

## 2011/2012 SITE-WIDE GROUNDWATER MONITORING REPORT

# BNSF FORMER MAINTENANCE AND FUELING FACILITY SKYKOMISH, WASHINGTON CONSENT DECREE NO. 07-2-33672-9 SEA

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#### 1.0 INTRODUCTION

This 2011/2012 Groundwater Monitoring Report was prepared on behalf of BNSF Railway Company (BNSF) and describes the fourth quarter 2011 and calendar year 2012 groundwater monitoring activities performed at the BNSF Former Maintenance and Fueling Facility in Skykomish, Washington (herein referred to as the Site). Groundwater monitoring is being conducted as part of the Site remediation activities being completed in accordance with the Cleanup Action Plan for BNSF Former Maintenance and Fueling Facility, Skykomish, Washington dated October 2007, prepared by the Washington State Department of Ecology (Ecology) (2007a) (CAP). The groundwater monitoring activities completed at the Site during the fourth quarter of 2011 and in 2012 were conducted by BNSF pursuant to Consent Decree No. 07-2-33672-9 SEA between BNSF and Ecology (2007b) (Consent Decree) and are part of an integrated and comprehensive remedial action being performed at the Site. Groundwater monitoring activities were performed in accordance with the 2010 Groundwater Monitoring Plan, Appendix E of the 2010 Compliance Monitoring Plan Update (AECOM Environment [AECOM] 2010a) (2010 GWMP).

BNSF retained Farallon Consulting, L.L.C. (Farallon) in July 2012 to manage cleanup at the Site. AECOM performed groundwater monitoring from October 2011 through June 2012, and Farallon performed groundwater monitoring from July through December 2012.

This document summarizes groundwater monitoring at the Site from October 2011 through December 2012 (Reporting Period) and includes:

- Semiannual Site-wide monitoring events completed in March and September 2012;
- Quarterly monitoring events conducted in December 2011 and June and December 2012; and
- Monthly monitoring of the air sparging system wells and hydraulic control and containment system (HCC System) monitoring network wells from October 2011 through December 2012.

#### 1.1 GROUNDWATER MONITORING OBJECTIVES

The objectives for the groundwater monitoring program described in the 2010 GWMP are to:

- Monitor any changes in contaminant distribution during and after implementation of cleanup actions throughout the Site;
- Provide monitoring data for groundwater in the Levee Zone to assess the effect of the cleanup actions on groundwater quality;
- Provide monitoring data to evaluate 2008 through 2012 remediation impacts on groundwater quality; and
- Provide fluid level gauging data to assess groundwater and surface water gradients and the extent of free product.



#### 1.2 SITE DESCRIPTION

The Site includes BNSF property and public and private properties within the Town of Skykomish, King County, Washington, and encompasses an area of about 40 acres. The Site is approximately bounded by the South Fork Skykomish River to the north, Town of Skykomish city limits to the east, Old Cascade Highway to the south, and Maloney Creek to the west. Railroad Avenue separates BNSF property from the main commercial district of the Town of Skykomish.

Additional Site history and background information was presented in the Consent Decree, CAP, and in Supplemental Remedial Investigation Volume 1: Text, Tables, Figures, and Appendices A through D (The RETEC Group, Inc. [RETEC] 2002b).

#### 1.3 REPORT ORGANIZATION

The remainder of this report is organized into the following sections:

- Section 2 Groundwater Monitoring Network. This section describes the monitoring well network and changes made to the network during the Reporting Period.
- Section 3 Sampling, Analysis, and Reporting. This section describes the procedures and protocols used to perform the monitoring activities, laboratory analyses and reporting, and subsequent data management and validation activities.
- Section 4 Results and Discussion. This section describes the results of the monitoring
  activities; specifically the fluid level gauging and analytical results from the groundwater
  sampling.
- Section 5 Summary and Recommendations. This section provides an overview of the groundwater monitoring activities conducted at the Site during the fourth quarter of 2011 and through 2012, and includes a summary of the data, and recommendations for future sampling events.
- **Section 6 Bibliography**. This section includes a listing of the documents cited in this report and other relevant documents providing additional background information.



#### 2.0 GROUNDWATER MONITORING NETWORK

This section describes the wells, piezometers, and vaults that were included in the groundwater monitoring network for fluid level gauging and groundwater sampling during the Reporting Period. The wells, piezometers, and vaults sampled and the frequency of the sampling were defined in the 2010 GWMP. Groundwater monitoring locations are shown on Figure 1.

#### 2.1 MODIFICATIONS TO THE MONITORING NETWORK

This section describes monitoring network changes implemented during the Reporting Period, including new well installation and well abandonment. Modifications to the groundwater monitoring network and the rationale for the abandoned wells are summarized in Table 1. Modification plans and construction and/or abandonment details prior to the Reporting Period were presented in previous Site documents. Monitoring wells MW-47 through MW-49 were added to the monitoring network as groundwater elevation gauging locations as part of the ongoing HCC System optimization efforts at the Site in accordance with the technical memorandum regarding HCC System Optimization Work Plan dated December 11, 2012 (Farallon 2012). A summary of well installation procedures, including well installation and lithology details, is presented in Appendix A.

Monitoring well 2A-W-4 at the Site was inadvertently covered during grading activities associated with the soil remediation excavation effort and is no longer serviceable or accessible. Although AECOM and Farallon made multiple attempts to locate the monitoring well during 2012, it could not be located and it is considered abandoned but not in accordance with Chapter 173-160 of the Washington Administrative Code.

#### 2.2 SUMMARY OF GROUNDWATER MONITORING NETWORK

The current network of wells and piezometers at the Site is shown on Figure 1. Figure 1 includes each well and piezometer location at the Site, including those not used for gauging or monitoring during the Reporting Period.

Table 2 summarizes monitoring activities during the Reporting Period and corresponding event dates. Tables 3 and 4 present additional details regarding the sampling and gauging frequencies of wells and vaults used in the groundwater monitoring network. Well abandonment and installation dates, where applicable, also are included in Tables 3 and 4 to define the basis for monitoring end dates at these locations.

The conditional points of compliance (CPOCs) for groundwater are generally described in Section 3.4 and on Figure 6 of the CAP. The monitoring network described above was partially established before the CAP was issued by Ecology in October 2007. However, all wells in the network are within the area bounded by the CPOC well locations, and the locations and designations of compliance wells were approved by Ecology in the 2010 Compliance Monitoring Plan Update (AECOM 2010a). Point of compliance wells will be defined in a Long-Term



Confirmational Monitoring Plan to be developed at the conclusion of active remediation pursuant to Exhibit C of the Consent Decree.



#### 3.0 SAMPLING, ANALYSIS, AND REPORTING

This section summarizes the groundwater monitoring network sampling methods, laboratory analysis and reporting procedures, and data management and validation protocols. Groundwater samples collected during the Reporting Period were analyzed by Pace Analytical Laboratories in Seattle, Washington (Pace). Pace is a Washington State-accredited laboratory.

#### 3.1 SAMPLING METHODS

The sampling methodology used to gauge fluid levels and collect groundwater samples was described in the 2010 GWMP. The procedures were established for gauging and sampling monitoring wells, although these procedures apply also to piezometer and vault locations.

#### 3.2 ANALYTICAL METHODS

The groundwater samples were analyzed for total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO) by Northwest Method NWTPH-Dx. The quarterly and semiannual groundwater samples collected from monitoring wells 5-W-14 through 5-W-19 within the Levee Zone were analyzed also for DRO and ORO after the samples had been prepared using a silica gel cleanup procedure to remove biogenic organic interferences.

The analytical laboratory reported detected sample concentrations using the method detection limit (MDL) rather than the method reporting limit (MRL), which usually is higher. Because analyte concentrations detected above the MDL and below the MRL have a degree of uncertainty, these results were considered to be estimated values, and were qualified with a J-flag. Using the MDL to report results was intended to minimize the occurrence of non-detected results with an MRL greater than the cleanup level.

#### 3.3 DATA MANAGEMENT AND VALIDATION

The analytical laboratory provided both text data reports (Appendix B) and electronic data deliverables that were directly imported into the project environmental data management system. A quality control check was performed on the imported data to ensure that it was accurately uploaded and that transfer errors did not occur.

Each laboratory analytical report included copies of the Chain of Custody forms and a case narrative containing the following information: a description of the case, comments on sample condition upon receipt, and a description of sample preparation and analysis. The following data were included in the data report: MDL, MRL, units of measure, dilution factor, batch number, date received, date prepared, date analyzed, analytical method, and any notes or qualifiers. The report also contained the details and results of laboratory quality assurance/quality control procedures that were performed on the samples.

Upon receipt of October 2011 through June 2012 analytical data from Pace, the electronic data deliverables and case narratives were checked for completeness, and data were then validated by AECOM Staff Chemists. Analytical data generated from the July 2012 through December 2012



groundwater sampling events were checked for completeness by a Farallon Project Scientist, and data were then validated by Sayler Data Solutions of Bothell, Washington.

AECOM Chemists and Sayler Data Solutions evaluated the groundwater data to assess whether the analytical results met the quality control/validation standards described in the 2010 GWMP. These metrics included precision, accuracy, method compliance, and completeness of the data set. Validation results were then used to evaluate whether the data were suitable for their intended use.

Data validation procedures, criteria, and findings are provided in Appendix C. Procedures used in the data validation are based on U.S. Environmental Protection Agency (EPA) (2008) guidelines for organic methods data review.



#### 4.0 RESULTS AND DISCUSSION

This section presents a summary and evaluation of results from groundwater monitoring during the Reporting Period.

### 4.1 FLUID LEVELS

Table 4 summarizes the frequency of gauging at Site locations, including monitoring wells and surface water gauging locations in the Skykomish River. With the exception of the HCC System, locations are gauged on a quarterly schedule, with additional locations during the semiannual monitoring and sampling events in March and September. Table 5 presents the groundwater elevation, surface water elevation, and product thickness measurements obtained during the Reporting Period. Groundwater flow direction, variations in groundwater elevations and product thickness, and changes in groundwater gradients in relation to seasonal variations and remediation activities are discussed below.

Quarterly and semiannual groundwater surface elevation maps for the Reporting Period are shown on Figures 2 through 6. As shown on these figures, the groundwater flow direction is generally consistent, with minimal seasonal variation. Groundwater elevations did fluctuate seasonally by approximately 4 feet adjacent to and south of the HCC barrier wall, and by approximately 2 feet adjacent to and north of the HCC barrier wall, with some influence imparted by HCC System pumping rates. The difference in groundwater elevations across the central part of the HCC barrier wall varied between approximately 4 feet in March 2012 and approximately 2 feet in September 2012. Flow in this area is influenced by seasonal variations and pumping rates in the HCC System. South of the HCC barrier wall, groundwater flow is predominantly toward the northwest or west. North of the HCC barrier wall, groundwater typically flows to the northwest in the direction of the Skykomish River. The HCC wall acts as a barrier to groundwater flow and accentuates a westerly component to flow in the area of the HCC barrier wall. Localized groundwater depressions are present near the HCC gates due to pumping of recovery wells on the south side of the HCC barrier wall.

Groundwater surface elevation maps continue to show that groundwater elevations are lower in the Levee Zone due to the presence of an impermeable liner along the south (up-gradient) boundary of the prior Levee Zone excavation. The extent of the liner is described in the *Levee Zone Interim Action for Cleanup - 2007 As-Built Completion Report* (ENSR 2007).

#### 4.2 FIELD PARAMETERS

Table 6 presents the stabilized field parameter measurements collected during the monthly, quarterly, and semiannual groundwater sampling events from each of the wells that did not contain free product. Each field parameter is discussed separately below.

#### 4.2.1 pH

The average pH of groundwater across the Site during the Reporting Period was 5.73. The minimum pH was 4.20 at monitoring well 1C-W-1 on May 30, 2012, and the maximum pH was



7.62 at monitoring well GW-2 on September 20, 2012. The average, minimum, and maximum pH measurements were consistent with past measurements at the Site.

#### 4.2.2 Temperature

The average temperature of groundwater during the Reporting Period was 8.40 degrees Centigrade (°C). The minimum temperature was 3.40°C at monitoring well MW-4 on March 28, 2012, and the maximum temperature was 14.8°C at monitoring well 5-W-56 on September 18, 2012. The temperature varied seasonally.

#### 4.2.3 Dissolved Oxygen

The average dissolved oxygen (DO) concentration in groundwater across the Site during the Reporting Period was 3.58 milligrams per liter (mg/l). DO levels ranged from a minimum of 0.13 mg/l at monitoring wells 2A-W-9 and 2A-W-10 on June 27, 2012 to a maximum of 10.14 mg/l measured at monitoring well 1C-W-1 on July 26, 2012. In general, monitoring wells with no detected petroleum hydrocarbon compounds had higher concentrations of DO than monitoring wells with detected petroleum hydrocarbon compounds. These measurements are consistent with historical values.

#### 4.2.4 Oxidation-Reduction Potential

The average oxidation-reduction potential (ORP) in groundwater across the Site during the Reporting Period was 41.8 millivolts (mV). The minimum ORP value was -309.6 mV at monitoring well GW-1 on June 27, 2012; the maximum was 360.1 mV at monitoring well 1C-W-1 on February 28, 2012. ORP in groundwater at the Site is most-commonly positive. A positive ORP and DO in excess of approximately 1 mg/l indicates that conditions are conducive to aerobic degradation of petroleum hydrocarbons. These measurements were consistent with historical values.

#### 4.2.5 Turbidity

The mean turbidity value in groundwater across the Site during the Reporting Period was 13.7 nephelometric turbidity units (NTU). Turbidity values ranged from 0 NTU at monitoring well 2A-W-42 on September 19, 2012, to a maximum of 615 NTU measured at monitoring well 1C-W-3 on September 20, 2012. There were two anomalous measurements during the monitoring period. These anomalies were not used in factoring the average due to instrumentation errors. Approximately 90 percent of the turbidity measurements during this reporting period were below approximately 25 NTU, and somewhat higher than presented in the previous groundwater monitoring report, when about 90 percent of the turbidity measurements were below approximately 10 NTU.

#### 4.3 NWTPH-Dx

#### 4.3.1 Applicable Groundwater Cleanup and Remediation Levels

The groundwater cleanup level (CUL) for NWTPH-Dx is 208 micrograms per liter ( $\mu$ g/l) and the remediation level (RL) is 477  $\mu$ g/l as specified in Section 3.4 and Table 1 of the CAP. The CAP anticipates that cleanup levels will be attained at the CPOC following implementation of all



cleanup actions specified in the CAP. The approximate CPOC boundary is shown on Figure 6 of the CAP. As described in the CAP, the CUL for petroleum hydrocarbons in groundwater is intended to protect sediments from recontamination by groundwater (e.g., near the South Fork Skykomish River and Former Maloney Creek) and the RL for petroleum hydrocarbons in groundwater is intended to protect drinking water.

#### 4.3.2 Analytical Results

NWTPH-Dx in groundwater was analyzed using Northwest Method NWTPH-Dx without silica gel cleanup (all samples), and with silica gel cleanup at selected sample locations, primarily in the Levee Zone. Analyses using samples prepared using the silica gel cleanup protocol were not performed during the December 2012 quarterly monitoring event.

DRO and ORO hydrocarbon fractions were added together to calculate an NWTPH-Dx concentration. If either the DRO or ORO fractions were not detected at or above the MDL, half of the MDL value was used to represent the non-detected component in the calculation. If both components were not detected, half of the MDL value of both components was added to represent the calculated NWTPH-Dx reporting value that was then denoted as not detected. Table 7 shows calculated NWTPH-Dx concentrations for samples not prepared with a silica gel cleanup. Table 8 shows calculated NWTPH-Dx concentrations for samples prepared with a silica gel cleanup, along with the NWTPH-Dx concentrations for the same sample without silica gel cleanup from Table 7. Figures 7 through 11 depict the groundwater NWTPH-Dx concentrations on Site plan maps for the five quarterly and semiannual monitoring events during the Reporting Period, and also show the estimated extent of light nonaqueous-phase liquid (LNAPL) identified at the Site during the five monitoring events of the Reporting Period.

Site-wide groundwater sampling was conducted on a semiannual schedule (March and September). In addition, select wells down-gradient of the HCC System, adjacent to the Former Maloney Creek Zone-East Wetland, the Levee Zone, and the HCC system gate and end wells were sampled on a quarterly schedule (June and December). Air sparging system wells were monitored and sampled on a monthly schedule.

Provided in the following sections is a discussion of the results of the semiannual Site-wide events (March and September 2012). Following this are discussions regarding results of more frequent monitoring events. The data are presented below by zone.

#### 4.3.3 Results from Semiannual Site-Wide Groundwater Monitoring Events

Groundwater samples were collected from up to 57 locations during the March and September 2012 semiannual groundwater monitoring events. The Site-wide discussion below pertains to data collected from all monitoring locations, with the exception of HCC sentry, gate, and vault wells. Groundwater samples collected from all 57 locations sampled during the semiannual monitoring events are listed in Table 2. These samples were analyzed for NWTPH-Dx by Northwest Method NWTPH-Dx. NWTPH-Dx results from these semiannual events are shown on Figures 8 and 10, and are presented in Tables 7 and 8.



#### 4.3.3.1 March 2012

The March 2012 semiannual groundwater monitoring event occurred from March 26 through 28, 2012. Groundwater samples were collected from 33 monitoring wells at the Site (not including HCC sentry, gate, or vault wells) during this Reporting Period. NWTPH-Dx was detected in 28 of the 33 samples collected during March 2012. NWTPH-Dx concentrations ranged from 42.5 to 27,400  $\mu$ g/l, six of which exceeded the RL of 477  $\mu$ g/l.

RL exceedances were detected in samples collected from monitoring wells 2A-W-9, 2A-W-10, 5-W-15, 5-W-50, 5-W-51, and 5-W-56. The RL exceedances occurred in monitoring wells located primarily within or adjacent to residual LNAPL plumes. Exceptions were monitoring well 2A-W-9 within the Railyard Zone and near a former LNAPL area, and monitoring well 5-W-15 in 6<sup>th</sup> Street and near an area containing LNAPL. Approximately 0.5 foot of LNAPL was measured in monitoring well 5-W-51 approximately 80 feet southwest of monitoring well 5-W-15 during the March 2012 groundwater monitoring event.

During the March 2012 groundwater monitoring event, six groundwater samples collected from the six Levee Zone monitoring wells were analyzed by Northwest Method NWTPH-Dx after the samples had been prepared with a silica gel cleanup. NWTPH-Dx was detected in two of the six samples prepared with silica gel cleanup. NWTPH-Dx concentrations (with silica gel cleanup) collected from monitoring wells 5-W-15 and 5-W-18 were 163.5 and 45.5  $\mu$ g/l, respectively, and below the RL and CUL.

#### 4.3.3.2 September 2012

The September 2012 semiannual groundwater monitoring event occurred from September 18 through 20, 2012. Groundwater samples were collected from 31 monitoring locations around the Site (not including HCC sentry, gate, or vault wells) during the September 2012 monitoring event and analyzed by Northwest Method NWTPH-Dx without silica gel cleanup. NWTPH-Dx was detected in 16 of the 31 samples collected during the September 2012 monitoring event. NWTPH-Dx concentrations ranged from 136 to 3,540  $\mu$ g/l. NWTPH-Dx concentrations exceeding the RL were detected in four of these samples, with concentrations ranging from 500 to 3,540  $\mu$ g/l.

The RL exceedances were detected in samples from monitoring wells 2A-W-9, 5-W-15, 5-W-50, and 5-W-56. The RL exceedances occurred in monitoring wells located primarily within or adjacent to residual LNAPL plumes (Figure 13). Exceptions were monitoring well 2A-W-9 within the Rail Yard Zone and near a former LNAPL area, and monitoring well 5-W-15 located in 6<sup>th</sup> Street and near an area containing LNAPL. Approximately 0.1 foot of LNAPL was measured in monitoring well 5-W-51 approximately 80 feet southwest of monitoring well 5-W-15 during the September 2012 groundwater monitoring event.



During the September 2012 groundwater monitoring event, six groundwater samples collected from the six Levee Zone monitoring locations were analyzed after the samples had been prepared with a silica gel cleanup. NWTPH-Dx was not detected in any of the six samples.

During the September 2012 monitoring event, high analytical method detection limits were provided by Pace Analytical Services, Inc. that were related to laboratory error with regards to project requirements and inability to re-run the samples within the analytical method holding time. The highest analytical method detection limit achieved by the analytical laboratory during the September 2012 monitoring event was 280  $\mu$ g/l which is less than the 477  $\mu$ g/l RL for total petroleum hydrocarbons.

#### 4.3.4 Air Sparging System Monitoring

Groundwater samples were collected from air sparging area monitoring wells 1C-W-1, 1C-W-7, and 1C-W-8 on a monthly basis throughout the Reporting Period. NWTPH-Dx results from these events are shown on Figures 9 through 13 (for the quarterly and semiannual sampling events) and in Table 7 (12 monthly events). A total of 45 groundwater samples were collected from these three monitoring wells during the Reporting Period. NWTPH-Dx was detected in 41 of the 45 samples. NWTPH-Dx concentrations in the samples ranged from 43.5 to 625 µg/l. Of the 41 samples, only one sample collected from monitoring well 1C-W-8 exceeded the NWTPH-Dx RL. After review of the laboratory analytical data, the calculated NWTPH-Dx value at this location resulted from an anomalously high ORO MDL of 750 µg/l, although the ORO result was non-detect at this level. Air sparging system well monitoring results are described further and evaluated in the 2012 Annual Air Sparging System Report being prepared by Farallon (2013b).

#### 4.3.5 Hydraulic Control and Containment System

The following sections summarize the groundwater analytical results from wells that monitor the HCC System and adjacent areas. Quarterly monitoring was completed during the Reporting Period for the HCC System monitoring wells in the backfill and down-gradient of the HCC System, and for the HCC System performance end and gate monitoring wells. If a sample from an HCC System monitoring well exceeded the NWTPH-Dx RL, the monitoring well was re-sampled the following month. NWTPH-Dx was detected at a concentration above the RL only in monitoring well GW-2 in March 2012. Monitoring well GW-2 was re-sampled in April 2012, and the NWTPH-Dx concentration was below the RL. NWTPH-Dx results from these events are shown on Figures 7 through 11 and in Table 7. The results from the HCC System well monitoring events are described further and evaluated in the 2012 Annual Hydraulic Control and Containment System Operations Report being prepared by Farallon (2013c).

#### 4.3.5.1 Backfill and Down-gradient of the HCC

Groundwater samples were collected quarterly from groundwater monitoring wells within the clean backfill placed during the HCC barrier wall construction and down-gradient of the HCC wall at monitoring wells 1B-W-23, 1C-W-7, 2A-W-40, 2A-W-41, 2A-W-42, and 5-W-43. An exception to the quarterly sampling frequency was



monitoring well 1C-W-7, which is sampled monthly because it is also used to monitor the performance of the air sparging system at the Site. A total of 38 groundwater samples were collected throughout the Reporting Period from these six down-gradient monitoring wells and analyzed by Northwest Method NWTPH-Dx without silica gel cleanup. NWTPH-Dx was detected in 26 of the 38 samples. NWTPH-Dx concentrations in the samples ranged from 46.5 to 224  $\mu$ g/l. Of the 26 samples with detected NWTPH-Dx, none of detections exceeded the RL.

#### 4.3.5.2 HCC System Performance

Groundwater samples were collected quarterly throughout the Reporting Period from monitoring wells EW-1 and EW-2A located at the west and east ends of the HCC barrier wall, respectively. Groundwater samples were not collected from monitoring wells EW-1 or EW-2A during the December 2012 event due to inaccessibility resulting from heavy snow accumulation. NWTPH-Dx was detected in two of the four samples collected from monitoring well EW-1, and in two of the four samples collected from monitoring well EW-2A. NWTPH-Dx concentrations were below the RL in each of the four samples with detections.

Groundwater samples were collected quarterly during the Reporting Period from gate monitoring wells (GW-1 to GW-4). A total of 21 groundwater samples were collected from these four locations during the Reporting Period. NWTPH-Dx was detected in 11 of the 21 samples. NWTPH-Dx concentrations in the samples ranged from 45 to 500 µg/l. NWTPH-Dx was detected at a concentration exceeding the RL in monitoring well GW-2 in March 2012. Monitoring well GW-2 was re-sampled in April 2012, and the NWTPH-Dx result was below the RL.

Groundwater samples were collected from the gate sentry monitoring wells during the semiannual monitoring events in March and September 2012. The procedures identified in the CAP require that groundwater samples be collected from the gate sentry wells following a system shutdown lasting more than 48 hours. The system shut down in January 2012 after a major snowfall event that resulted in a power outage to the Town of Skykomish for a period longer than 48 hours. The gate sentry wells were not sampled until the March 2012 semiannual monitoring event due to the heavy snow accumulation. No other system shutdown lasting 48 hours or longer occurred during the Reporting Period. Gate sentry wells are intended to enable monitoring of petroleum hydrocarbon concentrations in the reactive material in each gate to evaluate treatment capacity and exhaustion rates. Petroleum hydrocarbon constituents in groundwater at these locations are removed by the reactive media. Therefore, these results are not representative of Site groundwater conditions, and are not evaluated in this report. The groundwater results for the semiannual events are presented in Table 7 for reference.

#### 4.3.6 Levee Zone

Groundwater samples were collected quarterly during the Reporting Period from Levee Zone monitoring wells 5-W-14 to 5-W-19. The NWTPH-Dx results from these events are shown on Figures 7 through 11. A total of 29 groundwater samples were collected from the six Levee



Zone monitoring wells during the Reporting Period and analyzed by Northwest Method NWTPH-Dx both with and without silica gel cleanup. NWTPH-Dx was detected in 12 of the 29 samples not prepared with a silica gel cleanup. NWTPH-Dx was detected in 2 of the 24 samples prepared with silica gel cleanup. No silica gel cleanup was conducted on the groundwater samples collected in December 2012. NWTPH-Dx concentrations in the samples without silica gel cleanup ranged from 45.5 to 900 µg/l. NWTPH-Dx concentrations in samples prepared with silica gel cleanup ranged from 45.5 to 163.5 µg/l. Of the 12 samples not prepared with silica gel cleanup, 3 contained NWTPH-Dx concentrations exceeding the CUL, with concentrations ranging from 224 to 900 µg/l. NWTPH-Dx CUL exceedances were detected in samples from monitoring well 5-W-15 during each of the five monitoring events, and in monitoring well 5-W-18 during two of the five monitoring events. Monitoring well 5-W-15 is located within the 2006 interim cleanup action area, adjacent to the Skykomish School, and where accumulations of LNAPL have been measured.

#### 4.3.7 Former Maloney Creek Zone – East Wetland and Surrounding Area

Groundwater samples were collected quarterly from monitoring wells 2A-W-9, 2A-W-10, 2B-W-4, MW-3, and MW-4 adjacent to the Former Maloney Creek Zone-East Wetland during the Reporting Period. NWTPH-Dx results from these events are presented in Table 7 and are shown on Figures 7 through 11. A total of 25 groundwater samples were collected throughout the Reporting Period from these five monitoring locations. NWTPH-Dx was detected in 17 of the 25 samples. NWTPH-Dx concentrations ranged from 56.5 to 4,300 µg/l. Of the 17 samples with detections, 5 had NWTPH-Dx concentrations ranging from 500 to 4,300 µg/l, exceeding the RL. The NWTPH-Dx exceedances were detected in samples collected from monitoring wells 2A-W-9 and 2A-W-10.



#### 5.0 CONCLUSIONS

This report presents the results of groundwater monitoring performed for the Reporting Period from October 27, 2011 to December 27, 2012. The groundwater elevation and analytical data collected throughout the Reporting Period were compared to previous monitoring data. These data indicate that groundwater flow gradients are relatively consistent throughout the year and similar to gradients observed during previous monitoring events.

Site-wide analytical data collected during the Reporting Period indicate that the overall extent of the LNAPL and dissolved plumes remained relatively stable. The estimated extent of LNAPL at the Site is depicted in Figures 7 through 11 for each of the five monitoring events in the Reporting Period and shows LNAPL thicknesses measured during each event and estimated extent of inferred LNAPL based on prior monitoring events. Up to 1.6 feet of LNAPL encountered during the Reporting Period along sections of the south side of the HCC barrier wall and in the area around the Skykomish School. The thickest accumulations were measured west of the central gate along the HCC barrier wall between the central and western vaults, and heavy sheens were noted in the recovery wells and oil-water separator at the western vault. LNAPL mobility is monitored as part of the HCC System operations (Farallon 2013c). LNAPL was not measured during the Reporting Period in the southern portion of the railyard where it had been observed previously proximate to monitoring wells MW-11 and 2A-W-10.

Groundwater NWTPH-Dx concentrations during the Reporting Period exceeded the CUL of  $208\,\mu g/l$  and/or the RL of  $477\,\mu g/l$  at monitoring wells down-gradient of and immediately adjacent to areas currently or formerly containing LNAPL. A total of 57 wells were sampled, with samples from 45 monitoring wells having at least one detection of NWTPH-Dx. Of these detections, samples from two of the monitoring wells in the Levee Zone exceeded the CUL, and samples from six monitoring wells exceeded the RL. The data do not indicate significant migration of LNAPL or changes in NWTPH-Dx concentrations during the Reporting Period. The data indicate that the HCC System is effectively preventing LNAPL and NWTPH-Dx from passing through the HCC barrier gates.

