPA 8260B	9/28/10	102	99.6	1.90	80-120	25
Chloroethane														
	74644-03	<0.50	39.4	39.9	38.3	37.7	ug/L	EPA 8260B	9/28/10	97.2	94.4	2.96	70.0-130	25
Chloroform														
	74644-03	<0.50	39.4	39.9	39.5	39.8	ug/L	EPA 8260B	9/28/10	100	99.7	0.629	80.0-120	25
Chloromethane														
	74644-03	<0.50	39.4	39.9	42.8	42.4	ug/L	EPA 8260B	9/28/10	109	106	2.27	45.9-142	25
Dibromochloromethane														
	74644-03	<0.50	39.4	39.9	40.8	42.7	ug/L	EPA 8260B	9/28/10	104	107	3.18	70.0-130	25
Dibromomethane														
	74644-03	<0.50	39.4	39.9	40.7	41.5	ug/L	EPA 8260B	9/28/10	103	104	0.437	70.0-130	25
Dichlorodifluoromethane														
	74644-03	<0.50	39.4	39.9	39.3	39.2	ug/L	EPA 8260B	9/28/10	99.8	98.3	1.58	47.4-151	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Ethylbenzene														
	74644-03	<0.50	39.4	39.9	41.0	41.0	ug/L	EPA 8260B	9/28/10	104	103	1.36	80-120	25
Hexachlorobutadiene														
	74644-03	<0.50	39.4	39.9	40.4	41.0	ug/L	EPA 8260B	9/28/10	102	103	0.322	70.0-130	25
Isopropyl benzene														
	74644-03	<0.50	39.4	39.9	40.8	40.9	ug/L	EPA 8260B	9/28/10	104	102	1.16	70.0-130	25
Methylene Chloride														
	74644-03	<5.0	39.4	39.9	40.0	40.5	ug/L	EPA 8260B	9/28/10	102	101	0.202	70.0-130	25
Naphthalene														
	74644-03	0.64	39.4	39.9	39.3	40.8	ug/L	EPA 8260B	9/28/10	98.2	101	2.60	70.0-130	25
O-Xylene														
	74644-03	<0.50	39.4	39.9	40.9	41.1	ug/L	EPA 8260B	9/28/10	104	103	0.904	79.7-120	25
P + M Xylene														
	74644-03	<1.0	39.4	39.9	41.2	41.1	ug/L	EPA 8260B	9/28/10	105	103	1.74	76.8-120	25
Styrene														
	74644-03	<0.50	39.4	39.9	43.1	43.3	ug/L	EPA 8260B	9/28/10	110	108	1.02	70.0-130	25
Tetrachloroethene														
	74644-03	62	39.4	39.9	97.0	97.2	ug/L	EPA 8260B	9/28/10	89.4	88.7	0.770	77.0-120	25
Toluene														
	74644-03	<0.50	39.4	39.9	39.8	40.1	ug/L	EPA 8260B	9/28/10	101	100	0.487	80-120	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Trichloroethene														
	74644-03	16	39.4	39.9	55.0	55.5	ug/L	EPA 8260B	9/28/10	98.6	98.4	0.276	80-120	25
Trichlorofluoromethane														
	74644-03	<0.50	39.4	39.9	38.5	39.0	ug/L	EPA 8260B	9/28/10	97.9	97.6	0.299	70.0-130	25
Vinyl Chloride														
	74644-03	0.66	39.4	39.9	38.8	40.2	ug/L	EPA 8260B	9/28/10	96.8	98.9	2.21	42.1-138	25
c-1,3-Dichloropropene														
	74644-03	<5.0	39.4	39.9	39.2	39.6	ug/L	EPA 8260B	9/28/10	99.5	99.1	0.384	70.0-130	25
cis-1,2-Dichloroethene														
	74644-03	35	39.4	39.9	72.9	73.1	ug/L	EPA 8260B	9/28/10	95.6	94.7	0.865	70.0-130	25
n-butylbenzene														
	74644-03	<0.50	39.4	39.9	40.6	41.1	ug/L	EPA 8260B	9/28/10	103	103	0.0956	70.0-130	25
n-propylbenzene														
	74644-03	<0.50	39.4	39.9	42.3	42.0	ug/L	EPA 8260B	9/28/10	108	105	2.07	70.0-130	25
p-isopropyltoluene														
	74644-03	<0.50	39.4	39.9	42.4	41.9	ug/L	EPA 8260B	9/28/10	108	105	2.54	70.0-130	25
sec-butylbenzene														
	74644-03	<0.50	39.4	39.9	41.7	41.4	ug/L	EPA 8260B	9/28/10	106	104	2.23	70.0-130	25
t-1,2-Dichloroethene														
	74644-03	<5.0	39.4	39.9	40.8	41.3	ug/L	EPA 8260B	9/28/10	104	103	0.154	70.0-130	25

Report Number : 74644

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
t-1,3-Dichloropropene														
	74644-03	<5.0	39.4	39.9	39.2	40.2	ug/L	EPA 8260B	9/28/10	99.6	101	1.15	70.0-130	25
tert-butylbenzene														
	74644-03	<0.50	39.4	39.9	41.2	40.8	ug/L	EPA 8260B	9/28/10	105	102	2.22	70.0-130	25
Chloride														
	74567-01	46	2.50	2.50	48.7	48.1	mg/L	EPA 300.0	9/22/10	90.7	**65.6**	1.30	85.0-115	10
Nitrite as NO2														
	74567-01	< 0.50	1.64	1.64	1.52	1.45	mg/L	EPA 300.0	9/22/10	92.6	88.3	4.76	85.0-115	10
Nitrate as NO3														
	74567-01	< 0.50	2.21	2.21	2.06	2.06	mg/L	EPA 300.0	9/22/10	93.0	93.0	0.0922	85.0-115	10
Sulfate														
	74663-04	20	2.50	2.50	22.2	22.3	mg/L	EPA 300.0	9/24/10	96.5	100	0.447	85.0-115	10
1,1,1,2-Tetrachloroethane														
	74640-15	<0.50	40.0	40.0	41.2	40.4	ug/L	EPA 8260B	9/23/10	103	101	2.00	70.0-130	25
1,1,1-Trichloroethane														
	74640-15	<0.50	40.0	40.0	39.3	38.8	ug/L	EPA 8260B	9/23/10	98.3	96.9	1.46	70.0-130	25
1,1,2-Trichloroethane														
	74640-15	<0.50	40.0	40.0	39.0	38.4	ug/L	EPA 8260B	9/23/10	97.4	96.1	1.39	70.0-130	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,1-Dichloroethane														
	74640-15	<0.50	40.0	40.0	41.7	41.2	ug/L	EPA 8260B	9/23/10	104	103	1.32	76.5-120	25
1,1-Dichloroethene														
	74640-15	<0.50	40.0	40.0	45.1	44.0	ug/L	EPA 8260B	9/23/10	113	110	2.40	69.6-124	25
1,1-Dichloropropene														
	74640-15	<0.50	40.0	40.0	39.0	37.9	ug/L	EPA 8260B	9/23/10	97.6	94.8	2.86	70.0-130	25
1,2,3-Trichlorobenzene														
	74640-15	<0.50	40.0	40.0	38.0	37.0	ug/L	EPA 8260B	9/23/10	95.1	92.4	2.86	70.0-130	25
1,2,3-Trichloropropane														
	74640-15	<0.50	40.0	40.0	40.4	39.6	ug/L	EPA 8260B	9/23/10	101	98.9	2.13	70.0-130	25
1,2,4-Trichlorobenzene														
	74640-15	<0.50	40.0	40.0	38.2	37.9	ug/L	EPA 8260B	9/23/10	95.5	94.7	0.821	70.0-130	25
1,2,4-Trimethylbenzene														
	74640-15	<0.50	40.0	40.0	42.1	40.3	ug/L	EPA 8260B	9/23/10	105	101	4.37	70.0-130	25
1,2-Dibromoethane														
	74640-15	<0.50	40.0	40.0	34.4	34.2	ug/L	EPA 8260B	9/23/10	86.0	85.6	0.502	80-120	25
1,2-Dichlorobenzene														
	74640-15	<0.50	40.0	40.0	38.7	38.6	ug/L	EPA 8260B	9/23/10	96.7	96.6	0.0836	80-120	25
1,2-Dichloroethane														
	74640-15	<0.50	40.0	40.0	37.1	36.2	ug/L	EPA 8260B	9/23/10	92.8	90.5	2.46	75.7-122	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2-Dichloropropane														
	74640-15	<0.50	40.0	40.0	38.1	37.8	ug/L	EPA 8260B	9/23/10	95.3	94.5	0.805	80-120	25
1,2-dibromo-3-chloropropane														
	74640-15	<0.50	40.0	40.0	41.0	42.2	ug/L	EPA 8260B	9/23/10	103	105	2.66	70.0-130	25
1,3,5-Trimethylbenzene														
	74640-15	<0.50	40.0	40.0	41.7	40.0	ug/L	EPA 8260B	9/23/10	104	100	3.97	70.0-130	25
1,3-Dichlorobenzene														
	74640-15	<0.50	40.0	40.0	40.4	38.9	ug/L	EPA 8260B	9/23/10	101	97.2	3.78	79.3-120	25
1,3-Dichloropropane														
	74640-15	<0.50	40.0	40.0	38.0	37.5	ug/L	EPA 8260B	9/23/10	95.0	93.9	1.17	70.0-130	25
1,4-Dichlorobenzene														
	74640-15	<0.50	40.0	40.0	38.5	38.2	ug/L	EPA 8260B	9/23/10	96.3	95.6	0.719	80-120	25
2+4-Chlorotoluene														
	74640-15	<1.0	80.0	80.0	81.9	78.9	ug/L	EPA 8260B	9/23/10	102	98.6	3.71	70.0-130	25
2,2-Dichloropropane														
	74640-15	<0.50	40.0	40.0	40.3	39.6	ug/L	EPA 8260B	9/23/10	101	99.0	1.76	65.6-145	25
Benzene														
	74640-15	<0.50	40.0	40.0	38.9	38.2	ug/L	EPA 8260B	9/23/10	97.3	95.4	1.95	80-120	25
Bromobenzene														
	74640-15	<0.50	40.0	40.0	40.1	39.4	ug/L	EPA 8260B	9/23/10	100	98.5	1.73	70.0-130	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Bromochloromethane														
	74640-15	<0.50	40.0	40.0	39.8	39.7	ug/L	EPA 8260B	9/23/10	99.6	99.2	0.455	70.0-130	25
Bromodichloromethane														
	74640-15	<0.50	40.0	40.0	39.5	39.0	ug/L	EPA 8260B	9/23/10	98.7	97.6	1.09	70.0-130	25
Bromoform														
	74640-15	<0.50	40.0	40.0	45.0	44.4	ug/L	EPA 8260B	9/23/10	112	111	1.20	73.0-142	25
Bromomethane														
	74640-15	<20	200	200	201	226	ug/L	EPA 8260B	9/23/10	100	113	12.0	33.5-140	25
Carbon Tetrachloride														
	74640-15	<0.50	40.0	40.0	38.4	38.4	ug/L	EPA 8260B	9/23/10	96.0	96.0	0.0165	70.0-130	25
Chlorobenzene														
	74640-15	<0.50	40.0	40.0	38.9	38.1	ug/L	EPA 8260B	9/23/10	97.3	95.3	2.10	80-120	25
Chloroethane														
	74640-15	<0.50	40.0	40.0	45.2	44.5	ug/L	EPA 8260B	9/23/10	113	111	1.57	70.0-130	25
Chloroform														
	74640-15	<0.50	40.0	40.0	40.1	39.4	ug/L	EPA 8260B	9/23/10	100	98.6	1.79	80.0-120	25
Chloromethane														
	74640-15	<0.50	40.0	40.0	43.1	43.1	ug/L	EPA 8260B	9/23/10	108	108	0.00913	45.9-142	25
Dibromochloromethane														
	74640-15	<0.50	40.0	40.0	41.1	41.0	ug/L	EPA 8260B	9/23/10	103	102	0.251	70.0-130	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Dibromomethane														
	74640-15	<0.50	40.0	40.0	40.2	39.1	ug/L	EPA 8260B	9/23/10	100	97.7	2.86	70.0-130	25
Dichlorodifluoromethane														
	74640-15	<0.50	40.0	40.0	44.4	43.5	ug/L	EPA 8260B	9/23/10	111	109	1.89	47.4-151	25
Ethylbenzene														
	74640-15	2.8	40.0	40.0	43.2	42.1	ug/L	EPA 8260B	9/23/10	101	98.4	2.75	80-120	25
Hexachlorobutadiene														
	74640-15	<0.50	40.0	40.0	36.9	36.6	ug/L	EPA 8260B	9/23/10	92.3	91.5	0.890	70.0-130	25
Isopropyl benzene														
	74640-15	<0.50	40.0	40.0	41.6	40.2	ug/L	EPA 8260B	9/23/10	104	100	3.58	70.0-130	25
Methylene Chloride														
	74640-15	<5.0	40.0	40.0	42.6	42.4	ug/L	EPA 8260B	9/23/10	106	106	0.599	70.0-130	25
Naphthalene														
	74640-15	1.2	40.0	40.0	42.3	42.5	ug/L	EPA 8260B	9/23/10	103	103	0.579	70.0-130	25
O-Xylene														
	74640-15	<0.50	40.0	40.0	42.1	40.8	ug/L	EPA 8260B	9/23/10	105	102	3.02	79.7-120	25
P + M Xylene														
	74640-15	1.2	40.0	40.0	40.6	39.0	ug/L	EPA 8260B	9/23/10	98.6	94.5	4.30	76.8-120	25
Styrene														
	74640-15	<0.50	40.0	40.0	43.9	42.6	ug/L	EPA 8260B	9/23/10	110	106	2.94	70.0-130	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Tetrachloroethene														
	74640-15	<0.50	40.0	40.0	38.1	36.9	ug/L	EPA 8260B	9/23/10	95.3	92.2	3.32	77.0-120	25
Toluene														
	74640-15	0.94	40.0	40.0	38.6	38.0	ug/L	EPA 8260B	9/23/10	94.1	92.6	1.54	80-120	25
Trichloroethene														
	74640-15	<0.50	40.0	40.0	38.3	38.0	ug/L	EPA 8260B	9/23/10	95.9	95.1	0.785	80-120	25
Trichlorofluoromethane														
	74640-15	<0.50	40.0	40.0	47.4	46.8	ug/L	EPA 8260B	9/23/10	118	117	1.40	70.0-130	25
Vinyl Chloride														
	74640-15	<0.50	40.0	40.0	41.8	41.7	ug/L	EPA 8260B	9/23/10	104	104	0.123	42.1-138	25
c-1,3-Dichloropropene														
	74640-15	<5.0	40.0	40.0	37.3	37.7	ug/L	EPA 8260B	9/23/10	93.4	94.4	1.05	70.0-130	25
cis-1,2-Dichloroethene														
	74640-15	<0.50	40.0	40.0	41.3	40.7	ug/L	EPA 8260B	9/23/10	103	102	1.49	70.0-130	25
n-butylbenzene														
	74640-15	<0.50	40.0	40.0	39.8	39.1	ug/L	EPA 8260B	9/23/10	99.6	97.7	1.94	70.0-130	25
n-propylbenzene														
	74640-15	1.2	40.0	40.0	42.4	41.0	ug/L	EPA 8260B	9/23/10	103	99.5	3.56	70.0-130	25
p-isopropyltoluene														
	74640-15	<0.50	40.0	40.0	42.6	41.0	ug/L	EPA 8260B	9/23/10	106	102	3.94	70.0-130	25

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
sec-butylbenzene														
	74640-15	<0.50	40.0	40.0	41.7	40.3	ug/L	EPA 8260B	9/23/10	104	101	3.39	70.0-130	25
t-1,2-Dichloroethene														
	74640-15	<5.0	40.0	40.0	43.4	43.4	ug/L	EPA 8260B	9/23/10	108	108	0.157	70.0-130	25
t-1,3-Dichloropropene														
	74640-15	<5.0	40.0	40.0	38.1	38.5	ug/L	EPA 8260B	9/23/10	95.2	96.2	0.987	70.0-130	25
tert-butylbenzene														
	74640-15	<0.50	40.0	40.0	41.0	39.8	ug/L	EPA 8260B	9/23/10	102	99.5	3.03	70.0-130	25

KIFF ANALYTICAL, LLC
2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 74644

QC Report : Laboratory Control Sample (LCS)

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Iron	0.400	mg/L	EPA 6010B	9/29/10	102	85-115
Manganese	0.400	mg/L	EPA 6010B	9/29/10	104	85-115
Potassium	4.00	mg/L	EPA 6010B	9/29/10	106	85-115
1,1,1,2-Tetrachloroethane	40.0	ug/L	EPA 8260B	9/28/10	106	70.0-130
1,1,1-Trichloroethane	40.0	ug/L	EPA 8260B	9/28/10	101	70.0-130
1,1,2,2-Tetrachloroethane	40.0	ug/L	EPA 8260B	9/28/10	109	80-121
1,1,2-Trichloroethane	40.0	ug/L	EPA 8260B	9/28/10	102	70.0-130
1,1-Dichloroethane	40.0	ug/L	EPA 8260B	9/28/10	99.4	76.5-120
1,1-Dichloroethene	40.0	ug/L	EPA 8260B	9/28/10	103	69.6-124
1,1-Dichloropropene	40.0	ug/L	EPA 8260B	9/28/10	100	70.0-130
1,2,3-Trichlorobenzene	40.0	ug/L	EPA 8260B	9/28/10	102	70.0-130
1,2,3-Trichloropropane	40.0	ug/L	EPA 8260B	9/28/10	112	70.0-130
1,2,4-Trichlorobenzene	40.0	ug/L	EPA 8260B	9/28/10	100	70.0-130
1,2,4-Trimethylbenzene	40.0	ug/L	EPA 8260B	9/28/10	104	70.0-130
1,2-Dibromoethane	40.0	ug/L	EPA 8260B	9/28/10	94.9	80-120
1,2-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/28/10	97.6	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	9/28/10	98.5	75.7-122
1,2-Dichloropropane	40.0	ug/L	EPA 8260B	9/28/10	98.5	80-120
1,2-dibromo-3-chloropropane	40.0	ug/L	EPA 8260B	9/28/10	125	70.0-130
1,3,5-Trimethylbenzene	40.0	ug/L	EPA 8260B	9/28/10	104	70.0-130
1,3-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/28/10	102	79.3-120
1,3-Dichloropropane	40.0	ug/L	EPA 8260B	9/28/10	100	70.0-130

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,4-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/28/10	96.6	80-120
2+4-Chlorotoluene	80.0	ug/L	EPA 8260B	9/28/10	102	70.0-130
2,2-Dichloropropane	40.0	ug/L	EPA 8260B	9/28/10	96.6	65.6-145
Benzene	40.0	ug/L	EPA 8260B	9/28/10	98.8	80-120
Bromobenzene	40.0	ug/L	EPA 8260B	9/28/10	99.4	70.0-130
Bromochloromethane	40.0	ug/L	EPA 8260B	9/28/10	99.9	70.0-130
Bromodichloromethane	40.0	ug/L	EPA 8260B	9/28/10	100	70.0-130
Bromoform	40.0	ug/L	EPA 8260B	9/28/10	118	73.0-142
Bromomethane	200	ug/L	EPA 8260B	9/28/10	87.4	33.5-140
Carbon Tetrachloride	40.0	ug/L	EPA 8260B	9/28/10	103	70.0-130
Chlorobenzene	40.0	ug/L	EPA 8260B	9/28/10	99.7	80-120
Chloroethane	40.0	ug/L	EPA 8260B	9/28/10	94.2	70.0-130
Chloroform	40.0	ug/L	EPA 8260B	9/28/10	98.3	80.0-120
Chloromethane	40.0	ug/L	EPA 8260B	9/28/10	110	45.9-142
Dibromochloromethane	40.0	ug/L	EPA 8260B	9/28/10	104	70.0-130
Dibromomethane	40.0	ug/L	EPA 8260B	9/28/10	106	70.0-130
Dichlorodifluoromethane	40.0	ug/L	EPA 8260B	9/28/10	89.4	47.4-151
Ethylbenzene	40.0	ug/L	EPA 8260B	9/28/10	102	80-120
Hexachlorobutadiene	40.0	ug/L	EPA 8260B	9/28/10	103	70.0-130
Isopropyl benzene	40.0	ug/L	EPA 8260B	9/28/10	103	70.0-130
Methylene Chloride	40.0	ug/L	EPA 8260B	9/28/10	100	70.0-130
Naphthalene	40.0	ug/L	EPA 8260B	9/28/10	112	70.0-130
O-Xylene	40.0	ug/L	EPA 8260B	9/28/10	102	79.7-120

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
P + M Xylene	40.0	ug/L	EPA 8260B	9/28/10	102	76.8-120
Styrene	40.0	ug/L	EPA 8260B	9/28/10	108	70.0-130
Tetrachloroethene	40.0	ug/L	EPA 8260B	9/28/10	104	77.0-120
Toluene	40.0	ug/L	EPA 8260B	9/28/10	99.5	80-120
Trichloroethene	40.0	ug/L	EPA 8260B	9/28/10	106	80-120
Trichlorofluoromethane	40.0	ug/L	EPA 8260B	9/28/10	95.0	70.0-130
Vinyl Chloride	40.0	ug/L	EPA 8260B	9/28/10	96.3	42.1-138
c-1,3-Dichloropropene	40.0	ug/L	EPA 8260B	9/28/10	98.0	70.0-130
cis-1,2-Dichloroethene	40.0	ug/L	EPA 8260B	9/28/10	100	70.0-130
n-butylbenzene	40.0	ug/L	EPA 8260B	9/28/10	103	70.0-130
n-propylbenzene	40.0	ug/L	EPA 8260B	9/28/10	105	70.0-130
p-isopropyltoluene	40.0	ug/L	EPA 8260B	9/28/10	106	70.0-130
sec-butylbenzene	40.0	ug/L	EPA 8260B	9/28/10	104	70.0-130
t-1,2-Dichloroethene	40.0	ug/L	EPA 8260B	9/28/10	102	70.0-130
t-1,3-Dichloropropene	40.0	ug/L	EPA 8260B	9/28/10	99.5	70.0-130
tert-butylbenzene	40.0	ug/L	EPA 8260B	9/28/10	102	70.0-130
1,1,1,2-Tetrachloroethane	40.0	ug/L	EPA 8260B	9/23/10	102	70.0-130
1,1,1-Trichloroethane	40.0	ug/L	EPA 8260B	9/23/10	96.2	70.0-130
1,1,2-Trichloroethane	40.0	ug/L	EPA 8260B	9/23/10	93.1	70.0-130
1,1-Dichloroethane	40.0	ug/L	EPA 8260B	9/23/10	104	76.5-120
1,1-Dichloroethene	40.0	ug/L	EPA 8260B	9/23/10	112	69.6-124
1,1-Dichloropropene	40.0	ug/L	EPA 8260B	9/23/10	95.2	70.0-130

QC Report : Laboratory Control Sample (LCS)