With the exception of the Skykomish School, 2011 marked the completion of cleanup action work at the Site. Cleanup at the school yard is tentatively scheduled to occur during the summer of 2013, followed by treatment beneath the Skykomish School building in 2014, pending negotiation of access agreements with the School District. Cleanup work to date has included installation of the HCC System and an air sparge system, and excavation of soil containing NWTPH-Dx and free product throughout a substantive portion of the Site. In accordance with the 2010 Compliance Monitoring Plan Update (AECOM 2010a), Site-wide groundwater monitoring has been conducted semiannually at the Site since 2006. In addition, groundwater monitoring wells down- and up-gradient of the HCC System and along the levee have been monitored quarterly.

Upon completion of all cleanup actions specified in the CAP, groundwater monitoring will be conducted in accordance with a Long-Term Confirmational Monitoring Plan, which will be



prepared and submitted to Ecology in accordance with Exhibit C of the Consent Decree. In advance of developing the Long-Term Confirmational Monitoring Plan, BNSF proposes a number of changes to the groundwater monitoring activities conducted to date, as summarized below.

As outlined in the 2012 Annual Air Sparging System Report (Farallon 2013b), BNSF proposes to discontinue operation of the air sparge system. The 2012 Annual Hydraulic Control and Containment System Operations Report (Farallon 2013c) presents results of testing conducted during operation of the HCC System. Groundwater monitoring summarized in that report includes quarterly and semiannual groundwater monitoring associated with operation of the HCC System, including end wells EW-1 and EW-2A and gate wells GW-1 through GW-4, and semiannual monitoring of 20 sentry wells installed in the activated carbon media designed to treat dissolved NWTPH-Dx as it flows through the gates.

BNSF proposes that the number of wells monitored for NWTPH-Dx be reduced to those monitoring wells proximate to areas where cleanup work remains, measured LNAPL or sheen is present, and at the down-gradient monitoring wells along the Skykomish River. Modifications to the groundwater monitoring approach will be documented in an update to the 2010 GWMP with concurrence from Ecology. No changes are proposed to the number of locations for Site-wide groundwater level gauging at this time.



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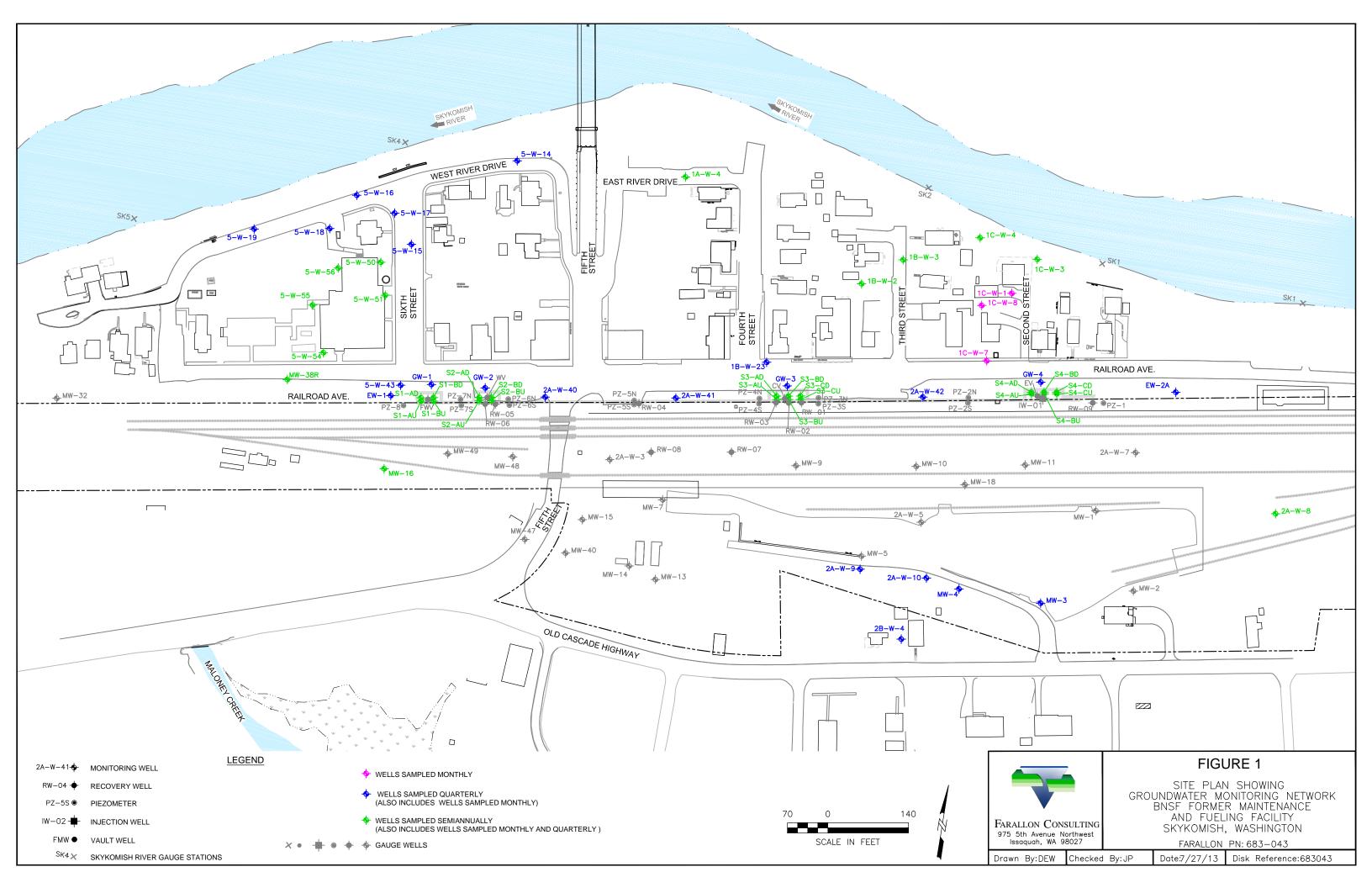
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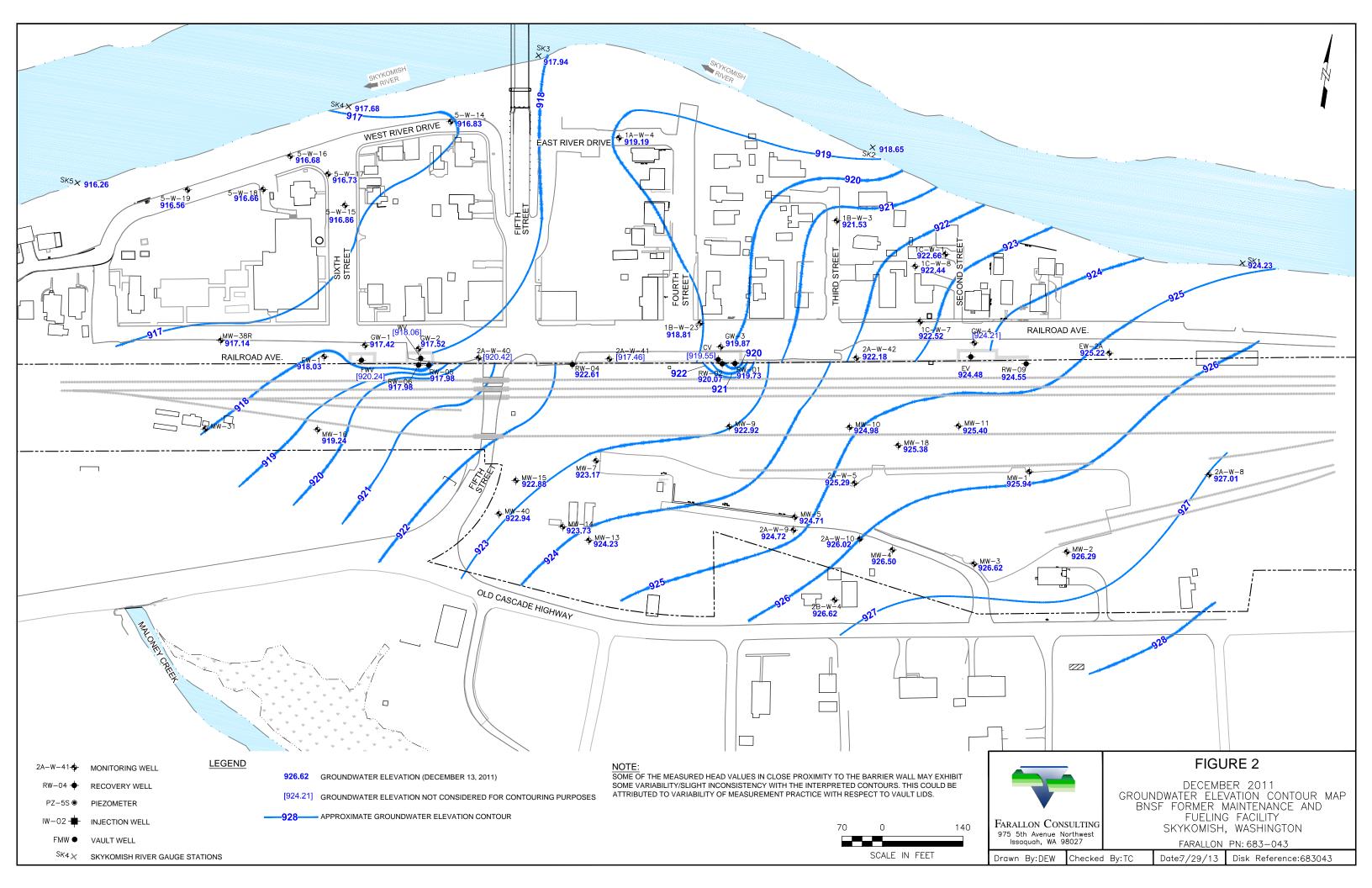
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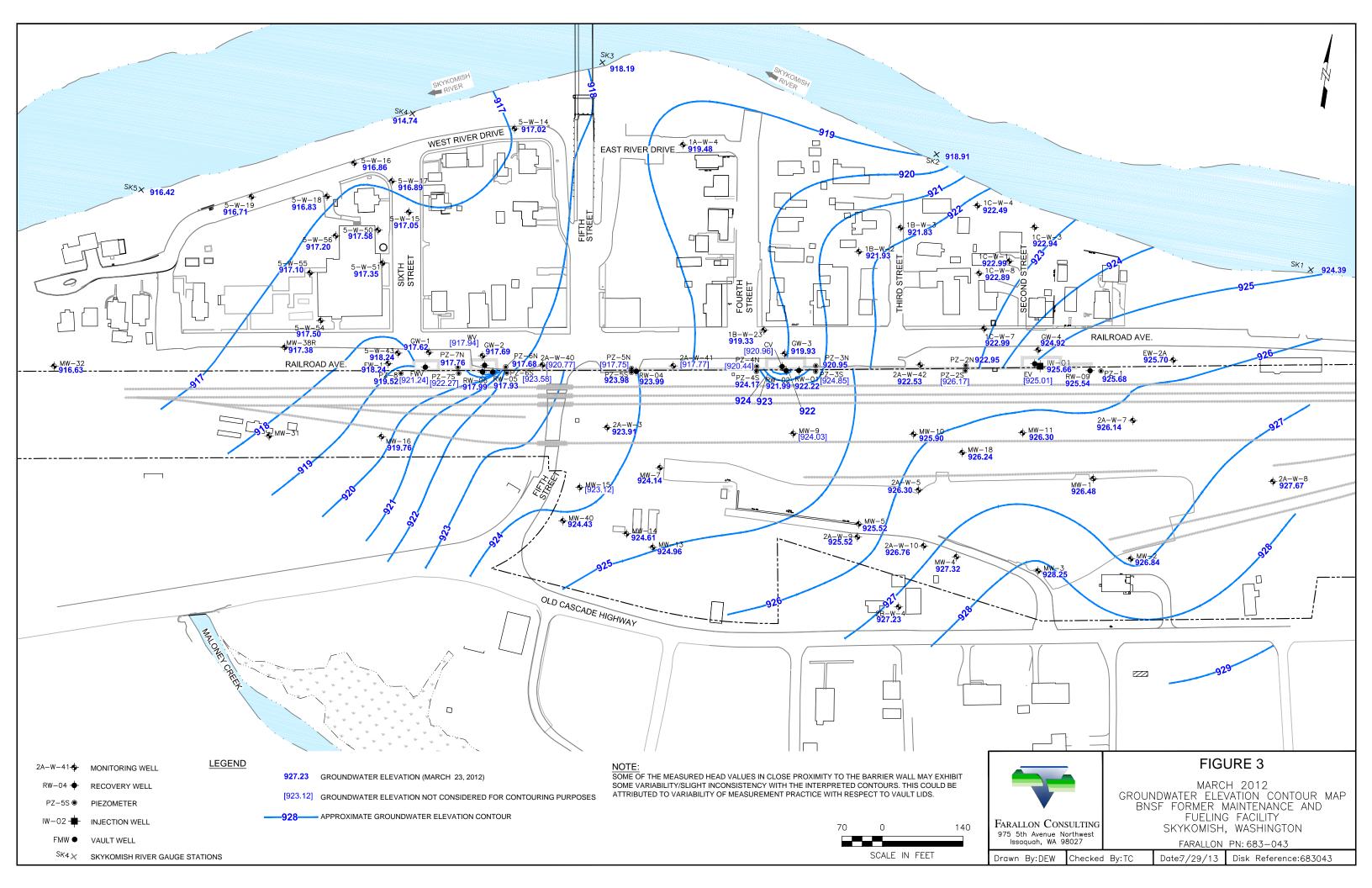
## **FIGURES**

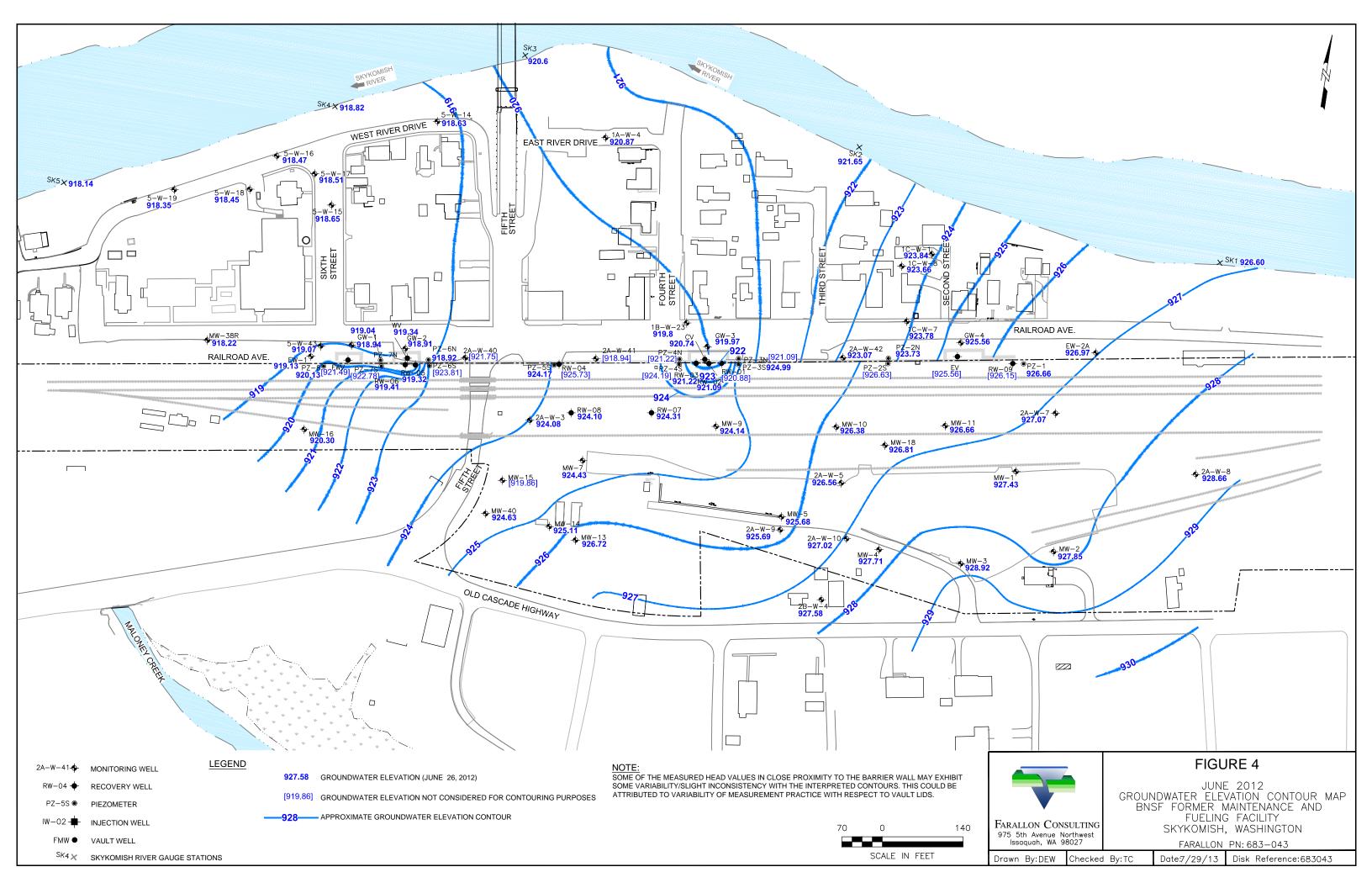
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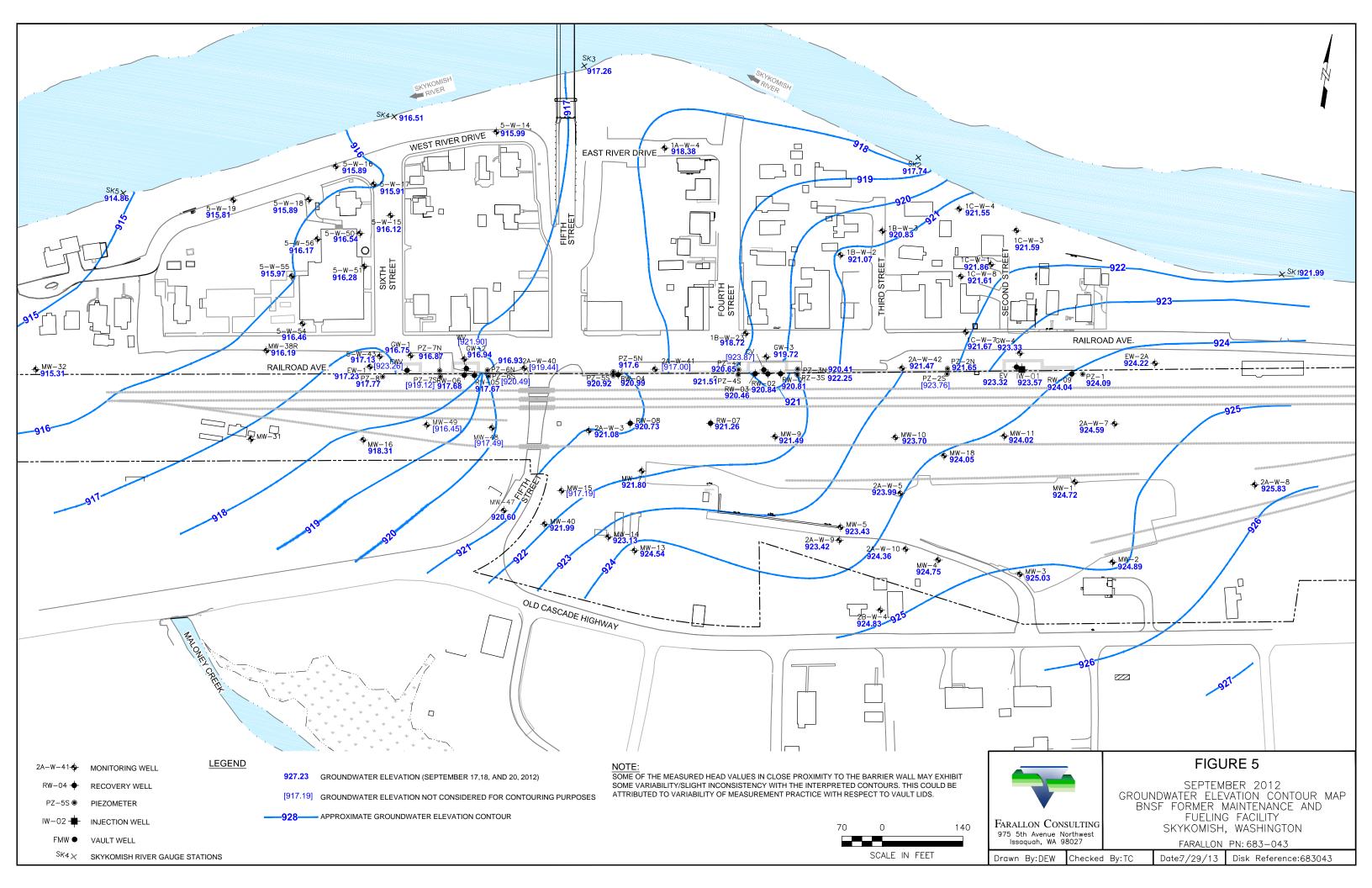
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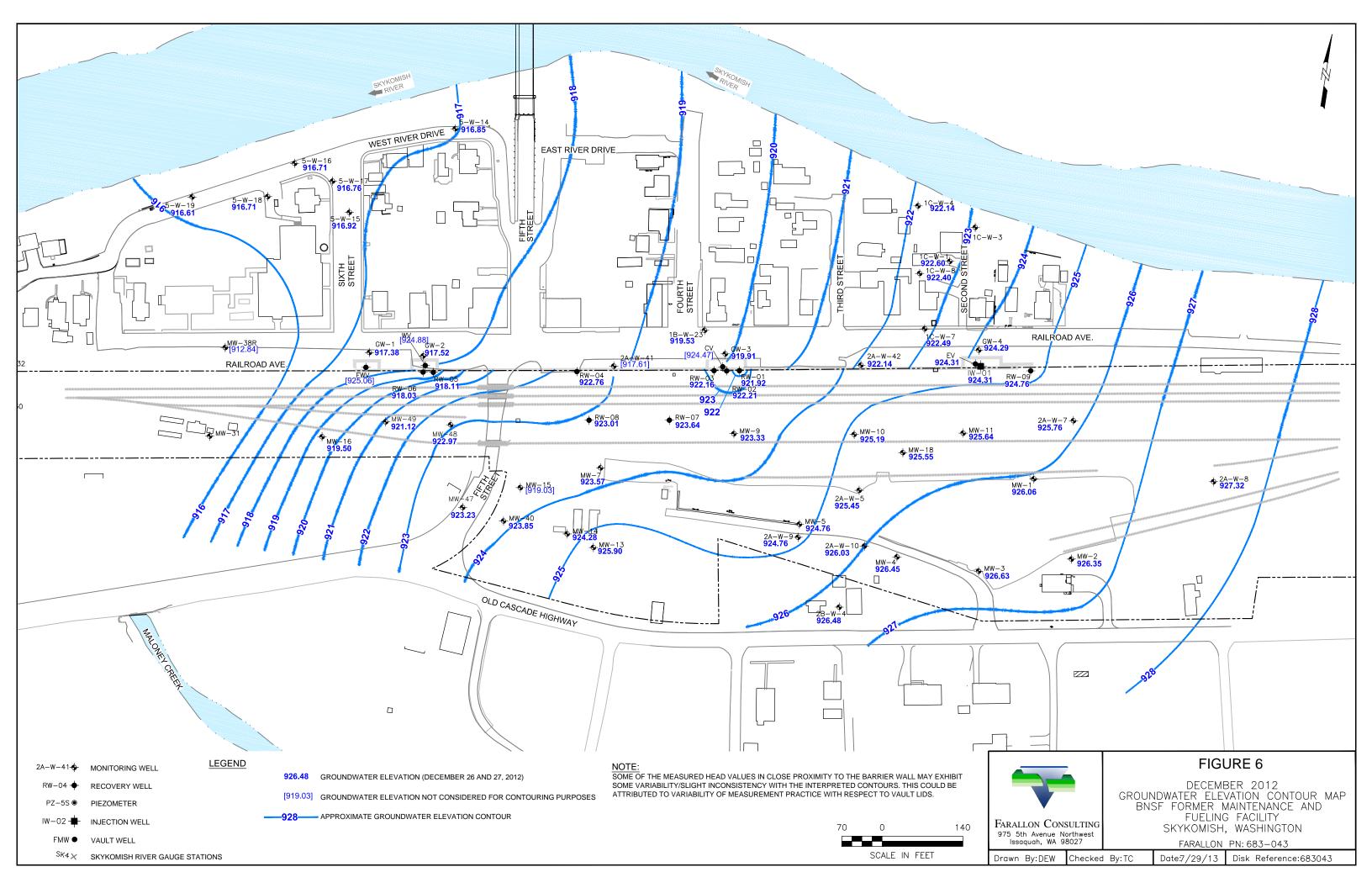


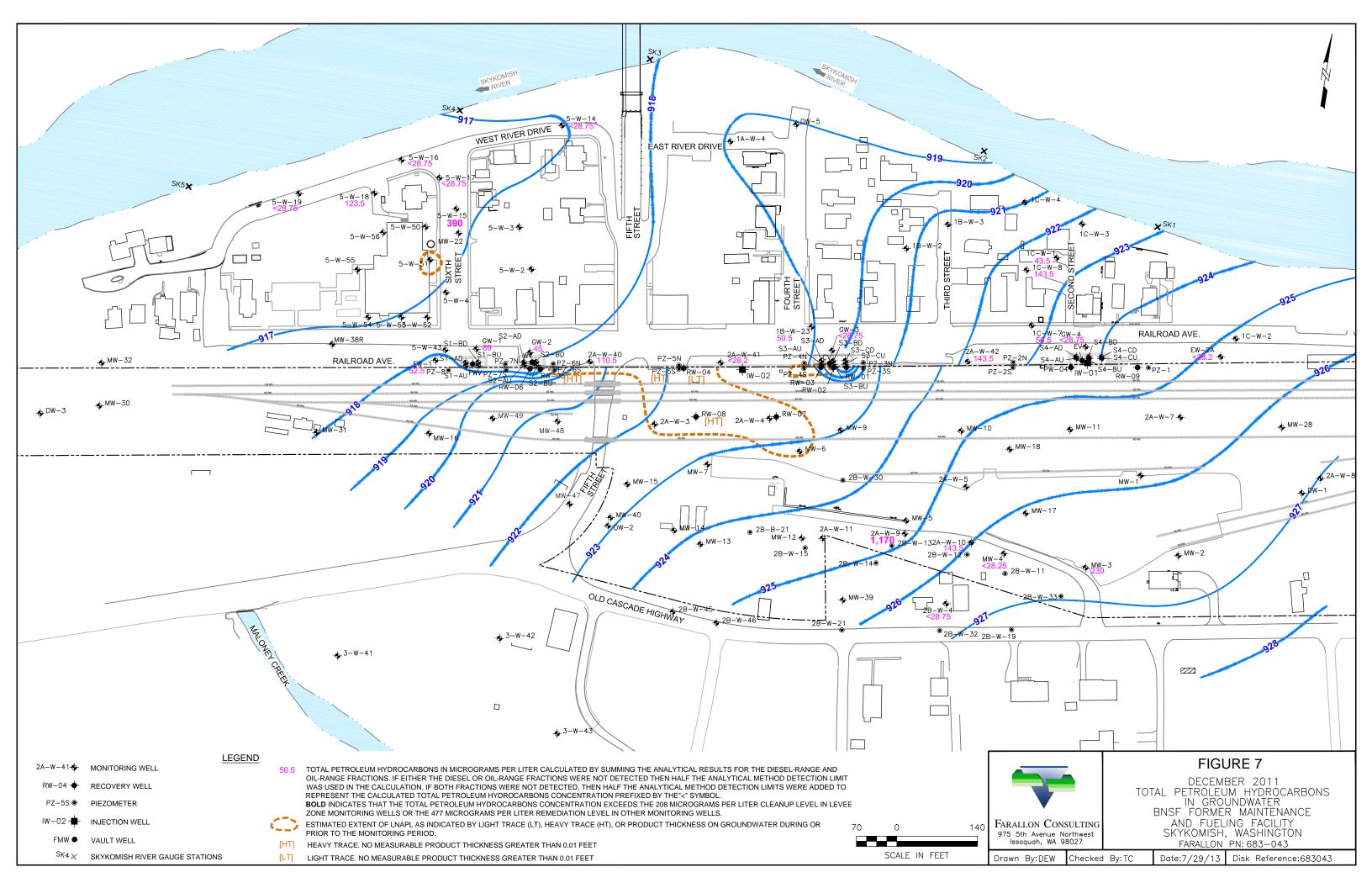


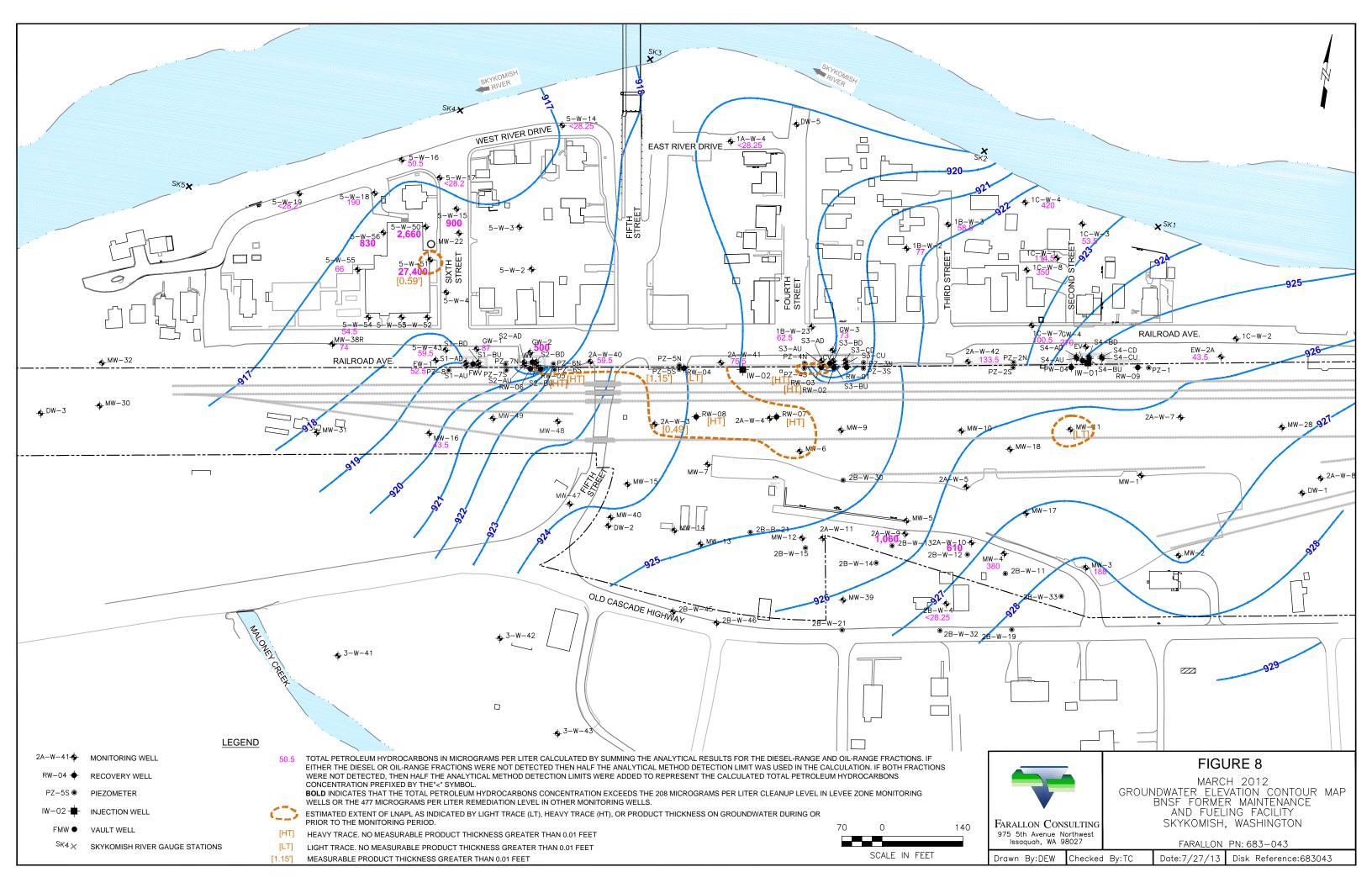


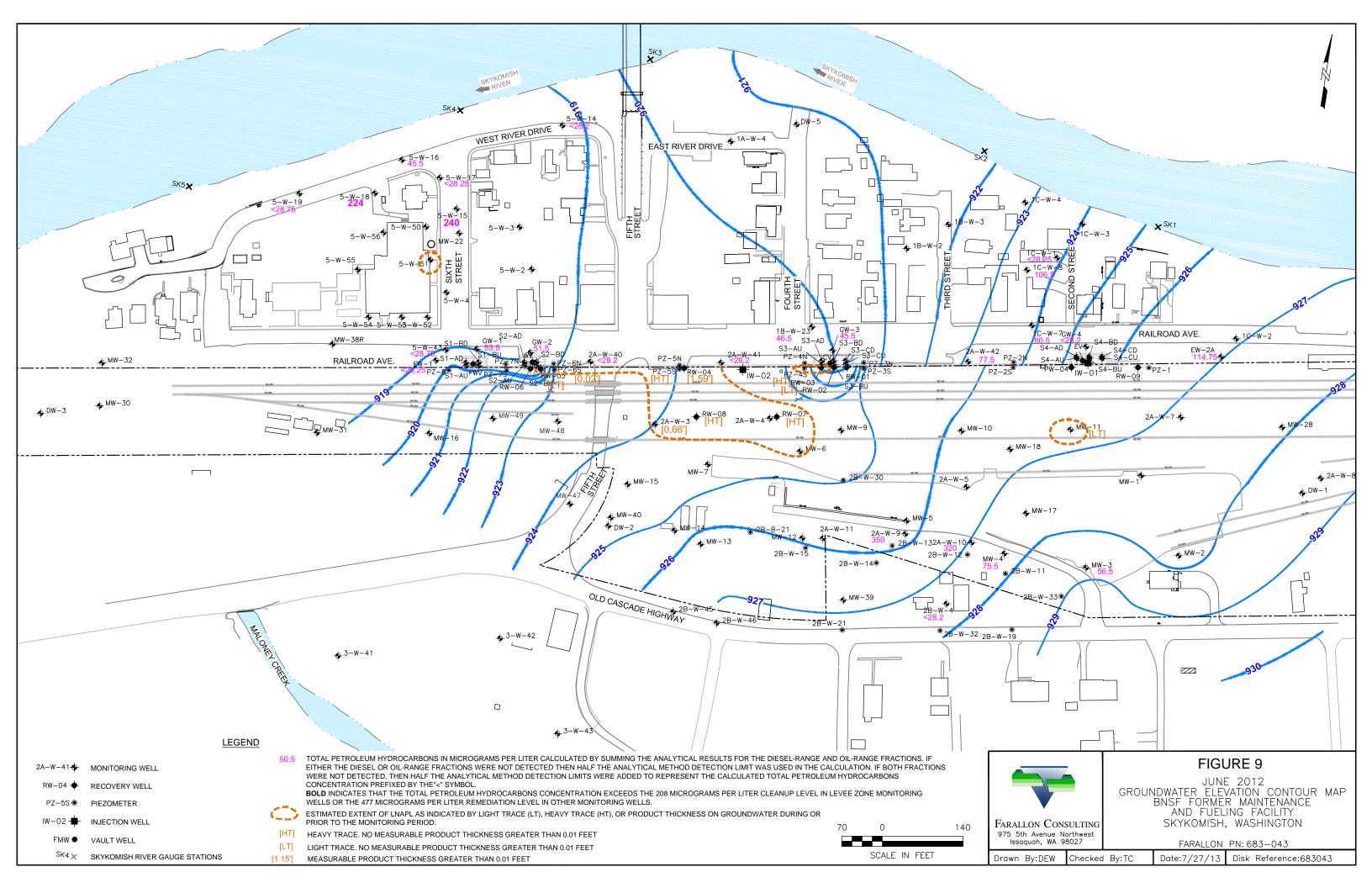


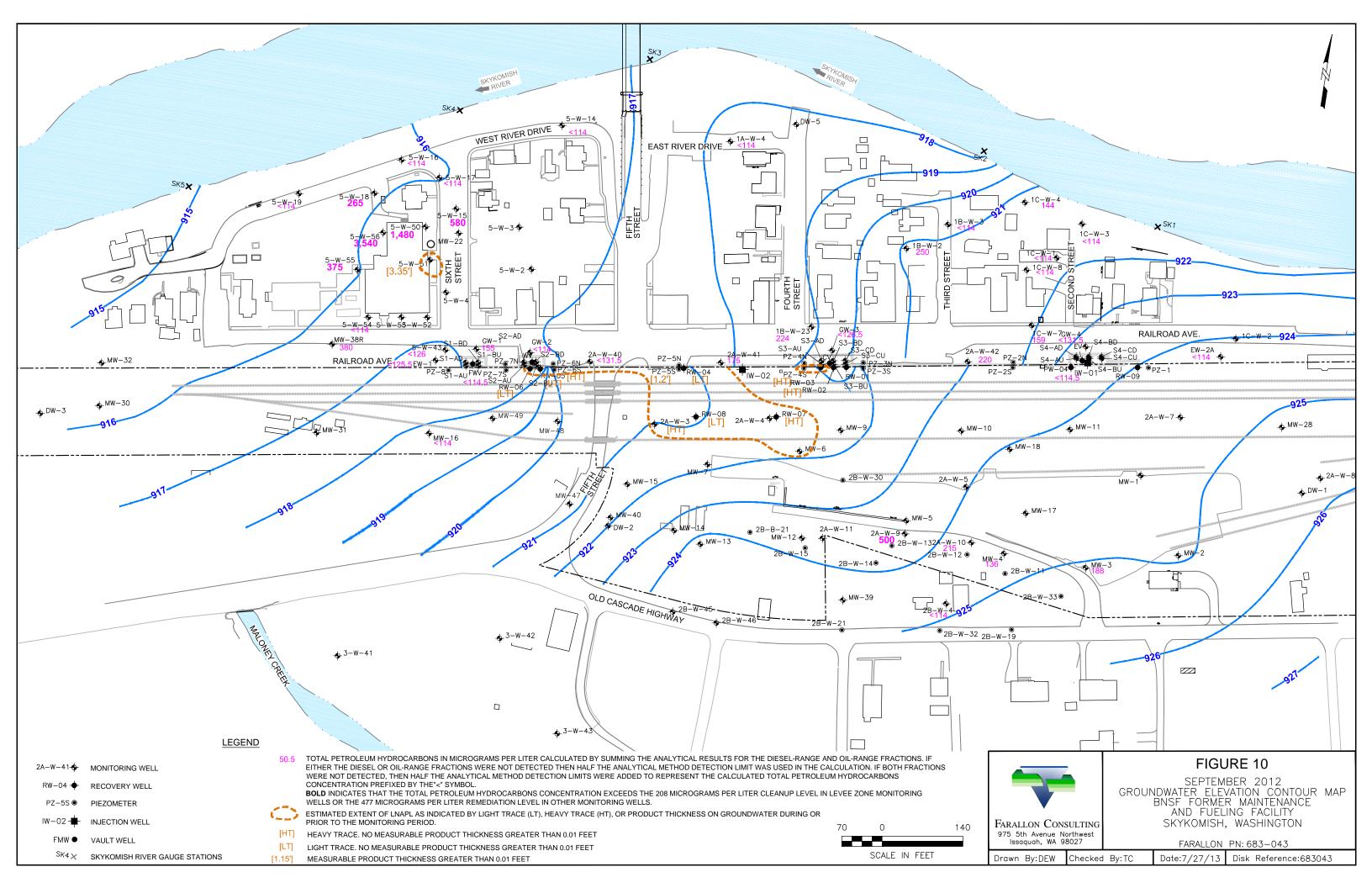


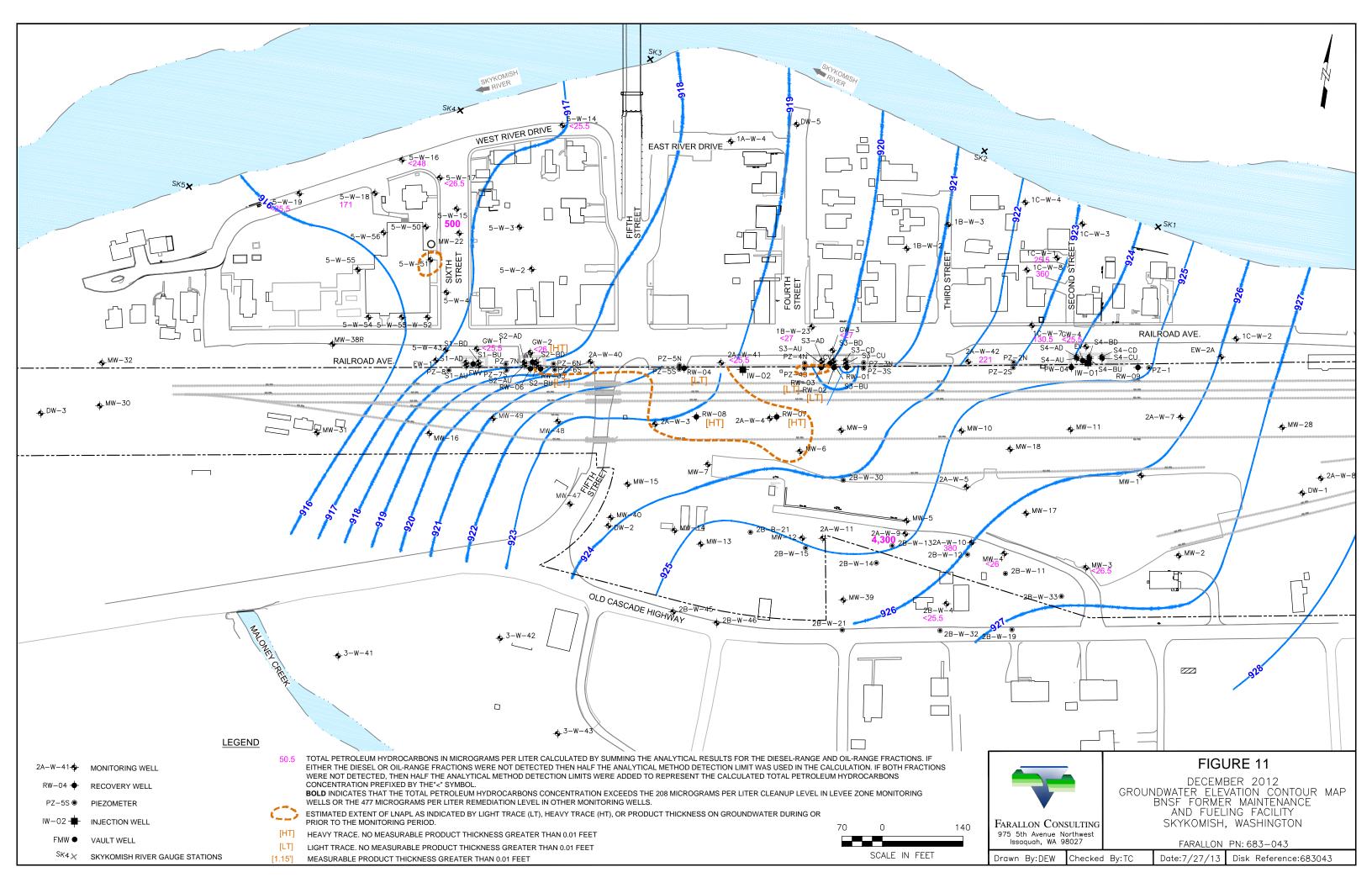












## **TABLES**

2011/2012 SITE-WIDE GROUNDWATER MONITORING REPORT BNSF Former Maintenance and Fueling Facility Skykomish, Washington Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-043

#### Table 1

#### **Modifications to the Groundwater Monitoring Network**

### **BNSF Former Maintenance and Fueling Facility**

## Skykomish, Washington Farallon PN: 683-043

Activity	Date	Location Identification	Location Type	Location Monitoring Function	Rationale for Abandoned, Destroyed, Deferred, Canceled, or Not Installed Locations	Reference for Planned Activity <sup>1</sup>	Reference for Completed Activity <sup>1</sup>
Installed	8/22/2012	MW-47	Monitoring Well	Site-wide	_	HCC System Optimization Work Plan	HCC System Optimization Status Report
Installed	8/24/2012	MW-48	Monitoring Well	Site-wide		HCC System Optimization Work Plan	HCC System Optimization Status Report
Installed	8/24/2012	MW-49	Monitoring Well	Site-wide	_	HCC System Optimization Work Plan	HCC System Optimization Status Report
Abandoned <sup>2</sup>	2011	2A-W-4	Monitoring Well	Site-wide	Abandoned due to damage during grading activities.	_	_

#### NOTES:

<sup>2</sup>Monitoring well 2A-W-4 was not abandoned in accordance with Chapter 173-360 of the Washington Administrative Code (WAC) Minimum Standards for the Construction and Maintenance of Wells.

HCC = Hydraulic Control and Containment

<sup>&</sup>lt;sup>1</sup>Complete references are presented in Section 6.0 of the report.

<sup>--- =</sup> not applicable

## Table 2

## **Groundwater Monitoring Event Dates BNSF Former Maintenance and Fueling Facility**

## Skykomish, Washington Farallon PN: 683-043

Event	Start Date	End Date
Air Sparge System Monthly Groundwater Sampling Event	10/27/2011	10/27/2011
Air Sparge System Monthly Groundwater Sampling Event	11/21/2011	11/21/2011
Quarterly Fluid Gauging Event	12/13/2011	12/13/2011
Quarterly Groundwater Sampling Event	12/13/2011	12/14/2011
Air Sparge System Monthly Groundwater Sampling Event	1/31/2012	1/31/2012
Air Sparge System Monthly Groundwater Sampling Event	2/28/2012	2/28/2012
Semiannual Fluid Gauging Event	3/26/2012	3/26/2012
Semiannual Groundwater Sampling Event	3/26/2012	3/28/2012
Air Sparge System Monthly Groundwater Sampling Event	4/24/2012	4/24/2012
Air Sparge System Monthly Groundwater Sampling Event	5/30/2012	5/30/2012
Quarterly Fluid Gauging Event	6/26/2012	6/26/2012
Quarterly Groundwater Sampling Event	6/27/2012	6/28/2012
Air Sparge System Monthly and Compliance Groundwater Sampling Event	7/26/2012	7/26/2012
Air Sparge System Monthly and Compliance Groundwater Sampling Event	8/20/2012	8/20/2012
Semiannual Fluid Gauging Event	9/17/2012	9/18/2012
Semiannual Groundwater Sampling Event	9/18/2012	9/20/2012
Air Sparge System Monthly Groundwater Sampling Event	10/10/2012	10/10/2012
Air Sparge System Monthly Groundwater Sampling Event	11/21/2012	11/21/2012
Quarterly Fluid Gauging Event	12/26/2012	12/26/2012
Quarterly Groundwater Sampling Event	12/26/2012	12/27/2012

NOTES:

Sampling details for each monitoring event are included in Table 3.

#### Groundwater Sampling Event Details

#### BNSF Former Maintenance and Fueling Facility Skykomish, Washington

	Location	Gro	oundwater Samplin	g Events	
Zone	Identification	Monthly	Quarterly	Semiannually	Analyte
	1C-W-1	X	X	X	NWTPH-Dx
Air Sparging System	1C-W-7	X	X	X	NWTPH-Dx
	1C-W-8	X	X	X	NWTPH-Dx
	1B-W-23	_	X	X	NWTPH-Dx
T 11 . C.1	2A-W-40	_	X	X	NWTPH-Dx
Down-gradient of the	2A-W-41	_	X	X	NWTPH-Dx
HCC -	2A-W-42	_	X	X	NWTPH-Dx
	5-W-43	_	X	X	NWTPH-Dx
	2A-W-10	_	X	X	NWTPH-Dx
EMCZ EW1	2A-W-9	_	X	X	NWTPH-Dx
FMCZ-EW and	2B-W-4	_	X	X	NWTPH-Dx
Surrounding Areas	MW-3	_	X	X	NWTPH-Dx
	MW-4	_	X	X	NWTPH-Dx
	EW-1		X	X	NWTPH-Dx
	EW-2A	_	X	X	NWTPH-Dx
	GW-1	_	X	X	NWTPH-Dx
	GW-2	_	X	X	NWTPH-Dx
	GW-3	_	X	X	NWTPH-Dx
	GW-4	_	X	X	NWTPH-Dx
	S1-AD		_	X	NWTPH-Dx
	S1-AU	_	_	X	NWTPH-Dx
	S1-BD	_		X	NWTPH-Dx
	S1-BU	_		X	NWTPH-Dx
	S2-AD	_		X	NWTPH-Dx
	S2-AU		_	X	NWTPH-Dx
IICC System	S2-BD	_		X	NWTPH-Dx
HCC System	S2-BU	_		X	NWTPH-Dx
	S3-AD	_	_	X	NWTPH-Dx
	S3-AU	_	<del>-</del>	X	NWTPH-Dx
	S3-BD	_		X	NWTPH-Dx
	S3-BU	_		X	NWTPH-Dx
	S3-CD	_	_	X	NWTPH-Dx
	S3-CU	_	<del></del>	X	NWTPH-Dx
	S4-AD	_	<del></del>	X	NWTPH-Dx
	S4-AU	_	_	X	NWTPH-Dx
	S4-BD	_		X	NWTPH-Dx
Ī	S4-BU	<u> </u>	<u> </u>	X	NWTPH-Dx
Ī	S4-CD	_	_	X	NWTPH-Dx
	S4-CU	_	_	X	NWTPH-Dx
	5-W-14		X	X	NWTPH-Dx
Ī	5-W-15	_	X	X	NWTPH-Dx
Levee	5-W-16	_	X	X	NWTPH-Dx
Levee	5-W-17		X	X	NWTPH-Dx
Ī	5-W-18	_	X	X	NWTPH-Dx
Ī	5-W-19	_	X	X	NWTPH-Dx

### Groundwater Sampling Event Details

#### **BNSF Former Maintenance and Fueling Facility**

### Skykomish, Washington Farallon PN: 683-043

	Location	Location Groundwater Sampling Ev		g Events	
Zone	Identification	Monthly	Quarterly	Semiannually	Analyte
	5-W-50	_	_	X	NWTPH-Dx
	5-W-51	_	_	X	NWTPH-Dx
Schoolyard	5-W-54	_	_	X	NWTPH-Dx
	5-W-55	_	_	X	NWTPH-Dx
	5-W-56	_	_	X	NWTPH-Dx
	1A-W-4	_	_	X	NWTPH-Dx
	1B-W-2	_	_	X	NWTPH-Dx
	1B-W-3	_	_	X	NWTPH-Dx
Site-Wide	1C-W-3	_	_	X	NWTPH-Dx
	1C-W-4	_	_	X	NWTPH-Dx
	MW-16	_	_	X	NWTPH-Dx
	MW-38R	_	_	X	NWTPH-Dx

#### NOTES:

FMCZ - EW = Former Maloney Creek Zone - East Wetland

HCC = Hydraulic Control and Containment

TPH = total petroleum hydrocarbons by Northwest Method NWTPH-Dx

#### Fluid Gauging Events Summary

#### **BNSF Former Maintenance and Fueling Facility**

	Location	Gauging Monitoring Frequency					
Zone	Identification	Continuous <sup>1</sup>	Weekly	Monthly	Quarterly	Semiannually	
	1C-W-1	_	_	X	X	X	
Air Sparging System	1C-W-7	_	_	X	X	X	
	1C-W-8	_	_	X	X	X	
	1B-W-23	_		_	X	X	
Down-gradient of the	2A-W-40	_	_	_	X	X	
_	2A-W-41	_	_	_	X	X	
HCC System <sup>1</sup>	2A-W-42	_	_	_	X	X	
	5-W-43	_	_	_	X	X	
	2A-W-10	_		_	X	X	
	2A-W-3	_		_	X	X	
	2A-W-4 <sup>2</sup>	_		_	_	_	
	2A-W-5	_			X	X	
	2A-W-7	<u> </u>		_	X	X	
	2A-W-9	<b>†</b> _		_	X	X	
	2B-W-4				X	X	
	MW-1	_		_	X	X	
	MW-11	_	_	_	X	X	
FMCZ-EW and	MW-13				X	X	
Surrounding Areas	MW-14	_	_	_	X	X	
8	MW-15	_	_	_	X	X	
	MW-18	_	_	_	X	X	
	MW-2	_	_	_	X	X	
	MW-3	_	_	_	X	X	
	MW-4	_		_	X	X	
	MW-40	_	_		X	X	
	MW-5	_			X	X	
	MW-7	_			X	X	
	MW-9	_		_	X	X	
	MW-10	_			X	X	
	CV	_	X		X	X	
	EV	<b>†</b> _	X	_	X	X	
	WV	<del>  _  </del>	X	_	X	X	
	FWV	† _	X	_	X	X	
	EW-1	<del>  _  </del>	<u> </u>	_	X	X	
	EW-2A	<u> </u>		_	X	X	
	GW-1	† _	X	_	X	X	
	GW-2	<del>  _  </del>	X	_	X	X	
HCC System	GW-3	<u> </u>	X	_	X	X	
2200 System	GW-4	_	X	_	X	X	
	IW-01	X	<u> </u>		——————————————————————————————————————	X	
	PW-04	—		_	_		
	PZ-1	X		_	X	X	
	PZ-2N	X		_	X	X	
	PZ-2S	X		_	X	X	
	PZ-3N	X			X	X	
	PZ-3S	X		_	X	X	
	1 L-JO	Λ	<del></del>		Λ	Λ	

#### Fluid Gauging Events Summary

#### BNSF Former Maintenance and Fueling Facility Skykomish, Washington

	Location		Gauging Monitoring Frequency					
Zone	Identification	Continuous <sup>1</sup>	Weekly	Monthly	Quarterly	Semiannually		
	PZ-4N	X			X	X		
	PZ-4S	X	_	_	X	X		
	PZ-5N	X		_	X	X		
	PZ-5S	X	_	_	X	X		
	PZ-6N	X	_	_	X	X		
	PZ-6S	X	_	_	X	X		
	PZ-7N	X	_	_	X	X		
	PZ-7S	X	_	_	X	X		
	PZ-8	X	_	_	X	X		
	RW-01	_	_	_	X	X		
	RW-02	X		_	X	X		
	RW-03	_	_	_	X	X		
	RW-04	_	_	_	X	X		
	RW-05	X	_	_	X	X		
	RW-06	_	_	_	X	X		
	RW-07	_	_	_	X	X		
	RW-08	_	_	_	X	X		
HCC System	RW-09	_	_	_	X	X		
	S1-AD	_	_	_	_	_		
(continued)	S1-AU	_	_	_	_	_		
	S1-BD	_	_	_		_		
	S1-BU	_	_	_	_	_		
	S2-AD	_	_	_	_	_		
	S2-AU	_	_	_	_	_		
	S2-BD	_				_		
	S2-BU	_	_	_		_		
	S3-AD	_	_		_	_		
	S3-AU	_	_	_	_	_		
	S3-BD	_	_	_		_		
	S3-BU	_	_		_	_		
	S3-CD	_	_	_	_	_		
	S3-CU					_		
	S4-AD	_		_	_	_		
	S4-AU	_	_	_		_		
	S4-BD			_	_	_		
	S4-BU	_	_	_	_	_		
	S4-CD	_	_	_	_	_		
	S4-CU	_	_	_	_	_		

#### Fluid Gauging Events Summary

#### **BNSF Former Maintenance and Fueling Facility**

# Skykomish, Washington Farallon PN: 683-043

	Location		Gaugi	ng Monitoring	Frequency	
Zone	Identification	Continuous <sup>1</sup>	Weekly	Monthly	Quarterly	Semiannually
	5-W-14	_	_	_	X	X
	5-W-15	_	_	_	X	X
Levee	5-W-16	_	_	_	X	X
Levee	5-W-17	_	_	_	X	X
	5-W-18		_	_	X	X
	5-W-19	_	_	_	X	X
	5-W-50	_	_	_	_	X
	5-W-51	_	_	_	_	X
Schoolyard	5-W-54	_	_	_	_	X
	5-W-55	_	_	_	_	X
	5-W-56	_	_	_	_	X
	1A-W-4	_	_	_	X	X
	1B-W-2	_	_	_	_	X
	1B-W-3	_	_	_	_	X
	1C-W-3	_	_	_		X
	1C-W-4	_	_	_	_	X
	2A-W-8	_	_	_	X	X
Site-Wide	MW-16	_	_	_	X	X
	MW-32	_	_	_	_	X
	MW-38R	_	_	_	X	X
	MW-47 <sup>3</sup>	_	_	_	X	X
	MW-48 <sup>3</sup>	_	_	_	X	X
	MW-49 <sup>3</sup>	_	_	—	X	X
		urface Water Gai	uging Locatio	ons		
	SK1			_	_	X
South Fork Skykomish	SK2	_				X
River	SK3					X
Niver	SK4					X
	SK5					X

#### **NOTES:**

FMCZ - EW = Former Maloney Creek Zone - East Wetland HCC = Hydraulic Control and Containment

<sup>&</sup>lt;sup>1</sup> Water level transducers have been used to collect continuous water level measurements at these locations since August 31, 2009. Water levels are recorded daily.

<sup>&</sup>lt;sup>2</sup>Well abandoned due to damage during grading activities.

<sup>&</sup>lt;sup>3</sup>Wells installed during August 2012.