Date : 10/14/2010

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2,3-Trichlorobenzene	40.0	ug/L	EPA 8260B	9/23/10	96.8	70.0-130
1,2,3-Trichloropropane	40.0	ug/L	EPA 8260B	9/23/10	97.3	70.0-130
1,2,4-Trichlorobenzene	40.0	ug/L	EPA 8260B	9/23/10	97.7	70.0-130
1,2,4-Trimethylbenzene	40.0	ug/L	EPA 8260B	9/23/10	107	70.0-130
1,2-Dibromoethane	40.0	ug/L	EPA 8260B	9/23/10	84.3	80-120
1,2-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/23/10	96.1	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	9/23/10	89.2	75.7-122
1,2-Dichloropropane	40.0	ug/L	EPA 8260B	9/23/10	92.9	80-120
1,2-dibromo-3-chloropropane	40.0	ug/L	EPA 8260B	9/23/10	99.5	70.0-130
1,3,5-Trimethylbenzene	40.0	ug/L	EPA 8260B	9/23/10	107	70.0-130
1,3-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/23/10	101	79.3-120
1,3-Dichloropropane	40.0	ug/L	EPA 8260B	9/23/10	92.4	70.0-130
1,4-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/23/10	95.8	80-120
2+4-Chlorotoluene	80.0	ug/L	EPA 8260B	9/23/10	101	70.0-130
2,2-Dichloropropane	40.0	ug/L	EPA 8260B	9/23/10	100	65.6-145
Benzene	40.0	ug/L	EPA 8260B	9/23/10	96.2	80-120
Bromobenzene	40.0	ug/L	EPA 8260B	9/23/10	100	70.0-130
Bromochloromethane	40.0	ug/L	EPA 8260B	9/23/10	99.9	70.0-130
Bromodichloromethane	40.0	ug/L	EPA 8260B	9/23/10	96.9	70.0-130
Bromoform	40.0	ug/L	EPA 8260B	9/23/10	109	73.0-142
Bromomethane	200	ug/L	EPA 8260B	9/23/10	112	33.5-140
Carbon Tetrachloride	40.0	ug/L	EPA 8260B	9/23/10	94.7	70.0-130
Chlorobenzene	40.0	ug/L	EPA 8260B	9/23/10	96.3	80-120

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Chloroethane	40.0	ug/L	EPA 8260B	9/23/10	115	70.0-130
Chloroform	40.0	ug/L	EPA 8260B	9/23/10	98.2	80.0-120
Chloromethane	40.0	ug/L	EPA 8260B	9/23/10	110	45.9-142
Dibromochloromethane	40.0	ug/L	EPA 8260B	9/23/10	101	70.0-130
Dibromomethane	40.0	ug/L	EPA 8260B	9/23/10	98.4	70.0-130
Dichlorodifluoromethane	40.0	ug/L	EPA 8260B	9/23/10	113	47.4-151
Ethylbenzene	40.0	ug/L	EPA 8260B	9/23/10	103	80-120
Hexachlorobutadiene	40.0	ug/L	EPA 8260B	9/23/10	97.0	70.0-130
Isopropyl benzene	40.0	ug/L	EPA 8260B	9/23/10	102	70.0-130
Methylene Chloride	40.0	ug/L	EPA 8260B	9/23/10	105	70.0-130
Naphthalene	40.0	ug/L	EPA 8260B	9/23/10	104	70.0-130
O-Xylene	40.0	ug/L	EPA 8260B	9/23/10	107	79.7-120
P + M Xylene	40.0	ug/L	EPA 8260B	9/23/10	104	76.8-120
Styrene	40.0	ug/L	EPA 8260B	9/23/10	109	70.0-130
Tetrachloroethene	40.0	ug/L	EPA 8260B	9/23/10	93.1	77.0-120
Toluene	40.0	ug/L	EPA 8260B	9/23/10	96.8	80-120
Trichloroethene	40.0	ug/L	EPA 8260B	9/23/10	95.5	80-120
Trichlorofluoromethane	40.0	ug/L	EPA 8260B	9/23/10	119	70.0-130
Vinyl Chloride	40.0	ug/L	EPA 8260B	9/23/10	110	42.1-138
c-1,3-Dichloropropene	40.0	ug/L	EPA 8260B	9/23/10	93.3	70.0-130
cis-1,2-Dichloroethene	40.0	ug/L	EPA 8260B	9/23/10	102	70.0-130
n-butylbenzene	40.0	ug/L	EPA 8260B	9/23/10	100	70.0-130
n-propylbenzene	40.0	ug/L	EPA 8260B	9/23/10	104	70.0-130

QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
p-isopropyltoluene	40.0	ug/L	EPA 8260B	9/23/10	106	70.0-130
sec-butylbenzene	40.0	ug/L	EPA 8260B	9/23/10	104	70.0-130
t-1,2-Dichloroethene	40.0	ug/L	EPA 8260B	9/23/10	109	70.0-130
t-1,3-Dichloropropene	40.0	ug/L	EPA 8260B	9/23/10	93.8	70.0-130
tert-butylbenzene	40.0	ug/L	EPA 8260B	9/23/10	104	70.0-130
Chloride	2.50	mg/L	EPA 300.0	9/22/10	97.6	85.0-115
Nitrite as NO2	1.64	mg/L	EPA 300.0	9/22/10	94.6	85.0-115
Nitrate as NO3	2.21	mg/L	EPA 300.0	9/22/10	92.6	85.0-115
Sulfate	2.50	mg/L	EPA 300.0	9/24/10	93.4	85.0-115

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 74644

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): STEPHANIE BOSZE
Company / Address: ASH CREEK
Phone Number: (503) 924-4704
Fax Number:
Project #: 1126-09
P.O. #:
Project Name: NiSter Vancouver - Confirmation Borings

California EDF Report? ☐ Yes ☐ No
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address): sbosze@ashcreekassociates.com
Bill to: NiSter
Sampler Print Name: ADAM REESE
Sampler Signature:

Project Address:

Analysis Request — CIRCLE METHOD

TAT: ☐ 12 hr ☐ 24 hr ☐ 48hr ☐ 72hr ☐ 1 wk

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: Sleeve	Container: Poly	Container: Glass	Container: Tedlar	Preservative: HCl	Preservative: HNO_3	Preservative: None	Matrix: Water	Matrix: Soil	Matrix: Air	MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	CAM 17 Metals (EPA 200.7 / 6010)	5 Waste Oil Metals (Cd,Cr,Ni,Pb,Zn) (EPA 200.7 / 6010)	Mercury (EPA 245.1 / 7470 / 7471)	Total Lead (EPA 200.7 / 6010)	W.E.T. Lead (STLC)	For Lab Use Only
CB-1 (9)	9/20/10	1010	3	AL								X								X										KT
CB-1 (29.5)	9/20/10	1200	3	AL								X								X										KT
CB-1 (17.5)	9/20/10	1030	3	AL								X								X										KT
CB-1 (37.5)	9/20/10	1245	3	AL								X								X										KT
CB-1 (35)	9/20/10	1230	3								X									X										KT 01
CB-1 (45)	9/20/10	1330	3								X									X										KT 02
CB-2 (9)	9/20/10	1500	3	AL								X								X										KT
CB-2 (18)	9/20/10	1530	3	AL								X								X										KT
CB-2 (28)	9/20/10	1600	3	AL								X								X										KT
CB-2 (35)	9/20/10	1610	3								X									X										KT 03

	Date	Time		
Relinquished by:	9/21/10	1700	Received by:	
Relinquished by:			Received by:	
Relinquished by:	092210	1040	Received by Laboratory:	

Remarks:

Distribution: White - Lab; Pink - Originator
Rev: 060409

KIFF Analytical LLC

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 241644

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): STEPHANIE BOSZE
Company / Address: ASH CREEK ASSOCIATES
Phone Number: 503 927 4704
Fax Number:
Project #: 1120-09
P.O. #:
Project Name: NuStar Vancouver Contamination Buildup

California EDF Report? ☐ Yes ☐ No
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address): sbosze@ashcreekassociates.com
Bill to: NuStar
Sampler Print Name: ADAM REESE
Sampler Signature:

Project Address:

Analysis Request

CIRCLE METHOD

TAT: ☐ 12 hr ☐ 24 hr ☐ 48hr ☐ 72hr ☐ 1 wk

Sample Designation	Date	Time	Sampling	Container: 40 ml VOA	Container: Sleeve	Container: Poly	Container: Glass	Container: Tedlar	Preservative: HCl	Preservative: HNO_3	Preservative: None	Matrix: Water	Matrix: Soil	Matrix: Air	MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	CAM 17 Metals (EPA 200.7 / 6010)	5 Waste Oil Metals (Cd,Cr,Ni,Pb,Zn) (EPA 200.7 / 6010)	Mercury (EPA 245.1 / 7470 / 7471)	Total Lead (EPA 200.7 / 6010)	W.E.T. Lead (STLC)	For Lab Use Only
CB-2 (42)	9/21/10	0830		3									X								X									11
CB-2 (45)	9/21/10	0900		3								X									X									12
CB-2 (45) DUP	9/21/10	0900		3								X									X									13
CB-4 (18)	9/21/10	1030		3									X								X									14
CB-4 (28)	9/21/10	1045		3									X								X									15
CB-4 (35)	9/21/10	1100		3								X									X									16
CB-4 (38.5)	9/21/10	1300		4									X								X									17
CB-4 (45)	9/21/10	1345		3								X									X									18
Field Blank	9/20/10	1400		1								X									HOLD									19
Field Blank #2	9/21/10	0730		1								X									HOLD									20

Relinquished by: [signature] Date 9/21/10 Time 1720 Received by:
Relinquished by: Date Time Received by:
Relinquished by: Date 092210 Time 1040 Received by Laboratory: [signature]

Remarks: For CB-2 (45) groundwater sample. 9 total vials include ~~duplicate~~ MS/MSD samples.

Distribution: White - Lab; Pink - Originator
Rev: 060409

KIFF Analytical LLC

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 741644

Page 3 of 3

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): STEPHANIE BOSZE	California EDF Report? ☐ Yes ☐ No
Company / Address: ASH CREEK ASSOCIATES	Sampling Company Log Code:
Phone Number: (503) 524-4704	Global ID:
Fax Number:	EDF Deliverable To (Email Address): sbosze@ashcreekassociates.com
Project #: 1126-09 / P.O. #:	Bill to: N. Star
Project Name: N. Star Vancouver - Confirmation Sampling	Sampler Print Name: ADAM REESE
	Sampler Signature:

Project Address:

Sample Designation	Date	Time	40 ml VOA	Sleeve	Poly	Glass	Tedlar	HCl	HNO_3	None	H_2SO_4	Water	Soil	Air
CB-3 (9)	9/21/10	1500	4										X	
CB-3 (18)	9/21/10	1530	4										X	
CB-3 (35)	9/21/10	1545	4		X	X		X			X	X		
TRIP BLANK	9/21/10	—	2											
CB-3 (29)	9/21/10	1540	4										X	

Analysis Request — PLEASE CIRCLE METHOD

MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	CAM 17 Metals (EPA 200.7 / 6010)	5 Waste Oil Metals (Cd,Cr,Ni,Pb,Zn) (EPA 200.7 / 6010)	Mercury (EPA 245.1 / 7470 / 7471)	Total Lead (EPA 200.7 / 6010)	W.E.T. Lead (STLC)	Co, Arsenic, Selenium, Iron, Manganese, Chloride, Nitrate, Sulfate, Methane, Ethane, Ethene, Methanol, TOC, Orthophosphate
							X									
							X									
							X									X
							HOLD									
							X									

TAT: ☐ 12 hr ☐ 24 hr ☐ 48hr ☐ 72hr ☐ 1 wk

For Lab Use Only: 21, 22, 23 10, 24 11, 25

Relinquished by:	Date	Time	Received by:
	9/21/10	1700	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	092210	1040	

Remarks:

For Lab Use Only: Sample Receipt

Temp °C	Initials	Date	Time	Therm. ID #	Coolant Present
					Yes / No

Distribution: White - Lab; Pink - Originator
Rev: 061708

KIFF Analytical LLC

SAMPLE RECEIPT CHECKLIST

RECEIVER: KT (Initials)

SRG#: 74644 Date: 092210

Project ID: WuStar Vancouver

Method of Receipt: ☐ Courier ☐ Over-the-counter ☒ Shipper

COC Inspection

Is COC present?	☒ Yes	☐ No	
Custody seals on shipping container?	☐ Intact	☐ Broken	☒ Not present ☐ N/A
Is COC Signed by Relinquisher? ☒ Yes ☐ No Dated?	☒ Yes	☐ No	
Is sampler name legibly indicated on COC?	☒ Yes	☐ No	
Is analysis or hold requested for all samples	☒ Yes	☐ No	
Is the turnaround time indicated on COC?	☒ Yes	☐ No	
Is COC free of whiteout and uninitialed cross-outs?	☒ Yes	☐ No, Whiteout	☐ No, Cross-outs

Sample Inspection

Coolant Present: ☒ Yes ☐ No (includes water)

Temperature °C 2.4 Therm. ID# IR5 Initial KT Date/Time 092210 1040 ☐ N/A

Are there custody seals on sample containers?	☐ Intact	☐ Broken	☒ Not present
Do containers match COC? ☒ Yes ☐ No ☐ No, COC lists absent sample(s)			☐ No, Extra sample(s) present
Are there samples matrices other than soil, water, air or carbon?	☐ Yes	☒ No	
Are any sample containers broken, leaking or damaged?	☒ Yes	☐ No	
Are preservatives indicated? ☐ Yes, on sample containers	☒ Yes, on COC	☐ Not indicated	☐ N/A
Are preservatives correct for analyses requested?	☒ Yes	☐ No	☐ N/A
Are samples within holding time for analyses requested?	☒ Yes	☐ No	
Are the correct sample containers used for the analyses requested?	☒ Yes	☐ No	
Is there sufficient sample to perform testing?	☒ Yes	☐ No	

Does any sample contain product, have strong odor or are otherwise suspected to be hot? ☐ Yes ☒ No

Receipt Details

Matrix H2O Container type Vial # of containers received 36

Matrix H2O Container type Poly # of containers received 6

Matrix H2O Container type Amber # of containers received 2

Date and Time Sample Put into Temp Storage Date: 092210 Time: 1040

Quicklog

Are the Sample ID's indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If Sample ID's are listed on both COC and containers, do they all match?	☒ Yes	☐ No		☐ N/A
Is the Project ID indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If project ID is listed on both COC and containers, do they all match?	☒ Yes	☐ No		☐ N/A
Are the sample collection dates indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection dates are listed on both COC and containers, do they all match?	☒ Yes	☐ No		☐ N/A
Are the sample collection times indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection times are listed on both COC and containers, do they all match?	☒ Yes	☐ No		☐ N/A

COMMENTS:

Leaders in Analytical Science and Service

KIFF Analytical LLC

Subcontract Laboratory Report Attachments

2795 Second Street, Suite 300 Davis, CA 95618
tel 530.297.4800 fax 530.297.4808
www.kiffanalytical.com

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

September 30, 2010

CLS Work Order #: CTI0939
COC #: 74644

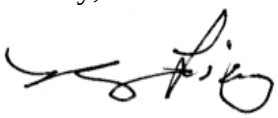
Scott Forbes
KIFF Analytical
2795 Second St. Suite 300
Davis, CA 95616

Project Name: Nustar Vancouver

Enclosed are the results of analyses for samples received by the laboratory on 09/23/10 15:40. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,



James Liang, Ph.D.
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES

KIFF Analytical	Project: Nustar Vancouver	
2795 Second St. Suite 300	Project Number: 1126-09	**CLS Work Order #: CTI0939**
Davis, CA 95616	Project Manager: Scott Forbes	COC #: 74644

CTI0939

KIFF Analytical LLC

2795 Second Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4808

California Laboratory Services
3249 Fitzgerald Road
Rancho Cordova, CA 95742
916-638-7301

COC No. **74644** Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF to): Scott Forbes
Company/Address: Kiff Analytical
Phone No.: 530-297-4800 FAX No.: 530-297-4808
Project Number: 1126-09 P.O. No.: 74644
Project Name: Nustar Vancouver
Project Address:

EDF Report? YES

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
Deliverables to (Email Address): inbox@kiffanalytical.com

Sample Designation	Sampling Date	Sampling Time	Container / Preservative: 250ml Poly None	Matrix: Water	Analysis Request: Carbon Dioxide	TAT: Standard	For Lab Use Only
CB-3 (35)	09/21/10	15:45	1	X	X	X	

Relinquished by: K.ff Analytical	Date 092310	Time 1540	Received by:	Remarks:
Relinquished by:	Date	Time	Received by:	1.1°C
Relinquished by:	Date	Time	Received by Laboratory: Jon R 9-23-10 15:40	Bill to: Accounts Payable

CALIFORNIA LABORATORY SERVICES

 09/30/10 10:33

KIFF Analytical
2795 Second St. Suite 300
Davis, CA 95616

Project: Nustar Vancouver
Project Number: 1126-09
Project Manager: Scott Forbes

CLS Work Order #: CTI0939
COC #: 74644

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
CB-3 (35) (CTI0939-01) Water	**Sampled: 09/21/10 15:45**		**Received: 09/23/10 15:40**						
Carbon Dioxide as CO2	**38**	5.0	mg/L	1	CT07166	09/24/10	09/24/10	SM 4500C	

KIFF Analytical
2795 Second St. Suite 300
Davis, CA 95616

Project: Nustar Vancouver
Project Number: 1126-09
Project Manager: Scott Forbes

CLS Work Order #: CTI0939
COC #: 74644

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch CT07166 - General Preparation										
Blank (CT07166-BLK1)				Prepared & Analyzed: 09/24/10						
Carbon Dioxide as CO2	ND	5.0	mg/L							

KIFF Analytical	Project: Nustar Vancouver	
2795 Second St. Suite 300	Project Number: 1126-09	**CLS Work Order #: CTI0939**
Davis, CA 95616	Project Manager: Scott Forbes	COC #: 74644

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Calscience
Environmental
Laboratories, Inc.

September 29, 2010

Joel Kiff
Kiff Analytical
2795 2nd Street, Suite 300
Davis, CA 95616-6593

Subject: **Calscience Work Order No.: 10-09-1711**
Client Reference: NuStar Vancouver

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 9/23/2010 and analyzed in accordance with the attached chain-of-custody.

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Amanda Porter

Calscience Environmental
Laboratories, Inc.
Amanda Porter
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Kiff Analytical
2795 2nd Street, Suite 300
Davis, CA 95616-6593

Date Received: 09/23/10
Work Order No: 10-09-1711
Preparation: N/A
Method: RSK-175M
Units: ug/L

Project: NuStar Vancouver

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
CB-3 (35)	**10-09-1711-1-A**	**09/21/10 15:45**	**Aqueous**	**GC 33**	**N/A**	**09/24/10 00:00**	**100924L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Ethane	ND	1.00	1		Methane	2100	8.00	8	
Ethylene	ND	1.00	1						

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-661-349**	**N/A**	**Aqueous**	**GC 33**	**N/A**	**09/24/10 00:00**	**100924L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Ethane	ND	1.00	1		Methane	ND	1.00	1	
Ethylene	ND	1.00	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Kiff Analytical
2795 2nd Street, Suite 300
Davis, CA 95616-6593

Date Received: 09/23/10
Work Order No: 10-09-1711

Project: NuStar Vancouver

Client Sample Number	Lab Sample Number	Date Collected	Matrix
CB-3 (35)	**10-09-1711-1**	**09/21/10**	**Aqueous**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
o-Phosphate (as P)	ND	0.10	1		mg/L	N/A	09/23/10	EPA 300.0
Ammonia (as N)	89	1.0	10		mg/L	09/27/10	09/27/10	SM 4500-NH3 B/C
Carbon, Total Organic	4.8	0.50	1		mg/L	N/A	09/28/10	SM 5310 D

Method Blank			**N/A**	**Aqueous**

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
o-Phosphate (as P)	ND	0.10	1		mg/L	N/A	09/23/10	EPA 300.0
Ammonia (as N)	ND	0.10	1		mg/L	09/27/10	09/27/10	SM 4500-NH3 B/C
Carbon, Total Organic	ND	0.50	1		mg/L	N/A	09/28/10	SM 5310 D

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Kiff Analytical
2795 2nd Street, Suite 300
Davis, CA 95616-6593

Date Received: N/A
Work Order No: 10-09-1711

Project: NuStar Vancouver

Matrix: Aqueous or Solid

Parameter	Method	Quality Control Sample ID	Date Analyzed	Date Extracted	MS% REC	MSD % REC	%REC CL	RPD	RPD CL	Qualifiers
o-Phosphate (as P)	EPA 300.0	10-09-1674-1	09/23/10	N/A	91	94	80-120	3	0-20	
Carbon, Total Organic	SM 5310 D	10-09-1998-1	09/28/10	N/A	93	92	75-125	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Kiff Analytical
2795 2nd Street, Suite 300
Davis, CA 95616-6593

Date Received: N/A
Work Order No: 10-09-1711
Preparation: N/A
Method: RSK-175M

Project: NuStar Vancouver

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-661-349	**Aqueous**	**GC 33**	**N/A**	**09/24/10**	**100924L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Ethane	96	97	80-120	1	0-20	
Methane	101	102	79-109	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Kiff Analytical
2795 2nd Street, Suite 300
Davis, CA 95616-6593

Date Received: N/A
Work Order No: 10-09-1711

Project: NuStar Vancouver

Matrix: Aqueous or Solid

Parameter	Method	Quality Control Sample ID	Date Extracted	Date Analyzed	LCS % REC	LCSD % REC	%REC CL	RPD	RPD CL	Qual
o-Phosphate (as P)	EPA 300.0	099-12-906-1,282	N/A	09/23/10	97	100	90-110	4	0-15	
Ammonia (as N)	SM 4500-NH3 B	099-12-814-792	09/27/10	09/27/10	99	97	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Kiff Analytical
2795 2nd Street, Suite 300
Davis, CA 95616-6593

Date Received: N/A
Work Order No: 10-09-1711

Project: NuStar Vancouver

Matrix: Aqueous or Solid

Parameter	Method	Quality Control Sample ID	Date Analyzed	Date Extracted	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Carbon, Total Organic	SM 5310 D	099-05-097-4,008	09/28/10	N/A	5	4.86	97	80-120	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 10-09-1711

Qualifier	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
E	Concentration exceeds the calibration range.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

KIFF Analytical LLC

2795 Second Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4808

Calscience
7440 Lincoln Way
Garden Grove, CA 92841-1427
714-895-5494

1711

COC No. **74644** Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF to): Scott Forbes

EDF Report? YES

Company/Address: Kiff Analytical

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

Phone No.: 530-297-4800 FAX No.: 530-297-4808

Project Number: 1126-09 P.O. No.: 74644

Deliverables to (Email Address): inbox@kiffanalytical.com

Project Name: Nustar Vancouver

Project Address:

Sample Designation	Sampling Date	Sampling Time	Container / Preservative: 1-L Amber H2SO4	500 ml Poly None	250ml Poly H2SO4	VOA 40 ml HCl	Matrix: Water	Analysis Request: Ammonia as Nitrogen	Hydrocarbons in Water by RSK 175 (1)	Orthophosphate	Total Organic Carbon	TAT: 4-Days	For Lab Use Only
CB-3 (35)	09/21/10	15:45	2	1	1	2	X	X	X	X	X	X	1

Relinquished by:	Date	Time	Received by:
Kiff Analytical	092210	1900	
Relinquished by:	Date	Time	Received by:
Relinquished by: ONTRAC	Date 9/23/10	Time 0930	Received by Laboratory:

Remarks: Please refer to attached Test Detail.

Bill to: Accounts Payable

1711

OnTrac
On Time Delivery For Less

800.334.5000
ontrac.com

D10010317594219

Date Printed 9/22/2010

Tracking#D10010317594219

Shipped From:
KIFF ANALYTICAL
2795 2ND STREET 300
DAVIS, CA 95616

Sent By: SAMPLE RECEIVING
Phone#: (530)297-4800
wgt(lbs): 10
Reference: SUB SAMPLES
Reference 2:

Ship To Company:	*Service:* **S**
CALSCIENCE ENVIRONMENTAL LABS **7440 LINCOLN WAY** **GARDEN GROVE, CA 92841** **SAMPLE RECEIVING (714)895-5494** **B10207210772**	*Sort Code:* **ORG** *Special Services:* **Signature Required**

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 10-09-☐☑☐☐

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: KIFF ANALYTICAL DATE: 09/23/10

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 2.2 °C + 0.5 °C (CF) = 2.7 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter Initial: WB

CUSTODY SEALS INTACT:

☑ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Initial: WB

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: RS

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☐	☐	☑
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Residual Chlorine / Dissolved Sulfide received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☑2 VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☑1AGB (WSC 9-23-10) ☐1AGBna_2 ☑2 1AGBs

☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☑500PB ☐500PBna

☑250PBs ☐250PBn ☐125PB ☐125PBznna ☐100PJ ☐100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** RS

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** WSC

Preservative: h: HCL n: HNO_3 na_2: $Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** RS

Exova
9240 Santa Fe Springs Road
Santa Fe Springs
California
USA
90670

T: +1 (562) 948-2225
F: +1 (562) 948-5850
E: info400@exova.com
W: www.exova.com

Testing. Advising. Assuring.

Certificate of Analysis

October 7, 2010

Kiff Analytical LLC
2795 Second St
Ste 300
Davis, CA 95616

Exova Job No: 125380
Purchase Order: 74644
Project Name: Water
Samples Received: One (1) Sample
Date Received: 09/23/2010

Attn: Scott Forbes

Analysis	Page
Organic Acids by SOP 4130, Rev 4	2 - 3

Michael Shelton
Technical Director

Patricia Metzger
Senior Chemist

EXOVA

Organic Acids by SOP 4130, Rev 4
Ion Chromatography-Suppressed Conductivity

Column:	AS11-HC 250 mm x 4 mm, AG11-HC Guard 50 mm x 4 mm
Eluent:	Sodium hydroxide, 2.4 mM, 1.2 mL/min
Injection:	300 µL
Detection:	Suppressed Conductivity

The sample was diluted by 1:50 with water for analysis. Detection limits are corrected for the dilution factor necessary for analysis. Results were measured as the anion and converted to the acid by molecular weight.

Sample ID: Method Blank

Analyte	Parts Per Milion (mg/L)	Detection Limit
Acetic Acid	ND	0.009
Butyric Acid	ND	0.02
Lactic Acid	ND	0.01
Propionic Acid	ND	0.008

Date Analyzed: 10-04-10

Sample ID: CB-3 (35)

Analyte	Parts Per Milion (mg/L)	Detection Limit
Acetic Acid	ND	0.5
Butyric Acid	ND	1
Lactic Acid	ND	0.5
Propionic Acid	ND	0.4

Date Analyzed: 10-04-10

Calibration Summary

Sample ID: Laboratory Control Standard (2.00 ppm Second Source Standard)

Analyte	Result	% Rec	% Rec Limits
Acetate	1.94	97	90-110
Butyrate	2.06	103	90-110
Lactate	2.00	100	90-110
Propionate	1.99	100	90-110

Standard Curve (n=5) $r^2 \geq 0.999$ for all ions
Date Analyzed: 10-04-10

EXOVA

Quality Control Summary

Sample ID: CB-3 (35)

Analyte	Sample Result	Spike Conc	Spike Result	Spike % Rec	Spike Duplicate Result	Spike Duplicate % Rec	Spike RPD
Acetic Acid	ND	50.9	53.7	106	53.3	105	1
Butyric Acid	ND	50.6	52.6	104	52.4	104	< 1
Lactic Acid	ND	50.6	51.8	102	52.1	103	1
Propionic Acid	ND	50.7	53.3	105	53.0	105	1

QC Guidelines

Analyte	% Recovery	RPD Limit
Acetic Acid	69 - 140	20
Butyric Acid	63 - 148	26
Lactic Acid		
Propionic Acid		

KIFF Analytical LLC

2795 Second Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4808

Exova (West Coast/Bodycoat)
9240 Santa Fe Springs Rd.
Santa Fe Springs, CA 90670
562-948-2225

COC No. **74644** Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF to): Scott Forbes

EDF Report? YES

Company/Address: Kiff Analytical

Phone No.: 530-297-4800 FAX No.: 530-297-4808

Project Number: 1126-09 P.O. No.: 74644

Project Name: Nustar Vancouver

Project Address:

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

Deliverables to (Email Address): inbox@kiffanalytical.com

Sample Designation	Sampling Date	Sampling Time	Container / Preservative: 500 ml Poly None	Matrix: Water	Analysis Request: Metabolic Acids	TAT: Standard	For Lab Use Only
CB-3 (35) ~	09/21/10	15:45	1	X	X	X	

Relinquished by:	Date	Time	Received by:
Kiff Analytical	092110	1900	Courier
Courier	09-23-10	08:24	Vanessa M Ryan Exova
	Date	Time	Received by Laboratory:

Remarks:

125380

Bill to: Accounts Payable

Client: Kiff Analytical LLC
Job No.: 125380

Organic Acids by SOP 4130, Rev 4
Ion Chromatography-Suppressed Conductivity

Column: AS11-HC 250 mm x 4 mm, AG11-HC Guard 50 mm x 4 mm
Eluent: Sodium hydroxide, 2.4 mM, 1.2 mL/min
Injection: 300 µL
Detection: Suppressed Conductivity

The sample was diluted by 1:50 with water for analysis. Detection limits are corrected for the dilution factor necessary for analysis. Results were measured as the anion and converted to the acid by molecular weight.

Sample ID: Method Blank

Analyte	Parts Per Milion (mg/L)	Detection Limit
Acetic Acid	ND	0.009
Butyric Acid	ND	0.02
Lactic Acid	ND	0.01
Propionic Acid	ND	0.008

Date Analyzed: 10-04-10

Sample ID: CB-3 (35)

Analyte	Parts Per Milion (mg/L)	Detection Limit
Acetic Acid	ND	0.5
Butyric Acid	ND	1
Lactic Acid	ND	0.5
Propionic Acid	ND	0.4

Date Analyzed: 10-04-10

Calibration Summary

Sample ID: Laboratory Control Standard (2.00 ppm Second Source Standard)

Analyte	Result	% Rec	% Rec Limits
Acetate	1.94	97	90-110
Butyrate	2.06	103	90-110
Lactate	2.00	100	90-110
Propionate	1.99	100	90-110

Standard Curve (n=5) r^2 >= 0.999 for all ions
Date Analyzed: 10-04-10

Client: Kiff Analytical LLC
Job No.: 125380

Quality Control Summary

Sample ID: CB-3 (35)

Analyte	Sample Result	Spike Conc	Spike Result	Spike % Rec	Spike Duplicate Result	Spike Duplicate % Rec	Spike RPD
Acetic Acid	ND	50.9	53.7	106	53.3	105	1
Butyric Acid	ND	50.6	52.6	104	52.4	104	< 1
Lactic Acid	ND	50.6	51.8	102	52.1	103	1
Propionic Acid	ND	50.7	53.3	105	53.0	105	1

QC Guidelines

Analyte	% Recovery	RPD Limit
Acetic Acid	69 - 140	20
Butyric Acid	63 - 148	26
Lactic Acid		
Propionic Acid		

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Laboratory Results

Stephanie Bosze
Ash Creek Assoc.
3015 SW First Avenue
Portland, OR 97201-4707

Subject : 14 Soil Samples
Project Name : NuStar Vancouver Interim Action Confirmation Sampl
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Dear Ms. Bosze,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Subject : 14 Soil Samples
Project Name : NuStar Vancouver Interim Action Confirmation Sampl
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Case Narrative

Methanol extracts of soil samples were subsampled prior to weighing for determining the soil mass present. 100 microliter aliquots were removed from each extract. To compensate for this, an adjustment of 0.08g was included in the mass calculation. This scenario applies to samples CB-1 (9), CB-1 (29.5), CB-2 (9.5), CB-2 (42), CB-3 (9), CB-3 (18), CB-3 (29), CB-4 (18), and CB-4 (38.5) by EPA Method 8260B.

The Bromomethane Reporting Limit has been raised for samples CB-1 (9), CB-1 (29.5), CB-2 (9.5), CB-2 (42), CB-3 (18), and CB-3 (29) due to a matrix effect.

Matrix Spike/Matrix Spike Duplicate results associated with samples CB-1 (9), CB-1 (29.5), CB-2 (42), CB-3 (18), CB-3 (29), and CB-4 (38.5) for the analytes 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, Hexachlorobutadiene, and Naphthalene were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Matrix Spike/Matrix Spike Duplicate results associated with samples CB-1 (9), CB-1 (17.5), CB-1 (37.5), CB-2 (9.5), CB-2 (18), CB-2 (28), CB-3 (9), CB-4 (18), and CB-4 (28) for the analytes 1,1,1,2-Tetrachloroethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2+4-Chlorotoluene, Bromobenzene, Chlorobenzene, Hexachlorobutadiene, Isopropyl benzene, Naphthalene, Styrene, c-1,3-Dichloropropene, n-butylbenzene, n-propylbenzene, p-isopropyltoluene, sec-butylbenzene, t-1,3-Dichloropropene, and tert-butylbenzene were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

All sample results are reported on a Dry Weight basis.

The chain of custody indicates samples were frozen in the field and shipped at below zero temperatures. However, samples were 5.2 degrees C upon receipt, and therefore unpreserved samples were tested within 48 hours of receipt by the lab.

A version of this report was previously issued on 09/30/2010. This revised version replaces that report.

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-1 (9)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-01

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Chloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Vinyl Chloride	< 0.040	0.040	mg/Kg	09/23/10 21:03
Bromomethane	< 5.0	5.0	mg/Kg	09/23/10 21:03
Chloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Trichlorofluoromethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,1-Dichloroethene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Methylene Chloride	< 0.040	0.040	mg/Kg	09/23/10 21:03
trans-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,1-Dichloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
2,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:03
cis-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Chloroform	< 0.040	0.040	mg/Kg	09/23/10 21:03
Bromochloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,1,1-Trichloroethane	< 4.0	4.0	mg/Kg	09/24/10 15:40
1,1-Dichloropropene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2-Dichloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Carbon Tetrachloride	< 0.040	0.040	mg/Kg	09/23/10 21:03
Benzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Trichloroethene	< 4.0	4.0	mg/Kg	09/24/10 15:40
1,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Bromodichloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Dibromomethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
cis-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Toluene	< 0.040	0.040	mg/Kg	09/23/10 21:03
trans-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,1,2-Trichloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,3-Dichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Tetrachloroethene	**6700**	70	mg/Kg	09/28/10 00:24
Dibromochloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2-Dibromoethane	< 0.040	0.040	mg/Kg	09/23/10 21:03
Chlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,1,1,2-Tetrachloroethane	< 4.0	4.0	mg/Kg	09/24/10 15:40
Ethylbenzene	< 4.0	4.0	mg/Kg	09/24/10 15:40

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-1 (9)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-01

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.040	0.040	mg/Kg	09/23/10 21:03
O-Xylene	< 4.0	4.0	mg/Kg	09/24/10 15:40
Styrene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Isopropyl benzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Bromoform	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,1,2,2-Tetrachloroethane	< 0.050	0.050	mg/Kg	09/23/10 21:03
1,2,3-Trichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:03
n-Propylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Bromobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,3,5-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
2+4-Chlorotoluene	< 0.070	0.070	mg/Kg	09/23/10 21:03
tert-Butylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2,4-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
sec-Butylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
p-Isopropyltoluene	< 4.0	4.0	mg/Kg	09/24/10 15:40
1,3-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,4-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
n-Butylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2-Dibromo-3-chloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2,4-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Hexachlorobutadiene	< 0.040	0.040	mg/Kg	09/23/10 21:03
Naphthalene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2,3-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:03
1,2-Dichloroethane-d4 (Surr)	95.2		% Recovery	09/23/10 21:03
4-Bromofluorobenzene (Surr)	100		% Recovery	09/23/10 21:03
Toluene - d8 (Surr)	99.0		% Recovery	09/23/10 21:03

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-1 (29.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-02

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Chloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Vinyl Chloride	< 0.040	0.040	mg/Kg	09/23/10 21:40
Bromomethane	< 2.0	2.0	mg/Kg	09/23/10 21:40
Chloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Trichlorofluoromethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,1-Dichloroethene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Methylene Chloride	< 0.040	0.040	mg/Kg	09/23/10 21:40
trans-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,1-Dichloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
2,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:40
cis-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Chloroform	< 0.040	0.040	mg/Kg	09/23/10 21:40
Bromochloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,1,1-Trichloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,1-Dichloropropene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2-Dichloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Carbon Tetrachloride	< 0.040	0.040	mg/Kg	09/23/10 21:40
Benzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Trichloroethene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Bromodichloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Dibromomethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
cis-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Toluene	< 0.040	0.040	mg/Kg	09/23/10 21:40
trans-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,1,2-Trichloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,3-Dichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Tetrachloroethene	**160**	0.70	mg/Kg	09/25/10 13:24
Dibromochloromethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2-Dibromoethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Chlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,1,1,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
Ethylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-1 (29.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-02

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.040	0.040	mg/Kg	09/23/10 21:40
O-Xylene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Styrene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Isopropyl benzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Bromoform	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,1,2,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2,3-Trichloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:40
n-Propylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Bromobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,3,5-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
2+4-Chlorotoluene	< 0.070	0.070	mg/Kg	09/23/10 21:40
tert-Butylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2,4-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
sec-Butylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
p-Isopropyltoluene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,3-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,4-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
n-Butylbenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2-Dibromo-3-chloropropane	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2,4-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Hexachlorobutadiene	< 0.040	0.040	mg/Kg	09/23/10 21:40
Naphthalene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2,3-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/23/10 21:40
1,2-Dichloroethane-d4 (Surr)	97.8		% Recovery	09/23/10 21:40
4-Bromofluorobenzene (Surr)	99.3		% Recovery	09/23/10 21:40
Toluene - d8 (Surr)	99.3		% Recovery	09/23/10 21:40

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-1 (17.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-03

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Chloromethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Vinyl Chloride	< 0.030	0.030	mg/Kg	09/28/10 02:47
Bromomethane	< 0.60	0.60	mg/Kg	09/28/10 02:47
Chloroethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Trichlorofluoromethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,1-Dichloroethene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Methylene Chloride	< 0.030	0.030	mg/Kg	09/28/10 02:47
trans-1,2-Dichloroethene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,1-Dichloroethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
2,2-Dichloropropane	< 0.030	0.030	mg/Kg	09/28/10 02:47
cis-1,2-Dichloroethene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Chloroform	< 0.030	0.030	mg/Kg	09/28/10 02:47
Bromochloromethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,1,1-Trichloroethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,1-Dichloropropene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2-Dichloroethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Carbon Tetrachloride	< 0.030	0.030	mg/Kg	09/28/10 02:47
Benzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Trichloroethene	**0.093**	0.030	mg/Kg	09/28/10 02:47
1,2-Dichloropropane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Bromodichloromethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Dibromomethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
cis-1,3-Dichloropropene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Toluene	< 0.030	0.030	mg/Kg	09/28/10 02:47
trans-1,3-Dichloropropene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,1,2-Trichloroethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,3-Dichloropropane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Tetrachloroethene	**10**	0.030	mg/Kg	09/28/10 02:47
Dibromochloromethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2-Dibromoethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Chlorobenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,1,1,2-Tetrachloroethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
Ethylbenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-1 (17.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-03

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.030	0.030	mg/Kg	09/28/10 02:47
O-Xylene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Styrene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Isopropyl benzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Bromoform	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,1,2,2-Tetrachloroethane	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2,3-Trichloropropane	< 0.030	0.030	mg/Kg	09/28/10 02:47
n-Propylbenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Bromobenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,3,5-Trimethylbenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
2+4-Chlorotoluene	< 0.060	0.060	mg/Kg	09/28/10 02:47
tert-Butylbenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2,4-Trimethylbenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
sec-Butylbenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
p-Isopropyltoluene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,3-Dichlorobenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,4-Dichlorobenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
n-Butylbenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2-Dichlorobenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2-Dibromo-3-chloropropane	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2,4-Trichlorobenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Hexachlorobutadiene	< 0.030	0.030	mg/Kg	09/28/10 02:47
Naphthalene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2,3-Trichlorobenzene	< 0.030	0.030	mg/Kg	09/28/10 02:47
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	09/28/10 02:47
4-Bromofluorobenzene (Surr)	101		% Recovery	09/28/10 02:47
Toluene - d8 (Surr)	99.2		% Recovery	09/28/10 02:47

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-1 (37.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-04

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Chloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Bromomethane	< 0.020	0.020	mg/Kg	09/25/10 00:01
Chloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Methylene Chloride	**0.0057**	0.0050	mg/Kg	09/25/10 00:01
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
cis-1,2-Dichloroethene	**0.034**	0.0050	mg/Kg	09/25/10 00:01
Chloroform	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Bromochloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Benzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Trichloroethene	**0.069**	0.0050	mg/Kg	09/25/10 00:01
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Dibromomethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Toluene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Tetrachloroethene	**0.20**	0.0050	mg/Kg	09/25/10 00:01
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Chlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Ethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-1 (37.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-04

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
O-Xylene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Styrene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Bromoform	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Bromobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
Naphthalene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 00:01
1,2-Dichloroethane-d4 (Surr)	108		% Recovery	09/25/10 00:01
4-Bromofluorobenzene (Surr)	100		% Recovery	09/25/10 00:01
Toluene - d8 (Surr)	100		% Recovery	09/25/10 00:01

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-2 (9.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-05

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Chloromethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Vinyl Chloride	< 0.040	0.040	mg/Kg	09/28/10 05:07
Bromomethane	< 0.80	0.80	mg/Kg	09/28/10 05:07
Chloroethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Trichlorofluoromethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,1-Dichloroethene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Methylene Chloride	< 0.040	0.040	mg/Kg	09/28/10 05:07
trans-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,1-Dichloroethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
2,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/28/10 05:07
cis-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Chloroform	< 0.040	0.040	mg/Kg	09/28/10 05:07
Bromochloromethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,1,1-Trichloroethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,1-Dichloropropene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2-Dichloroethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Carbon Tetrachloride	< 0.040	0.040	mg/Kg	09/28/10 05:07
Benzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Trichloroethene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Bromodichloromethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Dibromomethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
cis-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Toluene	< 0.040	0.040	mg/Kg	09/28/10 05:07
trans-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,1,2-Trichloroethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,3-Dichloropropane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Tetrachloroethene	**130**	0.70	mg/Kg	09/25/10 14:01
Dibromochloromethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2-Dibromoethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Chlorobenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,1,1,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
Ethylbenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-2 (9.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-05

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.040	0.040	mg/Kg	09/28/10 05:07
O-Xylene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Styrene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Isopropyl benzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Bromoform	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,1,2,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2,3-Trichloropropane	< 0.040	0.040	mg/Kg	09/28/10 05:07
n-Propylbenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Bromobenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,3,5-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
2+4-Chlorotoluene	< 0.070	0.070	mg/Kg	09/28/10 05:07
tert-Butylbenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2,4-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
sec-Butylbenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
p-Isopropyltoluene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,3-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,4-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
n-Butylbenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2-Dibromo-3-chloropropane	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2,4-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Hexachlorobutadiene	< 0.040	0.040	mg/Kg	09/28/10 05:07
Naphthalene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2,3-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/28/10 05:07
1,2-Dichloroethane-d4 (Surr)	99.5		% Recovery	09/28/10 05:07
4-Bromofluorobenzene (Surr)	102		% Recovery	09/28/10 05:07
Toluene - d8 (Surr)	99.3		% Recovery	09/28/10 05:07

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-2 (18)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-06

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Chloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Bromomethane	< 0.020	0.020	mg/Kg	09/24/10 16:48
Chloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Methylene Chloride	**0.0056**	0.0050	mg/Kg	09/24/10 16:48
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Chloroform	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Bromochloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Benzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Trichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Dibromomethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Toluene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Tetrachloroethene	**0.019**	0.0050	mg/Kg	09/24/10 16:48
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Chlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Ethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-2 (18)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-06

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
O-Xylene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Styrene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Bromoform	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Bromobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
Naphthalene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:48
1,2-Dichloroethane-d4 (Surr)	109		% Recovery	09/24/10 16:48
4-Bromofluorobenzene (Surr)	97.4		% Recovery	09/24/10 16:48
Toluene - d8 (Surr)	99.0		% Recovery	09/24/10 16:48

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-2 (28)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-07

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Chloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Bromomethane	< 0.020	0.020	mg/Kg	09/24/10 16:10
Chloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Methylene Chloride	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Chloroform	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Bromochloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Benzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Trichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Dibromomethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Toluene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Tetrachloroethene	**0.015**	0.0050	mg/Kg	09/24/10 16:10
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Chlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Ethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-2 (28)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-07

Matrix : Soil Sample Date :09/20/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
O-Xylene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Styrene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Bromoform	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Bromobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
Naphthalene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 16:10
1,2-Dichloroethane-d4 (Surr)	106		% Recovery	09/24/10 16:10
4-Bromofluorobenzene (Surr)	99.7		% Recovery	09/24/10 16:10
Toluene - d8 (Surr)	100		% Recovery	09/24/10 16:10

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-2 (42)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-08

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Chloromethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Vinyl Chloride	< 0.040	0.040	mg/Kg	09/24/10 01:12
Bromomethane	< 0.80	0.80	mg/Kg	09/24/10 01:12
Chloroethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Trichlorofluoromethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,1-Dichloroethene	**0.062**	0.040	mg/Kg	09/24/10 01:12
Methylene Chloride	< 0.040	0.040	mg/Kg	09/24/10 01:12
trans-1,2-Dichloroethene	**0.049**	0.040	mg/Kg	09/24/10 01:12
1,1-Dichloroethane	**0.27**	0.040	mg/Kg	09/24/10 01:12
2,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 01:12
cis-1,2-Dichloroethene	**1.9**	0.040	mg/Kg	09/24/10 01:12
Chloroform	< 0.040	0.040	mg/Kg	09/24/10 01:12
Bromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,1,1-Trichloroethane	**0.30**	0.040	mg/Kg	09/24/10 01:12
1,1-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2-Dichloroethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Carbon Tetrachloride	< 0.040	0.040	mg/Kg	09/24/10 01:12
Benzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Trichloroethene	**4.7**	0.040	mg/Kg	09/24/10 01:12
1,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Bromodichloromethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Dibromomethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
cis-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Toluene	< 0.040	0.040	mg/Kg	09/24/10 01:12
trans-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,1,2-Trichloroethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,3-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Tetrachloroethene	**42**	0.40	mg/Kg	09/25/10 12:47
Dibromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2-Dibromoethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Chlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,1,1,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
Ethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-2 (42)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-08

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.040	0.040	mg/Kg	09/24/10 01:12
O-Xylene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Styrene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Isopropyl benzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Bromoform	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,1,2,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2,3-Trichloropropane	< 0.040	0.040	mg/Kg	09/24/10 01:12
n-Propylbenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Bromobenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,3,5-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
2+4-Chlorotoluene	< 0.070	0.070	mg/Kg	09/24/10 01:12
tert-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2,4-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
sec-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
p-Isopropyltoluene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,3-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,4-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
n-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2-Dibromo-3-chloropropane	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2,4-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Hexachlorobutadiene	< 0.040	0.040	mg/Kg	09/24/10 01:12
Naphthalene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2,3-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 01:12
1,2-Dichloroethane-d4 (Surr)	96.1		% Recovery	09/24/10 01:12
4-Bromofluorobenzene (Surr)	100		% Recovery	09/24/10 01:12
Toluene - d8 (Surr)	98.9		% Recovery	09/24/10 01:12

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-3 (9)**
Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**
Project Number : **E3WR-0028** Lab Number : 74661-09
Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Chloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Bromomethane	< 0.020	0.020	mg/Kg	09/25/10 11:11
Chloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Methylene Chloride	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Chloroform	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Bromochloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Benzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Trichloroethene	**0.0069**	0.0050	mg/Kg	09/25/10 11:11
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Dibromomethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Toluene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Tetrachloroethene	**1.8**	0.040	mg/Kg	09/28/10 01:36
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Chlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Ethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-3 (9)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-09