	1		I		
	Top of Casing Elevation <sup>1</sup>		Depth to Water	Water Level Elevation <sup>2</sup>	LNAPL Thickness
Location	(NAVD88)	<b>Monitoring Date</b>	(feet) <sup>2</sup>	(feet, NAVD88)	(feet)
Location	(NA V Doo)	Air Sparging Syste		, ,	(Ieet)
	1	12/13/2011	13.78	922.66	_
		3/26/2012	13.45	922.99	_
1C-W-1	936.44	6/26/2012	12.6	923.84	_
		9/17/2012	14.58	921.86	
		12/26/2012	13.84	922.6	
	1	12/13/2011	12.52	922.52	
		3/26/2012	12.05	922.99	
1C-W-7	935.04	6/26/2012	11.26	923.78	<u> </u>
		9/17/2012	13.37	921.67	_
		12/26/2012	12.55	922.49	
		12/13/2011	13.26	922.44	_
		3/26/2012	12.81	922.89	_
1C-W-8	935.7	6/26/2012	12.04	923.66	
		9/17/2012	14.09	921.61	_
		12/26/2012	13.3	922.4	_
Monitor	ing Wells Dov	wn-Gradient of the H	Ivdraulic Co	ntrol and Contain	ment System
		12/13/2011	17.44	918.81	_
		3/26/2012	16.92	919.33	
1B-W-23	936.25	6/26/2012	16.45	919.8	_
		9/17/2012	17.53	918.72	_
		12/26/2012	16.72	919.53	_
		12/13/2011	12.88	920.42	_
<b>2</b> 1 <b>33</b> 10		3/26/2012	12.57	920.77	_
2A-W-40	933.3	6/26/2012	11.59	921.75	_
		9/17/2012	13.9	919.44	
	935.12	12/13/2011	17.66	917.46	_
		3/26/2012	17.45	917.77	_
2A-W-41	025.22	6/26/2012	16.28	918.94	
	935.22	9/17/2012	18.22	917	_
		12/26/2012	17.61	917.61	_
		12/13/2011	13.19	922.18	
		3/26/2012	12.84	922.53	
2A-W-42	935.37	6/26/2012	12.3	923.07	_
		9/17/2012	13.9	921.47	_
		12/26/2012	13.23	922.14	_
		3/26/2012	7.58	918.24	
5-W-43	925.82	6/26/2012	6.75	919.07	<u> </u>
		9/17/2012	8.69	917.13	_

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) 2	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
Former N	Maloney Cree	k Zone - East Wetlar	nd and Surre	ounding Area Mon	itoring Wells
		12/13/2011	11.91	926.02	_
		3/26/2012	11.17	926.76	_
2A-W-10	937.93	6/26/2012	10.91	927.02	_
		9/17/2012	13.57	924.36	_
		12/26/2012	11.9	926.03	
		3/26/2012	11	923.91	0.49
2A-W-3	934.43	6/26/2012	11	924.08	0.67
		9/20/2012	13.83	921.08	0.49
		12/13/2011	14.18	925.29	_
		3/26/2012	13.17	926.3	
2A-W-5	939.47	6/26/2012	12.91	926.56	_
		9/17/2012	15.48	923.99	_
		12/26/2012	14.02	925.45	
	937.76	3/26/2012	11.62	926.14	_
2A-W-7		6/26/2012	10.69	927.07	_
2A-W-/		9/17/2012	13.17	924.59	_
		12/26/2012	12	925.76	
		12/13/2011	11.86	924.72	
		3/26/2012	11.06	925.52	_
2A-W-9	936.58	6/26/2012	10.89	925.69	
		9/17/2012	13.16	923.42	
		12/26/2012	11.82	924.76	_
		12/13/2011	4.41	926.62	
	1	3/26/2012	3.8	927.23	
2B-W-4	931.03	6/26/2012	3.45	927.58	
		9/17/2012	6.2	924.83	_
		12/26/2012	4.55	926.48	
		12/13/2011	13.26	925.94	_
		3/26/2012	12.72	926.48	
MW-1	939.2	6/26/2012	11.77	927.43	
		9/17/2012	14.48	924.72	
		12/26/2012	13.14	926.06	_
		12/13/2011	13.36	924.98	_
		3/26/2012	12.44	925.9	
MW-10	938.34	6/26/2012	11.96	926.38	
		9/17/2012	14.64	923.7	_
		12/26/2012	13.15	925.19	_

MW-11 MW-13	939.2	12/13/2011 3/26/2012 6/26/2012 9/17/2012 12/27/2012 12/13/2011 3/26/2012 6/26/2012 9/17/2012	13.8 12.9 12.54 15.18 13.56 10.7 9.97 9.77	925.4 926.3 926.66 924.02 925.64 924.23 924.96	
	934.93	6/26/2012 9/17/2012 12/27/2012 12/13/2011 3/26/2012 6/26/2012 9/17/2012	12.54 15.18 13.56 10.7 9.97	926.66 924.02 925.64 924.23 924.96	
	934.93	9/17/2012 12/27/2012 12/13/2011 3/26/2012 6/26/2012 9/17/2012	15.18 13.56 10.7 9.97	924.02 925.64 924.23 924.96	
MW-13		12/27/2012 12/13/2011 3/26/2012 6/26/2012 9/17/2012	13.56 10.7 9.97	925.64 924.23 924.96	_ _ _ _
MW-13		12/13/2011 3/26/2012 6/26/2012 9/17/2012	10.7 9.97	924.23 924.96	<u> </u>
MW-13		3/26/2012 6/26/2012 9/17/2012	9.97	924.96	<u> </u>
MW-13		6/26/2012 9/17/2012			
MW-13		9/17/2012	9.77	00670	
				926.72	
			11.95	924.54	
		12/26/2012	10.59	925.9	_
	00640	12/13/2011	12.76	923.73	
	936.49	3/26/2012	11.88	924.61	_
MW-14		6/26/2012	11.69	925.11	
	936.8	9/17/2012	13.67	923.13	_
		12/26/2012	12.52	924.28	
	937.65	12/13/2011	14.77	922.88	_
ļ	936.8	3/26/2012	13.68	923.12	_
MW-15	933.32	6/26/2012	13.46	919.86	
11111		9/17/2012	16.13	917.19	_
		12/26/2012	14.29	919.03	
		12/13/2011	15.3	925.38	
		3/26/2012	14.44	926.24	
MW-18	940.68	6/26/2012	13.87	926.81	_
11111	710.00	9/17/2012	16.63	924.05	
		12/26/2012	15.13	925.55	
		12/13/2011	12.91	926.29	
	-	3/26/2012	12.36	926.84	
MW-2	939.2	6/26/2012	11.35	927.85	_
141 44 -7	737.2	9/17/2012	14.31	924.89	
		12/26/2012	12.85	926.35	
		12/13/2011	11.41	926.62	
	-	3/26/2012	9.78	928.25	
MW 2	038 02	6/26/2012	9.11	928.92	
MW-3	938.03	9/17/2012	13	925.03	
			11.4	925.03	<del>_</del>
		12/26/2012			_
	-	12/13/2011 3/26/2012	10.45 9.63	926.5 927.32	
) ANY 4	026.05				
MW-4	936.95	6/26/2012	9.24	927.71	
		9/17/2012	12.2 10.5	924.75 926.45	

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) <sup>2</sup>	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
	936.52	12/13/2011	13.58	922.94	_
		3/26/2012	12.52	924.43	_
MW-40	936.95	6/26/2012	12.32	924.63	_
	930.93	9/17/2012	14.96	921.99	_
		12/26/2012	13.1	923.85	_
		12/13/2011	8.65	924.71	_
		3/26/2012	7.84	925.52	
MW-5	933.36	6/26/2012	7.68	925.68	_
		9/17/2012	9.93	923.43	
		12/26/2012	8.6	924.76	_
		12/13/2011	13.72	923.17	_
		3/26/2012	12.75	924.14	_
MW-7	936.89	6/26/2012	12.46	924.43	
		9/17/2012	15.09	921.8	
		12/26/2012	13.32	923.57	_
		12/13/2011	14.61	922.92	
		3/26/2012	13.5	924.03	_
MW-9	937.53	6/26/2012	13.39	924.14	_
	931.33	9/17/2012	16.04	921.49	
		12/26/2012	14.2	923.33	
	Hydraulic	Control and Contain	nment Syster	n Monitoring Well	s
		12/13/2011	16.55	919.55	_
		3/26/2012	15.14	920.96	_
CV	936.1	6/26/2012	15.36	920.74	
		9/17/2012	12.23	923.87	_
		12/26/2012	11.63	924.47	
		12/13/2011	9.83	924.48	_
		3/26/2012	9.3	925.01	
EV	934.31	6/26/2012	8.75	925.56	_
		9/17/2012	10.99	923.32	_
	ŀ	12/26/2012	10	924.31	
	928.7	12/13/2011	10.67	918.03	_
		3/26/2012	10.3	918.42	_
EW-1	928.72	6/26/2012	9.59	919.13	_
		9/17/2012	11.49	917.23	
		12/13/2011	10.98	925.22	
		3/26/2012	10.5	925.7	
EW-2A	936.2	6/26/2012	9.23	926.97	
		9/17/2012	11.98	924.22	

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) <sup>2</sup>	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
		12/13/2011	10.5	920.24	<del>_</del>
		3/26/2012	9.5	921.24	<del></del>
FWV	930.74	6/26/2012	9.25	921.49	<del></del>
		9/18/2012	7.48	923.26	
		12/26/2012	5.68	925.06	_
	928.23	12/13/2011	10.81	917.42	_
		3/26/2012	10.62	917.62	
GW-1	028.24	6/26/2012	9.3	918.94	_
	928.24	9/17/2012	11.49	916.75	_
		12/26/2012	10.86	917.38	
	930.27	12/13/2011	12.75	917.52	
		3/26/2012	12.6	917.69	
GW-2	020.20	6/26/2012	11.38	918.91	_
	930.29	9/17/2012	13.35	916.94	
		12/26/2012	12.77	917.52	_
		12/13/2011	15.95	919.87	
		3/26/2012	15.89	919.93	
GW-3	935.82	6/26/2012	15.85	919.97	_
		9/17/2012	16.1	919.72	
		12/26/2012	15.91	919.91	_
	934.64	12/13/2011	10.43	924.21	
	70.1101	3/26/2012	9.76	924.92	
GW-4	Ī	6/26/2012	9.12	925.56	
	934.68	9/17/2012	11.35	923.33	
		12/26/2012	10.39	924.29	
		3/26/2012	7.83	925.66	
IW-01	933.49	9/17/2012	9.92	923.57	
PZ-1A	935.38	9/17/2012	11.29	924.09	_
D7 1D		3/26/2012	9.69	925.68	_
PZ-1R	935.37	6/26/2012	8.71	926.66	
		3/26/2012	11.4	922.95	_
PZ-2N	934.35	6/26/2012	10.62	923.73	
		9/17/2012	12.7	921.65	
		3/26/2012	8.77	926.17	
PZ-2S	934.94	6/26/2012	8.31	926.63	
		9/17/2012	11.18	923.76	
PZ-3N	934.41	3/26/2012	13.46	920.95	
rz-31N	934.41	9/17/2012	14	920.41	<u> </u>
		3/26/2012	9.6	924.85	
PZ-3S	934.45	6/26/2012	9.46	924.99	<del>_</del>
		9/17/2012	12.2	922.25	_

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) <sup>2</sup>	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
PZ-4N	935.27	3/26/2012	14.83	920.44	
rz-4n	933.21	9/17/2012	14.62	920.65	_
		3/26/2012	11.14	924.17	_
PZ-4S	935.31	6/26/2012	11.12	924.19	<u> </u>
		9/17/2012	13.8	921.51	Heavy Trace
PZ-5N	933.15	3/26/2012	15.4	917.75	_
1 2-511	733.13	9/17/2012	15.55	917.6	
		3/26/2012	10.6	923.98	1.15
PZ-5S	933.46	6/26/2012	9.29	924.17	Heavy Trace
		9/20/2012	13.91	920.92	1.41
		3/26/2012	13.49	917.68	
PZ-6N	931.17	6/26/2012	12.25	918.92	
		9/18/2012	14.24	916.93	_
		3/26/2012	7.83	923.58	
PZ-6S	931.41	6/26/2012	7.62	923.81	0.02
	1	9/20/2012	11.4	920.49	0.50
	930.37	3/26/2012	12.61	917.76	
PZ-7N		6/26/2012	11.33	919.04	
		9/18/2012	13.5	916.87	
		3/26/2012	8.13	922.27	
PZ-7S	930.4	6/26/2012	7.62	922.78	
		9/18/2012	11.28	919.12	
		3/26/2012	9.96	919.52	_
PZ-8	929.48	6/26/2012	9.35	920.13	
		9/18/2012	11.71	917.77	
	932.8	12/13/2011	13.07	919.73	
		3/26/2012	10.62	922.22	
RW-01	932.84	6/26/2012	11.96	920.88	
	932.04	9/17/2012	12.03	920.81	
		12/27/2012	10.92	921.92	
		12/13/2011	13.77	920.07	
	933.84	3/26/2012	11.85	921.99	
RW-02		6/26/2012	12.75	921.09	
		9/17/2012	13	920.84	
		12/27/2012	11.63	922.21	Light Trace
	†	3/26/2012	11.87	921.93	
		6/26/2012	12.58	921.22	_
RW-03	933.8	9/20/2012	13.38	920.46	0.04
	1 1	12/27/2012	11.64	922.16	Light Trace

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) 2	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
		12/13/2011	9.25	922.61	_
		3/26/2012	7.87	923.99	_
RW-04	931.86	6/26/2012	7.67	925.73	1.59
		9/18/2012	10.87	920.99	Light Trace
		12/27/2012	9.1	922.76	Light Trace
	928.48	12/13/2011	10.5	917.98	
		3/26/2012	10.6	917.93	_
RW-05	020.52	6/26/2012	9.21	919.32	_
	928.53	9/18/2012	10.86	917.67	Light Trace
		12/26/2012	10.42	918.11	Light Trace
	928.51	12/13/2011	10.53	917.98	_
		3/26/2012	10.54	917.99	_
RW-06	928.53	6/26/2012	9.12	919.41	
		9/18/2012	10.85	917.68	Light Trace
		12/26/2012	10.5	918.03	_
		6/26/2012	8.75	924.31	Heavy Trace
RW-07	933.06	9/18/2012	11.8	921.26	Heavy Trace
		12/27/2012	9.42	923.64	Heavy Trace
		6/26/2012	7.75	924.1	Heavy Trace
RW-08	931.85	9/18/2012	11.12	920.73	Light Trace
		12/27/2012	8.84	923.01	Heavy Trace
	933.95	12/13/2011	9.4	924.55	_
		3/26/2012	8.42	925.54	
RW-09	933.96	6/26/2012	7.81	926.15	_
	933.90	9/17/2012	9.92	924.04	_
		12/26/2012	9.2	924.76	_
		12/13/2011	13.76	918.06	
		3/26/2012	13.88	917.94	
WV	931.82	6/26/2012	12.48	919.34	
		9/18/2012	9.92	921.9	
		12/26/2012	6.94	924.88	Heavy Trace
		Levee Zone M	onitoring W	ells	
		12/13/2011	9.76	916.83	_
		3/26/2012	9.57	917.02	
5-W-14	926.59	6/26/2012	7.96	918.63	_
		9/17/2012	10.6	915.99	_
		12/26/2012	9.74	916.85	

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) <sup>2</sup>	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
		12/13/2011	8.29	916.86	_
		3/26/2012	8.1	917.05	_
5-W-15	925.15	6/26/2012	6.5	918.65	_
		9/17/2012	9.03	916.12	_
		12/26/2012	8.23	916.92	_
		12/13/2011	8.52	916.68	_
	1 [	3/26/2012	8.34	916.86	_
5-W-16	925.2	6/26/2012	6.73	918.47	_
	1	9/17/2012	9.31	915.89	_
	1 1	12/26/2012	8.49	916.71	_
	1	12/13/2011	7.87	916.73	_
		3/26/2012	7.71	916.89	
5-W-17	924.6	6/26/2012	6.09	918.51	<u>—</u>
	1	9/17/2012	8.69	915.91	_
	1 1	12/26/2012	7.84	916.76	_
	1	12/13/2011	7.98	916.66	_
	924.64	3/26/2012	7.81	916.83	<del></del>
5-W-18		6/26/2012	6.19	918.45	_
		9/17/2012	8.75	915.89	_
	1 1	12/26/2012	7.93	916.71	
	1	12/13/2011	7.79	916.56	_
		3/26/2012	7.64	916.71	_
5-W-19	924.35	6/26/2012	6	918.35	_
	1 1	9/17/2012	8.54	915.81	
		12/26/2012	7.74	916.61	
		Skykom	ish River		
	-	12/13/2011	-	924.23	
CV 1	-	3/26/2012	-	924.39	<del></del>
SK-1	-	6/26/2012	_	926.6	_
	-	9/20/2012	-	921.99	
	-	12/13/2011	-	918.65	
SV 2	-	3/26/2012	-	918.91	<u> </u>
SK-2	-	6/26/2012	-	921.65	
	-	9/20/2012	-	917.74	
	-	12/13/2011	-	917.94	
CV 2	-	3/26/2012	-	918.19	<del>_</del>
SK-3	-	6/26/2012	_	920.6	_
	-	9/20/2012	-	917.26	

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) <sup>2</sup>	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
	-	12/13/2011	-	917.68	
SK-4	-	3/26/2012	-	917.74	
	-	6/26/2012	-	918.82	_
	-	12/13/2011	-	916.26	_
	-	3/26/2012	-	916.42	
SK-5	-	6/26/2012	-	918.14	_
	-	9/20/2012	-	916.51	
	-	9/20/2012	-	914.86	
		Site-Wide Mo	nitoring We	ells	
		12/13/2011	9.88	919.19	
1A-W-4	929.07	3/26/2012	9.59	919.48	
1A-W-4	929.07	6/26/2012	8.2	920.87	
		9/17/2012	10.69	918.38	
1B-W-2	935.81	3/26/2012	13.88	921.93	_
1D-W-2	955.61	9/17/2012	14.74	921.07	_
	936.66	12/13/2011	15.13	921.53	_
1B-W-3		3/26/2012	14.83	921.83	_
		9/17/2012	15.83	920.83	_
1C-W-3	933.56	3/26/2012	10.62	922.94	
1C-W-3	933.30	9/17/2012	11.97	921.59	_
		3/26/2012	10.25	922.49	
1C-W-4	932.74	9/17/2012	11.19	921.55	
		12/26/2012	10.6	922.14	_
		12/13/2011	15.61	927.01	
		3/26/2012	14.95	927.67	
2A-W-8	942.62	6/26/2012	13.96	928.66	
		9/17/2012	16.79	925.83	
		12/26/2012	15.3	927.32	
		12/13/2011	14.08	919.24	
		3/26/2012	13.56	919.76	
MW-16	933.32	6/26/2012	13.02	920.3	
		9/17/2012	15.01	918.31	_
		12/26/2012	13.82	919.5	
) (IV) 22	02505	3/26/2012	9.43	916.63	
MW-32	926.06	9/17/2012	10.75	915.31	

Table 5
Groundwater Elevations and Product Thickness
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington

Farallon PN: 683-043

Location	Top of Casing Elevation <sup>1</sup> (NAVD88)	Monitoring Date	Depth to Water (feet) <sup>2</sup>	Water Level Elevation <sup>2</sup> (feet, NAVD88)	LNAPL Thickness (feet)
		12/13/2011	5.25	917.14	_
		3/26/2012	5.01	917.38	_
MW-38R	922.39	6/26/2012	4.17	918.22	_
		9/17/2012	6.2	916.19	_
		12/26/2012	9.55	912.84	_
MXV 47	022.61	9/17/2012	12.01	920.6	_
MW-47	932.61	12/26/2012	9.38	923.23	_
MW 40	022.0	9/17/2012	16.41	917.49	_
MW-48	933.9	12/26/2012	10.93	922.97	
MW-49	933.14	9/17/2012	16.69	916.45	_
141 (4 4 )	755.14	12/26/2012	12.02	921.12	
5-W-50	925.49	3/26/2012	7.91	917.58	_
3-11-30	723.47	9/17/2012	8.95	916.54	_
5-W-51	925.08	3/26/2012	8.3	917.35	0.59
3-W-31	923.08	9/20/2012	8.89	916.28	0.09
5-W-54	924.58	3/26/2012	7.08	917.5	
J- W-J4	724.30	9/17/2012	8.12	916.46	
5-W-55	923.92	3/26/2012	6.82	917.1	
J- VV -JJ	943.94	9/17/2012	7.95	915.97	
5-W-56	924.76	3/26/2012	7.56	917.2	_
3 11-30	724.70	9/17/2012	8.59	916.17	

#### NOTES:

<sup>— =</sup> denotes LNAPL was not present

<sup>&</sup>lt;sup>1</sup> In feet above mean sea level.

<sup>&</sup>lt;sup>2</sup> In feet below top of well casing.

			Oxidation Reduction			
		Dissolved Oxygen	Potential	pН	Temperature	Turbidity
Location	Sample Date	(milligrams per liter)	(millivolts)	(Standard pH Units)	(degrees Celsius)	(NTU)
	10/2=/2011		parging System Monitor		10.01	
	10/27/2011	4.14	179.6	5.98	10.81	0.71
	11/21/2011	4.42	139.9	4.86	8.26	0.79
	12/14/2011	3.86	200.9	5.71	7.89	0.42
	1/31/2012	6.21	182.9	4.79	7.06	0.43
	2/28/2012	5.35	360.1	4.91	5.86	0.81
	3/27/2012	5.81	-213.1	5.81	5.73	0.35
	4/24/2012	6.86	71.2	4.47	6.51	1.32
1C-W-1	5/30/2012	4.8	83	4.2	8.3	1.58
	6/27/2012	5.34	-216.1	5.46	8.84	0.2
	7/26/2012	10.14	107.6	4.82	10.75	0.73
	8/20/2012	4.99	30.1	6.16	12.21	0.94
	9/20/2012	4.09	148	6.96	9.35	1.7
	10/10/2012	3.65	-189.2	5.08	11.36	0.51
	11/21/2012	5.79	104	5.82	9.78	NM
	12/27/2012	3.24	174.4	5.8	7.6	1.9
	10/27/2011	3.57	131.6	6.2	9.96	0.76
	11/21/2011	4.79	257.2	5.32	8.46	1.39
	12/14/2011	5.48	184.7	6.17	7.31	0.79
	1/31/2012	3.08	287.2	5.37	6.99	0.66
	2/28/2012	3.53	293.1	5.39	5.49	0.32
	3/27/2012	3.42	-213.2	6.2	7.48	0.41
	4/24/2012	5.11	118.4	4.95	7.31	1.39
1C-W-7	5/30/2012	3.12	20.2	4.9	10.9	0.47
	6/27/2012	3.08	-248.3	6.06	9.9	0.44
	7/26/2012	7.9	81.7	6.08	12.08	4.58
	8/20/2012	7.19	132.3	6.12	13.19	3.87
	9/20/2012	6.03	101.6	7.35	10.69	3.8
	10/10/2012	7.5	-85.9	6.23	12.92	0.36
	11/21/2012	6.36	132.9	5.51	9.32	0.43
	12/27/2012	5.3	170.1	6.08	7.52	3.6
	10/27/2011	1.43	152.7	6.05	10.36	1.08
	11/21/2011	4.87	55.7	4.96	4.87	1.07
	12/14/2011	1.64	196.5	5.81	6.06	0.57
	1/31/2012	1.89	77.4	5	4.82	0.78
	2/28/2012	1.86	256.9	5.12	3.69	0.94
	3/27/2012	1.99	-249.2	5.96	6.04	0.57
	4/24/2012	6.27	45.1	4.66	7.63	1.75
1C-W-8	5/30/2012	2.71	13	4.57	11.4	1.32
	6/27/2012	4.23	-246.8	5.99	12.72	0.51
	7/26/2012	5.88	96.9	5.43	9.61	1.11
	8/20/2012	1.47	56	6	10.48	0.41
	9/20/2012	3.66	102.5	6.24	7.35	3.7
	10/10/2012	2.46	-175.2	5.08	10.59	45.2
	11/21/2012	1.74	103.2	5.8	10.22	NM
	12/27/2012	1.77	192.9	5.95	8.36	1.84

			Oxidation Reduction			
·	G 15.	Dissolved Oxygen	Potential	pH	Temperature	Turbidity
Location	Sample Date	(milligrams per liter)	(millivolts)	(Standard pH Units)	(degrees Celsius)	(NTU)
	12/14/2011	oring Wells Down-Grad	145.4	6.27	7.08	22.4
	3/28/2012	9.7	-205.8	6.47	7.65	74.1
1D W 22	6/28/2012	8.36	-203.8 -76.2	6.23	14.45	19.5
1B-W-23	9/19/2012	5.82	115.5	5.99	11.14	19.5 IE
	12/27/2012	4.26	137.4	6.3	5.86	12.7
	12/13/2011	6.09	183.7	6.57	8.56	3.7
	3/27/2011	7.6	-154	6.35	6.99	0.24
2A-W-40	6/27/2012	6.69	-134	6.22	10.43	0.24
	9/19/2012	5.79	109	5.7	12.08	2.1
	12/14/2011	4.92	86.2	5.98	6.61	0.38
0.4 777 44	3/27/2012	7.85	-153.7	6.21	8.3	0.39
2A-W-41	6/27/2012	7.04	-129.5	6.02	11.41	0.42
	9/19/2012	7.23	78.5	5.6	9.46	1.4
	12/27/2012	3.95	106.5	6.15	6.06	4.4
	12/14/2011	1.32	141.5	5.91	8.52	0.34
	3/27/2012	2.23	-224.1	6.19	7.86	0.33
2A-W-42	6/28/2012	1.8	-187.1	5.98	11.34	0.41
	9/19/2012	3.11	99	6.04	11.69	0
	12/27/2012	0.8	172.6	5.9	7.32	1.6
	3/26/2011	2.72	101.2	6.08	5.52	0.38
5-W-43	6/27/2012	1.27	-5.1	4.72	7.9	0.69
	9/19/2012	1.53	151.9	6	8.2	27.6
		er Malony Creek Zone E			_	
	12/14/2011	5.89	-63	4.93	6.9	2.26
	3/28/2012	0.2	63.2	5.1	5.5	3.71
2A-W-10	6/27/2012	0.13	23.2	4.6	11.2	1.31
	9/19/2012	1.57	111.4	5.67	9.25	36.4
	12/27/2012	0.33	168.9	5.16	7.08	9.02
	12/14/2011	2.6	-148	4.95	7.5	0.87
	3/28/2012	0.19	59	4.8	4.8	2.1
2A-W-9	6/27/2012	0.13	-97	4.75	10.8	1.12
	9/19/2012	1.45	-24.8	5.79	9.27	12.9
	12/27/2012	0.78	-5.2	6.19	6.48	5.67
	12/13/2011	5.16	95	4.78	7	2.66
	3/26/2011	3.65	245	4.6	5.2	0.8
2B-W-4	6/27/2012	2.27	-36.8	4.31	7.6	0.66
	9/19/2012	1.95	144.3	5.99	9.15	8.87
	12/27/2012	4.99	38.4	6.11	6.59	3.92
	12/14/2011	1.68	53	5.16	6.5	9.44
	3/28/2012	6.74	168	4.84	5.8	IE
MW-3	6/27/2012	4	94	4.57	13.4	1.1
	9/19/2012	1.21	54	5.99	9.08	55.3
	12/27/2012	1.33	60	5.01	7.1	40.3
	12/14/2011	3.55	-30	4.85	7.2	1.06
	3/28/2012	4.45	130	4.4	3.4	0.91
MW-4	6/27/2012	0.45	28.7	4.36	10.9	1.27
	9/19/2012	1.36	85.9	5.96	8.84	8.85
	12/27/2012	0.36	146.1	5.08	5.75	21.1

			Oxidation Reduction			
T	Sample Date	Dissolved Oxygen	Potential (millivolts)	pH	Temperature	Turbidity
Location	Sample Date	(milligrams per liter)		(Standard pH Units) stem Monitoring Wel	(degrees Celsius)	(NTU)
	12/14/2011	0.44	200.6	5.72	8.1	0.43
	3/28/2012	1.54	-267.6	6.07	5.82	0.29
EW-1	6/27/2012	1.15	-104	4.66	8.8	0.7
	9/19/2012	1.51	166.1	5.92	7.69	9.54
	12/14/2011	4.15	221	5.57	8.24	0.49
	3/28/2012	5.77	-233.3	5.93	7.16	0.43
EW-2A	6/27/2012	5.19	11.1	4.6	11.9	0.39
	9/19/2012	4.92	-45.6	4.59	9.67	0.01
	12/13/2011	0.51	45	5.65	8.4	5.92
	3/26/2011	1.83	178	5.83	5.6	12.1
	3/27/2012	0.88	75.3	6.34	6.5	1.86
a	3/27/2012	4.92	137.4	6.25	7.43	41.2
GW-1	3/27/2012	0.7	142	5.96	6.24	4.4
	6/27/2012	0.25	-309.6	6.48	9.61	0.44
	9/20/2012	0.94	44.7	7.43	10.59	11.8
	12/27/2012	0.24	128.1	6.05	8.11	3.05
	12/13/2011	0.85	78	5.23	8.2	1.51
	4/24/2012	2.46	54.6	5.62	7.5	2.65
GW-2	6/27/2012	1	-253.5	6.21	9.93	0.47
-	9/20/2012	0.93	34.6	7.62	10.2	4.4
	12/27/2012	1.71	46.1	6.41	6.72	22.27
	12/13/2011	5.75	47	5.32	6.3	174
GW-3	6/27/2012	5.28	-160.4	6.16	9.9	3.97
GW-3	9/19/2012	7.31	122.7	5.8	9.26	6
	12/27/2012	4	152	6.23	6.71	21.3
	12/13/2011	2.48	135	5.03	8.1	2.9
GW-4	6/27/2012	0.57	-21	5.11	9.8	2.28
O W -4	9/19/2012	5.47	156.6	5.48	10.53	4.02
	12/27/2012	0.8	100.1	6.42	7.02	3.9
			vee Zone Monitoring			
	12/14/2011	4.41	51	5.58	7	1.11
	3/28/2012	4.91	266	5.13	6.9	0.48
5-W-14	6/28/2012	5.82	-188.7	5.94	9.39	0.19
	9/18/2012	4.97	208.1	4.94	7.34	0.72
	12/27/2012	5.37	101.3	5.77	6.35	5.98
	12/14/2011	2.86	-53	6.5	7.3	2.91
	3/28/2012	0.16	-275.6	6.94	6.23	4.48
5-W-15	6/28/2012	0.67	-194.5	6.73	12.22	2.78
	9/18/2012	0.97	-61.3	6.6	8.61	65.6
	12/27/2012	0.16	-18.4	6.26	7.64	84.3
	12/14/2011	4.29	107	5.81	6.4	1.84
# TT	3/28/2012	5.41	235	5.61	5.9	1.39
5-W-16	6/28/2012	5.04	26	5.64	9.4	0.89
	9/18/2012	3.95	108.9	6.3	9.78	44.6
	12/27/2012	5.72	74.8	5.96	6.07	25.49