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
O-Xylene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Styrene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Bromoform	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Bromobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
Naphthalene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 11:11
1,2-Dichloroethane-d4 (Surr)	106		% Recovery	09/25/10 11:11
4-Bromofluorobenzene (Surr)	101		% Recovery	09/25/10 11:11
Toluene - d8 (Surr)	99.2		% Recovery	09/25/10 11:11

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-3 (18)**
Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**
Project Number : **E3WR-0028** Lab Number : 74661-10
Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Chloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Vinyl Chloride	< 0.040	0.040	mg/Kg	09/24/10 02:23
Bromomethane	< 1.0	1.0	mg/Kg	09/24/10 02:23
Chloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Trichlorofluoromethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,1-Dichloroethene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Methylene Chloride	< 0.040	0.040	mg/Kg	09/24/10 02:23
trans-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,1-Dichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
2,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:23
cis-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Chloroform	< 0.040	0.040	mg/Kg	09/24/10 02:23
Bromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,1,1-Trichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,1-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2-Dichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Carbon Tetrachloride	< 0.040	0.040	mg/Kg	09/24/10 02:23
Benzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Trichloroethene	**0.18**	0.040	mg/Kg	09/24/10 02:23
1,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Bromodichloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Dibromomethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
cis-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Toluene	< 0.040	0.040	mg/Kg	09/24/10 02:23
trans-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,1,2-Trichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,3-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Tetrachloroethene	**24**	0.40	mg/Kg	09/25/10 12:13
Dibromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2-Dibromoethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Chlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,1,1,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
Ethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-3 (18)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-10

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.040	0.040	mg/Kg	09/24/10 02:23
O-Xylene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Styrene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Isopropyl benzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Bromoform	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,1,2,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2,3-Trichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:23
n-Propylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Bromobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,3,5-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
2+4-Chlorotoluene	< 0.080	0.080	mg/Kg	09/24/10 02:23
tert-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2,4-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
sec-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
p-Isopropyltoluene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,3-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,4-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
n-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2-Dibromo-3-chloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2,4-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Hexachlorobutadiene	< 0.040	0.040	mg/Kg	09/24/10 02:23
Naphthalene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2,3-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:23
1,2-Dichloroethane-d4 (Surr)	101		% Recovery	09/24/10 02:23
4-Bromofluorobenzene (Surr)	99.2		% Recovery	09/24/10 02:23
Toluene - d8 (Surr)	99.1		% Recovery	09/24/10 02:23

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-3 (29)**
Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**
Project Number : **E3WR-0028** Lab Number : 74661-11
Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Chloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Vinyl Chloride	< 0.040	0.040	mg/Kg	09/24/10 02:57
Bromomethane	< 0.80	0.80	mg/Kg	09/24/10 02:57
Chloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Trichlorofluoromethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,1-Dichloroethene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Methylene Chloride	< 0.040	0.040	mg/Kg	09/24/10 02:57
trans-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,1-Dichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
2,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:57
cis-1,2-Dichloroethene	**0.23**	0.040	mg/Kg	09/24/10 02:57
Chloroform	< 0.040	0.040	mg/Kg	09/24/10 02:57
Bromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,1,1-Trichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,1-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2-Dichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Carbon Tetrachloride	< 0.040	0.040	mg/Kg	09/24/10 02:57
Benzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Trichloroethene	**0.72**	0.040	mg/Kg	09/24/10 02:57
1,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Bromodichloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Dibromomethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
cis-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Toluene	< 0.040	0.040	mg/Kg	09/24/10 02:57
trans-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,1,2-Trichloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,3-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Tetrachloroethene	**34**	0.40	mg/Kg	09/25/10 11:39
Dibromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2-Dibromoethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Chlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,1,1,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
Ethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-3 (29)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-11

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.040	0.040	mg/Kg	09/24/10 02:57
O-Xylene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Styrene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Isopropyl benzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Bromoform	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,1,2,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2,3-Trichloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:57
n-Propylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Bromobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,3,5-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
2+4-Chlorotoluene	< 0.070	0.070	mg/Kg	09/24/10 02:57
tert-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2,4-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
sec-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
p-Isopropyltoluene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,3-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,4-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
n-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2-Dibromo-3-chloropropane	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2,4-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Hexachlorobutadiene	< 0.040	0.040	mg/Kg	09/24/10 02:57
Naphthalene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2,3-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 02:57
1,2-Dichloroethane-d4 (Surr)	93.9		% Recovery	09/24/10 02:57
4-Bromofluorobenzene (Surr)	98.8		% Recovery	09/24/10 02:57
Toluene - d8 (Surr)	98.6		% Recovery	09/24/10 02:57

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-4 (18)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-12

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Chloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Bromomethane	< 0.020	0.020	mg/Kg	09/25/10 02:26
Chloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Methylene Chloride	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Chloroform	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Bromochloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Benzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Trichloroethene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Dibromomethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Toluene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Tetrachloroethene	**2.0**	0.025	mg/Kg	09/27/10 23:12
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Chlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Ethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-4 (18)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-12

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
O-Xylene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Styrene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Bromoform	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Bromobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
Naphthalene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/25/10 02:26
1,2-Dichloroethane-d4 (Surr)	108		% Recovery	09/25/10 02:26
4-Bromofluorobenzene (Surr)	101		% Recovery	09/25/10 02:26
Toluene - d8 (Surr)	98.8		% Recovery	09/25/10 02:26

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-4 (28)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-13

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Chloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Bromomethane	< 0.020	0.020	mg/Kg	09/24/10 17:24
Chloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Methylene Chloride	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Chloroform	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Bromochloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Benzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Trichloroethene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Dibromomethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Toluene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Tetrachloroethene	**0.080**	0.0050	mg/Kg	09/24/10 17:24
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Chlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Ethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24

KIFF Analytical LLC

Report Number : 74661

Date : 10/14/2010

Sample : **CB-4 (28)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-13

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
O-Xylene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Styrene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Bromoform	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Bromobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
Naphthalene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	09/24/10 17:24
1,2-Dichloroethane-d4 (Surr)	109		% Recovery	09/24/10 17:24
4-Bromofluorobenzene (Surr)	101		% Recovery	09/24/10 17:24
Toluene - d8 (Surr)	99.8		% Recovery	09/24/10 17:24

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-4 (38.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-14

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Dichlorodifluoromethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Chloromethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Vinyl Chloride	< 0.040	0.040	mg/Kg	09/24/10 04:46
Bromomethane	< 0.80	0.80	mg/Kg	09/24/10 04:46
Chloroethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Trichlorofluoromethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,1-Dichloroethene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Methylene Chloride	< 0.040	0.040	mg/Kg	09/24/10 04:46
trans-1,2-Dichloroethene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,1-Dichloroethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
2,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 04:46
cis-1,2-Dichloroethene	**1.3**	0.040	mg/Kg	09/24/10 04:46
Chloroform	< 0.040	0.040	mg/Kg	09/24/10 04:46
Bromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,1,1-Trichloroethane	**0.12**	0.040	mg/Kg	09/24/10 04:46
1,1-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2-Dichloroethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Carbon Tetrachloride	< 0.040	0.040	mg/Kg	09/24/10 04:46
Benzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Trichloroethene	**2.0**	0.040	mg/Kg	09/24/10 04:46
1,2-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Bromodichloromethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Dibromomethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
cis-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Toluene	< 0.040	0.040	mg/Kg	09/24/10 04:46
trans-1,3-Dichloropropene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,1,2-Trichloroethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,3-Dichloropropane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Tetrachloroethene	**26**	0.080	mg/Kg	09/28/10 10:36
Dibromochloromethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2-Dibromoethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Chlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,1,1,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
Ethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46

KIFF Analytical LLC

Report Number : 74661
Date : 10/14/2010

Sample : **CB-4 (38.5)**

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028** Lab Number : 74661-14

Matrix : Soil Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
P,M-Xylene	< 0.040	0.040	mg/Kg	09/24/10 04:46
O-Xylene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Styrene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Isopropyl benzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Bromoform	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,1,2,2-Tetrachloroethane	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2,3-Trichloropropane	< 0.040	0.040	mg/Kg	09/24/10 04:46
n-Propylbenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Bromobenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,3,5-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
2+4-Chlorotoluene	< 0.080	0.080	mg/Kg	09/24/10 04:46
tert-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2,4-Trimethylbenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
sec-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
p-Isopropyltoluene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,3-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,4-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
n-Butylbenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2-Dichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2-Dibromo-3-chloropropane	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2,4-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Hexachlorobutadiene	< 0.040	0.040	mg/Kg	09/24/10 04:46
Naphthalene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2,3-Trichlorobenzene	< 0.040	0.040	mg/Kg	09/24/10 04:46
1,2-Dichloroethane-d4 (Surr)	97.3		% Recovery	09/24/10 04:46
4-Bromofluorobenzene (Surr)	99.1		% Recovery	09/24/10 04:46
Toluene - d8 (Surr)	99.1		% Recovery	09/24/10 04:46

Report Number : 74661

QC Report : Method Blank Data

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Chloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Bromomethane	< 0.020	0.020	mg/Kg	EPA 8260B	09/23/2010
Chloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Methylene Chloride	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Chloroform	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Bromochloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Trichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Dibromomethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Chlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
P,M-Xylene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
O-Xylene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Styrene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Bromoform	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Bromobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
Naphthalene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/23/2010
1,2-Dichloroethane-d4 (Surr)	105		%	EPA 8260B	09/23/2010
4-Bromofluorobenzene (Surr)	100		%	EPA 8260B	09/23/2010
Toluene - d8 (Surr)	99.1		%	EPA 8260B	09/23/2010

Report Number : 74661

QC Report : Method Blank Data

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Dichlorodifluoromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Chloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Vinyl Chloride	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Bromomethane	< 0.020	0.020	mg/Kg	EPA 8260B	09/24/2010
Chloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Trichlorofluoromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,1-Dichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Methylene Chloride	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
trans-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,1-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
2,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
cis-1,2-Dichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Chloroform	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Bromochloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,1,1-Trichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,1-Dichloropropene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2-Dichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Carbon Tetrachloride	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Trichloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2-Dichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Bromodichloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Dibromomethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
cis-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
trans-1,3-Dichloropropene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,1,2-Trichloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,3-Dichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Tetrachloroethene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Dibromochloromethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2-Dibromoethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Chlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,1,1,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
P,M-Xylene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
O-Xylene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Styrene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Isopropyl benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Bromoform	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,1,2,2-Tetrachloroethane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2,3-Trichloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
n-Propylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Bromobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,3,5-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
2+4-Chlorotoluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
tert-Butylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2,4-Trimethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
sec-Butylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
p-Isopropyltoluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,3-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,4-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
n-Butylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2-Dichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2-Dibromo-3-chloropropane	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2,4-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Hexachlorobutadiene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
Naphthalene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2,3-Trichlorobenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	09/24/2010
1,2-Dichloroethane-d4 (Surr)	102		%	EPA 8260B	09/24/2010
4-Bromofluorobenzene (Surr)	97.2		%	EPA 8260B	09/24/2010
Toluene - d8 (Surr)	99.0		%	EPA 8260B	09/24/2010

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,1,1,2-Tetrachloroethane														
	74557-20	<0.0050	0.0399	0.0391	0.0357	0.0348	mg/Kg	EPA 8260B	9/23/10	89.4	88.9	0.534	70.0-130	25
1,1,1-Trichloroethane														
	74557-20	<0.0050	0.0399	0.0391	0.0360	0.0350	mg/Kg	EPA 8260B	9/23/10	90.3	89.5	0.913	70.0-130	25
1,1,2,2-Tetrachloroethane														
	74557-20	<0.0050	0.0399	0.0391	0.0369	0.0368	mg/Kg	EPA 8260B	9/23/10	92.5	94.2	1.80	60.7-133	25
1,1,2-Trichloroethane														
	74557-20	<0.0050	0.0399	0.0391	0.0347	0.0342	mg/Kg	EPA 8260B	9/23/10	86.9	87.5	0.698	70.0-130	25
1,1-Dichloroethane														
	74557-20	<0.0050	0.0399	0.0391	0.0349	0.0341	mg/Kg	EPA 8260B	9/23/10	87.5	87.1	0.460	66.1-120	25
1,1-Dichloroethene														
	74557-20	<0.0050	0.0399	0.0391	0.0335	0.0327	mg/Kg	EPA 8260B	9/23/10	83.9	83.4	0.514	65.9-122	25
1,1-Dichloropropene														
	74557-20	<0.0050	0.0399	0.0391	0.0347	0.0337	mg/Kg	EPA 8260B	9/23/10	87.0	86.1	1.12	70.0-130	25
1,2,3-Trichlorobenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0235	0.0227	mg/Kg	EPA 8260B	9/23/10	**58.8**	**57.9**	1.44	70.0-130	25
1,2,3-Trichloropropane														
	74557-20	<0.0050	0.0399	0.0391	0.0354	0.0356	mg/Kg	EPA 8260B	9/23/10	88.6	91.0	2.68	70.0-130	25
1,2,4-Trichlorobenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0232	0.0226	mg/Kg	EPA 8260B	9/23/10	**58.1**	**57.8**	0.616	70.0-130	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2,4-Trimethylbenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0321	0.0314	mg/Kg	EPA 8260B	9/23/10	80.4	80.1	0.413	70.0-130	25
1,2-Dibromoethane														
	74557-20	<0.0050	0.0399	0.0391	0.0357	0.0351	mg/Kg	EPA 8260B	9/23/10	89.5	89.7	0.258	67.2-121	25
1,2-Dichlorobenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0282	0.0275	mg/Kg	EPA 8260B	9/23/10	70.7	70.3	0.581	56.3-123	25
1,2-Dichloroethane														
	74557-20	<0.0050	0.0399	0.0391	0.0368	0.0359	mg/Kg	EPA 8260B	9/23/10	92.1	91.7	0.463	64.0-124	25
1,2-Dichloropropane														
	74557-20	<0.0050	0.0399	0.0391	0.0339	0.0334	mg/Kg	EPA 8260B	9/23/10	85.0	85.4	0.496	66.6-120	25
1,2-dibromo-3-chloropropane														
	74557-20	<0.0050	0.0399	0.0391	0.0329	0.0345	mg/Kg	EPA 8260B	9/23/10	82.5	88.0	6.48	59.4-138	25
1,3,5-Trimethylbenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0322	0.0313	mg/Kg	EPA 8260B	9/23/10	80.6	80.0	0.793	70.0-130	25
1,3-Dichlorobenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0299	0.0295	mg/Kg	EPA 8260B	9/23/10	74.8	75.3	0.605	52.5-132	25
1,3-Dichloropropane														
	74557-20	<0.0050	0.0399	0.0391	0.0349	0.0345	mg/Kg	EPA 8260B	9/23/10	87.4	88.1	0.742	70.0-130	25
1,4-Dichlorobenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0281	0.0275	mg/Kg	EPA 8260B	9/23/10	70.4	70.2	0.281	57.0-123	25

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QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
2+4-Chlorotoluene														
	74557-20	<0.0050	0.0798	0.0783	0.0611	0.0600	mg/Kg	EPA 8260B	9/23/10	76.5	76.6	0.107	70.0-130	25
2,2-Dichloropropane														
	74557-20	<0.0050	0.0399	0.0391	0.0357	0.0345	mg/Kg	EPA 8260B	9/23/10	89.5	88.1	1.58	70.0-130	25
Benzene														
	74557-20	<0.0050	0.0399	0.0391	0.0348	0.0341	mg/Kg	EPA 8260B	9/23/10	87.3	87.2	0.130	67.9-120	25
Bromobenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0317	0.0312	mg/Kg	EPA 8260B	9/23/10	79.5	79.6	0.129	70.0-130	25
Bromochloromethane														
	74557-20	<0.0050	0.0399	0.0391	0.0353	0.0343	mg/Kg	EPA 8260B	9/23/10	88.5	87.7	0.871	70.0-130	25
Bromodichloromethane														
	74557-20	<0.0050	0.0399	0.0391	0.0359	0.0355	mg/Kg	EPA 8260B	9/23/10	90.0	90.8	0.932	70.0-130	25
Bromoform														
	74557-20	<0.0050	0.0399	0.0391	0.0371	0.0371	mg/Kg	EPA 8260B	9/23/10	92.8	94.9	2.18	58.2-146	25
Bromomethane														
	74557-20	<0.020	0.200	0.196	0.170	0.174	mg/Kg	EPA 8260B	9/23/10	85.0	89.2	4.81	45.5-139	25
Carbon Tetrachloride														
	74557-20	<0.0050	0.0399	0.0391	0.0364	0.0358	mg/Kg	EPA 8260B	9/23/10	91.2	91.5	0.418	70.0-130	25
Chlorobenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0325	0.0318	mg/Kg	EPA 8260B	9/23/10	81.4	81.2	0.232	63.4-122	25

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Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Chloroethane	74557-20	<0.0050	0.0399	0.0391	0.0389	0.0379	mg/Kg	EPA 8260B	9/23/10	97.6	96.7	0.834	70.0-130	25
Chloroform	74557-20	<0.0050	0.0399	0.0391	0.0354	0.0346	mg/Kg	EPA 8260B	9/23/10	88.6	88.5	0.132	67.4-121	25
Chloromethane	74557-20	<0.0050	0.0399	0.0391	0.0354	0.0333	mg/Kg	EPA 8260B	9/23/10	88.7	85.0	4.26	47.9-127	25
Dibromochloromethane	74557-20	<0.0050	0.0399	0.0391	0.0362	0.0355	mg/Kg	EPA 8260B	9/23/10	90.6	90.8	0.196	70.0-130	25
Dibromomethane	74557-20	<0.0050	0.0399	0.0391	0.0368	0.0360	mg/Kg	EPA 8260B	9/23/10	92.1	92.0	0.152	70.0-130	25
Dichlorodifluoromethane	74557-20	<0.0050	0.0399	0.0391	0.0289	0.0283	mg/Kg	EPA 8260B	9/23/10	72.3	72.3	0.0443	40.5-144	25
Ethylbenzene	74557-20	<0.0050	0.0399	0.0391	0.0357	0.0349	mg/Kg	EPA 8260B	9/23/10	89.4	89.2	0.180	65.5-127	25
Hexachlorobutadiene	74557-20	<0.0050	0.0399	0.0391	0.0249	0.0249	mg/Kg	EPA 8260B	9/23/10	**62.3**	**63.6**	2.01	70.0-130	25
Isopropyl benzene	74557-20	<0.0050	0.0399	0.0391	0.0326	0.0320	mg/Kg	EPA 8260B	9/23/10	81.8	81.7	0.119	70.0-130	25
Methylene Chloride	74557-20	<0.0050	0.0399	0.0391	0.0340	0.0334	mg/Kg	EPA 8260B	9/23/10	85.2	85.2	0.0252	70.0-130	25

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Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Naphthalene														
	74557-20	<0.0050	0.0399	0.0391	0.0247	0.0244	mg/Kg	EPA 8260B	9/23/10	**61.9**	**62.4**	0.903	70.0-130	25
O-Xylene														
	74557-20	<0.0050	0.0399	0.0391	0.0346	0.0340	mg/Kg	EPA 8260B	9/23/10	86.6	86.8	0.238	62.3-124	25
P + M Xylene														
	74557-20	<0.0050	0.0399	0.0391	0.0335	0.0330	mg/Kg	EPA 8260B	9/23/10	83.9	84.4	0.524	62.5-124	25
Styrene														
	74557-20	<0.0050	0.0399	0.0391	0.0322	0.0316	mg/Kg	EPA 8260B	9/23/10	80.8	80.8	0.0317	70.0-130	25
Toluene														
	74557-20	<0.0050	0.0399	0.0391	0.0347	0.0340	mg/Kg	EPA 8260B	9/23/10	87.0	86.9	0.0929	65.7-120	25
Trichloroethene														
	74557-20	<0.0050	0.0399	0.0391	0.0320	0.0314	mg/Kg	EPA 8260B	9/23/10	80.2	80.4	0.215	63.9-121	25
Trichlorofluoromethane														
	74557-20	<0.0050	0.0399	0.0391	0.0340	0.0333	mg/Kg	EPA 8260B	9/23/10	85.2	85.2	0.0225	70.0-130	25
Vinyl Chloride														
	74557-20	<0.0050	0.0399	0.0391	0.0326	0.0318	mg/Kg	EPA 8260B	9/23/10	81.7	81.3	0.482	45.9-127	25
c-1,3-Dichloropropene														
	74557-20	<0.0050	0.0399	0.0391	0.0342	0.0333	mg/Kg	EPA 8260B	9/23/10	85.6	85.2	0.529	70.0-130	25
cis-1,2-Dichloroethene														
	74557-20	<0.0050	0.0399	0.0391	0.0342	0.0336	mg/Kg	EPA 8260B	9/23/10	85.6	85.8	0.186	70.0-130	25

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n-butylbenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0280	0.0277	mg/Kg	EPA 8260B	9/23/10	70.2	70.9	0.974	70.0-130	25
n-propylbenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0319	0.0308	mg/Kg	EPA 8260B	9/23/10	79.8	78.8	1.25	70.0-130	25
p-isopropyltoluene														
	74557-20	<0.0050	0.0399	0.0391	0.0313	0.0304	mg/Kg	EPA 8260B	9/23/10	78.3	77.6	0.947	70.0-130	25
sec-butylbenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0317	0.0312	mg/Kg	EPA 8260B	9/23/10	79.3	79.7	0.503	70.0-130	25
t-1,2-Dichloroethene														
	74557-20	<0.0050	0.0399	0.0391	0.0338	0.0333	mg/Kg	EPA 8260B	9/23/10	84.6	85.2	0.684	70.0-130	25
t-1,3-Dichloropropene														
	74557-20	<0.0050	0.0399	0.0391	0.0350	0.0340	mg/Kg	EPA 8260B	9/23/10	87.6	86.8	0.846	70.0-130	25
tert-butylbenzene														
	74557-20	<0.0050	0.0399	0.0391	0.0320	0.0314	mg/Kg	EPA 8260B	9/23/10	80.1	80.2	0.0754	70.0-130	25
1,1,1,2-Tetrachloroethane														
	74557-07	<0.0050	0.0401	0.0394	0.0284	0.0265	mg/Kg	EPA 8260B	9/24/10	71.0	**67.1**	5.57	70.0-130	25
1,1,1-Trichloroethane														
	74557-07	<0.0050	0.0401	0.0394	0.0337	0.0322	mg/Kg	EPA 8260B	9/24/10	84.2	81.7	3.03	70.0-130	25

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1,1,2,2-Tetrachloroethane														
	74557-07	<0.0050	0.0401	0.0394	0.0314	0.0295	mg/Kg	EPA 8260B	9/24/10	78.4	74.7	4.75	60.7-133	25
1,1,2-Trichloroethane														
	74557-07	<0.0050	0.0401	0.0394	0.0321	0.0302	mg/Kg	EPA 8260B	9/24/10	80.1	76.5	4.63	70.0-130	25
1,1-Dichloroethane														
	74557-07	<0.0050	0.0401	0.0394	0.0336	0.0315	mg/Kg	EPA 8260B	9/24/10	83.7	79.9	4.70	66.1-120	25
1,1-Dichloroethene														
	74557-07	<0.0050	0.0401	0.0394	0.0364	0.0345	mg/Kg	EPA 8260B	9/24/10	90.8	87.6	3.66	65.9-122	25
1,1-Dichloropropene														
	74557-07	<0.0050	0.0401	0.0394	0.0332	0.0317	mg/Kg	EPA 8260B	9/24/10	82.8	80.4	2.95	70.0-130	25
1,2,3-Trichlorobenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0101	0.00884	mg/Kg	EPA 8260B	9/24/10	**25.2**	**22.4**	11.7	70.0-130	25
1,2,3-Trichloropropane														
	74557-07	<0.0050	0.0401	0.0394	0.0327	0.0311	mg/Kg	EPA 8260B	9/24/10	81.6	78.9	3.27	70.0-130	25
1,2,4-Trichlorobenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0105	0.00920	mg/Kg	EPA 8260B	9/24/10	**26.3**	**23.3**	11.9	70.0-130	25
1,2,4-Trimethylbenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0237	0.0223	mg/Kg	EPA 8260B	9/24/10	**59.2**	**56.5**	4.74	70.0-130	25
1,2-Dibromoethane														
	74557-07	<0.0050	0.0401	0.0394	0.0287	0.0274	mg/Kg	EPA 8260B	9/24/10	71.7	69.4	3.30	67.2-121	25