**Farallon PN: 683-043** 

			Oxidation Reduction			
Location	Sample Date	Dissolved Oxygen (milligrams per liter)	Potential (millivolts)	pH (Standard pH Units)	Temperature (degrees Celsius)	Turbidity (NTU)
	12/14/2011	8.55	64	5.28	7	0.95
	3/28/2012	4.58	211	5.14	6.8	2.63
5-W-17	6/28/2012	4.8	-6.5	4.8	8.6	0.63
	9/18/2012	5.13	99.8	6.1	8.16	5.42
	12/27/2012	6.4	55.7	6.15	7.12	1.71
	12/14/2011	0.48	36	6.29	7.1	0.75
	3/28/2012	0.26	151	6.4	5.8	3.96
5-W-18	6/28/2012	0.67	79	6.08	10.2	1.15
	9/18/2012	1.49	106.5	6.55	12.34	47.6
	12/27/2012	0.56	7	6.86	6.65	4.36
	12/14/2011	7	28.6	5.52	6.5	0.5
	3/28/2012	6.19	-247.9	6.47	6.73	0.34
5-W-19	6/28/2012	5.4	-54	5.14	8.9	0.58
	9/18/2012	5.24	150.1	6.14	9.66	2.21
	12/27/2012	4.81	230.8	4.94	6.65	0.65
		Si	te-Wide Monitoring	Wells		
1 1 777 4	3/28/2012	7.23	-219.5	6.49	6.86	0.3
1A-W-4	9/19/2012	7.53	-41.3	6.35	9.95	0.19
1D III 0	3/27/2012	5.67	153.6	5.97	6.87	2.47
1B-W-2	9/19/2012	0.5	-141.3	5.41	12.72	16.86
1D W 2	3/28/2012	3.59	-253.6	6.72	6.36	0.44
1B-W-3	9/19/2012	3.3	-118.2	6.07	11.21	0.38
10 111 2	3/27/2012	5.27	-223.4	6.07	7.94	229
1C-W-3	9/20/2012	5.52	125.3	6.83	12.41	615
10 11 4	3/27/2012	1.2	-235.1	5.93	6.74	0.65
1C-W-4	9/20/2012	3.98	167.9	5.17	7.81	8.4
MW 16	3/28/2012	6.37	251	4.41	5.4	1.76
MW-16	9/19/2012	3.13	191.2	5.76	9.36	74.5
1 (III 20D	3/26/2011	0.42	110.5	6.24	6.99	0.17
MW-38R	9/19/2012	0.98	181.1	6.14	7.34	40.9
5 MI 50	3/27/2012	0.35	-96.1	5.93	4.83	1.22
5-W-50	9/19/2012	0.96	-99.7	6.55	11.59	12.8
	3/27/2012	1.85	107.6	6.14	5.89	1.21
5-W-54	9/18/2012	0.85	174.6	6.09	12.98	19.8
	3/27/2012	6.86	76.9	6.27	8.54	1.97
5-W-55	9/18/2012	1.08	80.2	5.92	14.62	92
	3/27/2012	0.27	9.6	5.87	6.65	2.41
5-W-56	9/18/2012	0.92	-74.1	6.11	14.8	24.6

NOTES: IE = instrument error

umhos/cm = micromhos per centimeter

NM = not measured

 $NTU = nephelometric \ turbidity \ units$ 

Table 7

# Calculated Total Petroleum Hydrocarbons Concentrations in Groundwater BNSF Former Maintenance and Fueling Facility

		(mic	DRO rograms per	liter)	(mic	ORO rograms per	liter)	Calculated
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	NWTPH-Dx <sup>1</sup> (micrograms per liter)
			Air Sparg		Ionitoring W	ells		
	10/27/2011	35	19	9.4	< 47	94	47	58.5
	11/21/2011	41	19	9.4	< 47	94	47	64.5
	12/14/2011	20	19	9.4	< 47	94	47	43.5
	1/31/2012	< 47	47	94	38	9.4	19	61.5
	2/28/2012	< 47	47	94	89	9.4	19	112.5
	3/27/2012	91	19	9.4	< 47	94	47	114.5
	4/24/2012	< 9.4	19	9.4	< 47	94	47	<28.2
1C-W-1	5/30/2012	< 38	76	38	< 190	380	190	<114
	6/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25
	7/26/2012	< 9.6	19	9.6	< 48	96	48	<28.8
	8/20/2012	21	19	9.5	< 47	95	47	44.5
	9/20/2012	< 38	38	38	< 190	190	190	<114
	10/10/2012	< 150	150	150	< 750	750	750	<450
	11/21/2012	<83	400	83	<200	400	200	<141.5
	12/27/2012	<21	100	21	<30	100	30	<25.5
	10/27/2011	69	19	9.4	< 47	94	47	92.5
	11/21/2011	89	19	9.4	< 47	94	47	112.5
	12/14/2011	33	19	9.5	< 47	95	47	56.5
	1/31/2012	< 47	47	94	120	9.4	19	143.5
	1/31/2012 1	< 47	47	94	140	9.4	19	163.5
	2/28/2012	< 47	47	94	160	9.4	19	183.5
	3/27/2012	77	19	9.5	< 47	95	47	100.5
	4/24/2012	130	19	9.4	< 47	94	47	153.5
	5/30/2012	< 38	76	38	< 190	380	190	<114
	6/27/2012	57	19	9.4	< 47	94	47	80.5
1C-W-7	7/26/2012	31	19	9.5	< 48	95	48	55
1C-W-7	7/26/2012 1	44	19	9.5	< 48	95	48	68
l	8/20/2012	27	19	9.5	< 47	95	47	50.5
	8/20/2012 1	34	19	9.5	< 47	95	47	57.5
	9/20/2012	59	41	41	< 200	200	200	159
[	10/10/2012	< 150	150	150	< 750	750	750	<450
l t	10/10/2012 1	< 150	150	150	< 750	750	750	<450
	11/21/2012	< 83	400	83	< 200	400	200	<141.5
	11/21/2012 1	< 83	400	83	< 200	400	200	<141.5
[	12/27/2012	< 21	100	21	120	100	30	130.5
	12/27/2012							
	12/21/2012	<83	400	83	<200	400	200	<141.5

# Calculated Total Petroleum Hydrocarbons Concentrations in Groundwater BNSF Former Maintenance and Fueling Facility

		(mic	DRO rograms per	liter)	(mic	ORO rograms per	liter)	Calculated
								NWTPH-Dx <sup>1</sup>
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	(micrograms per liter)
	10/27/2011	180	19	9.4	< 47	94	47	203.5
	11/21/2011	230	19	9.4	< 47	94	47	253.5
-	12/14/2011	120	19	9.4 95	< 47	94	47 19	143.5 420
-	1/31/2012 2/28/2012	130 120	47 47	95	290 330	9.4 9.4	19	450
	2/28/2012							430
	3/27/2012	120 210	47 19	95 9.4	310 140	9.4 94	19 47	350
l	4/24/2012	220	19	9.4	< 47	94	47	243.5
1C-W-8	5/30/2012	100	76	38	< 190	380	190	195
10 ,, 0	6/27/2012	83	19	9.5	< 47	95	47	106.5
1	7/26/2012	78	19	9.5	< 48	95	48	102
1	8/20/2012	72	19	9.5	< 47	95	47	95.5
l t	9/20/2012	< 38	38	38	< 190	190	190	<114
<b>I</b>	9/20/2012 1	< 38	38	38	< 190	190	190	<114
l	10/10/2012	250	150	150	< 750	750	750	625
1	11/21/2012	< 83	400	83	< 200	400	200	<141.5
<b>1</b>	12/27/2012	160	100	21	200	100	30	360
	Monito	ring Wells D	own-Gradien	t of the Hyd	raulic Contro	l and Contai	nment Syste	m
	12/14/2011	27	19	9.5	< 47	95	47	50.5
1	3/28/2012	39	19	9.5	< 47	95	47	62.5
1B-W-23	6/28/2012	23	19	9.5	< 47	95	47	46.5
	9/19/2012	84	56	56	< 280	280	280	224
	12/27/2012	< 22	110	22	< 32	110	32	<27
	12/13/2012	87	19	9.4	< 47	94	47	110.5
1	3/27/2012	36	19	9.4	< 47	94	47	59.5
2A-W-40	6/27/2012	< 9.4	19	9.4	< 47	94	47	<28.2
	9/19/2012	< 43	43	43	< 220	220	220	<131.5
	12/14/2011	< 9.4	19	9.4	< 47	94	47	<28.2
1	3/27/2012	52	19	9.5	< 47	95	47	75.5
2A-W-41	6/27/2012	< 9.4	19	9.4	< 47	94	47	<28.2
211 11 11	9/19/2012	65	45	45	< 220	220	220	175
	12/27/2012	< 21	100	21	< 30	100	30	<25.5
	12/14/2011	120	19	9.4	< 47	94	47	143.5
	3/27/2012	110	19	9.4	< 47	94	47	133.5
2A-W-42	6/28/2012	54	19	9.4	< 47	94	47	77.5
2P1- VV -42	9/19/2012	110	44	44	< 220	220	220	220
	12/27/2012	< 22	100	22	210	100	31	221
<del>                                     </del>	3/26/2012	35	19	9.7	< 49	97	49	59.5
5-W-43	6/27/2012	< 9.5	19	9.7	< 49	95	49	<28.75
J- W-43	9/19/2012	< 42	42	42	< 210	210	210	<126
	7/17/2U12	<u>\ 4</u> 2	42	42	< 210	۷10	210	<u>\120</u>

# Calculated Total Petroleum Hydrocarbons Concentrations in Groundwater BNSF Former Maintenance and Fueling Facility

		(mic	DRO rograms per	liter)	(mic	ORO rograms per	liter)	Calculated
	-							NWTPH-Dx <sup>1</sup>
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	(micrograms per liter)
Т	12/14/2011	r Malony Cre	eek ZoneEas 19	9.5	nd Surroundi < 47	ing Area Moi 95	utoring Well 47	143.5
	3/28/2012	260	19	9.5	350	95	48	610
	6/27/2012	170	19	9.5	150	95	48	320
2A-W-10	9/19/2012	120	38	38	< 190	190	190	215
	12/27/2012 1	140	100	22	270	100	31	410
	12/27/2012	130	100	21	250	100	30	380
	12/14/2011	910	19	9.5	260	95	47	1,170
	3/28/2012	600	19	9.5	460	95	47	1,060
2A-W-9	6/27/2012	230	19	9.5	120	95	48	350
	9/19/2012	210	38	38	290	190	190	500
	12/27/2012	2,700	100	22	1,600	100	31	4,300
	12/13/2011	< 9.5	19	9.5	< 48	95	48	<28.75
	3/26/2012	< 9.5	19	9.5	< 47	95	47	<28.25
2B-W-4	6/27/2012	< 9.4	19	9.4	< 47	94	47	<28.2
	9/19/2012	< 38	38	38	< 190	190	190	<114
	12/27/2012	< 21	100	21	< 30	100	30	<25.5
	12/14/2011	120	19	9.5	110	95	48	230
	3/28/2012	78	19	9.5	110	95	48	188
MW-3	6/27/2012	33	19	9.5	< 47	95	47	56.5
	9/19/2012	93	38	38	< 190	190	190	188
	12/27/2012	< 22	100	22	< 31	100	31	<26.5
	12/14/2011	< 9.5	19	9.5	< 47	95	47	<28.25
	3/28/2012	160	19	9.5	220	95	48	380
MW-4	6/27/2012	52	19	9.5	< 47	95	47	75.5
	9/19/2012	41	38	38	< 190	190	190	136
	12/27/2012	< 21	100	21	< 31	100	31	<26
			ic Control an	d Containme	ent System M	onitoring We		
	12/14/2011	29	19	9.4	< 47	94	47	52.5
EW-1	3/28/2012	29	19	9.4	< 47	94	47	52.5
L 17,7-1	6/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25
	9/19/2012	< 41	41	41	< 210	210	210	<125.5
	12/14/2011	< 9.4	19	9.4	< 47	94	47	<28.2
EW-2A	3/28/2012	20	19	9.4	< 47	94	47	43.5
12 11 -2/1	6/27/2012	< 9.5	19	9.5	110	95	48	114.75
	9/19/2012	< 38	38	38	< 190	190	190	<114

# Calculated Total Petroleum Hydrocarbons Concentrations in Groundwater BNSF Former Maintenance and Fueling Facility

		(mic	DRO rograms per	liter)	(mic	ORO rograms per	liter)	Calculated
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	NWTPH-Dx <sup>1</sup> (micrograms per liter)
	12/13/2011	65	19	9.6	< 48	96	48	89
	3/26/2012	63	19	9.5	< 48	95	48	87
GW-1	6/27/2012	30	19	9.5	< 47	95	47	53.5
	9/20/2012	60	38	38	< 190	190	190	155
	12/27/2012	< 21	100	21	< 30	100	30	<25.5
	12/13/2011	21	19	9.5	< 48	95	48	45
	3/27/2012	330	20	9.9	170	99	50	500
G	4/24/2012	140	19	9.4	100	94	47	240
GW-2	6/27/2012	28	19	9.5	< 47	95	47	51.5
	9/20/2012	< 38	38	38	< 190	190	190	<114
	12/27/2012	< 21	100	21	< 31	100	31	<26
	12/13/2011	< 9.5	19	9.5	< 48	95	48	<28.75
	3/27/2012	47	21	10	< 52	100	52	73
GW-3	6/27/2012	22	19	9.4	< 47	94	47	45.5
	9/19/2012	< 43	43	43	< 210	210	210	<126.5
	12/27/2012	< 22	110	22	< 32	110	32	<27
	12/13/2011	< 9.5	19	9.5	< 48	95	48	<28.75
	3/27/2012	160	21	10	110	100	52	270
GW-4	6/27/2012	< 9.4	19	9.4	< 47	94	47	<28.2
	9/19/2012	< 43	43	43	< 220	220	220	<131.5
	12/27/2012	< 21	100	21	< 30	100	30	<25.5
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2
S1-AD	3/27/2012	< 9.6	19	9.6	< 48	96	48	<28.8
	9/19/2012	< 44	44	44	< 220	220	220	<132
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2
S1-AU	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25
	9/19/2012	< 44	44	44	< 220	220	220	<132
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2
S1-BD	3/27/2012	41	19	9.5	160	95	47	201
	9/19/2012	< 41	41	41	< 200	200	200	<120.5
	11/3/2011	< 9.5	19	9.5	< 47	95	47	<28.25
S1-BU	3/27/2012	19	19	9.5	< 47	95	47	42.5
	9/19/2012	< 42	42	42	< 210	210	210	<126
	11/3/2011	150	19	9.4	< 47	94	47	173.5
S2-AD	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25
	9/19/2012	< 38	38	38	< 190	190	190	<114
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2
S2-AU	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25
	9/19/2012	< 39	39	39	< 190	190	190	<114.5

# Calculated Total Petroleum Hydrocarbons Concentrations in Groundwater BNSF Former Maintenance and Fueling Facility

		DRO (micrograms per liter)			(mic	ORO rograms per	liter)	Calculated	
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	NWTPH-Dx <sup>1</sup> (micrograms per liter)	
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2	
S2-BD	3/27/2012	22	19	9.5	< 47	95	47	45.5	
	9/19/2012	< 42	42	42	< 210	210	210	<126	
	11/3/2011	150	19	9.4	< 47	94	47	173.5	
	3/27/2012	41	19	9.5	< 47	95	47	64.5	
S2-BU	9/19/2012	45	43	43	< 220	220	220	155	
	9/19/2012 1	< 41	41	41	< 200	200	200	<120.5	
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2	
	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25	
S3-AD	9/18/2012	< 42	42	42	< 210	210	210	<126	
	9/18/2012 1	< 42	42	42	< 210	210	210	<126	
	11/3/2011	69	19	9.4	< 47	94	47	92.5	
S3-AU	3/27/2012	85	19	9.5	< 47	95	47	108.5	
	9/19/2012	< 42	42	42	< 210	210	210	<126	
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2	
S3-BD	3/27/2012	22	19	9.5	< 47	95	47	45.5	
	9/18/2012	< 38	38	38	< 190	190	190	<114	
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2	
S3-BU	3/27/2012	42	19	9.5	< 47	95	47	65.5	
33-BU	9/19/2012	82	38	38	< 190	190	190	177	
	9/19/2012 1	< 38	38	38	< 190	190	190	<114	
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2	
S3-CD	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25	
	9/18/2012	< 42	42	42	< 210	210	210	<126	
	11/3/2011	< 9.5	19	9.5	< 47	95	47	<28.25	
S3-CU	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25	
	9/18/2012	< 38	38	38	< 190	190	190	<114	
	11/3/2011	< 9.5	19	9.5	< 47	95	47	<28.25	
S4-AD	3/27/2012	61	19	9.5	< 47	95	47	84.5	
	9/18/2012	< 38	38	38	< 190	190	190	<114	
	11/3/2011	< 9.5	19	9.5	< 47	95	47	<28.25	
S4-AU	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25	
	9/18/2012	< 39	39	39	< 190	190	190	<114.5	
	11/4/2011	20	19	9.4	< 47	94	47	43.5	
S4-BD	3/27/2012	24	19	9.5	< 47	95	47	47.5	
	9/18/2012	< 38	38	38	< 190	190	190	<114	

# Calculated Total Petroleum Hydrocarbons Concentrations in Groundwater BNSF Former Maintenance and Fueling Facility

		(mic	DRO rograms per	liter)	(mic	ORO rograms per	Calculated			
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	NWTPH-Dx <sup>1</sup> (micrograms per liter)		
	11/4/2011	72	19	9.5	180	95	47	252		
S4-BU	3/27/2012	40	19	9.4	< 47			63.5		
	9/18/2012	< 38	38	38	< 190			<114		
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2		
S4-CD	3/27/2012	< 9.5	19	9.5	< 47	95	47	<28.25		
	9/18/2012	86	40	40	250	200	200	336		
	11/3/2011	< 9.4	19	9.4	< 47	94	47	<28.2		
S4-CU	3/27/2012	34	19	9.5	< 47	95	47	57.5		
	9/18/2012	< 39	39	39	< 200	200	200	<119.5		
			Leve	e Zone Moni		•				
	12/14/2011	< 9.5	19	9.5	< 48	95	48	<28.75		
5-W-14	3/28/2012	< 9.5	19	9.5	< 47	95	47	<28.25		
3-11-14	6/28/2012	< 9.4	19	9.4	< 47 94		47	<28.2		
	12/27/2012	< 21	100	21	< 30	100	30	<25.5		
	12/14/2011	280	19	9.5 9.4	110	95	48	390		
	3/28/2012		<b>570</b> 19		330	94	47	900		
5-W-15	6/28/2012	110	19	9.4	130	94	47	240		
	9/18/2012	370	38	38	210	190	190	580		
	12/27/2012	210	100	21	290	100	30	500		
	12/14/2011	< 9.5	19	9.5	< 48	95	48	<28.75		
	3/28/2012	27	19	9.4	< 47	94	47	50.5		
5-W-16	6/28/2012	22	19	9.5	< 47	95	47	45.5		
3-W-10	9/18/2012	< 38	38	38	< 190	190	190	<114		
	12/27/2012	< 86	410	86	< 410	410	0	<248		
	12/27/2012 1	< 90	430	90	< 430	430	0	<260		
	12/14/2011	< 9.5	19	9.5	< 48	95	48	<28.75		
	3/28/2012	< 9.4	19	9.4	< 47	94	47	<28.2		
5-W-17	6/28/2012	< 9.5	19	9.5	< 47	95	47	<28.25		
	9/18/2012	< 38	38	38	< 190	190	190	<114		
	12/27/2012	< 22	100	22	< 31	100	31	<26.5		
	12/14/2011	100	19	9.5	< 47	95	47	123.5		
	3/28/2012	95	19	9.4	95	94	47	190		
5-W-18	6/28/2012	94	19	9.5	130	95	47	224		
	9/18/2012	170	38	38	< 190	190	190	265		
	12/27/2012	< 22	100	22	160	100	31	171		
	12/14/2011	< 9.5	19	9.5	< 48	95	48	<28.75		
	3/28/2012	< 9.4	19	9.4	< 47	94	47	<28.2		
5-W-19	6/28/2012	< 9.5	19	9.5	< 48	95	48	<28.75		
	9/18/2012	< 38	38	38	< 190	190	190	<114		
	12/27/2012	< 21	100	21	< 30	100	30	<25.5		

### Calculated Total Petroleum Hydrocarbons Concentrations in Groundwater BNSF Former Maintenance and Fueling Facility

### Skykomish, Washington Farallon PN: 683-043

		(mic	DRO rograms per	Calculated NWTPH-Dx <sup>1</sup>				
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	(micrograms per liter)
	, , ,							
	3/28/2012	< 9.5	19	Wide Monito 9.5	< 47	95	47	<28.25
1A-W-4	9/19/2012	< 38	38	38	< 190	190	190	<114
	9/19/2012	< 38	38	38	< 190	190	190	<114
1B-W-2	3/27/2012	51	21	10	< 52	100	52	77
1B-W-2	9/19/2012	120	53	53	< 260	260	260	250
1B-W-3	3/28/2012	35	19	9.5	< 47	95	47	58.5
1D-W-3	9/19/2012	< 38	38	38	< 190	190	190	<114
1C-W-3	3/27/2012	30	19	9.5			47	53.5
1C-W-3	9/20/2012	< 38	38	38	< 190	190	190	<114
1C-W-4	3/27/2012	260	19	9.5	160	95	47	420
1C- W-4	9/20/2012	49	38	38	< 190	190	190	144
MW-16	3/28/2012	20	19	9.5	< 47	95	47	43.5
WI W-10	9/19/2012	< 38	38	38	< 190	190	190	<114
MW-38R	3/26/2012	49	20	9.9	< 50	99	50	74
W W - 36K	9/19/2012	170	38	38	210	190	190	380
5-W-50	3/27/2012	2,000	21	10	660	100 52		2,660
3-W-30	9/18/2012	1,000	42	42	480	210	210	1,480
5-W-51	3/28/2012	14,100	190	95	13300	950	470	27,400
5-W-54	3/27/2012	30	20	9.8	< 49	98	49	54.5
3-W-34	9/18/2012	< 38	38	38	< 190	190	190	<114
	3/27/2012	40	21	10	< 52	100	52	66
5-W-55	9/18/2012	260	38	38	< 190	190	190	355
	9/18/2012	280	38	38	< 190	190	190	375
5-W-56	3/27/2012	420	20	9.9	410	99	50	830
3-W-30	9/18/2012	2,700	38	38	840	190	190	3,540

NOTES:

Yellow shading denotes the presence of

non-aqueous phase liquid.

**Bold** denotes concentration exceeds 208 ug/l TPH cleanup level (Levee Zone) or exceeds 477 ug/l TPH remediation level (all zones except Levee Zone).

 $\begin{aligned} MDL &= method \ detection \ limit \\ MRL &= method \ reporting \ limit \\ \mu g/l &= micrograms \ per \ liter \end{aligned}$ 

DRO = total petroleum hydrocarbons as diesel-range organics ORO = total petroleum hydrocarbons as oil-range organics

<sup>&</sup>lt; = analyte not detected at or above the laboratory method detection limit

<sup>&</sup>lt;sup>1</sup>NWTPH-Dx calculation uses one-half the MDL for non-detectable concentrations to derive the sum of TPH-O and TPH-D result.

Table 8

Comparison of Total Petroleum Hydrocarbon Concentrations in Groundwater With and Without Silica Gel Cleanup
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-043

		TPH-D TPH-O (micrograms per liter) (micrograms per liter)						Calculated NWTPH-Dx <sup>1</sup>
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	(micrograms per liter)
	2011 12 14	< 9.5	19	9.5	< 47	95	47	<28.25
	2011-12-14	< 9.5	19	9.5	< 48	95	48	<28.75
	2012-03-28	< 9.4	19	9.4	< 47	94	47	<28.2
5-W-14	2012-03-28	< 9.5	19	9.5	< 47	95	47	<28.25
	2012.06.29	< 9.4	19	9.4	< 47	94	47	<28.2
	2012-06-28	< 9.4	19	9.4	< 47	94	47	<28.2
	2012-09-18	< 38	38	38	< 190	190	190	<114
		< 9.5	19	9.5	< 48	95	48	<28.75
	2011-12-14	280	19	9.5	110	95	48	390
	2012 02 20	140	19	9.5	< 47	95	47	163.5
5 W 15	2012-03-28	570	19	9.4	330	94	47	900
5-W-15	2012-06-28	< 9.4	19	9.4	< 47	94	47	<28.2
		110	19	9.4	130	94	47	240
	2012-09-18	< 38	38	38	< 190	190	190	<114
		370	38	38	210	190	190	580
	2011-12-14	< 9.5	19	9.5	< 47	95	47	<28.25
	2011-12-14	< 9.5	19	9.5	< 48	95	48	<28.75
	2012-03-28	< 9.4	19	9.4	< 47	94	47	<28.2
5-W-16	2012-03-28	27	19	9.4	< 47	94	47	50.5
3-W-10	2012-06-28	< 9.5	19	9.5	< 47	95	47	<28.25
	2012-00-28	22	19	9.5	< 47	95	47	45.5
	2012-09-18	< 38	38	38	< 190	190	190	<114
	2012-09-18	< 38	38	38	< 190	190	190	<114
	2011-12-14	< 9.5	19	9.5	< 47	95	47	<28.25
	2011-12-14	< 9.5	19	9.5	< 48	95	48	<28.75
Ì	2012 02 29	< 9.4	19	9.4	< 47	94	47	<28.2
5 W 17	2012-03-28	< 9.4	19	9.4	< 47	94	47	<28.2
5-W-17	2012-06-28	< 9.5	19	9.5	< 47	95	47	<28.25
	2012-00-28	< 9.5	19	9.5	< 47	95	47	<28.25
	2012-09-18	< 38	38	38	< 190	190	190	<114
	2012-09-18	< 38	38	38	< 190	190	190	<114

Table 8

#### Comparison of Total Petroleum Hydrocarbon Concentrations in Groundwater With and Without Silica Gel Cleanup BNSF Former Maintenance and Fueling Facility Skykomish, Washington

Farallon PN: 683-043

		(mic	TPH-D rograms per	liter)	(mic	TPH-O rograms per	Calculated		
Location	Sample Date	Result	MRL	MDL	Result	MRL	MDL	NWTPH-Dx <sup>1</sup> (micrograms per liter)	
	2011-12-14	< 9.5	19	9.5	< 47	95	47	<28.25	
		100	19	9.5	< 47	95	47	123.5	
	2012-03-28	22	19	9.5	< 47	95	47	45.5	
5-W-18	2012-03-26	95	19	9.4	95	94	47	190	
J- VV -10	2012-06-28	< 9.5	19	9.5	< 47	95	47	<28.25	
		94	19	9.5	130	95	47	224	
	2012-09-18	< 38	38	38	< 190	190	190	<114	
		170	38	38	< 190	190	190	265	
	2011-12-14	< 9.4	19	9.4	< 47	94	47	<28.2	
	2011-12-14	< 9.5	19	9.5	< 48	95	48	<28.75	
	2012-03-28	< 9.5	19	9.5	< 47	95	47	<28.25	
5-W-19	2012-03-26	< 9.4	19	9.4	< 47	94	47	<28.2	
J- W-19	2012-06-28	< 9.5	19	9.5	< 48	95	48	<28.75	
	2012-00-28	< 9.5	19	9.5	< 48	95	48	<28.75	
	2012-09-18	< 38	38	38	< 190	190	190	<114	
	2012-09-18	< 38	38	38	< 190	190	190	<114	

#### NOTES:

**Bold** denotes concentration exceeds 208 ug/l TPH Levee Zone cleanup level.

Italics and shading indicates analytical result without silica gel cleanup.

< denotes analyte not detected at or above the laboratory method detection limit.

MDL = method detection limit

MRL = method reporting limit

TPH-D = total petroleum hydrocarbons as diesel-range organics

TPH-O = total petroleum hydrocarbons as oil-range organics

<sup>&</sup>lt;sup>1</sup>NWTPH-Dx calculation uses one-half the MDL for non-detectable concentrations to derive the sum of TPH-O and TPH-D result.

# APPENDIX A INSTALLATION OF NEW MONITORING WELLS

2011/2012 SITE-WIDE GROUNDWATER MONITORING REPORT BNSF Former Maintenance and Fueling Facility Skykomish, Washington Consent Decree No. 07-2-33672-9 SEA

# APPENDIX A SUMMARY OF INSTALLATION OF ADDITIONAL MONITORING WELLS

Groundwater monitoring wells MW-47 through MW-49 were installed in the vicinity of the west end of the Hydraulic Control and Containment (HCC) System wall as part of the HCC System optimization implementation for investigation of the groundwater flow direction and gradient west of 5<sup>th</sup> Street and south of the HCC System. The locations and screened intervals of the monitoring wells were based on hydrogeologic conditions observed at the Site and laboratory analytical results for groundwater samples collected during previous groundwater monitoring events at the Site. The monitoring well locations are depicted on Figures 2 and 3 of the report.

Cascade Drilling, L.P. performed the drilling activities at the Site on August 22 and 24, 2012 using a limited-access sonic drill rig. Each boring was sampled continuously from the surface to 20 feet below ground surface (bgs). The soil from each boring was described in accordance with Unified Soil Classification System ASTM Standard D2488-06, *Standard Practice for Description and Identification of Soils*, and evidence of potential contamination such as unusual odor, discoloration, or sheen was noted. The soil samples were also screened in the field using a photoionization detector (PID) to assess for the presence of volatile organic vapors. The boring logs containing the soil descriptions, field observations, and PID readings are provided in this appendix.

The monitoring wells were constructed of 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) casing and a 0.010-inch slotted PVC well screen. The three monitoring wells were screened from 5 to 20 feet bgs. A No. 2/12 sand filter pack was placed from the bottom of the screened interval to approximately 2 feet above the top of the screened interval. A minimum 2-foot-thick bentonite chip seal was emplaced above the sand pack in each well. Each monitoring well was fitted with a locking cap and completed using a flush-mounted traffic-rated monuments encased in concrete. Boring logs showing well construction details are included in this appendix.