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Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,2-Dichlorobenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0172	0.0154	mg/Kg	EPA 8260B	9/24/10	**43.0**	**39.0**	9.72	56.3-123	25
1,2-Dichloroethane														
	74557-07	<0.0050	0.0401	0.0394	0.0325	0.0309	mg/Kg	EPA 8260B	9/24/10	81.1	78.4	3.48	64.0-124	25
1,2-Dichloropropane														
	74557-07	<0.0050	0.0401	0.0394	0.0318	0.0298	mg/Kg	EPA 8260B	9/24/10	79.3	75.6	4.77	66.6-120	25
1,2-dibromo-3-chloropropane														
	74557-07	<0.0050	0.0401	0.0394	0.0294	0.0279	mg/Kg	EPA 8260B	9/24/10	73.3	70.6	3.68	59.4-138	25
1,3,5-Trimethylbenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0234	0.0220	mg/Kg	EPA 8260B	9/24/10	**58.4**	**55.9**	4.41	70.0-130	25
1,3-Dichlorobenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0178	0.0166	mg/Kg	EPA 8260B	9/24/10	**44.4**	**42.0**	5.72	52.5-132	25
1,3-Dichloropropane														
	74557-07	<0.0050	0.0401	0.0394	0.0313	0.0297	mg/Kg	EPA 8260B	9/24/10	78.0	75.3	3.62	70.0-130	25
1,4-Dichlorobenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0176	0.0156	mg/Kg	EPA 8260B	9/24/10	**44.0**	**39.7**	10.3	57.0-123	25
2+4-Chlorotoluene														
	74557-07	<0.0050	0.0802	0.0789	0.0426	0.0395	mg/Kg	EPA 8260B	9/24/10	**53.1**	**50.1**	5.85	70.0-130	25
2,2-Dichloropropane														
	74557-07	<0.0050	0.0401	0.0394	0.0336	0.0318	mg/Kg	EPA 8260B	9/24/10	83.8	80.7	3.72	70.0-130	25

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Benzene														
	74557-07	<0.0050	0.0401	0.0394	0.0320	0.0301	mg/Kg	EPA 8260B	9/24/10	79.7	76.3	4.45	67.9-120	25
Bromobenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0217	0.0203	mg/Kg	EPA 8260B	9/24/10	**54.2**	**51.5**	5.02	70.0-130	25
Bromochloromethane														
	74557-07	<0.0050	0.0401	0.0394	0.0323	0.0303	mg/Kg	EPA 8260B	9/24/10	80.7	76.8	4.90	70.0-130	25
Bromodichloromethane														
	74557-07	<0.0050	0.0401	0.0394	0.0306	0.0289	mg/Kg	EPA 8260B	9/24/10	76.5	73.3	4.18	70.0-130	25
Bromoform														
	74557-07	<0.0050	0.0401	0.0394	0.0311	0.0295	mg/Kg	EPA 8260B	9/24/10	77.5	74.7	3.64	58.2-146	25
Bromomethane														
	74557-07	<0.020	0.200	0.197	0.166	0.168	mg/Kg	EPA 8260B	9/24/10	82.8	85.0	2.58	45.5-139	25
Carbon Tetrachloride														
	74557-07	<0.0050	0.0401	0.0394	0.0337	0.0323	mg/Kg	EPA 8260B	9/24/10	84.1	81.9	2.66	70.0-130	25
Chlorobenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0257	0.0241	mg/Kg	EPA 8260B	9/24/10	64.2	**61.1**	4.90	63.4-122	25
Chloroethane														
	74557-07	<0.0050	0.0401	0.0394	0.0344	0.0311	mg/Kg	EPA 8260B	9/24/10	85.9	78.8	8.53	70.0-130	25
Chloroform														
	74557-07	<0.0050	0.0401	0.0394	0.0318	0.0301	mg/Kg	EPA 8260B	9/24/10	79.5	76.2	4.18	67.4-121	25

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Chloromethane														
	74557-07	<0.0050	0.0401	0.0394	0.0378	0.0351	mg/Kg	EPA 8260B	9/24/10	94.4	89.1	5.78	47.9-127	25
Dibromochloromethane														
	74557-07	<0.0050	0.0401	0.0394	0.0302	0.0283	mg/Kg	EPA 8260B	9/24/10	75.4	71.7	4.94	70.0-130	25
Dibromomethane														
	74557-07	<0.0050	0.0401	0.0394	0.0337	0.0314	mg/Kg	EPA 8260B	9/24/10	84.2	79.7	5.38	70.0-130	25
Dichlorodifluoromethane														
	74557-07	<0.0050	0.0401	0.0394	0.0325	0.0315	mg/Kg	EPA 8260B	9/24/10	81.0	79.8	1.50	40.5-144	25
Ethylbenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0281	0.0267	mg/Kg	EPA 8260B	9/24/10	70.1	67.8	3.35	65.5-127	25
Hexachlorobutadiene														
	74557-07	<0.0050	0.0401	0.0394	0.0144	0.0130	mg/Kg	EPA 8260B	9/24/10	**36.1**	**32.9**	9.31	70.0-130	25
Isopropyl benzene														
	74557-07	<0.0050	0.0401	0.0394	0.0260	0.0246	mg/Kg	EPA 8260B	9/24/10	**65.0**	**62.5**	3.91	70.0-130	25
Methylene Chloride														
	74557-07	<0.0050	0.0401	0.0394	0.0338	0.0315	mg/Kg	EPA 8260B	9/24/10	84.4	79.8	5.61	70.0-130	25
Naphthalene														
	74557-07	<0.0050	0.0401	0.0394	0.0157	0.0144	mg/Kg	EPA 8260B	9/24/10	**39.2**	**36.5**	7.11	70.0-130	25
O-Xylene														
	74557-07	<0.0050	0.0401	0.0394	0.0267	0.0254	mg/Kg	EPA 8260B	9/24/10	66.6	64.3	3.54	62.3-124	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
P + M Xylene														
	74557-07	<0.0050	0.0401	0.0394	0.0274	0.0262	mg/Kg	EPA 8260B	9/24/10	68.3	66.4	2.77	62.5-124	25
Styrene														
	74557-07	<0.0050	0.0401	0.0394	0.0255	0.0237	mg/Kg	EPA 8260B	9/24/10	**63.6**	**60.1**	5.59	70.0-130	25
Tetrachloroethene														
	74557-07	0.0082	0.0401	0.0394	0.0396	0.0377	mg/Kg	EPA 8260B	9/24/10	78.4	74.8	4.78	64.7-122	25
Toluene														
	74557-07	<0.0050	0.0401	0.0394	0.0310	0.0290	mg/Kg	EPA 8260B	9/24/10	77.2	73.4	5.09	65.7-120	25
Trichloroethene														
	74557-07	<0.0050	0.0401	0.0394	0.0320	0.0301	mg/Kg	EPA 8260B	9/24/10	79.8	76.4	4.28	63.9-121	25
Trichlorofluoromethane														
	74557-07	<0.0050	0.0401	0.0394	0.0345	0.0330	mg/Kg	EPA 8260B	9/24/10	86.2	83.5	3.10	70.0-130	25
Vinyl Chloride														
	74557-07	<0.0050	0.0401	0.0394	0.0351	0.0338	mg/Kg	EPA 8260B	9/24/10	87.7	85.6	2.41	45.9-127	25
c-1,3-Dichloropropene														
	74557-07	<0.0050	0.0401	0.0394	0.0288	0.0266	mg/Kg	EPA 8260B	9/24/10	72.0	**67.4**	6.53	70.0-130	25
cis-1,2-Dichloroethene														
	74557-07	<0.0050	0.0401	0.0394	0.0329	0.0309	mg/Kg	EPA 8260B	9/24/10	82.2	78.3	4.77	70.0-130	25
n-butylbenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0196	0.0181	mg/Kg	EPA 8260B	9/24/10	**48.9**	**46.0**	6.18	70.0-130	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
n-propylbenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0249	0.0238	mg/Kg	EPA 8260B	9/24/10	**62.0**	**60.3**	2.86	70.0-130	25
p-isopropyltoluene														
	74557-07	<0.0050	0.0401	0.0394	0.0220	0.0209	mg/Kg	EPA 8260B	9/24/10	**55.0**	**52.9**	3.74	70.0-130	25
sec-butylbenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0235	0.0224	mg/Kg	EPA 8260B	9/24/10	**58.6**	**56.9**	2.88	70.0-130	25
t-1,2-Dichloroethene														
	74557-07	<0.0050	0.0401	0.0394	0.0346	0.0328	mg/Kg	EPA 8260B	9/24/10	86.3	83.2	3.68	70.0-130	25
t-1,3-Dichloropropene														
	74557-07	<0.0050	0.0401	0.0394	0.0294	0.0275	mg/Kg	EPA 8260B	9/24/10	73.3	**69.7**	5.02	70.0-130	25
tert-butylbenzene														
	74557-07	<0.0050	0.0401	0.0394	0.0241	0.0228	mg/Kg	EPA 8260B	9/24/10	**60.1**	**57.8**	3.89	70.0-130	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,1,1,2-Tetrachloroethane	0.0391	mg/Kg	EPA 8260B	9/23/10	97.3	70.0-130
1,1,1-Trichloroethane	0.0391	mg/Kg	EPA 8260B	9/23/10	94.0	70.0-130
1,1,2,2-Tetrachloroethane	0.0391	mg/Kg	EPA 8260B	9/23/10	105	60.7-133
1,1,2-Trichloroethane	0.0391	mg/Kg	EPA 8260B	9/23/10	94.7	70.0-130
1,1-Dichloroethane	0.0391	mg/Kg	EPA 8260B	9/23/10	91.0	66.1-120
1,1-Dichloroethene	0.0391	mg/Kg	EPA 8260B	9/23/10	86.6	65.9-122
1,1-Dichloropropene	0.0391	mg/Kg	EPA 8260B	9/23/10	91.0	70.0-130
1,2,3-Trichlorobenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	90.3	70.0-130
1,2,3-Trichloropropane	0.0391	mg/Kg	EPA 8260B	9/23/10	98.8	70.0-130
1,2,4-Trichlorobenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	88.6	70.0-130
1,2,4-Trimethylbenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	94.7	70.0-130
1,2-Dibromoethane	0.0391	mg/Kg	EPA 8260B	9/23/10	98.5	67.2-121
1,2-Dichlorobenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	90.6	56.3-123
1,2-Dichloroethane	0.0391	mg/Kg	EPA 8260B	9/23/10	99.9	64.0-124
1,2-Dichloropropane	0.0391	mg/Kg	EPA 8260B	9/23/10	90.9	66.6-120
1,2-dibromo-3-chloropropane	0.0391	mg/Kg	EPA 8260B	9/23/10	99.8	59.4-138
1,3,5-Trimethylbenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	92.1	70.0-130
1,3-Dichlorobenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	94.7	52.5-132
1,3-Dichloropropane	0.0391	mg/Kg	EPA 8260B	9/23/10	95.7	70.0-130
1,4-Dichlorobenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	89.4	57.0-123
2+4-Chlorotoluene	0.0783	mg/Kg	EPA 8260B	9/23/10	91.9	70.0-130
2,2-Dichloropropane	0.0391	mg/Kg	EPA 8260B	9/23/10	94.7	70.0-130
Benzene	0.0391	mg/Kg	EPA 8260B	9/23/10	92.8	67.9-120

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2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Date : 10/14/2010

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Bromobenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	94.2	70.0-130
Bromochloromethane	0.0391	mg/Kg	EPA 8260B	9/23/10	93.7	70.0-130
Bromodichloromethane	0.0391	mg/Kg	EPA 8260B	9/23/10	96.5	70.0-130
Bromoform	0.0391	mg/Kg	EPA 8260B	9/23/10	104	58.2-146
Bromomethane	0.196	mg/Kg	EPA 8260B	9/23/10	83.8	45.5-139
Carbon Tetrachloride	0.0391	mg/Kg	EPA 8260B	9/23/10	96.3	70.0-130
Chlorobenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	91.7	63.4-122
Chloroethane	0.0391	mg/Kg	EPA 8260B	9/23/10	100	70.0-130
Chloroform	0.0391	mg/Kg	EPA 8260B	9/23/10	93.6	67.4-121
Chloromethane	0.0391	mg/Kg	EPA 8260B	9/23/10	95.2	47.9-127
Dibromochloromethane	0.0391	mg/Kg	EPA 8260B	9/23/10	99.5	70.0-130
Dibromomethane	0.0391	mg/Kg	EPA 8260B	9/23/10	100	70.0-130
Dichlorodifluoromethane	0.0391	mg/Kg	EPA 8260B	9/23/10	74.3	40.5-144
Ethylbenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	98.0	65.5-127
Hexachlorobutadiene	0.0391	mg/Kg	EPA 8260B	9/23/10	90.0	70.0-130
Isopropyl benzene	0.0391	mg/Kg	EPA 8260B	9/23/10	92.2	70.0-130
Methylene Chloride	0.0391	mg/Kg	EPA 8260B	9/23/10	90.4	70.0-130
Naphthalene	0.0391	mg/Kg	EPA 8260B	9/23/10	93.5	70.0-130
O-Xylene	0.0391	mg/Kg	EPA 8260B	9/23/10	95.9	62.3-124
P + M Xylene	0.0391	mg/Kg	EPA 8260B	9/23/10	94.2	62.5-124
Styrene	0.0391	mg/Kg	EPA 8260B	9/23/10	95.9	70.0-130
Toluene	0.0391	mg/Kg	EPA 8260B	9/23/10	93.8	65.7-120
Trichloroethene	0.0391	mg/Kg	EPA 8260B	9/23/10	86.4	63.9-121

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QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Trichlorofluoromethane	0.0391	mg/Kg	EPA 8260B	9/23/10	89.4	70.0-130
Vinyl Chloride	0.0391	mg/Kg	EPA 8260B	9/23/10	84.3	45.9-127
c-1,3-Dichloropropene	0.0391	mg/Kg	EPA 8260B	9/23/10	93.8	70.0-130
cis-1,2-Dichloroethene	0.0391	mg/Kg	EPA 8260B	9/23/10	92.1	70.0-130
n-butylbenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	89.6	70.0-130
n-propylbenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	91.5	70.0-130
p-isopropyltoluene	0.0391	mg/Kg	EPA 8260B	9/23/10	92.6	70.0-130
sec-butylbenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	93.8	70.0-130
t-1,2-Dichloroethene	0.0391	mg/Kg	EPA 8260B	9/23/10	89.1	70.0-130
t-1,3-Dichloropropene	0.0391	mg/Kg	EPA 8260B	9/23/10	97.0	70.0-130
tert-butylbenzene	0.0391	mg/Kg	EPA 8260B	9/23/10	92.5	70.0-130
1,1,1,2-Tetrachloroethane	0.0400	mg/Kg	EPA 8260B	9/24/10	95.0	70.0-130
1,1,1-Trichloroethane	0.0400	mg/Kg	EPA 8260B	9/24/10	91.3	70.0-130
1,1,2,2-Tetrachloroethane	0.0400	mg/Kg	EPA 8260B	9/24/10	103	60.7-133
1,1,2-Trichloroethane	0.0400	mg/Kg	EPA 8260B	9/24/10	96.0	70.0-130
1,1-Dichloroethane	0.0400	mg/Kg	EPA 8260B	9/24/10	91.3	66.1-120
1,1-Dichloroethene	0.0400	mg/Kg	EPA 8260B	9/24/10	94.2	65.9-122
1,1-Dichloropropene	0.0400	mg/Kg	EPA 8260B	9/24/10	90.5	70.0-130
1,2,3-Trichlorobenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	89.1	70.0-130
1,2,3-Trichloropropane	0.0400	mg/Kg	EPA 8260B	9/24/10	98.8	70.0-130
1,2,4-Trichlorobenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	88.0	70.0-130
1,2,4-Trimethylbenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	95.2	70.0-130

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2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,2-Dibromoethane	0.0400	mg/Kg	EPA 8260B	9/24/10	87.4	67.2-121
1,2-Dichlorobenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	90.7	56.3-123
1,2-Dichloroethane	0.0400	mg/Kg	EPA 8260B	9/24/10	91.8	64.0-124
1,2-Dichloropropane	0.0400	mg/Kg	EPA 8260B	9/24/10	92.6	66.6-120
1,2-dibromo-3-chloropropane	0.0400	mg/Kg	EPA 8260B	9/24/10	100	59.4-138
1,3,5-Trimethylbenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	94.9	70.0-130
1,3-Dichlorobenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	95.0	52.5-132
1,3-Dichloropropane	0.0400	mg/Kg	EPA 8260B	9/24/10	93.4	70.0-130
1,4-Dichlorobenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	88.0	57.0-123
2+4-Chlorotoluene	0.0800	mg/Kg	EPA 8260B	9/24/10	93.8	70.0-130
2,2-Dichloropropane	0.0400	mg/Kg	EPA 8260B	9/24/10	88.9	70.0-130
Benzene	0.0400	mg/Kg	EPA 8260B	9/24/10	91.6	67.9-120
Bromobenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	91.2	70.0-130
Bromochloromethane	0.0400	mg/Kg	EPA 8260B	9/24/10	92.2	70.0-130
Bromodichloromethane	0.0400	mg/Kg	EPA 8260B	9/24/10	92.7	70.0-130
Bromoform	0.0400	mg/Kg	EPA 8260B	9/24/10	102	58.2-146
Bromomethane	0.200	mg/Kg	EPA 8260B	9/24/10	83.0	45.5-139
Carbon Tetrachloride	0.0400	mg/Kg	EPA 8260B	9/24/10	91.4	70.0-130
Chlorobenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	92.1	63.4-122
Chloroethane	0.0400	mg/Kg	EPA 8260B	9/24/10	87.7	70.0-130
Chloroform	0.0400	mg/Kg	EPA 8260B	9/24/10	90.6	67.4-121
Chloromethane	0.0400	mg/Kg	EPA 8260B	9/24/10	96.0	47.9-127
Dibromochloromethane	0.0400	mg/Kg	EPA 8260B	9/24/10	94.2	70.0-130

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QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Dibromomethane	0.0400	mg/Kg	EPA 8260B	9/24/10	95.2	70.0-130
Dichlorodifluoromethane	0.0400	mg/Kg	EPA 8260B	9/24/10	78.1	40.5-144
Ethylbenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	94.9	65.5-127
Hexachlorobutadiene	0.0400	mg/Kg	EPA 8260B	9/24/10	91.7	70.0-130
Isopropyl benzene	0.0400	mg/Kg	EPA 8260B	9/24/10	93.6	70.0-130
Methylene Chloride	0.0400	mg/Kg	EPA 8260B	9/24/10	92.4	70.0-130
Naphthalene	0.0400	mg/Kg	EPA 8260B	9/24/10	97.7	70.0-130
O-Xylene	0.0400	mg/Kg	EPA 8260B	9/24/10	94.5	62.3-124
P + M Xylene	0.0400	mg/Kg	EPA 8260B	9/24/10	95.2	62.5-124
Styrene	0.0400	mg/Kg	EPA 8260B	9/24/10	101	70.0-130
Tetrachloroethene	0.0400	mg/Kg	EPA 8260B	9/24/10	93.7	64.7-122
Toluene	0.0400	mg/Kg	EPA 8260B	9/24/10	91.9	65.7-120
Trichloroethene	0.0400	mg/Kg	EPA 8260B	9/24/10	92.0	63.9-121
Trichlorofluoromethane	0.0400	mg/Kg	EPA 8260B	9/24/10	85.4	70.0-130
Vinyl Chloride	0.0400	mg/Kg	EPA 8260B	9/24/10	87.0	45.9-127
c-1,3-Dichloropropene	0.0400	mg/Kg	EPA 8260B	9/24/10	89.1	70.0-130
cis-1,2-Dichloroethene	0.0400	mg/Kg	EPA 8260B	9/24/10	91.4	70.0-130
n-butylbenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	94.2	70.0-130
n-propylbenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	97.9	70.0-130
p-isopropyltoluene	0.0400	mg/Kg	EPA 8260B	9/24/10	97.8	70.0-130
sec-butylbenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	96.3	70.0-130
t-1,2-Dichloroethene	0.0400	mg/Kg	EPA 8260B	9/24/10	93.4	70.0-130
t-1,3-Dichloropropene	0.0400	mg/Kg	EPA 8260B	9/24/10	92.0	70.0-130

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Project Name : **NuStar Vancouver Interim Action Confirmation Sampl**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
tert-butylbenzene	0.0400	mg/Kg	EPA 8260B	9/24/10	94.3	70.0-130

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KIFF Analytical LLC

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Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 14161

Page 1 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Stephanie Bosze	California EDF Report? ☐ Yes ☐ No
Company / Address: Ash Creek Associates	Sampling Company Log Code:
Phone Number: 503-924-4704 x125	Global ID:
Fax Number:	EDF Deliverable To (Email Address): sbosze@ashcreekassociates.com
Project #: 1126-09 / P.O. #:	Bill to: NuStar
Project Name: NuStar Vancouver Intim Action Confirmation Sampling	Sampler Print Name: Adam Reese
	Sampler Signature: Stephanie Bosze for Adam Reese

Project Address:

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: Sleeve	Container: Poly	Container: Glass	Container: Tedlar	Preservative: HCl	Preservative: HNO_3	Preservative: None (Cat)	Preservative: Methanol	Matrix: Water	Matrix: Soil	Matrix: Air	For Lab Use Only
CB-1 (9)	9/20/10	1010	3							2	1		X		01
CB-1 (29.5)	9/20/10	1200	3							2	1		X		02
CB-1 (37.5)	9/20/10	1030	3							2	1		X		03
CB-1 (37.5)	9/20/10	1245	3							2	1		X		04
CB-2 (9)	9/20/10	1500	3							2	1		X		05
CB-2 (18)	9/20/10	1530	3							2	1		X		06
CB-2 (28)	9/20/10	1600	3							2	1		X		07
CB-2 (42)	9/20/10	1610	3							2	1		X		08
CB-3 (9)	9/21/10	1100	3							2	1		X		09
CB-3 (18)	9/21/10	1520	3							2	1		X		10

Analysis Request — PLEASE CIRCLE METHOD

MTBE @ 0.5 ppb (EPA 8260B); BTEX (EPA 8260B); TPH Gas (EPA 8260B); 5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B); 7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B); Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B); Volatile Halocarbons (EPA 8260B); Volatile Organics Full List (EPA 8260B) — X

TAT: ☐ 12 hr ☐ 24 hr ☐ 48hr ☐ 72hr ☐ 1 wk

Relinquished by:	Date	Time	Received by:
Stephanie Bosze	9/22/10	1150	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	092310	1200	Michelle Spencer, KIFF Analytical

Remarks:
* ~~water~~ samples frozen prior to shipping
* Soil jar samples submitted in separate coolers on 9/21/10

For Lab Use Only: Sample Receipt

Temp °C	Initials	Date	Time	Therm. ID #	Coolant Present
					Yes / No

Distribution: White - Lab; Pink - Originator
Rev: 061708

KIFF Analytical LLC

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 74661

Page 2 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Stephanie Bosze	California EDF Report? ☐ Yes ☐ No
Company / Address: Ash Creek Associates — Ash Creek Associates	Sampling Company Log Code:
Phone Number: 503-894-4704 x125	Global ID:
Fax Number:	EDF Deliverable To (Email Address): sbosze@ashcreekassociates.com
Project #: 1126-09 / P.O. #:	Bill to: NuStar
Project Name: NuStar Vancouver Interim Action Confirmation Sampling	Sampler Signature: For: Stephanie Bosze / Adam Reese
Project Address:	

Sample Designation	Sampling Date	Sampling Time	Container and Preservative: 40 ml VOA	250 mL HNO_3 HDPE	250 mL H_2SO_4 HDPE	1 L H_2SO_4 amber	125 mL $ZnAc_2$ & NaOH	250 mL unpres HDPE	40 ml HCl VOA (RSK)	HNO_3	None VOA	None Vial and Methanol	Matrix: Water	Soil	Air	HVOCs (EPA 8260)	Total Iron, Manganese (EPA 6010)	Total Organic Carbon (SM 5310 D)	Total Ammonia as Nitrogen (EPA 350.2)	Sulfide (EPA 376.2)	Phosphorous (EPA 365.1)	Anions: Chloride, Nitrate, Nitrite, Sulfate (EPA 300.0)	Total Alkalinity (EPA 310.1)	Methane (RSK-175)	VOCs EPA 8260	TAT	For Lab Use Only
CB-3(35)	9/21/10	1545	3								2	1		X											X		
CB-3(29)	9/21/10	1540	3								2	1		X											X		11
CB-4(18)	9/21/10	1030	3								2	1		X											X		12
CB-4(28)	9/21/10	1045	3								2	1		X											X		13
CB-4(38.5)	9/21/10	1300	3								2	1		X											X		14

Relinquished by:	Date	Time	Received by:
Stephanie Bosze	9/22/10	1130	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	092310	1200	Michelle Spencer (Kiff Analytical)

Remarks:
* Soil jars (for dry weight) submitted in separate cooler on 9/21/10

For Lab Use Only: Sample Receipt

Temp °C	Initials	Date	Time	Therm. ID #	Coolant Present
					Yes / No

Distribution: White - Lab; Pink - Originator
Rev: 031308

KIFF Analytical LLC

SAMPLE RECEIPT CHECKLIST

RECEIVER: MAS (Initials)

SRG#: 74661 Date: 092310

Project ID: NuStar Vancouve Interim Action Confirmation Sampling

Method of Receipt: ☐ Courier ☐ Over-the-counter ☒ Shipper

COC Inspection

Is COC present?	☒ Yes	☐ No			
Custody seals on shipping container?	☐ Intact	☐ Broken	☒ Not present	☐ N/A	
Is COC Signed by Relinquisher? ☒ Yes ☐ No	Dated? ☒ Yes	☐ No			
Is sampler name legibly indicated on COC?	☒ Yes	☐ No			
Is analysis or hold requested for all samples	☒ Yes	☐ No			
Is the turnaround time indicated on COC?	☐ Yes	☒ No			
Is COC free of whiteout and uninitialed cross-outs?	☐ Yes	☐ No, Whiteout	☒ No, Cross-outs		

Sample Inspection

Coolant Present: ☒ Yes ☐ No (includes water)

Temperature °C 5.2 Therm. ID# IR-5 Initial MAS Date/Time 092310/1116 ☐ N/A

Are there custody seals on sample containers?	☐ Intact	☐ Broken	☒ Not present	
Do containers match COC? ☒ Yes ☐ No ☐ No, COC lists absent sample(s)	☐ No, Extra sample(s) present			
Are there samples matrices other than soil, water, air or carbon?	☐ Yes	☒ No		
Are any sample containers broken, leaking or damaged?	☐ Yes	☒ No		
Are preservatives indicated? ☒ Yes, on sample containers	☒ Yes, on COC	☐ Not indicated	☐ N/A	
Are preservatives correct for analyses requested?	☒ Yes	☐ No	☐ N/A	
Are samples within holding time for analyses requested?	☒ Yes	☐ No		
Are the correct sample containers used for the analyses requested?	☒ Yes	☐ No		
Is there sufficient sample to perform testing?	☒ Yes	☐ No		

Does any sample contain product, have strong odor or are otherwise suspected to be hot? ☐ Yes ☒ No

Receipt Details

Matrix SO	Container type VOA	# of containers received 42
Matrix	Container type	# of containers received
Matrix	Container type	# of containers received

Date and Time Sample Put into Temp Storage Date: 092310 Time: 1200

Quicklog

Are the Sample ID's indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If Sample ID's are listed on both COC and containers, do they all match?	☐ Yes	☒ No	☐ N/A	
Is the Project ID indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If project ID is listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Are the sample collection dates indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection dates are listed on both COC and containers, do they all match?	☐ Yes	☒ No	☐ N/A	
Are the sample collection times indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection times are listed on both COC and containers, do they all match?	☐ Yes	☒ No	☐ N/A	

COMMENTS: NO TAT. Sample ~~-03~~ -05 labels say CB2 (9.5). Date & time on labels for -08 say 0830 on 092110. For ~~tatget~~ mws sample -07 the label on glass jar says 1500 - the lid and VOAs say 1600 which ~~matches~~ matches COC. For -03 all VOAs appear to be Methanol preserved. MAS 092310 1226

O:\old_ed\samprec\Forms\Sample Receipt Checklist rev 051409.doc

KIFF Analytical LLC

Report Number : 74657
Date : 09/27/2010

Laboratory Results

Stephanie Bosze
Ash Creek Assoc.
3015 SW First Avenue
Portland, OR 97201-4707

Subject : 1 Water Sample
Project Name : Vancouver IA Confirmation Sampling
Project Number : E3WR-0028
P.O. Number : 4501259182-20

Dear Ms. Bosze,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed. Testing procedures comply with the 2003 NELAC standard. All soil samples are reported on a total weight (wet weight) basis unless noted otherwise in the case narrative. Laboratory results relate only to the samples tested. This report may be freely reproduced in full, but may only be reproduced in part with the express permission of Kiff Analytical, LLC. Kiff Analytical, LLC is certified by the State of California under the National Environmental Laboratory Accreditation Program (NELAP), lab # 08263CA. If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 74657

Date : 09/27/2010

Sample : **CB-3(45)**

Project Name : **Vancouver IA Confirmation Sampling**

Project Number : **E3WR-0028** Lab Number : 74657-01

Matrix : Water Sample Date :09/21/2010 Analysis Method: EPA 8260B

Parameter	Measured Value	Method Reporting Limit	Units	Date/Time Analyzed
Chloromethane	< 3.0	3.0	ug/L	09/24/10 10:54
Vinyl Chloride	**26**	3.0	ug/L	09/24/10 10:54
Bromomethane	< 60	60	ug/L	09/24/10 10:54
Chloroethane	< 3.0	3.0	ug/L	09/24/10 10:54
Trichlorofluoromethane	< 3.0	3.0	ug/L	09/24/10 10:54
1,1-Dichloroethene	**4.5**	3.0	ug/L	09/24/10 10:54
Methylene Chloride	< 5.0	5.0	ug/L	09/24/10 10:54
trans-1,2-Dichloroethene	**5.8**	3.0	ug/L	09/24/10 10:54
1,1-Dichloroethane	**28**	3.0	ug/L	09/24/10 10:54
cis-1,2-Dichloroethene	**280**	3.0	ug/L	09/24/10 10:54
Chloroform	< 3.0	3.0	ug/L	09/24/10 10:54
1,1,1-Trichloroethane	**11**	3.0	ug/L	09/24/10 10:54
1,2-Dichloroethane	< 3.0	3.0	ug/L	09/24/10 10:54
Carbon Tetrachloride	< 3.0	3.0	ug/L	09/24/10 10:54
Trichloroethene	**270**	3.0	ug/L	09/24/10 10:54
1,2-Dichloropropane	< 3.0	3.0	ug/L	09/24/10 10:54
Bromodichloromethane	< 3.0	3.0	ug/L	09/24/10 10:54
cis-1,3-Dichloropropene	< 3.0	3.0	ug/L	09/24/10 10:54
trans-1,3-Dichloropropene	< 3.0	3.0	ug/L	09/24/10 10:54
1,1,2-Trichloroethane	< 3.0	3.0	ug/L	09/24/10 10:54
Tetrachloroethene	**690**	3.0	ug/L	09/24/10 10:54
Dibromochloromethane	< 3.0	3.0	ug/L	09/24/10 10:54
1,2-Dibromoethane	< 3.0	3.0	ug/L	09/24/10 10:54
Chlorobenzene	< 3.0	3.0	ug/L	09/24/10 10:54
Bromoform	< 3.0	3.0	ug/L	09/24/10 10:54
1,1,2,2-Tetrachloroethane	< 3.0	3.0	ug/L	09/24/10 10:54
1,3-Dichlorobenzene	< 3.0	3.0	ug/L	09/24/10 10:54
1,4-Dichlorobenzene	< 3.0	3.0	ug/L	09/24/10 10:54
1,2-Dichlorobenzene	< 3.0	3.0	ug/L	09/24/10 10:54
1,2-Dichloroethane-d4 (Surr)	103		% Recovery	09/24/10 10:54
4-Bromofluorobenzene (Surr)	101		% Recovery	09/24/10 10:54
Toluene - d8 (Surr)	100		% Recovery	09/24/10 10:54

Report Number : 74657

Date : 09/27/2010

QC Report : Method Blank Data

Project Name : **Vancouver IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,1-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,1-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,2-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Bromodichloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Bromoform	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Bromomethane	< 20	20	ug/L	EPA 8260B	09/24/2010
Carbon Tetrachloride	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Chlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Chloroethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Chloroform	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Chloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Dibromochloromethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Methylene Chloride	< 5.0	5.0	ug/L	EPA 8260B	09/24/2010
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Trichlorofluoromethane	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
Vinyl Chloride	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	09/24/2010
1,2-Dichloroethane-d4 (Surr)	101		%	EPA 8260B	09/24/2010
4-Bromofluorobenzene (Surr)	98.9		%	EPA 8260B	09/24/2010
Toluene - d8 (Surr)	99.9		%	EPA 8260B	09/24/2010

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 09/27/2010

Project Name : **Vancouver IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,1,1-Trichloroethane														
	74665-01	<0.50	39.9	40.0	41.0	39.9	ug/L	EPA 8260B	9/24/10	102	99.7	2.87	70.0-130	25
1,1,2,2-Tetrachloroethane														
	74665-01	<0.50	39.9	40.0	41.0	40.6	ug/L	EPA 8260B	9/24/10	103	101	1.23	80-121	25
1,1,2-Trichloroethane														
	74665-01	<0.50	39.9	40.0	38.4	38.0	ug/L	EPA 8260B	9/24/10	96.1	95.0	1.21	70.0-130	25
1,1-Dichloroethane														
	74665-01	<0.50	39.9	40.0	39.2	38.5	ug/L	EPA 8260B	9/24/10	98.1	96.3	1.90	76.5-120	25
1,1-Dichloroethene														
	74665-01	<0.50	39.9	40.0	37.8	36.6	ug/L	EPA 8260B	9/24/10	94.6	91.4	3.49	69.6-124	25
1,2-Dibromoethane														
	74665-01	<0.50	39.9	40.0	39.3	38.8	ug/L	EPA 8260B	9/24/10	98.4	96.9	1.61	80-120	25
1,2-Dichlorobenzene														
	74665-01	<0.50	39.9	40.0	37.8	37.5	ug/L	EPA 8260B	9/24/10	94.8	93.7	1.07	80-120	25
1,2-Dichloroethane														
	74665-01	<0.50	39.9	40.0	41.0	40.3	ug/L	EPA 8260B	9/24/10	103	101	2.00	75.7-122	25
1,2-Dichloropropane														
	74665-01	<0.50	39.9	40.0	38.0	37.8	ug/L	EPA 8260B	9/24/10	95.2	94.6	0.646	80-120	25
1,3-Dichlorobenzene														
	74665-01	<0.50	39.9	40.0	39.8	39.4	ug/L	EPA 8260B	9/24/10	99.6	98.5	1.15	79.3-120	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 09/27/2010

Project Name : **Vancouver IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
1,4-Dichlorobenzene														
	74665-01	<0.50	39.9	40.0	37.5	37.1	ug/L	EPA 8260B	9/24/10	93.9	92.8	1.18	80-120	25
Bromodichloromethane														
	74665-01	<0.50	39.9	40.0	40.7	40.3	ug/L	EPA 8260B	9/24/10	102	101	1.23	70.0-130	25
Bromoform														
	74665-01	<0.50	39.9	40.0	42.2	41.1	ug/L	EPA 8260B	9/24/10	106	103	3.04	73.0-142	25
Bromomethane														
	74665-01	<20	200	200	182	197	ug/L	EPA 8260B	9/24/10	91.1	98.4	7.70	33.5-140	25
Carbon Tetrachloride														
	74665-01	<0.50	39.9	40.0	42.0	40.7	ug/L	EPA 8260B	9/24/10	105	102	3.46	70.0-130	25
Chlorobenzene														
	74665-01	<0.50	39.9	40.0	38.9	38.5	ug/L	EPA 8260B	9/24/10	97.3	96.3	1.04	80-120	25
Chloroethane														
	74665-01	<0.50	39.9	40.0	43.3	42.4	ug/L	EPA 8260B	9/24/10	108	106	2.24	70.0-130	25
Chloroform														
	74665-01	<0.50	39.9	40.0	40.2	39.6	ug/L	EPA 8260B	9/24/10	100	98.9	1.69	80.0-120	25
Chloromethane														
	74665-01	<0.50	39.9	40.0	39.5	37.3	ug/L	EPA 8260B	9/24/10	99.0	93.3	5.91	45.9-142	25
Dibromochloromethane														
	74665-01	<0.50	39.9	40.0	40.8	40.6	ug/L	EPA 8260B	9/24/10	102	102	0.747	70.0-130	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 09/27/2010

Project Name : **Vancouver IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Methylene Chloride														
	74665-01	<5.0	39.9	40.0	38.0	37.6	ug/L	EPA 8260B	9/24/10	95.1	93.9	1.22	70.0-130	25
Tetrachloroethene														
	74665-01	<0.50	39.9	40.0	38.8	38.4	ug/L	EPA 8260B	9/24/10	97.1	96.0	1.16	77.0-120	25
Trichloroethene														
	74665-01	<0.50	39.9	40.0	37.0	36.2	ug/L	EPA 8260B	9/24/10	92.8	90.6	2.38	80-120	25
Trichlorofluoromethane														
	74665-01	<0.50	39.9	40.0	38.9	37.6	ug/L	EPA 8260B	9/24/10	97.5	93.9	3.75	70.0-130	25
Vinyl Chloride														
	74665-01	<0.50	39.9	40.0	37.0	35.6	ug/L	EPA 8260B	9/24/10	92.6	88.9	4.04	42.1-138	25
c-1,3-Dichloropropene														
	74665-01	<5.0	39.9	40.0	38.4	37.8	ug/L	EPA 8260B	9/24/10	96.2	94.6	1.73	70.0-130	25
cis-1,2-Dichloroethene														
	74665-01	<0.50	39.9	40.0	38.8	38.3	ug/L	EPA 8260B	9/24/10	97.1	95.8	1.38	70.0-130	25
t-1,2-Dichloroethene														
	74665-01	<5.0	39.9	40.0	38.0	36.9	ug/L	EPA 8260B	9/24/10	95.2	92.3	3.12	70.0-130	25
t-1,3-Dichloropropene														
	74665-01	<5.0	39.9	40.0	38.5	38.3	ug/L	EPA 8260B	9/24/10	96.3	95.7	0.661	70.0-130	25

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

QC Report : Laboratory Control Sample (LCS)

Project Name : **Vancouver IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
1,1,1-Trichloroethane	40.0	ug/L	EPA 8260B	9/24/10	102	70.0-130
1,1,2,2-Tetrachloroethane	40.0	ug/L	EPA 8260B	9/24/10	97.8	80-121
1,1,2-Trichloroethane	40.0	ug/L	EPA 8260B	9/24/10	94.5	70.0-130
1,1-Dichloroethane	40.0	ug/L	EPA 8260B	9/24/10	96.8	76.5-120
1,1-Dichloroethene	40.0	ug/L	EPA 8260B	9/24/10	93.8	69.6-124
1,2-Dibromoethane	40.0	ug/L	EPA 8260B	9/24/10	98.2	80-120
1,2-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/24/10	94.0	80-120
1,2-Dichloroethane	40.0	ug/L	EPA 8260B	9/24/10	102	75.7-122
1,2-Dichloropropane	40.0	ug/L	EPA 8260B	9/24/10	94.2	80-120
1,3-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/24/10	99.0	79.3-120
1,4-Dichlorobenzene	40.0	ug/L	EPA 8260B	9/24/10	94.2	80-120
Bromodichloromethane	40.0	ug/L	EPA 8260B	9/24/10	102	70.0-130
Bromoform	40.0	ug/L	EPA 8260B	9/24/10	105	73.0-142
Bromomethane	200	ug/L	EPA 8260B	9/24/10	98.2	33.5-140
Carbon Tetrachloride	40.0	ug/L	EPA 8260B	9/24/10	104	70.0-130
Chlorobenzene	40.0	ug/L	EPA 8260B	9/24/10	97.2	80-120
Chloroethane	40.0	ug/L	EPA 8260B	9/24/10	108	70.0-130
Chloroform	40.0	ug/L	EPA 8260B	9/24/10	99.8	80.0-120
Chloromethane	40.0	ug/L	EPA 8260B	9/24/10	102	45.9-142
Dibromochloromethane	40.0	ug/L	EPA 8260B	9/24/10	101	70.0-130
Methylene Chloride	40.0	ug/L	EPA 8260B	9/24/10	94.9	70.0-130
Tetrachloroethene	40.0	ug/L	EPA 8260B	9/24/10	98.1	77.0-120
Trichloroethene	40.0	ug/L	EPA 8260B	9/24/10	95.0	80-120

QC Report : Laboratory Control Sample (LCS)

Project Name : **Vancouver IA Confirmation Sampling**

Project Number : **E3WR-0028**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Trichlorofluoromethane	40.0	ug/L	EPA 8260B	9/24/10	97.3	70.0-130
Vinyl Chloride	40.0	ug/L	EPA 8260B	9/24/10	93.1	42.1-138
c-1,3-Dichloropropene	40.0	ug/L	EPA 8260B	9/24/10	95.5	70.0-130
cis-1,2-Dichloroethene	40.0	ug/L	EPA 8260B	9/24/10	96.9	70.0-130
t-1,2-Dichloroethene	40.0	ug/L	EPA 8260B	9/24/10	95.2	70.0-130
t-1,3-Dichloropropene	40.0	ug/L	EPA 8260B	9/24/10	96.7	70.0-130

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 74657

Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Stephanie Bosze	California EDF Report? ☐ Yes ☐ No
Company / Address: 3015 SW 1st Ave Portland OR 97201	Sampling Company Log Code: Ash Creek Associates
Phone Number: 503-924-4704	Global ID:
Fax Number:	EDF Deliverable To (Email Address):
Project #: 1126-09 / P.O. #:	Bill to: NuStar
Project Name: Vancouver IA Confirmation Sampling	Sampler Signature: Mike Whitson
Project Address:	

Sample Designation	Sampling: Date	Sampling: Time	Container: 40 ml VOA	Container: Sleeve	Container: Poly	Container: Glass	Container: Tedlar	Container:	Preservative: HCl	Preservative: HNO_3	Preservative: None	Preservative:	Preservative:	Matrix: Water	Matrix: Soil	Matrix: Air	Matrix:
CB-3(45)	09/21/10	1055	X						X					X			

Analysis Request

Sample Designation	MTBE @ 0.5 ppb (EPA 8260B)	BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates (MTBE, DIPE, ETBE, TAME, TBA) (EPA 8260B)	7 Oxygenates (5 oxy + EtOH, MeOH) (EPA 8260B)	Lead Scav. (1,2 DCA & 1,2 EDB) (EPA 8260B)	Volatile Halocarbons (EPA 8260B)	Volatile Organics Full List (EPA 8260B)	Volatile Organics (EPA 524.2 Drinking Water)	TPH as Diesel (EPA 8015M)	TPH as Motor Oil (EPA 8015M)	circle method: CAM 17 Metals (EPA 200.7 / 6010)	circle method: 5 Waste Oil Metals (Cd,Cr,Ni,Pb,Zn) (EPA 200.7 / 6010)	circle method: Mercury (EPA 245.1 / 7470 / 7471)	circle method: Total Lead (EPA 200.7 / 6010)	W.E.T. Lead (STLC)					TAT	For Lab Use Only
CB-3(45)							X															☐ 12 hr ☐ 24 hr ☐ 48hr ☐ 72hr ☐ 1 wk	01

Relinquished by:	Date	Time	Received by:
[signature]	9/22/10	1515	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	092310	1038	[signature] Kiff Analytical

Remarks:

For Lab Use Only: Sample Receipt

Temp °C	Initials	Date	Time	Therm. ID #	Coolant Present
					Yes / No

Distribution: White - Lab; Pink - Originator
Rev: 031308

KIFF Analytical LLC

SAMPLE RECEIPT CHECKLIST

RECEIVER Initials: EGS

SRG#: 74657 Date: 092310

Project ID: Vancovr IA Confirmation Sampling

Method of Receipt: ☐ Courier ☐ Over-the-counter ☒ Shipper

COC Inspection

Is COC present?	☒ Yes	☐ No		
Custody seals on shipping container?	☐ Intact	☐ Broken	☒ Not present	☐ N/A
Is COC Signed by Relinquisher? ☒ Yes ☐ No	Dated? ☒ Yes	☐ No		
Is sampler name legibly indicated on COC?	☒ Yes	☐ No		
Is analysis or hold requested for all samples	☒ Yes	☐ No		
Is the turnaround time indicated on COC?	☐ Yes	☒ No		
Is COC free of whiteout and uninitialed cross-outs?	☐ Yes	☐ No, Whiteout	☒ No, Cross-outs	

Sample Inspection

Coolant Present: ☒ Yes ☐ No (includes water)

Temperature °C 6.4 Therm. ID# IR-5 Initial EGS Date/Time 092310 1030 ☐ N/A

Are there custody seals on sample containers?	☐ Intact	☐ Broken	☒ Not present	
Do containers match COC? ☒ Yes ☐ No ☐ No, COC lists absent sample(s)	☐ No, Extra sample(s) present			
Are there samples matrices other than soil, water, air or carbon?	☐ Yes	☒ No		
Are any sample containers broken, leaking or damaged?	☐ Yes	☒ No		
Are preservatives indicated? ☒ Yes, on sample containers	☒ Yes, on COC	☐ Not indicated	☐ N/A	
Are preservatives correct for analyses requested?	☒ Yes	☐ No	☐ N/A	
Are samples within holding time for analyses requested?	☒ Yes	☐ No		
Are the correct sample containers used for the analyses requested?	☒ Yes	☐ No		
Is there sufficient sample to perform testing?	☒ Yes	☐ No		

Does any sample contain product, have strong odor or are otherwise suspected to be hot? ☐ Yes ☒ No

Receipt Details

Matrix WA	Container type Voa	# of containers received 3
Matrix	Container type	# of containers received
Matrix	Container type	# of containers received

Date and Time Sample Put into Temp Storage Date: 092310 Time: 1038

Quicklog

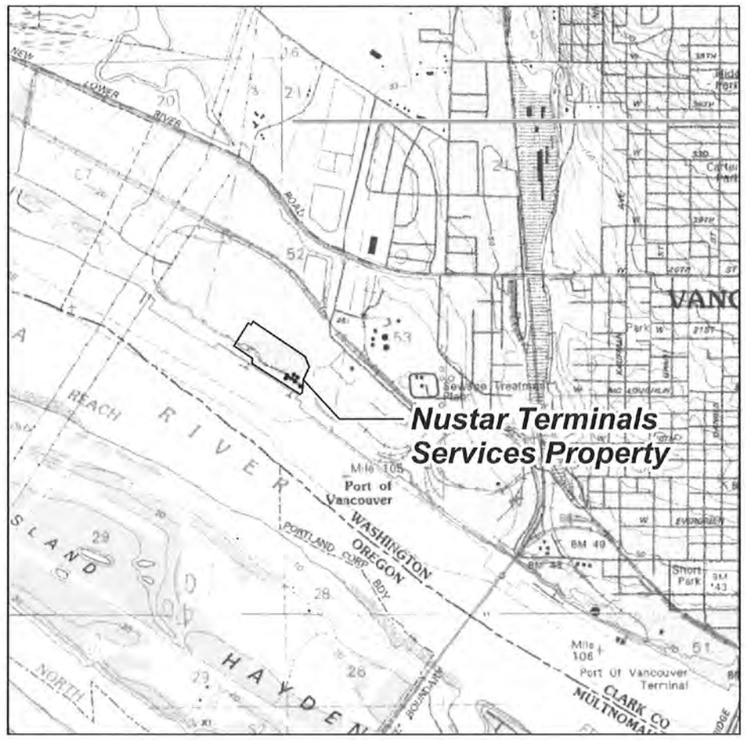
Are the Sample ID's indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If Sample ID's are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Is the Project ID indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If project ID is listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Are the sample collection dates indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection dates are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	
Are the sample collection times indicated:	☐ On COC	☐ On sample container(s)	☒ On Both	☐ Not indicated
If collection times are listed on both COC and containers, do they all match?	☒ Yes	☐ No	☐ N/A	

COMMENTS: NO TAT. Temperature exceptions. EGS 092310 1038

Logged project name per COC but container labels have "VANCOUVER." EGS 092310 1119

Appendix B

Soil Vapor Extraction Design



DRAWING SET:

LEGEND:

- **VE-1-2** 2008 INTERIM ACTION VAPOR EXTRACTION WELL LOCATION
- **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
- GATE VALVE
- FLOW METER
- PRESSURE GAUGE
- SAMPLE PORT
- LOGIC CONTROL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MH MANHOLE
- RAILROAD TRACKS
- 2" EXISTING UNDERGROUND SOIL VAPOR EXTRACTION (SVE) PIPING AND DIAMETER
- **VE-1-2** PROPOSED 2010 EXPANDED INTERIM ACTION WELL LOCATION AND VAULT
- 4" NEW UNDERGROUND SVE PIPING AND DIAMETER
- 8" NEW ABOVE–GROUND SVE PIPING AND DIAMETER

N

WASHINGTON

VANCOUVER

MICHAEL W STEVENS
STATE OF WASHINGTON
40227
REGISTERED
PROFESSIONAL ENGINEER
3/24/11

SOURCES:

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.