Monitoring well MW-47 was partially developed immediately following well construction but the submersible pump failed. Well development was completed two days following well construction. Monitoring wells MW-48 and MW-49 were developed immediately after construction. Each monitoring well was surged using a polyvinyl chloride surge rod to flush water into the soil surrounding the well screen to loosen fine-grained sediment and pull it into the well. The surge rod was then removed from the monitoring well, and a submersible pump was used to evacuate the water from the monitoring well. This process was repeated until three to five well volumes of water had been removed from the monitoring well or visual observation indicated that sediment no longer was present in groundwater.

The installation of monitoring wells was conducted in accordance with Farallon Standard Operating Procedure No. FAR-101 for well construction and Standard Operating Procedure No. FAR-102 for well development. The monitoring wells also were constructed in accordance with Chapter 173-160 of the Washington Administrative Code, *Minimum Standards for Construction and Maintenance of Wells*. Decontamination water and purged groundwater generated during installation and development of the monitoring wells was stored on Site in labeled 55-gallon drums for future disposal.

The position of groundwater monitoring wells MW-47 through MW-49 and the elevations of the top of casing measuring points were surveyed by professional surveyors True North Land Surveying, Inc. of Seattle, Washington on October 25, 2012.



Page 1 of 2

**BNSF** Client:

Project: BNSF Skykomish Location: Skykomish, WA

**Farallon PN: 683-043** 

Logged By: Dincer Kayhan

Date/Time Started: 8/22/12 1313

Date/Time Completed: 8/22/12 1449

**Equipment:** Geoprobe 8140LS **Drilling Company:** Cascade Drilling

Jeff Johnson

**Drilling Method:** Sonic

**Drilling Foreman:** 

Sampler Type: D&M SS 18"x2"

AUTO Drive Hammer (lbs.): Depth of Water ATD (ft bgs): 10.9

Total Boring Depth (ft bgs): 20.0 Total Well Depth (ft bgs): 20.0

Blow Counts 8/8/8 Sample Analyzed Depth (feet bgs.) Sample Interval **USGS Graphic** % Recovery **Boring/Well** (mdd) **Lithologic Description** Construction Sample ID **Details** \* \*

	\	0.0-0.8 Asphalt. 3 seperate layers23' thick each	AC						
-		0.8-1.8 Poorly graded SAND with gravel [65% sand, 35% gravel] fine to coarse sand, fine to coarse gravel, gray, dry, no odor	SP						Concrete
_		1.8-2.9 Poorly graded SAND with gravel [80% sand, 20% gravel] fine to coarse sand, fine to coarse gravel, brown, dry, no odor	SP		75	NA	1.3		Bentonite
_		2.9-3.8 Poorly graded SAND with gravel [75% sand, 25% gravel] fine to coarse sand, fine to coarse gravel, gray, dry, no odor, contains organic bark/tree debris	SP						
-		3.8-4.0 No recovery	SP						
	\ /	4.0-4.8 Poorly graded SAND with gravel [75% sand, 25% gravel] fine to coarse sand, fine to coarse gravel, gray, dry, no odor							
5-	$\backslash \backslash \rfloor$	4.8-5.5 Wood debris, moist at 4.8' bgs	WD	Z <sub>Z</sub>			1.9		
-	$\bigwedge$	5.5-6.3 Poorly graded SAND with gravel [80% sand, 15% gravel, 5% silt] fine to coarse sand, fine to coarse gravel, gray, moist, no odor	SP						
_	$\left  \cdot \right $	6.3-7.5 No recovery			80	NA			
_		7.5-8.5 Poorly graded SAND [85% sand, 10% silt, 5% gravel] fine to medium sand, coarse gravel, brown, moist, no odor	SP				1.4		
-	$\left  \right $	8.5-9.5 Poorly graded GRAVEL with sand [80% gravel, 20% sand] fine to coarse gravel, medium to coarse sand, brown, moist, no odor	GP	⊠. ⊠.: ⊠.:					
10 –		9.5-10.9 Poorly graded SAND [85% sand, 10% silt, 5% gravel] fine to medium sand, coarse gravel, brown, moist, no odor, water at 10.9' bgs	SP				19.3		

Monument Type: Flush Mount Casing Diameter (inches): Screen Slot Size (inches): 0.020 Screened Interval (ft bgs): 5-20

**Well Construction Information** Filter Pack: #2/12 Sand Surface Seal: Concrete **Annular Seal:** Bentonite

**Boring Abandonment:** 

932.98 **Ground Surface Elevation (ft):** Top of Casing Elevation (ft): 932.61 Surveyed Location: X:1510528.16

Y: 258862.76



**Lithologic Description** 

#### Log of Boring: MW-47

Page 2 of 2

**BNSF** Client:

Depth (feet bgs.) Sample Interval

Project: BNSF Skykomish Location: Skykomish, WA

**Farallon PN: 683-043** 

Logged By: Dincer Kayhan

Date/Time Started: 8/22/12 1313 Date/Time Completed: 8/22/12 1449

**Equipment:** 

**Drilling Company:** Cascade Drilling Jeff Johnson **Drilling Foreman:** 

**Drilling Method:** Sonic Sampler Type: D&M SS 18"x2"

AUTO Drive Hammer (lbs.): Depth of Water ATD (ft bgs): 10.9

Total Boring Depth (ft bgs): 20.0 Total Well Depth (ft bgs): 20.0

Sample Analyzed

Sample ID

**USGS Graphic** % Recovery Blow Counts 8/8/8

(mdd)

Geoprobe 8140LS

**Boring/Well** Construction **Details** 

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ı	11 /		1	 1	1	1	1 1	<del>lebo</del> 1	J 1
-		10.9-12.0 Poorly graded SAND with gravel [80% sand, 15% gravel, 5% silt] fine to coarse sand, fine to coarse gravel, gray, moist, no odor	SP	80	NA				Water Level
-	1\	12.0-12.5 No recovery							
-		12.5-15.0 Poorly graded GRAVEL with sand [80% gravel, 20% sand] fine to coarse gravel, medium to coarse sand, cobbles present, brown to light grey at 14.3' bgs, wet, sand percentage increases to 50% sand and 50% gravel at 14.4' bgs	GP			1.6			
15 -		15.0-16.5 Poorly graded GRAVEL with sand [80% gravel, 20% sand] fine to coarse gravel, medium to coarse sand, cobbles present, gray, wet, no odor	GP						Sand Pack
-	_//\	16.5-17.5 Poorly graded SAND with gravel [60% sand, 40% gravel] coarse sand, fine to coarse gravel, brown, wet, no odor	SP	100	NA				
-		17.5-20.0 Poorly graded SAND [90% sand, 10% gravel] fine to coarse sand, fine gravel, brown, wet, no odor	SP			1.0			
20 -				100	NA				
20-						1.9		_	

Monument Type: Flush Mount Casing Diameter (inches): Screen Slot Size (inches): 0.020 Screened Interval (ft bgs): 5-20

**Well Construction Information** Filter Pack: #2/12 Sand Surface Seal: Concrete **Annular Seal:** Bentonite

**Boring Abandonment:** 

932.98 **Ground Surface Elevation (ft):** Top of Casing Elevation (ft): 932.61 **Surveyed Location:** X:1510528.16 Y: 258862.76



Page 1 of 2

Client: BNSF

**Project:** BNSF Skykomish **Location:** Skykomish, WA

**Farallon PN**: 683-043

Logged By: E.E. Mulanax

**Date/Time Started:** 8/24/12 0953

Date/Time Completed: 8/24/12 1124

Equipment: Sonic SDC 390-14

Drilling Company: Cascade Drilling

Drilling Foreman: Andy

Drilling Method: Sonic

Sampler Type: Plastic sleeve

Drive Hammer (lbs.): NA

Depth of Water ATD (ft bgs): 5.0 Total Boring Depth (ft bgs): 20.0

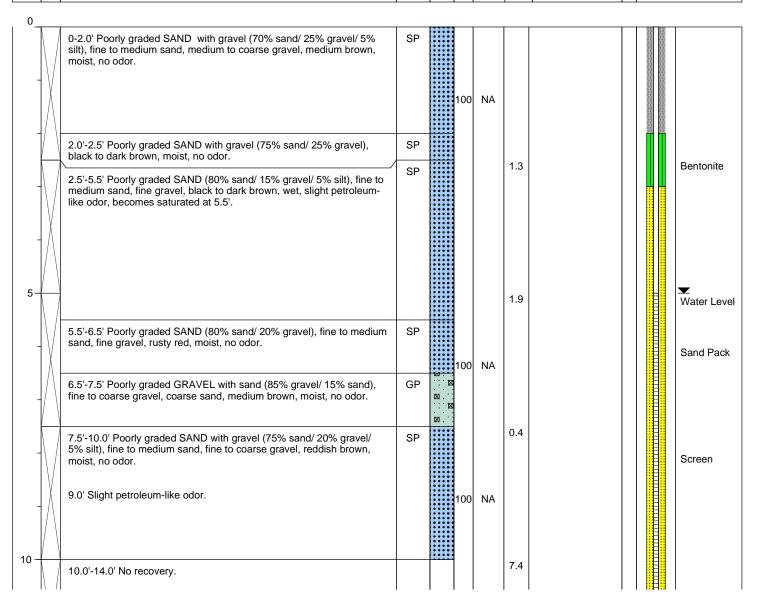
Total Well Depth (ft bgs): 20.0

Sample Interval

USGS Graphic

USGS Graphic

W Recovery
Blow Counts 8/8/8



Monument Type: Flush Mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.020
Screened Interval (ft bgs): 5-20

Well Construction Information

Filter Pack: #2/12 Sand
Surface Seal: Concrete
Annular Seal: Bentonite
Boring Abandonment: NA

Ground Surface Elevation (ft): 934.34

Top of Casing Elevation (ft): 933.90

Surveyed Location: X:1510485.27

Y: 258999.99



Page 2 of 2

**BNSF** Client:

Project: BNSF Skykomish Location: Skykomish, WA

**Farallon PN: 683-043** 

Logged By: E.E. Mulanax

Date/Time Started: 8/24/12 0953

8/24/12 1124 Date/Time Completed: Sonic SDC 390-14

**Drilling Company:** Cascade Drilling

**Drilling Foreman:** Andy **Drilling Method:** Sonic

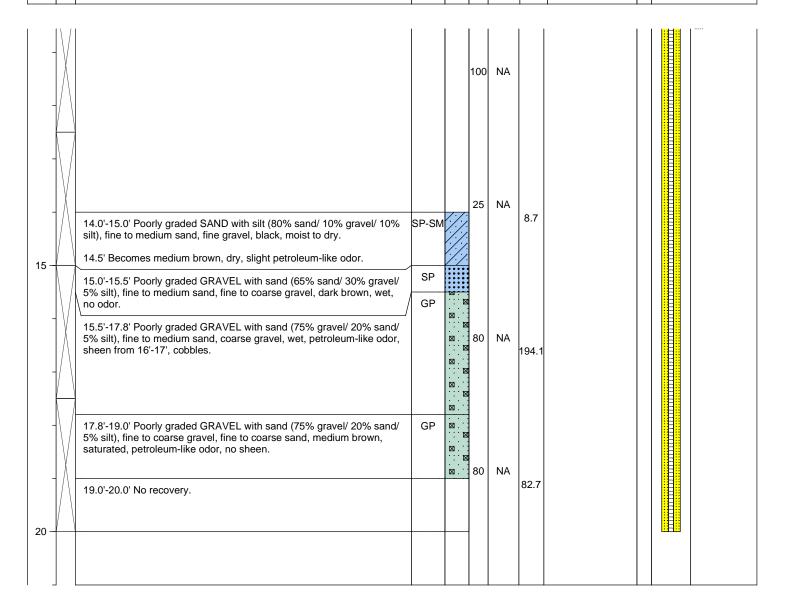
**Equipment:** 

Sampler Type: Plastic sleeve

NA Drive Hammer (lbs.): Depth of Water ATD (ft bgs): 5.0

Total Boring Depth (ft bgs): 20.0 Total Well Depth (ft bgs): 20.0

Blow Counts 8/8/8 Sample Analyzed Depth (feet bgs.) Sample Interval **USGS Graphic** % Recovery Boring/Well (mdd) **Lithologic Description** Construction Sample ID **Details** 吕



Monument Type: Flush Mount Casing Diameter (inches): Screen Slot Size (inches): 0.020 Screened Interval (ft bgs): 5-20

**Well Construction Information** 

Filter Pack: #2/12 Sand **Surface Seal:** Concrete **Annular Seal: Bentonite Boring Abandonment:** 

934.34 **Ground Surface Elevation (ft):** Top of Casing Elevation (ft): 933.90 Surveyed Location: X: 1510485.27

Y: 258999.99



Page 1 of 2

Client: BNSF

Project: Skykomish Ongoing Cleanup

Location: Skykomish, WA

**Farallon PN**: 683-043

Logged By: E.E. Mulanax

**Date/Time Started:** 8/24/12 1342 **Date/Time Completed:** 8/24/12 1441

Equipment:
Drilling Company:

**Drilling Foreman:** 

Sonic SDC 390-14

Cascade Drilling

Andy

Drilling Method: Sonic

Sampler Type: Plastic sleeve

Drive Hammer (lbs.): NA

Depth of Water ATD (ft bgs): 10.0 Total Boring Depth (ft bgs): 20.0

Total Well Depth (ft bgs): 20.0

Sample Interval

NSCS

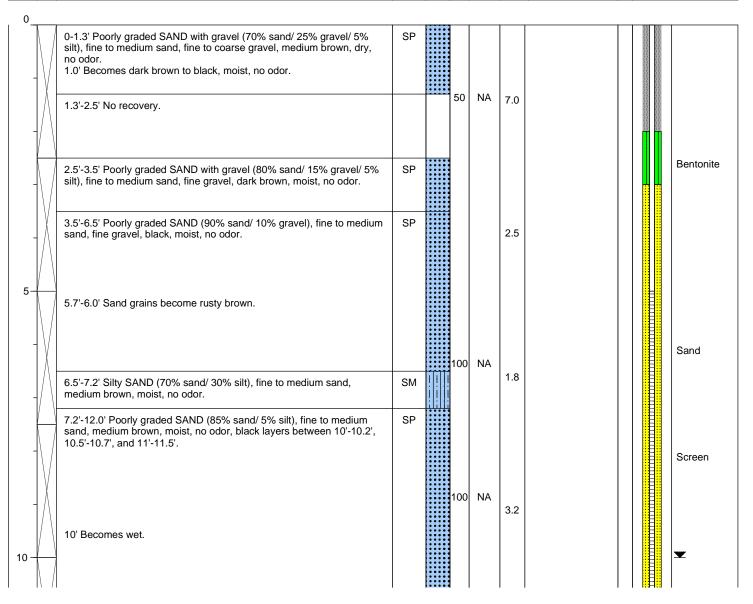
USCS

Bounds 8/8/8

Bounds 8/8/8

Sample ID

Countration
Details



Monument Type: Flush Mount
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.020
Screened Interval (ft bgs): 5-20

Well Construction Information

Filter Pack: #2/12 Sand
Surface Seal: Concrete
Annular Seal: Bentonite
Boring Abandonment: NA

Ground Surface Elevation (ft): 933.57

Top of Casing Elevation (ft): 933.14

Surveyed Location: X:1510373.13

Y: 258987.47



Page 2 of 2

**BNSF** Client:

Project: Skykomish Ongoing Cleanup

Location: Skykomish, WA

**Farallon PN: 683-043** 

Logged By: E.E. Mulanax

Date/Time Started: 8/24/12 1342 8/24/12 1441 Date/Time Completed:

Sonic SDC 390-14 **Equipment:** 

**Drilling Company:** Cascade Drilling **Drilling Foreman:** Andy

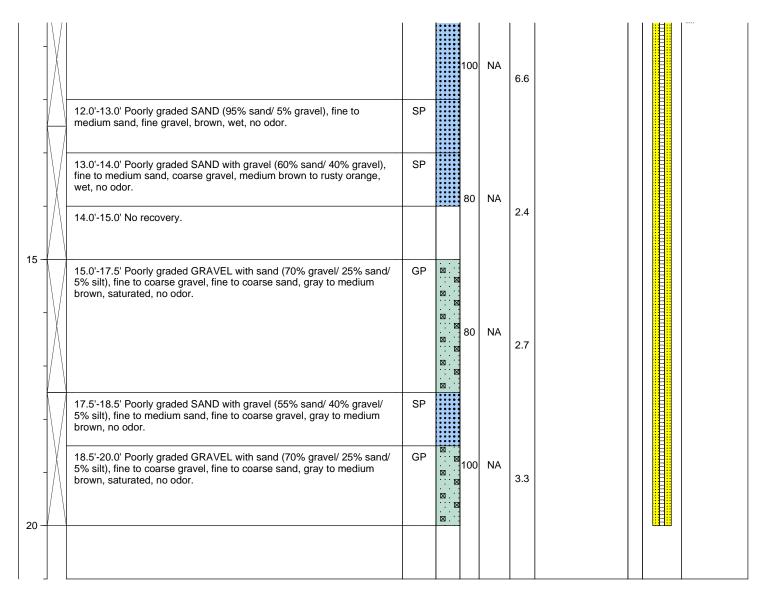
Sonic

Sampler Type: Plastic sleeve

NA Drive Hammer (lbs.): Depth of Water ATD (ft bgs): 10.0

Total Boring Depth (ft bgs): 20.0 Total Well Depth (ft bgs): 20.0

**Drilling Method:** 



Monument Type: Flush Mount Casing Diameter (inches): Screen Slot Size (inches): 0.020 Screened Interval (ft bgs): 5-20

**Well Construction Information** Filter Pack: #2/12 Sand **Surface Seal:** Concrete **Annular Seal: Bentonite Boring Abandonment:** 

933.57 **Ground Surface Elevation (ft):** Top of Casing Elevation (ft): 933.14 Surveyed Location: X: 1510373.13

Y: 258987.47

# APPENDIX B LABORATORY ANALYTICAL REPORTS (PROVIDED ON CD IN PRINT REPORT)

2011/2012 SITE-WIDE GROUNDWATER MONITORING REPORT BNSF Former Maintenance and Fueling Facility Skykomish, Washington Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-043





November 07, 2011

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: Skykomish

Pace Project No.: 259777

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on October 27, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Andy Brownfield

andy Brownfield

andy.brownfield@pacelabs.com Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







# **CERTIFICATIONS**

Project: Skykomish Pace Project No.: 259777

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



# **SAMPLE ANALYTE COUNT**

Project: Skykomish Pace Project No.: 259777

				Analytes	
Lab ID	Sample ID	Method	Analysts	Reported	Laboratory
259777001	IC-W-7-1011	NWTPH-Dx	AY1	4	PASI-S
259777002	IC-W-1-1011	NWTPH-Dx	AY1	4	PASI-S
259777003	IC-W-8-1011	NWTPH-Dx	AY1	4	PASI-S
259777004	IC-W-80-1011	NWTPH-Dx	AY1	4	PASI-S



Project: Skykomish Pace Project No.: 259777

Pace Project No.: 259777									
Sample: IC-W-7-1011	Lab ID: 259	777001	Collected:	10/27/1	1 11:10	Received: 1	10/27/11 16:25	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTF	H-Dx Prepai	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.069</b> mg	g/L		0.019	1	11/01/11 12:50	0 11/03/11 01:48	3	
Motor Oil Range	ND m	g/L		0.094	1	11/01/11 12:50	11/03/11 01:48	8 64742-65-0	
n-Octacosane (S)	75 %			50-150	1	11/01/11 12:50	11/03/11 01:48	3 630-02-4	
o-Terphenyl (S)	57 %			50-150	1	11/01/11 12:50	) 11/03/11 01:48	84-15-1	
Sample: IC-W-1-1011	Lab ID: 259	777002	Collected:	10/27/1	1 12:00	Received: 1	0/27/11 16:25	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTF	H-Dx Prepai	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.035</b> mg	g/L		0.019	1	11/01/11 12:50	0 11/03/11 02:40	)	
Motor Oil Range	ND m	g/L		0.094	1	11/01/11 12:50	11/03/11 02:40	64742-65-0	
n-Octacosane (S)	72 %	_		50-150	1	11/01/11 12:50	11/03/11 02:40	630-02-4	
o-Terphenyl (S)	56 %			50-150	1	11/01/11 12:50	) 11/03/11 02:40	84-15-1	
Sample: IC-W-8-1011	Lab ID: 259	777003	Collected:	10/27/1	1 12:40	Received: 1	0/27/11 16:25	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metl	hod: NWTF	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.18</b> mg	g/L		0.019	1	11/01/11 12:50	0 11/03/11 03:57	,	
Motor Oil Range	ND m	g/L		0.094	1	11/01/11 12:50	11/03/11 03:57	64742-65-0	
n-Octacosane (S)	66 %			50-150	1	11/01/11 12:50	11/03/11 03:57	630-02-4	
o-Terphenyl (S)	52 %			50-150	1	11/01/11 12:50	) 11/03/11 03:57	7 84-15-1	
Sample: IC-W-80-1011	Lab ID: 259	777004	Collected:	10/27/1	1 13:00	Received: 1	0/27/11 16:25	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTF	H-Dx Prepai	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.21</b> mg	g/L		0.019	1	11/01/11 12:50	0 11/03/11 04:23	3	
Motor Oil Range	ND m	-		0.094	1	11/01/11 12:50	11/03/11 04:23	8 64742-65-0	
n-Octacosane (S)	66 %	-		50-150	1	11/01/11 12:50	11/03/11 04:23	8 630-02-4	
σσιασσσασ (σ)				30-130					

Date: 11/07/2011 10:22 AM

# **REPORT OF LABORATORY ANALYSIS**



Project: Skykomish Pace Project No.: 259777

QC Batch: OEXT/4668 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259777001, 259777002, 259777003, 259777004

METHOD BLANK: 92486 Matrix: Water

Associated Lab Samples: 259777001, 259777002, 259777003, 259777004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.020	11/03/11 00:06	
Motor Oil Range	mg/L	ND	0.10	11/03/11 00:06	
n-Octacosane (S)	%	91	50-150	11/03/11 00:06	
o-Terphenyl (S)	%	79	50-150	11/03/11 00:06	

LABORATORY CONTROL SAMPLE: 92487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	4	3.2	81	51-147	
Motor Oil Range	mg/L	4	3.4	86	20-160	
n-Octacosane (S)	%			93	50-150	
o-Terphenyl (S)	%			86	50-150	

SAMPLE DUPLICATE: 92488

Parameter	Units	259777001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.069	0.059	16	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	75	69	8	
o-Terphenyl (S)	%	57	57	.05	

SAMPLE DUPLICATE: 92489

Parameter	Units	259783007 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L		 ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	93	92	2	
o-Terphenyl (S)	%	78	78	3	<b>;</b>

Date: 11/07/2011 10:22 AM



#### **QUALIFIERS**

Project: Skykomish Pace Project No.: 259777

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

#### **LABORATORIES**

Date: 11/07/2011 10:22 AM

PASI-S Pace Analytical Services - Seattle



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Skykomish Pace Project No.: 259777

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
259777001	IC-W-7-1011	EPA 3510	OEXT/4668	NWTPH-Dx	GCSV/3050
259777002	IC-W-1-1011	EPA 3510	OEXT/4668	NWTPH-Dx	GCSV/3050
259777003	IC-W-8-1011	EPA 3510	OEXT/4668	NWTPH-Dx	GCSV/3050
259777004	IC-W-80-1011	EPA 3510	OEXT/4668	NWTPH-Dx	GCSV/3050



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

					3		12	=======================================	10	9	8	7	6	cn	4	ω	2	-	Required Company Address:  See Email To: Phone Phone Requeste Requeste
	ORIG				without syeu.	ADDITIONAL COMMENTS									10-W-80-1011	1C-W-8-1011	1101-1-M-21	1C-W-7-1011	Client Information:  AECOM TIO 2 nd AVR. Ste 1000  AHO WA 98 10 4  MARK HAVI 9 nors F  6-6493 Fax:  d Due Date/TAT:  Matrix Contraction  Matrix Co
	OHIGINAL			0	Andels	RELI													opy To:  Opy
				AI	han	NQUIS	L	-							X	X	X	X	MATRIX CODE (see valid codes to left)  SAMPLE TYPE (G=GRAB C=COMP)  Day  MATRIX CODE (see valid codes to left)  Control of the
	ī	S		中国でい	dian & Bane	RELINQUISHED BY / AFFILIATION									1	10/271	10/27 1	10/27 1	SAMPLE TYPE (G=GRAB C=COMP)  SAMPLE TYPE  COMPOSITE  START  TIME  TIME  TIME  TIME
2 3	pn	AMPLER I			rype	FILIATION	_								300	1240	1200	1110	E 02 175
SIGNATURE OF SAMPLER:	amen TNIS	SAMPLER NAME AND SIGNATURE									2000								STED STED COMPOSITE ENDIGRAB
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	1				N	m	E												H <sub>2</sub> SO <sub>4</sub>
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DATE Signed	1				,	NOI	-	+	+	$\vdash$							-		sted
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					1420	DATE													REGULATORY A REGULATORY A REGULATORY A SITE Location SI STATE:  Requested Analysis Filtered
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					1625	TIME			F										
Temp	in °	С		-	1.2		-												Residual Chlorine (Y/N)
Receiv				-	X	SAI													Pau Pau
Cust	Coo				×	SAMPLE CONDITIONS					-								39111  R DRINKII  OTHER
Sample	(N) es In '(N)	itact			7	SNOITIONS											Par	ne 8	391118  Pace Project No./ Lab I.Do

# Sample Container Count

Pace Analytical \*\*

CLIENT: AECOM

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU		 	Comments	
1		200													
2															
3															
4		VV													
5															
6															
7															
8															
9															
10															
11										-				11	
12													 Trip Blank?	No	

AG1H	1 liter HCL amber glass	. BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	R	terra core kit
	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial		4oz clear soil jar
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial		Ziploc Bag
	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		Wipe/Swab		

#### Sample Condition Upon Receipt ace Analytical Client Name: ASCON Project # Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other Tracking #: Yes Seals intact: Custody Seal on Cooler/Box Present: ☐ No Packing Material: Mubble Wrap Bubble Bags None Other Temp. Blank Yes Thermometer Used 132013 of 101731962 or 226099 Type of Ice: (Wet) Blue None Samples on ice, cooling process has begun Date and Initials of person examining contents: (C) 0171 Biological Tissue is Frozen: Yes No Cooler Temperature Temp should be above freezing ≤ 6 °C Comments: EYes - No □N/A Chain of Custody Present: Chain of Custody Filled Out: DYes DNo □N/A Chain of Custody Relinquished: Yes DNo □N/A ☐Yes ☐No Sampler Name & Signature on COC: □N/A □Yes □No Samples Arrived within Hold Time: □N/A ☐Yes ☐No EN/A Short Hold Time Analysis (<72hr): ☐Yes ☐No □N/A Rush Turn Around Time Requested: ☐Yes ☐No Follow Up / Hold Analysis Requested: □N/A ₩Yes □No □N/A Sufficient Volume: Nes DNo □N/A Correct Containers Used: TYes DNo -Pace Containers Used: □N/A □Yes □No Containers Intact: □N/A ☐Yes ☐No DN/A Filtered volume received for Dissolved tests 12 Yes No Sample Labels match COC: □N/A -Includes date/time/ID/Analysis Matrix: \ All containers needing preservation have been checked. Yes No □N/A All containers needing preservation are found to be in □Yes □No compliance with EPA recommendation. Initial when Lot # of added completed preservative Exceptions: VOA, coliform, TOC, O&G □Yes □No □N/A Samples checked for dechlorination: ☐Yes ☐No MN/A Headspace in VOA Vials ( >6mm): □Yes \No Trip Blanks Present:

Client Notification/ Resolution:		Field Data Required?	Y	1	N	
Person Contacted:	Date/Time:		10			
Comments/ Resolution:						

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

□Yes □No □N/A

Project Manager Review:

Trip Blank Custody Seals Present Pace Trip Blank Creation Date:

10/28/11

Date:





December 01, 2011

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: BNSF-Skykomish

Pace Project No.: 2510110

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on November 22, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Andy Brownfield

andy Brownfield

andy.brownfield@pacelabs.com Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







# **CERTIFICATIONS**

Project: BNSF-Skykomish

Pace Project No.: 2510110

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



# **SAMPLE ANALYTE COUNT**

Project: BNSF-Skykomish

Pace Project No.: 2510110

				Analytes	
Lab ID	Sample ID	Method	Analysts	Reported	Laboratory
2510110001	IC-W-1-1111	NWTPH-Dx	AY1	4	PASI-S
2510110002	IC-W-8-1111	NWTPH-Dx	AY1	4	PASI-S
2510110003	IC-W-80-1111	NWTPH-Dx	AY1	4	PASI-S
2510110004	IC-W-7-1111	NWTPH-Dx	AY1	4	PASI-S



Project: BNSF-Skykomish

Pace Project No.: 2510110

Sample: IC-W-1-1111	Lab ID: 251	0110001	Collected	d: 11/21/1	11 14:00	Received: 11	1/22/11 09:50	Matrix: Water	
Parameters	Results	Units	Rep	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTPI	H-Dx Prep	aration M	ethod: E	PA 3510			
Diesel Range	<b>0.041</b> m	g/L		0.019	1	11/28/11 11:40	11/28/11 23:23		
Motor Oil Range	ND m	g/L		0.094	1	11/28/11 11:40	11/28/11 23:23	64742-65-0	
Surrogates n-Octacosane (S)	83 %			50-150	1	11/28/11 11:40	11/28/11 23:23	620 02 4	
o-Terphenyl (S)	72 %			50-150	1		11/28/11 23:23		
o-respirettyr (o)	12 /0			30-130	•	11/20/11 11.40	11/20/11 20.20	04-10-1	
Sample: IC-W-8-1111	Lab ID: 251	0110002	Collected	d: 11/21/1	11 14:50	Received: 11	1/22/11 09:50	Matrix: Water	
Parameters	Results	Units	Rep	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTPI	H-Dx Prep	aration M	ethod: E	PA 3510			
Diesel Range	<b>0.23</b> m	g/L		0.019	1	11/28/11 11:40	11/29/11 00:13		
Motor Oil Range	ND m	•		0.094	1	11/28/11 11:40	11/29/11 00:13	64742-65-0	
Surrogates									
n-Octacosane (S)	99 %			50-150	1	11/28/11 11:40			
o-Terphenyl (S)	85 %			50-150	1	11/28/11 11:40	11/29/11 00:13	84-15-1	
Sample: IC-W-80-1111	Lab ID: 251	0110003	Collected	d: 11/21/1	11 15:30	Received: 11	1/22/11 09:50	Matrix: Water	
Parameters	Results	Units	Rep	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTPI	H-Dx Prep	aration M	ethod: E	PA 3510			
Diesel Range	<b>0.20</b> m	g/L		0.019	1	11/28/11 11:40	11/29/11 00:38		
Motor Oil Range	ND m	g/L		0.094	1	11/28/11 11:40	11/29/11 00:38	64742-65-0	
Surrogates									
n-Octacosane (S)	88 %			50-150	1	11/28/11 11:40	11/29/11 00:38		
o-Terphenyl (S)	76 %			50-150	1	11/28/11 11:40	11/29/11 00:38	84-15-1	
Sample: IC-W-7-1111	Lab ID: 251	0110004	Collected	d: 11/21/1	11 16:00	Received: 11	1/22/11 09:50	Matrix: Water	
Parameters	Results	Units	Rep	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTPI	H-Dx Prep	aration M	ethod: E	PA 3510	_		
Diesel Range	<b>0.089</b> m	g/L		0.019	1	11/28/11 11:40	11/29/11 01:03		
Motor Oil Range	ND m			0.094	1	11/28/11 11:40	11/29/11 01:03	64742-65-0	
Surrogates	,								
n-Octacosane (S)	91 %			50-150	1	11/28/11 11:40	11/29/11 01:03	630-02-4	
( - )	79 %			50-150	1		11/29/11 01:03		

Date: 12/01/2011 03:25 PM

# **REPORT OF LABORATORY ANALYSIS**



Project: BNSF-Skykomish

Pace Project No.: 2510110

QC Batch: OEXT/4790 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2510110001, 2510110002, 2510110003, 2510110004

METHOD BLANK: 95512 Matrix: Water

Associated Lab Samples: 2510110001, 2510110002, 2510110003, 2510110004

Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	11/28/11 17:59	
Motor Oil Range	mg/L	ND	0.10	11/28/11 17:59	
n-Octacosane (S)	%	96	50-150	11/28/11 17:59	
o-Terphenyl (S)	%	82	50-150	11/28/11 17:59	

LABORATORY CONTROL SAMPLE: 95513

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		3.2	79	51-114	
Motor Oil Range	mg/L	4	3.5	87	62-120	
n-Octacosane (S)	%			94	50-150	
o-Terphenyl (S)	%			88	50-150	

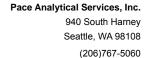
SAMPLE DUPLICATE: 95514

Parameter	Units	2510078015 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	96	93	2	
o-Terphenyl (S)	%	83	80	3	

SAMPLE DUPLICATE: 95515

Parameter	Units	2510110001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.041	0.050	20	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	83	94	12	
o-Terphenyl (S)	%	72	81	12	

Date: 12/01/2011 03:25 PM REPORT OF LABORATORY ANALYSIS





#### **QUALIFIERS**

Project: BNSF-Skykomish

Pace Project No.: 2510110

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

#### **LABORATORIES**

Date: 12/01/2011 03:25 PM

PASI-S Pace Analytical Services - Seattle



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF-Skykomish

Pace Project No.: 2510110

Date: 12/01/2011 03:25 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2510110001	IC-W-1-1111	EPA 3510	OEXT/4790	NWTPH-Dx	GCSV/3124
2510110002	IC-W-8-1111	EPA 3510	OEXT/4790	NWTPH-Dx	GCSV/3124
2510110003	IC-W-80-1111	EPA 3510	OEXT/4790	NWTPH-Dx	GCSV/3124
2510110004	IC-W-7-1111	EPA 3510	OEXT/4790	NWTPH-Dx	GCSV/3124



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2510110

Section A	Section B								Secti	on C											Pag	je:	1	of (		
Required Client Information:  Company: A = C D M	Required P Report To:	roject	t Informatio	n:	( ) - ( - 0)	ref.			Invoice	e Inform on:	ation:	_						phoy			5.65	1	470	1484	-	
Company: AECOM  Address: 710 End AVE. Stc 1000  Seattle WA 98104  Email To: Mark. Havighorst Quecou	Copy To:	700	and i	Cine	1900	12/			Comp	any Nar	ne:							REGULATORY AGENCY								
Contto WIA about	Ron	00	Khi	ch	+	(1 kg)	_	MI I	Addre	ss:						artino to	a Ul	Name and Address of the Owner, where	IPDES			IND WAT	ER [	DRINKIN	G WATER	
Email To: Mark Havighors Dayo	Purchase O	rder I	No.:		May 2-10 a Le Ma			1	Pace Quote								IST		RCRA		Г	OTHER	ECONO GENERAL			
Phone 206.624.93 [24]	Project Nam	ne: «	SKV	160	mist	1-13	ASP		Referen Pace P	roject		_		_										INC. INC. IN		
Phone: 206.624.93 Page: Requested Due Date/TAT: Standard.	Project Num	nber:	GOI	91	112	05	40	1.0	Manage Pace P	er: rofile #:	2111	11-2	1.41	SHILL	25.10		17,702	in the same	STATE	,	WX	cmist L	a ale			
Sicualani			00 1	11	113		70				_	-	_			Reque	ested		sis Filte	_						
Section D  Required Client Information  MATRIX /  Drinking Wate Water Waste Water Product Soil/Soild Oil Wipe	CODE	(see valid codes to left)	(G=GRAB C=COMP)	COMPO		CTED COMPO END/G		AT COLLECTION	ERS		Presei	vativ	/es	11.7	Test   Y/N	-DK	di sa	en er	3 21		2010	ine (Y/N)				
(A-Z, 0-9 /,-) Sample IDs MUST BE UNIQUE Tissue Other	AR TS OT	MATRIX CODE	SAMPLE TYPE	ATE	TIME	DATE	TIME	SAMPLE TEMP	# OF CONTAINERS	Unpreserved H <sub>2</sub> SO <sub>4</sub>	HCI HCI	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Other	(C)	NWTPH						Residual Chlorine (Y/N)	Pace	Project N	o./ Lab I.D.	
1 1C-W-1-1111 2 1C-W-8-1111 3 1C-W-80-1111		W	14		1400			826	2		K	Ш	$\perp$			$\times$						Ш				
2 1C-W-8-1111		W	11/	21	1450	150-11	el m	4,8	2		X	Н	70			X							Model	A franchis		
3 1C-W-80-1111		W	11/	21	1530			4.3	2		X	$\square$		+		K				$\perp$	-	-	1707.1			
4 1C-W-7-1111		W	(1)	21	1600		USTAN	84	2		X		-			X				+	-	H		FF 81		
5									-				+	+			-			+	-					-
6					15101111	9 11 77		$\vdash$	lat to M	-	$\vdash$	$\vdash$		-			-			+	-		77311			_
7								-	11000			Н		+	7					+			4 17 14	174		
8		-						$\vdash$		_		$\vdash$	-	+			_			+	-	H				_
9		-							OIL S					100												-
10												Н			100											_
11		-		_							-	$\vdash$	+							+	+		_			-
12 ADDITIONAL COMMENTS		DELL	INOUIEUE	D DV /	AFFILIATIO	M.	DAT		T1	ME		Н	ACCE	DTE	BV	/ AFFILIAT	TION		DATE		TIME	ш	SAME	LE CONDIT	ONS	-
ADDITIONAL COMMENTS											4.0			_	_							1. 6	N/	No. of Contract of	ons.	-
Lab Turbit 19 at 201	nee				Se65	ane	11/20	[[]	09	20	Cold	ette	- W	ua	vei	2/PA	E	Ш	2211	Ox.	150	6.9	7	N	7	
		1	AFC	00	И											4	MILL.		F 4-4		Lift of			141		
ORIGINAL SAMPLER NAME AND SIGNAL									-			1/						0, 0	no pa	dy Cooler I)	Intaci					
PRINT Name of SAMPLE						Al	od	eg	Tre	ca	7-	DATES	igned	u	/	1 , ,		Тетр іп	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)					
SIGNATURE of SAMPLER!Pa					age	8 of 10	J					DATE S	/YY):	111	1221	111		F	8 -	Se	Sar					

# Sample Container Count

2510110

Pace Analytical "

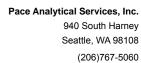
CLIENT:	AEcom	
COC PAGE o		Trip Blank(s) Provided?

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG		Comments
1		2 12															
2																	
3																	
4		4 4															
5																	
6																	
7																	
8																	
9																	
10																	
11																	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

	A STATE OF THE STA	Sample C	ondi	tion Upon Rec	eipt	
Pace Analytical	Client Name:	AECO	m		Project #	2 5 1 0 1 10
Courier: Fed Ex UPS Tracking #:	USPS Client	Comme	ercial	Pace Other		
Custody Seal on Cooler/Box	Present: Yes	No No	Seals	intact: Yes	☐ No	
Packing Material: Bubble	Wrap Bubble I	Bags 🗌 N	lone	Other	Temp. Blank Yes	No
Thermometer Used 1320	13 of 101731962 or 226099		Wet	Blue None		oling process has begun
Cooler Temperature Temp should be above freezing ≤	0.92	Biological *	Tissue	is Frozen: Yes No Comments:	Date and Initia contents:_ \	s of person examining
Chain of Custody Present:		☐Yes ☐No	□N/A	1.		
Chain of Custody Filled Out:		ØYes □No	□N/A	2.		
Chain of Custody Relinquished	d:	DYes □No	□N/A	3.		
Sampler Name & Signature or	COC:	MYes □No	□n/a	4.		
Samples Arrived within Hold T	ime:	☑Yes □No	□n/a	5.		
Short Hold Time Analysis (<	72hr):	□Yes ☑No	□N/A	6.		
Rush Turn Around Time Rec	uested:	□Yes ☑No	□N/A	7.		
Follow Up / Hold Analysis Re	equested:	□Yes □No	□N/A	8.		
Sufficient Volume:		DYes □No	□N/A	9.		
Correct Containers Used:		☑Yes □No	□n/a	10.		
-Pace Containers Used:		Yes DNo	□N/A			
Containers Intact:		☑Yes □No	□N/A	11.		
Filtered volume received for D	issolved tests	□Yes □No	⊠N/A	12.		
Sample Labels match COC:		¥Yes □No	□n/a	13.		
-Includes date/time/ID/Anal	ysis Matrix:	WT				
All containers needing preservation	have been checked.	□Yes □No	□n/a	14.		
All containers needing preservation compliance with EPA recommend		Yes DNo	□N/A			
Exceptions: VOA, coliform, TOC, O&G				Initial when completed	Lot # of added preservative	
Samples checked for dechloring	nation:	□Yes □No	DNA		procerrative	
Headspace in VOA Vials ( >6n		□Yes □No	MN/A			
Trip Blanks Present:		□Yes □No	MN/A			
Trip Blank Custody Seals Pres	ent	□Yes □No	<b>⊠</b> N/A			
Pace Trip Blank Creation Date						
Client Notification/ Resolution	n.				Field Data Beaute	19 V / N
Person Contacted:	,,,,		Date/	Time:	Field Data Required	1? Y / N
Comments/ Resolution:			- Date			
Project Manager Reviews		1 100	12		Data	11/2-/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





December 27, 2011

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on December 15, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Regina SteMarie for

Regina Se. Marie

Andy Brownfield andy.brownfield@pacelabs.com

Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







#### **CERTIFICATIONS**

Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555

Page 2 of 16



# **SAMPLE ANALYTE COUNT**

Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2510337001	2B-W-4-1211	NWTPH-Dx	AY1	4	PASI-S
2510337002	GW-1-1211	NWTPH-Dx	AY1	4	PASI-S
2510337003	GW-2-1211	NWTPH-Dx	AY1	4	PASI-S
2510337004	GW-3-1211	NWTPH-Dx	AY1	4	PASI-S
2510337005	GW-4-1211	NWTPH-Dx	AY1	4	PASI-S
2510337006	GW-30-1211	NWTPH-Dx	AY1	4	PASI-S
2510337007	2A-W-40-1211	NWTPH-Dx	AY1	4	PASI-S
2510337008	5-W-17-1211	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
2510337009	5-W-18-1211	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
2510337010	5-W-180-1211	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
2510337011	5-W-14-1211	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
2510337012	5-W-15-1211	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
2510337013	5-W-16-1211	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
2510337014	5-W-19-1211	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
2510337015	MW-4-1211	NWTPH-Dx	AY1	4	PASI-S
2510337016	2A-W-10-1211	NWTPH-Dx	AY1	4	PASI-S
2510337017	2A-W-9-1211	NWTPH-Dx	AY1	4	PASI-S
2510337018	2A-W-90-1211	NWTPH-Dx	AY1	4	PASI-S
2510337019	MW-3-1211	NWTPH-Dx	AY1	4	PASI-S
2510337020	IC-W-1-1211	NWTPH-Dx	AY1	4	PASI-S
2510337021	IC-W-8-1211	NWTPH-Dx	AY1	4	PASI-S
2510337022	IC-W-7-1211	NWTPH-Dx	AY1	4	PASI-S
2510337023	EW-2A-1211	NWTPH-Dx	AY1	4	PASI-S
2510337024	2A-W-42-1211	NWTPH-Dx	AY1	4	PASI-S
2510337025	1B-W-23-1211	NWTPH-Dx	AY1	4	PASI-S
2510337026	2A-W-41-1211	NWTPH-Dx	AY1	4	PASI-S
2510337027	2A-W-410-1211	NWTPH-Dx	AY1	4	PASI-S
2510337028	EW-1-1211	NWTPH-Dx	AY1	4	PASI-S

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Sample: 2B-W-4-1211	Lab ID: 251	U337UU1	Collected:	12/13/11	12:00	Received: 1	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report	Limit _	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
Diesel Range	ND m	g/L		0.019	1	12/21/11 11:50	12/22/11 00:29	9	
Motor Oil Range	ND m	g/L		0.095	1	12/21/11 11:50	12/22/11 00:29	9 64742-65-0	
Surrogates	0.4.07		_				10100111 00 0		
n-Octacosane (S)	84 %			60-150 60-150	1 1		12/22/11 00:29		
o-Terphenyl (S)	73 %		5	0-150	1	12/21/11 11.50	12/22/11 00:29	9 04-15-1	
Sample: GW-1-1211	Lab ID: 251	0337002	Collected:	12/13/11	13:30	Received: 1	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
Diesel Range	<b>0.065</b> mg	a/L		0.019	1	12/21/11 11:50	12/22/11 00:5	3	
Motor Oil Range	ND m	-		0.096	1		12/22/11 00:5		
Surrogates	·	•							
n-Octacosane (S)	82 %		5	0-150	1	12/21/11 11:50	12/22/11 00:5	3 630-02-4	
o-Terphenyl (S)	71 %		5	50-150	1	12/21/11 11:50	12/22/11 00:5	3 84-15-1	
Sample: GW-2-1211	Lab ID: 251	0337003	Collected:	12/13/11	14:05	Received: 1	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
Diesel Range	<b>0.021</b> mg	a/L		0.019	1	12/21/11 11:50	12/22/11 01:1	7	
Motor Oil Range	ND m	-		0.095	1	12/21/11 11:50	12/22/11 01:1	7 64742-65-0	
Surrogates		-							
n-Octacosane (S)	70 %		5	0-150	1	12/21/11 11:50	12/22/11 01:17		
n-Octacosarie (3)								7 84-15-1	
` '	59 %		5	50-150	1	12/21/11 11:50	12/22/11 01:1	04-10-1	
o-Terphenyl (S)  Sample: GW-3-1211	59 % <b>Lab ID: 251</b>	0337004	Collected:	50-150				Matrix: Water	
o-Terphenyl (S)		<b>0337004</b> Units		12/13/11					Qual
Sample: GW-3-1211 Parameters	Lab ID: 251	Units	Collected:	12/13/11 Limit	15:00 DF	Received: 1.	2/15/11 10:45	Matrix: Water	Qual
Sample: GW-3-1211 Parameters NWTPH-Dx GCS	Lab ID: 251  Results  Analytical Meti	Units	Collected:  Report  H-Dx Prepara	12/13/11 Limit	15:00 DF	Received: 1.	2/15/11 10:45 Analyzed	Matrix: Water  CAS No.	Qual
Sample: GW-3-1211 Parameters  NWTPH-Dx GCS  Diesel Range	Lab ID: 251 Results Analytical Methods ND methods	Units nod: NWTP g/L	Collected:  Report  H-Dx Prepara	12/13/11  Limit  ation Mer	15:00 DF thod: EF	Received: 1.  Prepared  PA 3510  12/21/11 11:50	2/15/11 10:45 Analyzed	Matrix: Water  CAS No.	Qual
Sample: GW-3-1211 Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range	Lab ID: 251  Results  Analytical Meti	Units nod: NWTP g/L	Collected:  Report  H-Dx Prepara	12/13/11 Limit ation Mer 0.019	15:00 DF thod: EF	Received: 1.  Prepared  PA 3510  12/21/11 11:50	2/15/11 10:45  Analyzed  12/22/11 01:4:	Matrix: Water  CAS No.	Qual
o-Terphenyl (S)  Sample: GW-3-1211	Lab ID: 251 Results Analytical Methods ND methods	Units nod: NWTP g/L	Collected: Report H-Dx Prepara	12/13/11 Limit ation Mer 0.019	15:00 DF thod: EF	Received: 1.  Prepared  PA 3510  12/21/11 11:50 12/21/11 11:50	2/15/11 10:45  Analyzed  12/22/11 01:4:	Matrix: Water  CAS No.  2 2 64742-65-0	Qual

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Date: 12/27/2011 04:23 PM

Sample: GW-4-1211	Lab ID: 2510	337005	Collected: 1	2/13/11 1	6:00	Received: 1	2/15/11 10:45 I	Matrix: Water	
Parameters	Results	Units	Report L	imit D	)F	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparat	ion Metho	od: El	PA 3510			
Diesel Range	ND mg/	L	0	.019	1	12/21/11 11:50	12/22/11 02:07		
Motor Oil Range	ND mg/	L	0	.095	1	12/21/11 11:50	12/22/11 02:07	64742-65-0	
Surrogates n-Octacosane (S)	74 %		50	-150	1	12/21/11 11:50	12/22/11 02:07	630-02-4	
o-Terphenyl (S)	62 %				1		12/22/11 02:07		
, , , ,									
Sample: GW-30-1211	Lab ID: 2510	337006	Collected: 1	2/13/11 1	5:15	Received: 1	2/15/11 10:45 I	Matrix: Water	
Parameters	Results	Units	Report L	imit D	F	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparat	ion Metho	od: El	PA 3510			
Diesel Range	ND mg/	L	0	.019	1	12/21/11 11:50	12/22/11 02:31		
Motor Oil Range	ND mg/	L	0	.095	1	12/21/11 11:50	12/22/11 02:31	64742-65-0	
Surrogates	76 %		E0	-150	1	12/21/11 11:50	12/22/11 02:31	620 02 4	
n-Octacosane (S) o-Terphenyl (S)	76 % 66 %				1 1		12/22/11 02:31		
o-resplicitys (o)	00 /1		50	-100		12/21/11 11:50	12/22/11 02.01	04-10-1	
Sample: 2A-W-40-1211	Lab ID: 2510	337007	Collected: 1	2/13/11 1	6:15	Received: 12	2/15/11 10:45 I	Matrix: Water	
Parameters	Results	Units	Report L	imit C	)F	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparat	ion Metho	od: El	PA 3510			
Diesel Range	<b>0.087</b> mg/	L	0	.019	1	12/21/11 11:50	12/22/11 02:56		
Motor Oil Range	ND mg/	L	0	.094	1	12/21/11 11:50	12/22/11 02:56	64742-65-0	
Surrogates n-Octacosane (S)	82 %		50	-150	1	12/21/11 11:50	12/22/11 02:56	630-02-4	
o-Terphenyl (S)	71 %				1		12/22/11 02:56		
- · · · · · · · · · · · · · · · · · · ·									
Sample: 5-W-17-1211	Lab ID: 2510	337008	Collected: 1	2/14/11 0	9:25	Received: 12	2/15/11 10:45 I	Matrix: Water	
Parameters	Results	Units	Report L	imit C	)F	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparat	ion Metho	od: El	PA 3510			
Diesel Range	ND mg/	L	0	.019	1	12/21/11 11:50	12/22/11 04:09	1	
Motor Oil Range	ND mg/	L	0	.095	1	12/21/11 11:50	12/22/11 04:09	64742-65-0	
Surrogates	04.0/		50	450		40/04/44 44:50	40/00/44 04:00	000 00 4	
n-Octacosane (S) o-Terphenyl (S)	84 % 72 %				1 1		12/22/11 04:09 12/22/11 04:09		
NWTPH-Dx GCS Silica Gel	Analytical Metho	od: NIMTD					12/22/11 04.09	04-13-1	
	•		•				40/00/11 10 ==		
Diesel Range SG	ND mg/				1		12/23/11 18:57		
Motor Oil Range SG Surrogates	ND mg/	L	0	.095	1	12/23/11 10:45	12/23/11 18:57	64/42-65-0	
n-Octacosane (S) SG	76 %		50	-150	1	12/23/11 10:45	12/23/11 18:57	630-02-4	
. ,									
						1/010			

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337						
Sample: 5-W-17-1211	Lab ID: 2510337008	Collected: 12/14/11 09:	:25 Received: 12	2/15/11 10:45 Ma	atrix: Water	
Parameters	Results Units	Report Limit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWT	PH-Dx Preparation Method	I: EPA 3510			
Surrogates o-Terphenyl (S) SG	61 %	50-150 1	12/23/11 10:45	12/23/11 18:57	84-15-1	
Sample: 5-W-18-1211	Lab ID: 2510337009	Collected: 12/14/11 10:	:05 Received: 12	2/15/11 10:45 Ma	atrix: Water	
Parameters	Results Units	Report Limit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation Method	I: EPA 3510			
Diesel Range	<b>0.10</b> mg/L	0.019 1	12/21/11 11:50	12/22/11 04:59		
Motor Oil Range	ND mg/L	0.095 1	12/21/11 11:50		64742-65-0	
Surrogates	g					
n-Octacosane (S)	69 %	50-150 1	12/21/11 11:50	12/22/11 04:59	630-02-4	
o-Terphenyl (S)	61 %	50-150 1	12/21/11 11:50	12/22/11 04:59	84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Method: NWT	PH-Dx Preparation Method	I: EPA 3510			
Diesel Range SG	ND mg/L	0.019 1	12/23/11 10:45	12/23/11 19:21		
Motor Oil Range SG  Surrogates	ND mg/L	0.095 1			64742-65-0	
n-Octacosane (S) SG	85 %	50-150 1	12/23/11 10:45	12/23/11 19:21	630-02-4	
o-Terphenyl (S) SG	72 %	50-150 1	12/23/11 10:45	12/23/11 19:21	84-15-1	
Sample: 5-W-180-1211	Lab ID: 2510337010	Collected: 12/14/11 10:	:20 Received: 12	2/15/11 10:45 Ma	atrix: Water	
Parameters	Results Units	Report Limit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation Method	I: EPA 3510			
Diesel Range	<b>0.12</b> mg/L	0.019 1	12/21/11 11:50	12/22/11 05:23		
Motor Oil Range <b>Surrogates</b>	ND mg/L	0.095 1		12/22/11 05:23	64742-65-0	
n-Octacosane (S)	74 %	50-150 1	12/21/11 11:50	12/22/11 05:23	630-02-4	
o-Terphenyl (S)	65 %	50-150 1	12/21/11 11:50	12/22/11 05:23	84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Method: NWT	PH-Dx Preparation Method	I: EPA 3510			
Diesel Range SG	ND mg/L	0.019 1	12/23/11 10:45	12/23/11 19:46		
Motor Oil Range SG	ND mg/L	0.095 1		12/23/11 19:46	64742-65-0	
Surrogates						
Surrogates n-Octacosane (S) SG	87 %	50-150 1	12/23/11 10:45	12/23/11 19:46	630-02-4	

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Sample: 5-W-14-1211	Lab ID: 2510	337011	Collected:	12/14/1	1 12:15	Received: 12	2/15/11 10:45 M	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Prepai	ration Me	ethod: E	PA 3510			
Diesel Range	ND mg/			0.019	1	12/21/11 11:50	12/22/11 05:48		
Motor Oil Range	ND mg/	'L		0.095	1	12/21/11 11:50	12/22/11 05:48	64742-65-0	
Surrogates	73 %			EO 4EO	1	10/04/44 14:50	40/00/44 05:40	000 00 4	
n-Octacosane (S) o-Terphenyl (S)	73 % 61 %			50-150 50-150	1		12/22/11 05:48 12/22/11 05:48		
NWTPH-Dx GCS Silica Gel	Analytical Metho	nd· NWTP					12/22/11 05.40	04-15-1	
	•						10/00/11 00:10		
Diesel Range SG Motor Oil Range SG	ND mg/ ND mg/			0.019 0.095	1 1		12/23/11 20:10 12/23/11 20:10	64742 65 0	
Surrogates	IND IIIg/	L		0.095	'	12/23/11 10.45	12/23/11/20:10	04742-03-0	
n-Octacosane (S) SG	88 %			50-150	1	12/23/11 10:45	12/23/11 20:10	630-02-4	
o-Terphenyl (S) SG	72 %			50-150	1	12/23/11 10:45	12/23/11 20:10	84-15-1	
, , ,									
Sample: 5-W-15-1211	Lab ID: 2510	337012	Collected:	12/14/1	1 12:55	Received: 12	2/15/11 10:45 N	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Prepai	ration Me	ethod: E	PA 3510			
Diesel Range	<b>0.28</b> mg/	′L		0.019	1	12/21/11 11:50	12/22/11 06:13		
Motor Oil Range	<b>0.11</b> mg/			0.095	1	12/21/11 11:50	12/22/11 06:13	64742-65-0	
Surrogates	-								
n-Octacosane (S)	69 %		:	50-150	1	12/21/11 11:50	12/22/11 06:13	630-02-4	
o-Terphenyl (S)	60 %			50-150	1	12/21/11 11:50	12/22/11 06:13	84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Metho	od: NWTP	H-Dx Prepai	ration Me	ethod: E	PA 3510			
Diesel Range SG	ND mg/	′L		0.019	1	12/23/11 10:45	12/23/11 20:35		
Motor Oil Range SG	ND mg/	′L		0.095	1	12/23/11 10:45	12/23/11 20:35	64742-65-0	
Surrogates									
n-Octacosane (S) SG	84 %			50-150	1		12/23/11 20:35		
o-Terphenyl (S) SG	72 %		:	50-150	1	12/23/11 10:45	12/23/11 20:35	84-15-1	
Sample: 5-W-16-1211	Lab ID: 2510	337013	Collected:	12/14/1	1 13:40	Received: 12	2/15/11 10:45 M	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Prepar	ration Me	ethod: E	PA 3510			
Diesel Range	ND mg/	′L		0.019	1	12/21/11 11:50	12/22/11 06:37		
Motor Oil Range	ND mg/			0.095	1		12/22/11 06:37	64742-65-0	
Surrogates	70.0/			EO 4EO	4	40/04/44 44:50	40/00/44 00:07	000 00 4	
n-Octacosane (S)	76 % 66 %			50-150 50-150	1 1		12/22/11 06:37 12/22/11 06:37		
o-Terphenyl (S)		ad. NIM/TD					12/22/11 00.3/	04-10-1	
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range SG	ND mg/	′L		0.019	1	12/23/11 10:45	12/23/11 21:00		
Motor Oil Range SG	ND mg/	'L		0.095	1	12/23/11 10:45	12/23/11 21:00	64742-65-0	
Date: 12/27/2011 04:23 PM	REF	PORT O	F LABOR	ATORY	ANA	LYSIS			Page 7 of 1