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

SUBMITTED: Michael Stevens, ASSOCIATE ENGINEER DATE: 11/1/2010

DESIGNED: MWS
DRAWN: JLP
CHECKED: HFC
CHECKED:
APPROVED: MWS

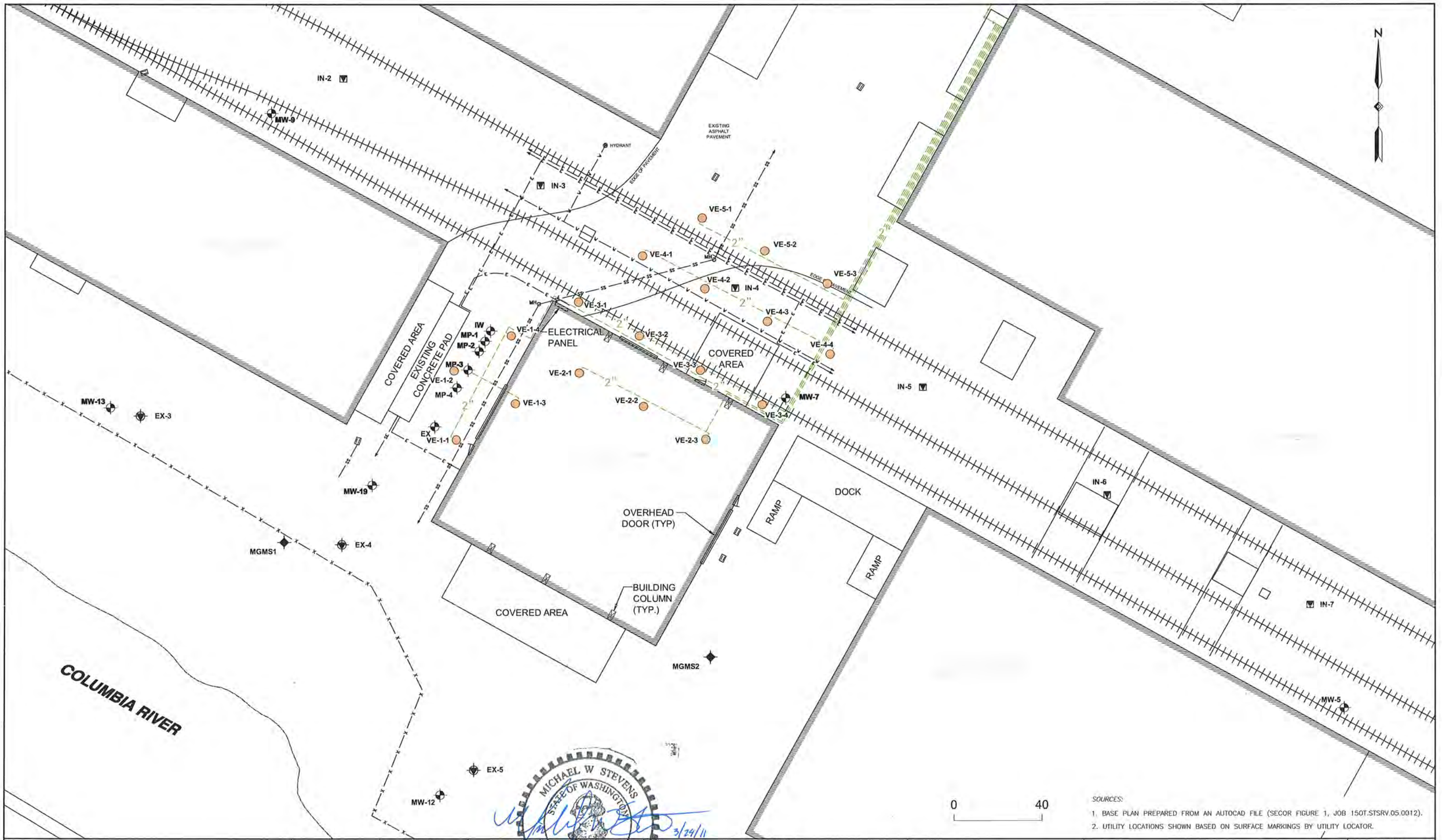
EXTERNAL REFERENCE FILES
UPDATED XREF Base 1126.DWG

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

DRAWING SET AND LEGEND

2010 INTERIM ACTION WORK PLAN IMPLEMENTATION
NUSTAR TERMINALS SERVICES, INC. VANCOUVER FACILITY
VANCOUVER, WASHINGTON

FILENAME: 1126–09 (DRAWING SET 1)
AC PROJECT NUMBER: 1126–09
SCALE: NOT TO SCALE
DRAWING NUMBER: B–1
SHEET NUMBER: 1 OF 6



SOURCES:

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.

MICHAEL W STEVENS
STATE OF WASHINGTON
40227
REGISTERED
PROFESSIONAL ENGINEER
3/24/11

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

SUBMITTED: Michael Stevens, ASSOCIATE ENGINEER DATE: 11/1/2010

DESIGNED: MWS
DRAWN: JLP
CHECKED: HFC
CHECKED:
APPROVED: MWS

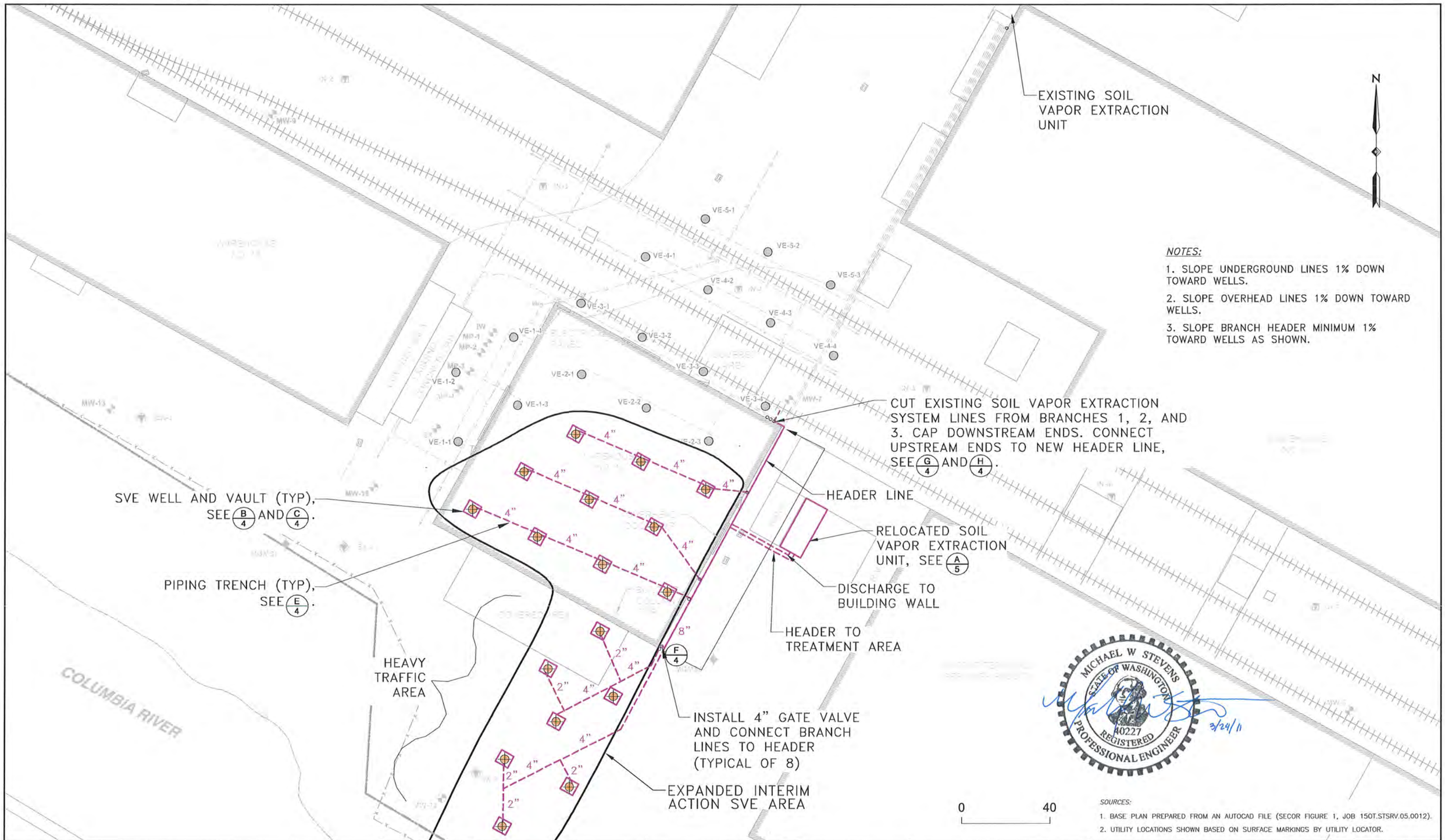
EXTERNAL REFERENCE FILES
UPDATED XREF Base 1126.DWG

ZONE	REV.	REVISIONS DESCRIPTION	BY	DATE	APP.

SITE PLAN

2010 INTERIM ACTION WORK PLAN IMPLEMENTATION
NUSTAR TERMINALS SERVICES, INC. VANCOUVER FACILITY
VANCOUVER, WASHINGTON

FILENAME	1126-09 (DRAWING SET 1)
AC PROJECT NUMBER	1126-09
SCALE	1" = 40'
DRAWING NUMBER	B-2
SHEET NUMBER	2 OF 6



Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

SUBMITTED: Michael Stevens, ASSOCIATE ENGINEER DATE: 3/22/2011

DESIGNED: MWS
DRAWN: JLP
CHECKED: HFC
CHECKED:
APPROVED: MWS

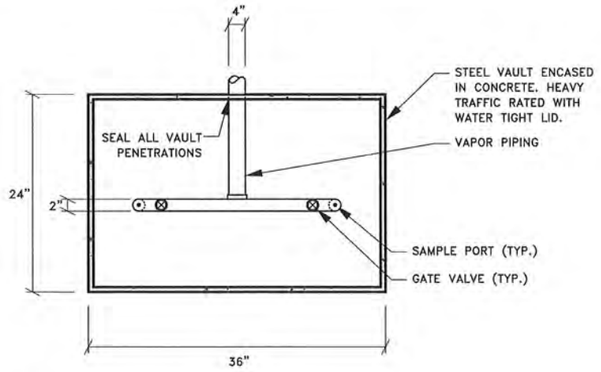
EXTERNAL REFERENCE FILES
UPDATED XREF Base 1126.DWG

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

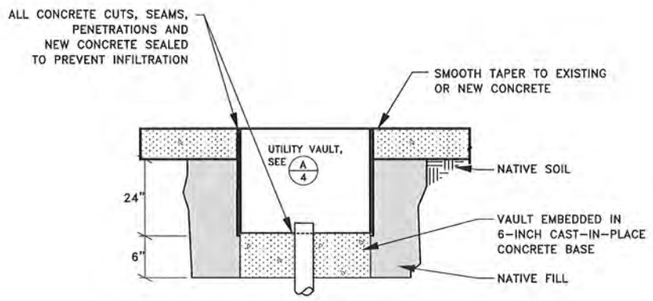
SVE SYSTEM LAYOUT

2010 INTERIM ACTION WORK PLAN IMPLEMENTATION
NUSTAR TERMINALS SERVICES, INC. VANCOUVER FACILITY
VANCOUVER, WASHINGTON

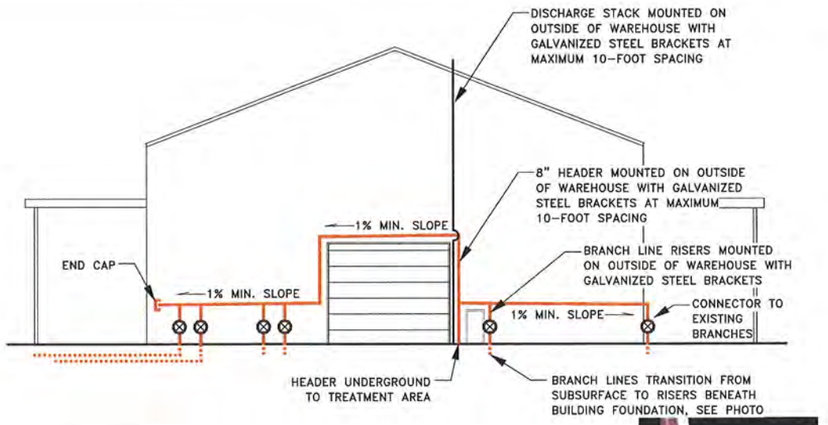
FILENAME	1126-09 (DRAWING SET 2)
AC PROJECT NUMBER	1126-09
SCALE	1" = 40'
DRAWING NUMBER	B-3
SHEET NUMBER	3 OF 6



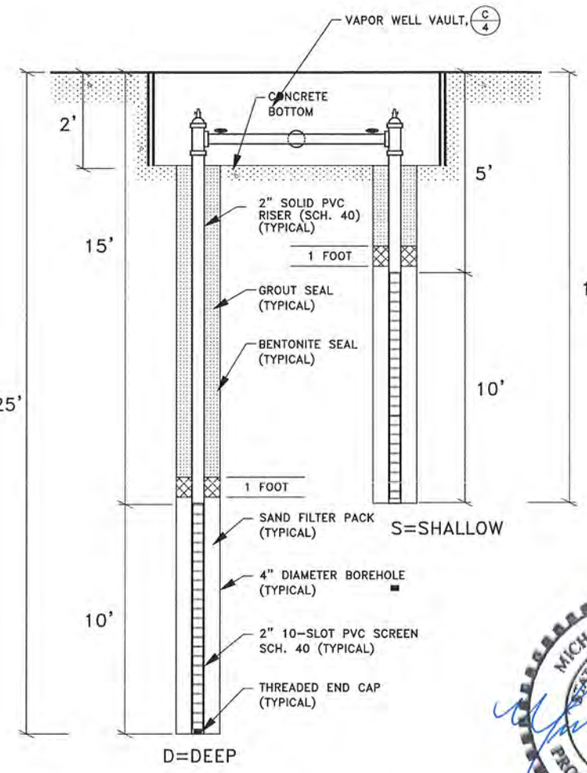
A/4 VAPOR WELL VAULT
NOT TO SCALE



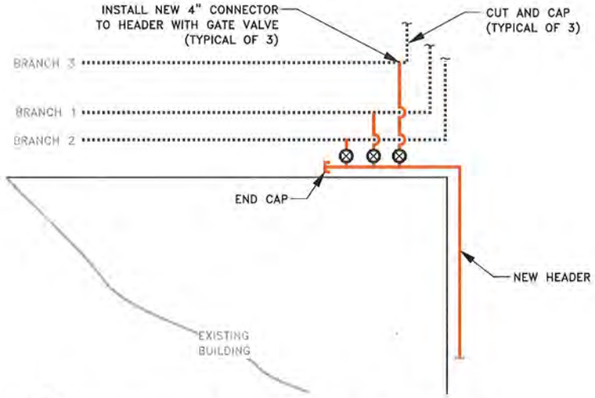
C/4 VAPOR WELL VAULT INSTALLATION DETAIL
NOT TO SCALE



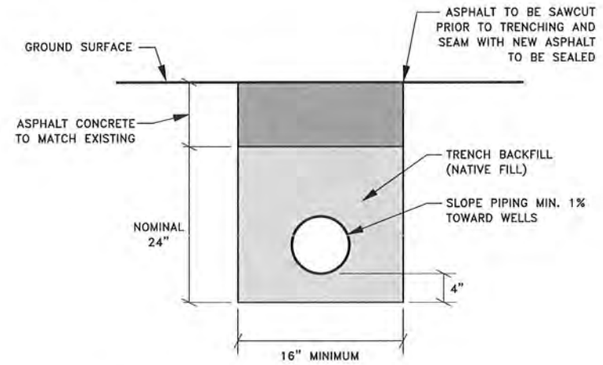
F/4 WAREHOUSE 13 HEADER – EAST ELEVATION
NOT TO SCALE



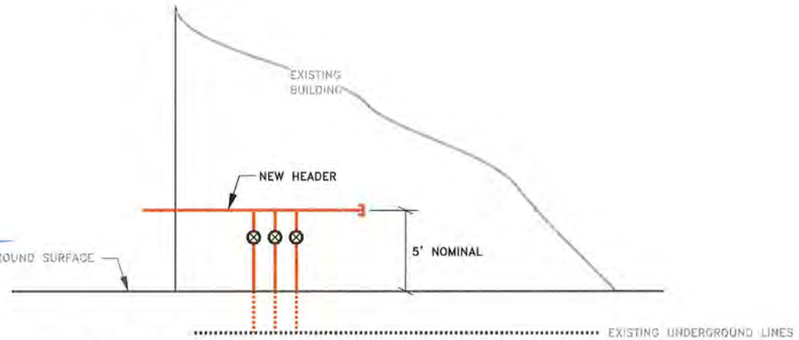
B/4 VAPOR EXTRACTION WELL DETAIL
NOT TO SCALE



G/4 CONNECTION–EXISTING TO NEW–PLAN VIEW
NOT TO SCALE



E/4 VAPOR PIPING TRENCH DETAIL
NOT TO SCALE



H/4 CONNECTION–EXISTING TO NEW–NORTH ELEVATION
NOT TO SCALE

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

SUBMITTED: Michael Stevens, ASSOCIATE ENGINEER DATE: 3/22/2011

DESIGNED: MWS
DRAWN: JLP
CHECKED: HFC
CHECKED:
APPROVED: MWS

EXTERNAL REFERENCE FILES

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

DETAILS

2010 INTERIM ACTION WORK PLAN IMPLEMENTATION
NUSTAR TERMINALS SERVICES, INC. VANCOUVER FACILITY
VANCOUVER, WASHINGTON

FILENAME: 1126-09 (DETAILS)
AC PROJECT NUMBER: 1126-09
SCALE: NTS
DRAWING NUMBER: B-4
SHEET NUMBER: 4 OF 6

RELOCATED KNOCKOUT DRUM, BLOWER, AND CARBON UNITS FROM EXISTING SYSTEM
(CONTROLS, VALVES, PORTS, MONITORS CONSISTENT WITH EXISTING)

NEW DISCHARGE STACK

RELOCATE EXISTING

NEW HEADER

NEW BRANCH LINES

EXISTING BRANCHES 1, 2, AND 3

EXISTING BRANCHES 4 AND 5

CUT AND CAP

ROTRON EN909 BLOWER

EFFLUENT – MID–CARBON SAMPLING LOCATIONS

AIR FLOW

DISCHARGE STACK

AIR FLOW

6"Ø

55–GAL KNOCKOUT DRUM

H

AIR FLOW

2,000 POUND VAPOR CARBON VESSELS

EFFLUENT – PRE–TREATMENT SAMPLING LOCATION

EFFLUENT – POST–TREATMENT SAMPLING LOCATION

H: HIGH LEVEL ALARM – SYSTEM SHUT–DOWN

CONTROL PANEL

AIR FLOW

55–GAL KNOCKOUT DRUM

H

SEALED REGENERATIVE BLOWER
MAX FLOW: 300SCFM NOMINAL
MAX VAC: 90 IN. WATER NOMINAL

H: HIGH LEVEL ALARM – SYSTEM SHUT–DOWN

CONTROL PANEL

A/5 UST BRANCH BLOWER ASSEMBLY
NOT TO SCALE

MICHAEL W STEVENS
STATE OF WASHINGTON
40227
REGISTERED
PROFESSIONAL ENGINEER
3/24/11

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

SUBMITTED: Michael Stevens, ASSOCIATE ENGINEER DATE: 3/22/2011

DESIGNED: MWS
DRAWN: JLP
CHECKED: HFC
CHECKED:
APPROVED: MWS

EXTERNAL REFERENCE FILES

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

VAPOR FLOW SCHEMATIC

2010 INTERIM ACTION WORK PLAN IMPLEMENTATION
NUSTAR TERMINALS SERVICES, INC. VANCOUVER FACILITY
VANCOUVER, WASHINGTON

FILENAME: 1126–09 (DETAILS)
AC PROJECT NUMBER: 1126–09
SCALE: NTS
DRAWING NUMBER: B–5
SHEET NUMBER: 5 OF 6

GENERAL:

1) THE WORK TO BE PERFORMED SHALL CONSIST OF FURNISHING ALL TOOLS, EQUIPMENT, MATERIALS, SUPPLIES, TRANSPORTATION AND SERVICES (INCLUDING FUEL, POWER, WATER AND ESSENTIAL COMMUNICATIONS), AND FOR THE PERFORMANCE OF ALL LABOR OR OTHER OPERATIONS REQUIRED IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS. THE WORK SHALL BE COMPLETED, AND ALL WORK, MATERIALS, AND SERVICES NOT EXPRESSLY SHOWN OR CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS WHICH MAY BE NECESSARY FOR THE COMPLETE AND PROPER CONSTRUCTION OF THE WORK IN GOOD FAITH SHALL BE PERFORMED, FURNISHED, AND INSTALLED BY THE CONTRACTOR AS THOUGH ORIGINALLY SO SPECIFIED OR SHOWN.

2) DURING ALL SITE ACTIVITIES, EXISTING STRUCTURES (INCLUDING BUT NOT LIMITED TO GROUNDWATER MONITORING WELLS, UTILITIES, PIPING, AND BUILDINGS) SHALL BE PROTECTED FROM DAMAGE CAUSED BY SITE ACTIVITIES. DAMAGED STRUCTURES SHALL BE REPAIRED OR REPLACED AS NECESSARY AT THE CONTRACTOR'S EXPENSE.

3) THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO ANY SUBSURFACE ACTIVITIES.

4) IF ANY PORTION OF THIS WORK REQUIRES A PERMIT TO LAWFULLY COMPLETE, THEN IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN THOSE PERMITS.

5) CONTRACTOR SHALL COMPLETE ALL WORK IN ACCORDANCE WITH A SITE-SPECIFIC HEALTH AND SAFETY PLAN TO BE PREPARED BY CONTRACTOR. THE PLAN SHALL BE AT LEAST AS STRINGENT AS THE HEALTH AND SAFETY PLAN IN THE RD/RA WORK PLAN (APPENDIX E).

EARTHWORK – MATERIALS:

1) IMPORTED FILL: IMPORTED FILL MATERIALS SHALL CONSIST OF SOIL OR ROCK THAT IS ESSENTIALLY FREE OF ORGANICS AND OTHER DELETERIOUS MATERIAL, WITH NO ROCKS OR LUMPS GREATER THAN 1 INCH IN ANY DIMENSION, AND WHICH CAN BE READILY PLACED, GRADED, AND COMPACTED AS NECESSARY.

EARTHWORK EXECUTION:

1) TRENCH EXCAVATIONS SHALL HAVE A MINIMUM BOTTOM WIDTH OF TWICE THE ASSOCIATED COMBINED PIPE DIAMETER, AND SHALL ALLOW FOR A MINIMUM OF 4 INCHES OF PIPE BEDDING BENEATH THE PIPES. EXCAVATION WALLS SHALL BE SLOPED OR SHORED AS NECESSARY TO ALLOW THE SAFE AND EFFICIENT COMPLETION OF THE WORK.

2) THE POTENTIAL EXISTS THAT SOILS ENCOUNTERED DURING THE TRENCHING ACTIVITIES WILL BE IMPACTED BY CONTAMINANTS (TETRACHLOROETHENE [PCE] AND/OR TRICHLOROETHENE [TCE] AND PETROLEUM SOLVENTS). IN THE EVENT THAT ENCOUNTERED SOIL OR GROUNDWATER SHOW EVIDENCE OF CONTAMINATION OR LNAPL, NOTIFY THE ENGINEER IMMEDIATELY. GROUNDWATER SHOULD NOT BE ENCOUNTERED DURING EXCAVATION ACTIVITIES. ALL SOIL SHALL BE ASSUMED TO BE CONTAMINATED UNTIL TESTING DEMONSTRATES OTHERWISE.

3) ALL FILL SHALL BE PLACED IN APPROXIMATELY HORIZONTAL, COMPACTED LAYERS OF UNIFORM THICKNESS. THE LAYERS SHALL BE CARRIED UP FULL WIDTH FROM THE BOTTOM OF THE FILL. EACH LAYER SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING 12 INCHES IN THICKNESS. IF THE ENTIRE FINISHED THICKNESS OF MATERIAL IS GREATER THAN 9 INCHES, IT SHALL BE CONSTRUCTED FROM TWO OR MORE LAYERS OF APPROXIMATELY EQUAL THICKNESS.

4) FILL IN LIGHTLY TRAVELED AREAS SHALL BE COMPACTED TO A FIRM, NON-YIELDING STATE USING HAND-TAMPING AROUND PIPES AND MECHANICAL COMPACTION ELSEWHERE. FILL IN HEAVY TRAFFIC AREAS (AS IDENTIFIED ON THE DRAWINGS) SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM DENSITY (MODIFIED PROCTOR). COMPACTION BY MECHANICAL MEANS MAY USE ANY APPROPRIATE MACHINES (SUCH AS A BACKHOE-MOUNTED VIBRATORY PLATE OR HAND-OPERATED COMPACTOR) PROVIDED THAT THEY ARE CAPABLE OF COMPACTING THE FILL TO THE SPECIFIED DENSITY AND DO NOT DAMAGE ADJACENT STRUCTURES OR BURIED PIPING.

5) STOCKPILES OF EXCAVATED SOIL OR IMPORTED FILL MATERIALS MAY BE STOCKPILED ON-SITE ONLY DURING THE DURATION OF THE EARTHWORK ACTIVITIES AT A LOCATION PRE-APPROVED BY THE ENGINEER. THE LOCATION OF ANY STOCKPILE MAY NOT INTERFERE WITH LOCAL BUSINESSES OR ON-SITE OPERATIONS. STOCKPILES OF EXCAVATED SOIL SHALL BE PLACED IN A MANNER TO PREVENT SEDIMENT FROM REACHING ANY LOCAL STORM DRAIN. IF DUST CONTROL IS NEEDED FOR A STOCKPILE, THE STOCKPILE SHALL BE COVERED BY SHEET PLASTIC.

6) DEBRIS (INCLUDING CONCRETE REMOVED DURING SYSTEM INSTALLATION) AND REMOVED SOILS SHALL BE PROPERLY DISPOSED OF AT A PERMITTED DISPOSAL FACILITY. IF SOIL IS TO BE REMOVED FROM THE SITE, IT SHALL BE THE RESPONSIBILITY OF THE ENGINEER TO DETERMINE THE PROPER WASTE DESIGNATION (INCLUDING ALL NECESSARY CHEMICAL ANALYSES). SOIL IMPACTED BY PCE AND/OR TCE MAY BE DESIGNATED AS A HAZARDOUS WASTE AND WILL NEED TO BE HANDLED AND DISPOSED OF ACCORDINGLY.

7) CONTRACTOR SHALL ASSESS THE CAPACITY OF THE EXISTING CONDUIT BENEATH THE RAIL LINES WITH REGARDS TO AVAILABLE APACE FOR THE MAIN HEADER PIPE. ALTERNATIVELY, CONTRACTOR SHALL RETAIN A STRUCTURAL ENGINEER AND SCOPE AN OVERHEAD PIPE SUPPORT BETWEEN THE WAREHOUSE BUILDINGS WITH A MINIMUM CLEARANCE SIMILAR TO OTHER OVERHEAD STRUCTURES OVER THE RAIL LINES. SCOPE OF OVERHEAD CROSSING TO BE COORDINATED WITH FACILITY STAFF AND APPROVED BY ENGINEER PRIOR TO IMPLEMENTATION.

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

SUBMITTED: Michael Stevens, ASSOCIATE ENGINEER DATE: 11/1/2010

DESIGNED: MWS
DRAWN: JLP
CHECKED: HFC
CHECKED:
APPROVED: MWS

EXTERNAL REFERENCE FILES

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

SPECIFICATIONS

2010 INTERIM ACTION WORK PLAN IMPLEMENTATION
NUSTAR TERMINALS SERVICES, INC. VANCOUVER FACILITY
VANCOUVER, WASHINGTON

FILENAME: 1126-09 (DETAILS)
AC PROJECT NUMBER: 1126-09
SCALE: NTS
DRAWING NUMBER: B-6
SHEET NUMBER: 6 OF 6

Appendix C

Design Support

Table C-1
Piping Size Calculator
Nustar Vancouver

System Air Flow [CFM]	Air Flow Per Well [CFM]	Head Losses ["H2O], Including Fittings								Head Loss ["H2O]
		Well		Branch Line (4 Wells)						
		1.5"	2"	2"	3"	4"	4"	6"	8"	
400	23.5	1.73	0.41	9.07	1.19	0.28	58.49	7.64	1.80	2.49

Notes:

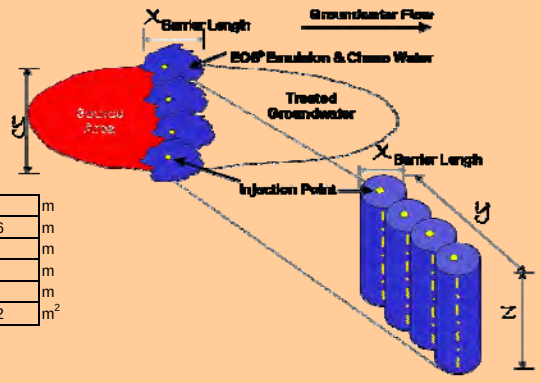
1. Head loss calculated from equation for friction loss in circular duct: $dP = (0.109136\ Q^{1.9})/(d^{5.02})$ [inches/100 feet]
2. Head loss associated with longest piping run of listed type
3. Pipe size selected such that head loss is less than 1 inch of water in 100 feet of pipe

EOS® BARRIER DESIGN WORKSHEET

U.S. Version 2.1e, Rev. Date: February 6, 2008
www.EOSRemediation.com

Help

Site Name:	NuStar Vancouver
Location:	
Project No.:	1126-09



Step 1: Select a Substrate from the EOS® Family of Bioremediation Products

Substrate Selected (pick from drop down list): EOS® 598B42 (Preferred for Chlorinateds)
For Product Literature Click Here

Step 2: EOS® Consumption During Contaminant Biodegradation / Biotransformation

Section A: Treatment Area Dimensions

Length of treatment area parallel to groundwater flow, "x"	320	ft	97.5	m
Width of treatment area perpendicular to groundwater flow, "y"	330	ft	100.6	m
Minimum depth to contamination	30	ft	9.1	m
Maximum depth of contamination	50	ft	15.2	m
Treatment thickness, "z"	20	ft	6.1	m
Treatment zone cross-sectional area, A = y * z	6,600	ft^2	613.2	m^2

Section B: Groundwater Flow Rate / Site Data

Soil Characteristics

Nominal Soil Type (pick from drop down list)	Silty Sand			
Total Porosity (accept default or enter *n*)	0.28	(decimal)		
Effective Porosity (accept default or enter n_e)	0.17	(decimal)		
Soil bulk density; (1-n)*2.65 g/cc (accept calculated or enter dry bulk density)	1.91	g/cc	119	lbs / ft^3

Hydraulic Characteristics

Hydraulic Conductivity (accept default or enter *K*)	29	ft/day	1.0E-02	cm/sec
Hydraulic Gradient (accept default or enter *i*)	0.005	ft/ft		

Note: Since the hydraulic gradient ($i = dh/dx$) is negative, we ask you to enter $-i$ in the EOS® Design Tool so that you can enter a positive number for convenience.

Non-reactive Transport Velocity, $V_x = -(K \times i) / n_e$	0.85	ft/day	0.260	m/day
Groundwater flow rate through treatment zone, $Q = -KiA$	7158.36	gallons/day	27,099.22	L/day

Section C: Calculated Contact Length

Contact time (τ) between oil and contaminants (accept default or enter τ)	60	typical values 60 to 180 days, see comment	
Calculated Contact Length (x) = $\tau * V_x$	51.2	ft	15.6 m

Treatment zone volume	2,112,000	ft^3	59,805.2	m^2
Treatment zone groundwater volume (volume * effective porosity)	2,685,619	gallons	10,166,881	L

Section D: Design Lifespan For One Application

	5	year(s)	typical values 5 to 10 years
Estimated total groundwater volume treated over design life	15,749,626	gallons	59,622,961 L

Section E: Electron Acceptors

Inputs	Typical Value	GW Conc. (mg/L)	MW (g/mole)	e^- equiv./ mole	Stoichiometry *Contaminant/ H_2 (wt/wt H_2)*	Hydrogen Demand *(g H_2)*
Dissolved Oxygen (DO)	0 to 8	2	32.0	4	7.94	15024.05902
Nitrate Nitrogen (NO_3^- - N)	1 to 10	320	62.0	5	12.30	1550689.897
Sulfate (SO_4^{2-})	10 to 500	5	96.1	8	11.91	25024.14488
Tetrachloroethene (PCE), C_2Cl_4		1.4	165.8	8	20.57	4058.592351
Trichloroethene (TCE), C_2HCl_3		0.6	131.4	6	21.73	1646.549571
cis-1,2-dichloroethene (c-DCE), $C_2H_2Cl_2$		0.2	96.9	4	24.05	495.9077939
Vinyl Chloride (VC), C_2H_3Cl		0.1	62.5	2	31.00	192.3047439
Carbon tetrachloride, CCl_4			153.8	8	19.08	
Chloroform, $CHCl_3$			119.4	6	19.74	
sym-tetrachloroethane, $C_2H_2Cl_4$			167.8	8	20.82	
1,1,1-Trichloroethane (TCA), CH_3CCl_3			133.4	6	22.06	
1,1-Dichloroethane (DCA), CH_2CHCl_2			99.0	4	24.55	
Chloroethane, C_2H_5Cl			64.9	2	32.18	
Perchlorate, ClO_4^-			99.4	8	12.33	
Hexavalent Chromium, Cr[VI]			52.0	3	17.20	
User added						
User added						
User added						

Section F: Additional Hydrogen Demand and Carbon Losses

Generation (Potential Amount Formed)	Typical Value	GW Conc. (mg/L)	MW (g/mole)	e^- equiv./ mole	Stoichiometry *Contaminant / H_2 (wt/wt H_2)*	Hydrogen Demand *(g H_2)*	DOC Released *(moles)*
Estimated Amount of $Fe2^+$ Formed	10 to 100	50	55.8	1	55.41	53804.26402	
Estimated Amount of Manganese (Mn^{2+}) Formed		5	54.9	2	27.25	10938.50932	
Estimated Amount of CH_4 Formed	5 to 20	10	16.0	8	1.99	299672.0356	
Target Amount of DOC to Release	60 to 100	80	12.0				397122.38

Design Safety Factor: 2.0 typical values 1 to 3

Calculations assume:
1.) all reactions go to completion during passage through emulsified edible oil treated zone; and,
2.) perfect reaction stoichiometry.

EOS® Requirement Calculations Based on Hydrogen Demand and Carbon Losses

Stoichiometric Hydrogen Demand	8,641.2	pounds
DOC Released	45,345.0	pounds

EOS® Requirement Based on Hydrogen Demand and Carbon Loss
84,723 lbs

Step 3: EOS® Requirement Based on Attachment by Aquifer Material

Soil Characteristics

Effective treatment thickness, "z_e" (typically less than 40%): 0.25
For Additional Information on Effective Thickness, Click Here

Weight of sediment to be treated: 62,891,425 lbs

Adsorptive Capacity of Soil (accept default or enter site specific value): 0.0016 lbs EOS® / lbs sediment

EOS® Attachment by Aquifer Material[1]
- Fine sand with some clay 0.001 to 0.002 lbs EOS® / lbs soil
- Sand with higher silt/clay content 0.002 to 0.004 lbs EOS® / lbs soil

[1]Default values provided based on laboratory studies completed by NCSU
For Additional Data, Click Here

EOS® Requirement Based on Oil Entrapment by Aquifer Material
100,626 lbs

Summary – How much EOS® do you need?

Suggested Quantity of EOS® for Your Project: 240 drums

PROJECT : AS-BUILT
=======

SCOPE : RESULTS OF FULL-SCALE PERMEABILITY TESTS
TEST DATE : 10/19/2010
WELL NUMBER : VE2-3

1. MODEL INPUT SUMMARY
----- ----- -------

MODEL DOMAIN : THICKNESS = 914.400 cm
: ESTIMATED PERMEABILITY = 0.100E-06 cm^2
: ESTIMATED ANISOTROPY RATIO = 1.00
UPPER CONFINING UNIT : THICKNESS = 10.140 cm
: ESTIMATED PERMEABILITY =.100E-08 cm^2
WELL DEPTH (HANTUSH d) : TOP OF SCREEN = 152.40 cm
WELL DEPTH (HANTUSH l) : BOTTOM OF SCREEN = 609.60 cm
WELL RADIUS : EFFECTIVE RADIUS = 10.14 cm
AIR FLOW DIRECTION : VAPOR EXTRACTION

2. MODEL OUTPUT SUMMARY
----- ------ -------

****

AIR TEMP	SOIL TEMP	ATMOS. PRESS.	SYSTEM PRESS.	FLOW METER TYPE	SCALE READING --	PREVAIL. FLOW --	ACTUAL FLOW
degC	degC	atm	atm			cm^3/sec	cm^3/sec
18.00	12.00	1.000	0.946	NONE	--	--	14200.000

****

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MASS FLOW	HORIZON. PERM.	VERTICAL PERM.	LEAKAGE RATIO(k/b)	ANISOTPY RATIO	MEAN OF ERROR IN PRESS.	STD DEV OF ERROR IN PRESS.
g/sec	cm^2	cm^2	cm^2/cm	(kr/kz)		
16.362	0.239E-05	0.239E-05	0.986E-10	1.000	0.167-306	0.544+292

****

60.96	-381.00	-0.464324E-01	-0.567044E-03	-0.464358E-01
121.92	-381.00	-0.212665E-01	-0.529632E-03	-0.212731E-01
182.88	-381.00	-0.127337E-01	-0.481786E-03	-0.127428E-01
243.84	-381.00	-0.869164E-02	-0.424907E-03	-0.870202E-02
304.80	-381.00	-0.631360E-02	-0.362399E-03	-0.632399E-02
365.76	-381.00	-0.487147E-02	-0.300803E-03	-0.488075E-02
426.72	-381.00	-0.393212E-02	-0.243122E-03	-0.393962E-02
487.68	-381.00	-0.328487E-02	-0.191412E-03	-0.329045E-02
548.64	-381.00	-0.281772E-02	-0.146545E-03	-0.282153E-02
609.60	-381.00	-0.246708E-02	-0.108416E-03	-0.246946E-02
670.56	-381.00	-0.219500E-02	-0.767667E-04	-0.219634E-02
731.52	-381.00	-0.197782E-02	-0.508988E-04	-0.197847E-02
792.48	-381.00	-0.180027E-02	-0.300292E-04	-0.180052E-02
853.44	-381.00	-0.165217E-02	-0.133816E-04	-0.165222E-02
914.40	-381.00	-0.152651E-02	-0.238169E-06	-0.152651E-02
975.36	-381.00	-0.141835E-02	0.100348E-04	-0.141838E-02
1036.32	-381.00	-0.132411E-02	0.179812E-04	-0.132423E-02
1097.28	-381.00	-0.124115E-02	0.240567E-04	-0.124138E-02
1158.24	-381.00	-0.116746E-02	0.286378E-04	-0.116781E-02

VOLUMETRIC FLOW SIGN CONVENTION :

NEGATIVE HORIZONTAL FLOW => FLOW TOWARDS WELL

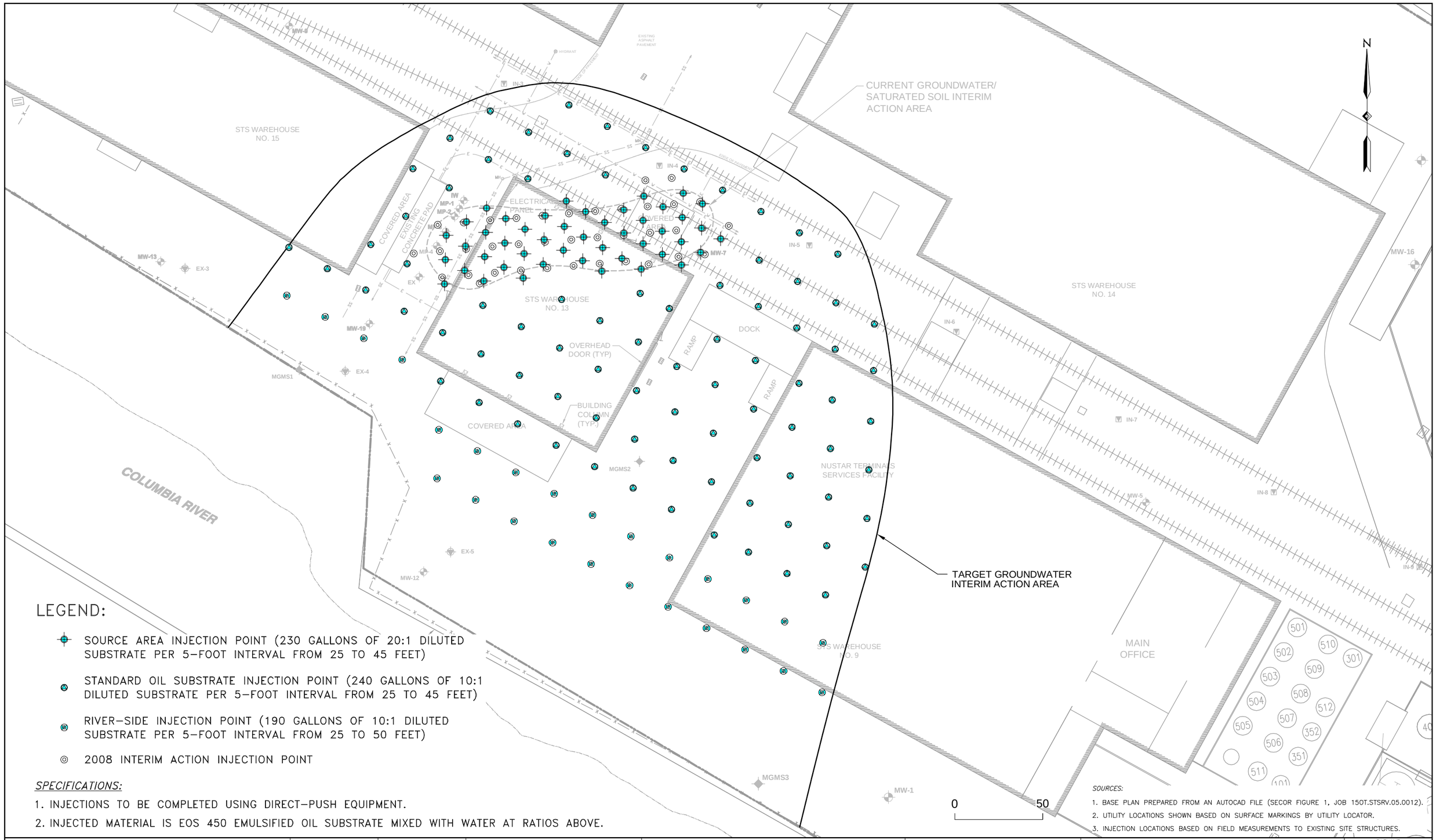
POSITIVE HORIZONTAL FLOW => FLOW AWAY FROM WELL

NEGATIVE VERTICAL FLOW => FLOW UPWARDS

POSITIVE VERTICAL FLOW => FLOW DOWNWARDS

Appendix D

Bioremediation Design



LEGEND:

- SOURCE AREA INJECTION POINT (230 GALLONS OF 20:1 DILUTED SUBSTRATE PER 5-FOOT INTERVAL FROM 25 TO 45 FEET)
- STANDARD OIL SUBSTRATE INJECTION POINT (240 GALLONS OF 10:1 DILUTED SUBSTRATE PER 5-FOOT INTERVAL FROM 25 TO 45 FEET)
- RIVER-SIDE INJECTION POINT (190 GALLONS OF 10:1 DILUTED SUBSTRATE PER 5-FOOT INTERVAL FROM 25 TO 50 FEET)
- 2008 INTERIM ACTION INJECTION POINT

SPECIFICATIONS:

1. INJECTIONS TO BE COMPLETED USING DIRECT-PUSH EQUIPMENT.
2. INJECTED MATERIAL IS EOS 450 EMULSIFIED OIL SUBSTRATE MIXED WITH WATER AT RATIOS ABOVE.

SOURCES:

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.

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

SUBMITTED: Michael Stevens, ASSOCIATE ENGINEER DATE: 11/1/2010

DESIGNED: MWS
DRAWN: JLP
CHECKED: HFC
CHECKED:
APPROVED: MWS

EXTERNAL REFERENCE FILES
UPDATED XREF Base 1126.DWG

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

ENHANCED BIOREMEDIATION LAYOUT

2010 INTERIM ACTION WORK PLAN IMPLEMENTATION
NUSTAR TERMINALS SERVICES, INC. VANCOUVER FACILITY
VANCOUVER, WASHINGTON

FILENAME	1126-09 (DRAWING SET 3)
AC PROJECT NUMBER	1126-09
SCALE	1" = 50'
DRAWING NUMBER	D-1
SHEET NUMBER	1 OF 1