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Sample: 5-W-16-1211	Lab ID: 251	0337013	Collected:	12/14/1	1 13:40	Received:	12/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Repor		DF	Prepared	Analyzed	CAS No.	Qual
			<u> </u>			·	- / maryzea	0/10/110.	
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Surrogates n-Octacosane (S) SG	91 %			50-150	1	12/23/11 10:/	45 12/23/11 21:0	0 630-02-4	
o-Terphenyl (S) SG	73 %			50-150	1		45 12/23/11 21:0 45 12/23/11 21:0		
o tolpholiyi (e) ee				00 100	·	12/20/11 10.	10 12/20/11 21:0	0 01 10 1	
Sample: 5-W-19-1211	Lab ID: 251	0337014	Collected:	12/14/1	1 15:00	Received:	12/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range	ND m	g/L		0.019	1	12/21/11 11:5	50 12/22/11 07:0	1	
Motor Oil Range	ND m	g/L		0.095	1	12/21/11 11:5	50 12/22/11 07:0	1 64742-65-0	
Surrogates	74.0/			E0 4E0		40/04/44 44:5	-0 40/00/44 07:0	4 000 00 4	
n-Octacosane (S) o-Terphenyl (S)	74 % 64 %			50-150 50-150	1 1		50 12/22/11 07:0 50 12/22/11 07:0		
, , ,							00 12/22/11 07.0	1 04-13-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range SG	ND m			0.019	1		45 12/23/11 21:2 <sub>0</sub>	-	
Motor Oil Range SG	ND m	g/L		0.094	1	12/23/11 10:4	45 12/23/11 21:2	4 64742-65-0	
Surrogates n-Octacosane (S) SG	78 %			50-150	1	12/23/11 10:4	45 12/23/11 21:2	4 630-02-4	
o-Terphenyl (S) SG	61 %			50-150	1		15 12/23/11 21:2		
Sample: MW-4-1211	Lab ID: 251	0337015	Collected:	12/14/1	1 15:55	Received:	12/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range	ND m	g/L		0.019	1	12/21/11 11:5	50 12/22/11 08:3	8	
Motor Oil Range	ND m	g/L		0.095	1	12/21/11 11:5	50 12/22/11 08:3	8 64742-65-0	
Surrogates	70.0/			E0 4E0		40/04/44 44:5	-0 40/00/44 00:0	0 000 00 4	
n-Octacosane (S) o-Terphenyl (S)	79 % 67 %			50-150 50-150	1 1		50 12/22/11 08:3 50 12/22/11 08:3		
o-reiphenyi (o)	01 70		•	30-130	'	12/21/11 11.5	00 12/22/11 00.5	0 04-13-1	
Sample: 2A-W-10-1211	Lab ID: 251	0337016	Collected:	12/14/1	1 16:25	Received:	12/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.12</b> mg	g/L		0.019	1	12/22/11 12:4	40 12/22/11 17:1	2	
Motor Oil Range	ND m	-		0.095	1	12/22/11 12:4	40 12/22/11 17:1	2 64742-65-0	
Surrogates	<b>75</b> 07			F0 450	4	40/00/11 12	40 40/00/44 4= 4	0 000 00 1	
n-Octacosane (S)	75 % 65 %			50-150 50-150	1 1		40   12/22/11  17:1: 40   12/22/11  17:1:		
o-Terphenyl (S)	65 %		;	50-150	1	12/22/11 12:4	+U 12/22/11 17:1.	∠ 0 <del>4</del> -13-1	

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# **REPORT OF LABORATORY ANALYSIS**

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Sample: 2A-W-9-1211	Lab ID: 251	0337017	Collected: 12	2/14/11 17:0	)5 Received:	12/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report Li	mit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Preparati	on Method:	EPA 3510			
Diesel Range	<b>0.91</b> m	g/L	0.	019 1	12/22/11 12:4	40 12/22/11 19:1	3	
Motor Oil Range <i>Surrogates</i>	<b>0.26</b> m	g/L	0.	095 1	12/22/11 12:4	40 12/22/11 19:1	3 64742-65-0	
n-Octacosane (S)	72 %		50-	150 1	12/22/11 12:4	40 12/22/11 19:1	3 630-02-4	
o-Terphenyl (S)	63 %		50-	150 1	12/22/11 12:4	40 12/22/11 19:1	3 84-15-1	
Sample: 2A-W-90-1211	Lab ID: 251	0337018	Collected: 12	2/14/11 17:2	20 Received:	12/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report Li	mit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTP	H-Dx Preparati	on Method:	EPA 3510			
Diesel Range	<b>0.80</b> mg	a/L	0.	019 1	12/22/11 12:4	40 12/22/11 19:3	7	
Motor Oil Range	<b>0.26</b> m	•		094 1		40 12/22/11 19:3		
Surrogates		5						
n-Octacosane (S)	71 %		50-	150 1	12/22/11 12:4	40 12/22/11 19:3	7 630-02-4	
o-Terphenyl (S)	61 %		50-	150 1	12/22/11 12:4	40 12/22/11 19:3	7 84-15-1	
Sample: MW-3-1211	Lab ID: 251	0337019	Collected: 12	2/14/11 18:0	00 Received:	12/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report Li	mit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparati	on Method:	EPA 3510			
	·		·	on Method: 019 1		40   12/22/11 17:5	9	
Diesel Range Motor Oil Range	Analytical Met 0.12 m 0.11 m	g/L	0.		12/22/11 12:4	40 12/22/11 17:5 40 12/22/11 17:5		
Diesel Range Motor Oil Range <i>Surrogat</i> es	<b>0.12</b> m	g/L	0. 0.	019 1	12/22/11 12:4 12/22/11 12:4		9 64742-65-0	
Diesel Range Motor Oil Range <i>Surrogates</i> n-Octacosane (S)	<b>0.12</b> m <sub>2</sub> <b>0.11</b> m <sub>3</sub>	g/L	0. 0. 50-	019 1 095 1	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4	40 12/22/11 17:5	9 64742-65-0 9 630-02-4	
Diesel Range Motor Oil Range <b>Surrogates</b> n-Octacosane (S) o-Terphenyl (S)	<b>0.12</b> m <sub>0</sub> <b>0.11</b> m <sub>0</sub> 76 %	g/L g/L	0. 0. 50-	019 1 095 1 150 1 150 1	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 12/22/11 12:4	40 12/22/11 17:5 40 12/22/11 17:5	9 64742-65-0 9 630-02-4	
NWTPH-Dx GCS  Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: IC-W-1-1211  Parameters	<b>0.12</b> m <b>0.11</b> m 76 % 67 %	g/L g/L	0. 0. 50- 50-	019 1 095 1 150 1 150 1	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 12/22/11 12:4	40 12/22/11 17:5 40 12/22/11 17:5 40 12/22/11 17:5	9 64742-65-0 9 630-02-4 9 84-15-1	Qual
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: IC-W-1-1211  Parameters	0.12 m 0.11 m 76 % 67 % Lab ID: 251	g/L g/L 0337020 Units	0. 0. 50- 50- Collected: 12	019 1 095 1 150 1 150 1 2/14/11 09:2	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 20 Received: Prepared	40 12/22/11 17:5 40 12/22/11 17:5 40 12/22/11 17:5 12/15/11 10:45	9 64742-65-0 9 630-02-4 9 84-15-1 Matrix: Water	Qual
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: IC-W-1-1211 Parameters  NWTPH-Dx GCS	0.12 m 0.11 m 76 % 67 % Lab ID: 251 Results	g/L g/L 0337020 Units hod: NWTP	Collected: 12 Report Li H-Dx Preparati	019 1 095 1 150 1 150 1 2/14/11 09:2	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 20 Received: Prepared	40 12/22/11 17:5 40 12/22/11 17:5 40 12/22/11 17:5 12/15/11 10:45	9 64742-65-0 9 630-02-4 9 84-15-1 Matrix: Water CAS No.	Qual
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: IC-W-1-1211 Parameters  NWTPH-Dx GCS Diesel Range	0.12 m 0.11 m 76 % 67 % Lab ID: 251 Results Analytical Met	g/L g/L 0337020 Units nod: NWTP	Collected: 12  Report Li  H-Dx Preparati	019 1 095 1 150 1 150 1 2/14/11 09:2 mit DF on Method:	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 20 Received: Prepared EPA 3510 12/22/11 12:4	40 12/22/11 17:5 40 12/22/11 17:5 40 12/22/11 17:5 12/15/11 10:45 Analyzed	9 64742-65-0 9 630-02-4 9 84-15-1 Matrix: Water CAS No.	Qual
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: IC-W-1-1211 Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range	0.12 m 0.11 m 76 % 67 % Lab ID: 251 Results	g/L g/L 0337020 Units nod: NWTP	Collected: 12  Report Li  H-Dx Preparati	019 1 095 1 150 1 150 1 2/14/11 09:2 mit DF on Method:	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 20 Received: Prepared EPA 3510 12/22/11 12:4	40 12/22/11 17:5 40 12/22/11 17:5 40 12/22/11 17:5 12/15/11 10:45 Analyzed 40 12/22/11 18:2	9 64742-65-0 9 630-02-4 9 84-15-1 Matrix: Water CAS No.	Qual
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: IC-W-1-1211	0.12 m 0.11 m 76 % 67 % Lab ID: 251 Results Analytical Met	g/L g/L 0337020 Units nod: NWTP	Collected: 12 Report Li H-Dx Preparati 0.	019 1 095 1 150 1 150 1 2/14/11 09:2 mit DF on Method:	12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 12/22/11 12:4 20 Received: Prepared EPA 3510 12/22/11 12:4	40 12/22/11 17:5 40 12/22/11 17:5 40 12/22/11 17:5 12/15/11 10:45 Analyzed 40 12/22/11 18:2	9 64742-65-0 9 630-02-4 9 84-15-1 Matrix: Water CAS No.	Qual

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Sample: IC W 8 4244	Lab ID: 05400	27024	Collected	10/14/14	1 10:00	Dogobio di 1	0/45/44 40:45	Motrice Meter	
Sample: IC-W-8-1211	Lab ID: 25103	37027	Collected:	12/14/1	1 10:00	Received: 1	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report	: Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTP	H-Dx Prepar	ation Me	thod: El	PA 3510			
Diesel Range	<b>0.12</b> mg/l	_		0.019	1	12/22/11 12:40	12/22/11 18:4	8	
Motor Oil Range	ND mg/l	_		0.094	1	12/22/11 12:40	12/22/11 18:4	8 64742-65-0	
Surrogates n-Octacosane (S)	77 %		Į.	50-150	1	12/22/11 12:40	12/22/11 18:4	8 630-02-4	
o-Terphenyl (S)	65 %			50-150	1		12/22/11 18:4		
Sample: IC-W-7-1211	Lab ID: 25103	37022	Collected:	12/14/1	1 10:50	Received: 1	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPI	H-Dx Prepar	ation Me	thod: El	PA 3510	-	•	
Diesel Range	<b>0.033</b> mg/l	_		0.019	1	12/22/11 12:40	12/22/11 20:4	8	
Motor Oil Range	ND mg/l	-		0.095	1	12/22/11 12:40	12/22/11 20:4	8 64742-65-0	
Surrogates n-Octacosane (S)	73 %		ı	50-150	1	12/22/11 12:40	12/22/11 20:4	8 630-02-4	
o-Terphenyl (S)	62 %		-	50-150	1		12/22/11 20:4		
Sample: EW-2A-1211	Lab ID: 25103	37023	Collected:	12/14/1	1 11:40	Received: 1	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPI	H-Dx Prepar	ation Me	thod: El	PA 3510			
Diesel Range	ND mg/l			0.019	1	12/22/11 12:40	12/22/11 21:1	2	
Motor Oil Range	ND mg/l	-		0.094	1	12/22/11 12:40	12/22/11 21:1	2 64742-65-0	
Surrogates n-Octacosane (S)	77 %		į	50-150	1	12/22/11 12:40	12/22/11 21:1	2 630-02-4	
o-Terphenyl (S)	63 %		Ę	50-150	1		12/22/11 21:1		
Sample: 2A-W-42-1211	Lab ID: 25103	37024	Collected:	12/14/1	1 12:30	Received: 1	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPI	H-Dx Prepar	ation Me	thod: El	PA 3510			
Diesel Range	<b>0.12</b> mg/l	_		0.019	1	12/22/11 12:40	12/22/11 21:3	5	
Motor Oil Range	ND mg/l	-		0.094	1	12/22/11 12:40	12/22/11 21:3	5 64742-65-0	
Surrogates	70 %		ı	50_150	1	12/22/11 12:40	12/22/11 21:3	5 630-02-4	
` '					1				
n-Octacosane (S) o-Terphenyl (S)	79 % 69 %			50-150 50-150	1 1		12/22/11 21:3 12/22/11 21:3		

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# **REPORT OF LABORATORY ANALYSIS**

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Sample: 1B-W-23-1211	Lab ID: 2510	0337025	Collected: 12/14/	11 14:20	Received: 12	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	<b>0.027</b> mg	g/L	0.019	1	12/22/11 12:40	12/22/11 21:59	9	
Motor Oil Range	ND mg	g/L	0.095	1	12/22/11 12:40	12/22/11 21:59	9 64742-65-0	
Surrogates n-Octacosane (S)	68 %		50-150	1	12/22/11 12:40	12/22/11 21:50	9 630-02-4	
o-Terphenyl (S)	60 %		50-150	1	12/22/11 12:40			
o Torphonyi (o)	00 //		00 100	·	12/22/11 12:10	12/22/11/21:00	, 01 10 1	
Sample: 2A-W-41-1211	Lab ID: 2510	0337026	Collected: 12/14/	11 15:25	Received: 12	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	ND mg	g/L	0.019	1	12/22/11 12:40	12/22/11 22:2:	3	
Motor Oil Range	ND mg	•	0.094	1	12/22/11 12:40	12/22/11 22:23	3 64742-65-0	
Surrogates								
n-Octacosane (S)	74 %		50-150	1				
o-Terphenyl (S)	61 %		50-150	1	12/22/11 12:40	12/22/11 22:2:	3 84-15-1	
Sample: 2A-W-410-1211	Lab ID: 2510	0337027	Collected: 12/14/	11 16:00	Received: 12	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	ND mg	ą/L	0.019	1	12/22/11 12:40	12/22/11 22:46	3	
Motor Oil Range	ND mg	g/L	0.094	1	12/22/11 12:40	12/22/11 22:40	6 64742-65-0	
Surrogates								
n-Octacosane (S)	70 %		50-150	1	12/22/11 12:40			
o-Terphenyl (S)	58 %		50-150	1	12/22/11 12:40	12/22/11 22:40	6 84-15-1	
Sample: EW-1-1211	Lab ID: 2510	0337028	Collected: 12/14/	11 16:30	Received: 12	2/15/11 10:45	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	<b>0.029</b> mg	g/L	0.019	1	12/22/11 12:40	12/22/11 23:10	)	
Motor Oil Range	ND mg	g/L	0.094	1	12/22/11 12:40	12/22/11 23:10	64742-65-0	
Surrogates	_							
•								
n-Octacosane (S)	68 % 57 %		50-150 50-150	1 1	12/22/11 12:40 12/22/11 12:40			

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# **REPORT OF LABORATORY ANALYSIS**

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

QC Batch: OEXT/4891 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2510337001, 2510337002, 2510337003, 2510337004, 2510337005, 2510337006, 2510337007, 2510337008,

2510337009, 2510337010, 2510337011, 2510337012, 2510337013, 2510337014, 2510337015

METHOD BLANK: 98051 Matrix: Water

Associated Lab Samples: 2510337001, 2510337002, 2510337003, 2510337004, 2510337005, 2510337006, 2510337007, 2510337008,

2510337009, 2510337010, 2510337011, 2510337012, 2510337013, 2510337014, 2510337015

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.020	12/21/11 23:40	
Motor Oil Range	mg/L	ND	0.10	12/21/11 23:40	
n-Octacosane (S)	%	87	50-150	12/21/11 23:40	
o-Terphenyl (S)	%	76	50-150	12/21/11 23:40	

LABORATORY CONTROL SAMPLE: 98052

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	 mg/L		0.70	70	51-114	
Motor Oil Range	mg/L	1	0.70	70	62-120	
n-Octacosane (S)	%			76	50-150	
o-Terphenyl (S)	%			74	50-150	

SAMPLE DUPLICATE: 98053

Parameter	Units	2510337008 Result	Dup Result	RPD	Qualifiers
Diesel Range Motor Oil Range	mg/L mg/L	ND ND	ND ND		
n-Octacosane (S)	%	84	73	15	
o-Terphenyl (S)	%	72	62	17	

SAMPLE DUPLICATE: 98064

Parameter	Units	2510337014 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	74	79	6	
o-Terphenyl (S)	%	64	71	12	

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

QC Batch: OEXT/4893 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2510337016, 2510337017, 2510337018, 2510337020, 2510337021, 2510337022, 2510337023,

2510337024, 2510337025, 2510337026, 2510337027, 2510337028

METHOD BLANK: 98199 Matrix: Water

Associated Lab Samples: 2510337016, 2510337017, 2510337018, 2510337019, 2510337020, 2510337021, 2510337022, 2510337023,

2510337024, 2510337025, 2510337026, 2510337027, 2510337028

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	12/22/11 16:23	
Motor Oil Range	mg/L	ND	0.10	12/22/11 16:23	
n-Octacosane (S)	%	80	50-150	12/22/11 16:23	
o-Terphenyl (S)	%	70	50-150	12/22/11 16:23	

LABORATORY CONTROL SAMPLE: 98200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.69	69	51-114	
Motor Oil Range	mg/L	1	0.78	78	62-120	
n-Octacosane (S)	%			82	50-150	
o-Terphenyl (S)	%			76	50-150	

SAMPLE DUPLICATE: 98201

Parameter	Units	2510337016 Result	Dup Result	RPD	Qualifiers
		0.12	0.13		
Diesel Range Motor Oil Range	mg/L mg/L	ND	0.13	9	
n-Octacosane (S)	%	75	74	.3	
o-Terphenyl (S)	%	65	65	.1	

SAMPLE DUPLICATE: 98202

Parameter	Units	2510400004 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	90	75	18	
o-Terphenyl (S)	%	80	67	18	

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Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

QC Batch: OEXT/4896 Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS SG

Associated Lab Samples: 2510337008, 2510337009, 2510337010, 2510337011, 2510337012, 2510337013, 2510337014

METHOD BLANK: 98298 Matrix: Water

Associated Lab Samples: 2510337008, 2510337009, 2510337010, 2510337011, 2510337012, 2510337013, 2510337014

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.020	12/23/11 18:08	
Motor Oil Range SG	mg/L	ND	0.10	12/23/11 18:08	
n-Octacosane (S) SG	%	87	50-150	12/23/11 18:08	
o-Terphenyl (S) SG	%	72	50-150	12/23/11 18:08	

LABORATORY CONTROL SAMPLE: 98299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L		0.70	70	59-114	
Motor Oil Range SG	mg/L	1	0.80	80	69-124	
n-Octacosane (S) SG	%			82	50-150	
o-Terphenyl (S) SG	%			75	50-150	

SAMPLE DUPLICATE: 98300

Parameter	Units	2510337014 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	ND		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	78	83	7	
o-Terphenyl (S) SG	%	61	69	12	

SAMPLE DUPLICATE: 98301

Parameter	Units	2510369002 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	ND		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	97	101	6	3
o-Terphenyl (S) SG	%	83	86	6	3

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#### **QUALIFIERS**

Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

#### **LABORATORIES**

Date: 12/27/2011 04:23 PM

PASI-S Pace Analytical Services - Seattle

**REPORT OF LABORATORY ANALYSIS** 

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### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF-Skykomish TT0100-K40

Pace Project No.: 2510337

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2510337001	2B-W-4-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337002	GW-1-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337003	GW-2-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337004	GW-3-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337005	GW-4-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337006	GW-30-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337007	2A-W-40-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337008	5-W-17-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337009	5-W-18-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337010	5-W-180-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337011	5-W-14-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337012	5-W-15-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337013	5-W-16-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337014	5-W-19-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337015	MW-4-1211	EPA 3510	OEXT/4891	NWTPH-Dx	GCSV/3186
2510337016	2A-W-10-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337017	2A-W-9-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337018	2A-W-90-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337019	MW-3-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337020	IC-W-1-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337021	IC-W-8-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337022	IC-W-7-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337023	EW-2A-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337024	2A-W-42-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337025	1B-W-23-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337026	2A-W-41-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337027	2A-W-410-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337028	EW-1-1211	EPA 3510	OEXT/4893	NWTPH-Dx	GCSV/3189
2510337008	5-W-17-1211	EPA 3510	OEXT/4896	NWTPH-Dx	GCSV/3191
2510337009	5-W-18-1211	EPA 3510	OEXT/4896	NWTPH-Dx	GCSV/3191
2510337010	5-W-180-1211	EPA 3510	OEXT/4896	NWTPH-Dx	GCSV/3191
2510337011	5-W-14-1211	EPA 3510	OEXT/4896	NWTPH-Dx	GCSV/3191
2510337012	5-W-15-1211	EPA 3510	OEXT/4896	NWTPH-Dx	GCSV/3191
2510337013	5-W-16-1211	EPA 3510	OEXT/4896	NWTPH-Dx	GCSV/3191
2510337014	5-W-19-1211	EPA 3510	OEXT/4896	NWTPH-Dx	GCSV/3191

Date: 12/27/2011 04:23 PM



## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Section A	Section B						Section C				Page	: 1	0	3	
Required Client Information:  Company: BNSF	Required Pr	Ren		n.			Invoice Infor Attention:		Shepping	110000	2	14	170	475	
Address:	Copy To:	Jen	. /	Na			Company N	ame: BNSE	21 sept and	REGULATORY	AGENCY				
men and a self-to-learn	100	JUN	11 201	100	101		Address:	DNSE	Marrott La	☐ NPDES	GROUN	ID WATER	1	DRINKING	WATER
Email To:	Purchase Or	der No.:	TOI	10	K41	`	Pace Quote			□ UST	RCRA		г	OTHER .	
Phone: Fax:	Project Name	e: 0	11-6	<1	ATT.	(-/	Reference: Pace Project			Site Location					
Requested Due Date/TAT:	Project Num	ber:		-21	ylear	MIL	Manager: Pace Profile #	HATTER CARE		STATE:	WA	Par II			
>ta		6	0191	115	,				Dagues	ted Analysis Filter			_		
Section D Matrix Required Client Information MATRIX Drinking Water Waste Wate Product	/ CODE ster DW WT er WW P	valid codes to left) RAB C=COMP)	COMPC STAF	OSITE	COMPO END/GI		Ego se t	Preservatives	1795 1795			(N/)			
SAMPLE ID  (A-Z, 0-9 /,-)  Sample IDs MUST BE UNIQUE  Soil/Solid Oil Wipe Air Tissue Other	SL OL WP AR TS	MATRIX CODE (see valid SAMPLE TYPE (G=GRAB	DATE	TIME	DATE	TAME TEMP AT COL	# OF CONTAINERS Unpreserved	HNO <sub>3</sub> HNO <sub>3</sub> HCI NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol	Other #Analysis Test # #NTPH-Dx W/o			Residual Chlorine (Y/N)	Pace	Project N	o./ Lab I.D.
	211				14/13/11	17007		X	X						
2 6W-1 -	1		a Am	1/8/1	1	1330 0	2	X	X				ti alir	MILL D	
3 GW-Z -						1405 B	Z	X							
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6 GW-30 -						1515 C	7_	X							
7 2A-W-40-	0.37110	HU TO	H Wite	3 11 1	4	1615 7	2	X		119 12 22 0	P.P.A		100		
8 5=61-17 -					iztesti	0925 7	4	X			124	7	100		
9 5-W-18 -					7	1005 7	1	X							
10 5-W-180 -		et en			100	1020 9	4		1 8			17-157-1-			
11 5-6/-14 -						12157	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	12	XX		10 2 100		Programme and the second		
12 5-W- 15 -	~					1255 7						$\top$			Tall.
ADDITIONAL COMMENTS	10000	RELINQU	ISHED BY	AFFILIAT	ION	DATE	TIME		TED BY / AFFILIATIO	N DATE	TIME		SAMPL	E CONDITI	ONS
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								394398	13.86,3.90					9	
O	RIGINAL			SAMPLE	PRINT Nan	ND SIGNATUR	De	n W. K	Topey	and		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
					SIGNATUR	E of SAMPLER		> 9/	DATE Sign	Y): 12/15/1	1	-	α.	So	Sar



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	Section B						Sec	tion C								Pag	ge: Z		of 3	K.
Required Client Information:  Company:	Required Pro Report To:	_		1/	11		_	ce Information;			-	1	1	7		Unit of the	1	471	)474	
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	Project Numb	-	NSF.		tomil	sh	Mana			110000	17.54		all to see	Sit	te Location	INA	4	Zini.		
Requested Due Date/TAT:	r roject rume		6019	1113			1 000	r tome w.							STATE		_			
			1				_					-1	Requeste	d Ana	lysis Filte	ered (Y/N)				
Section D Matrix Conception Matrix Conception Matrix Conception MATRIX /	CODE	MP)	10 000	COLL	ECTED	of males	190	1071	Presen	vatives	ral P	N/A		4	地口頂	1447	11/1			
Drinking Water Water	r DW WT	C=COMP)				NO NO		П		$\Box$			83	$\Box$		000 00 00	71 116	Soldie	riji:	
Waste Water Product	WW P	Valid or			COMPC END/G			Н				1	500				2			
SAMPLE ID Soil/Solid	SL OL	(G=GRAB	216	1016	at less		SS	1 1 20	10		10 100	<b>→</b>	2 3			P	Chlorine (Y/N)	11-1/19		1
(A-Z, 0-9 / ,-) Wipe	WP	u			11	TA G	CONTAINERS	_				Test	Z Z				lorin			
Sample IDs MUST BE UNIQUE Tissue Other	TS OT	TYPE	LIBERTY.			TEMP	NTA	1760			_	(C)	4-0-4				5	100		
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# KA b A h A h A h A h A h A h A h A h A h		SAN	DATE	TIME	DATE	TIME WY	# OF	Unpreserved H.SO.	HO3 HCI	NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Met	Analysis	3				Res	Pace	Project I	No./ Lab I.D.
1 5-W- 16 -12	11				12/14/1	13406	4		X				ZX					1		
2 5-W-19 -	1	1	100	1 10 11	1	1500#	to		X				XX				11.		THE PART	
3 MW-4 -						1555 5	Z		X				X							
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5 ZA-W-9-	11312		- Chi	1 127		17058	7		X		11 9		A		etti itti			10-21	17%	
6 ZA-W-90-						17-208			X				X							
7 MW-3 -			-	F WIT		1800 7	_		X	9	18		X				16 3	11177		
8 1C-W-1 -						8 6569							$\times$			1 20 10		No.		
9 1C-M-8 -		_				1000 6	_		X				$\rightarrow$				+			
10 1C-W-7-		+				1050 7		-	X		$\perp$		X	$\perp$				7-11-7-54	1001	
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provided for ms/nsp!																				
5-4-19-1211				1																
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OI .	TO THE				PRINT Nan	ne of SAMPLER	:	De	an	W.	10	101	nev				Temp in °C	Received on Ice (Y/N)	ustod ed Co	(Y/N)
					SIGNATUR	E of SAMPLER		20	2	21			DATE Signe	d /	415/	/1	Ter	Rec	Custody Sealed Cooler (Y/N)	Samples Intact (Y.N.)



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Section A	Section B						S	ection C									Page:		3	of 3	2
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Address:	Copy To:	10	neo		echt			ompany f	lame:	uco	_>	ho	ppara	DEC	TILL ATO	RY AGE	NCV		411	. 500	
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D	Project Num	BU			Kom	sh	M	anager: ace Profile		Det 1/ To	,		Alle Int I	Sit	e Locatio		WY	Λ			
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		_					_				-	<b>→</b> T	Requeste	d Ana	ysis Filt	ered (Y/I	N)	-			
Section D Matrix Required Client Information MATRIX	Codes / CODE	MP)	gal = n	COLL	ECTED	am azil-B	en e	-0	Presei	vatives	Suell	N/A	ibitition of	11	1 11 3	نا الله ال		is a li			
Drinking Water Waste Water Waste Water Product Soil/Solid Oil Wipe (A-Z, 0-9 /,-) Sample IDs MUST BE UNIQUE Tissue Other	ter DW WT r WW P SL OL WP	(see valid codes to left) (G=GRAB C=COMP)	COMPC		COMPO END/GI		AT COLLECTION	ERS	1 Par		was,	1	المنا		9.0/13	E 93		Chlorine (Y/N)		me M 7	
(A-Z, 0-9 / ,-) Air Sample IDs MUST BE UNIQUE Tissue	AR TS	MATRIX CODE SAMPLE TYPE	DATE	TIME	DATE	TIME	SAMPLE TEMP A	# OF CONTAINERS Unpreserved	H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCI	NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol Other		AMTPH-6					Residual Chlori	Pace	Project N	No./ Lab I.D.
1 1B-W-Z3-	1211				12/14/1	1420	7	2	X	П			X					$\sqcap$			
2 7A-W-41-	1		optoble	north	17	1525		2	X		TI X		X		V THE		110		1 FM	94	
3 ZA-W-410-						1600	7	2	X				$\times$								
4 EW-1 =	1	HI N 5	ii m Xi	mb.i.t	V	1630	Ö	2	X		Ш		X							1 1	
5	DESCRIPTION		dottmio	edin in	7711116	MITTER A			20 911 911	-	$\perp$	-	2 2 0 1			1 10 11					
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10							+		1 14 20			-							-011/20	1711	
11					-		+	$\dashv$			+	1		+		++-	$\vdash$	+			
ADDITIONAL COMMENTS		RELINQU	ISHED BY /	AFFILIATI	ION	DATE		TIME		ACC	EPTED	BY/	AFFILIATION	1000	DATE	TIM	E		SAMP	LE CONDIT	TIONS
	97	7	21	1	4000	12/151	1.		000	ette li			7		21511	104			Y	N	V
All XC 10	110	-	7	(	Recen	1901	11	1645	COC	cu i	~cao	4	1114		2011	104			11112/20	17	
	RIGINAL			SAMPLE	R NAME A	ND SIGNAT	URE											ပ္	uo (7	ty poler	Samples Intact (Y/N)
O	HIGHNAL				PRINT Nan	e of SAMPL	ER:	Dea	nh	, K	200	1,	4		,			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	ples I
					SIGNATUR	E of SAMPL	ER:		>	7	1	1	(MM/DD/YY):	d /.	7/15	121		Ter	Rec	Seal	Sam

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CLIENT: BNSF-AECOM

coc page 1 of 3 coc id# 1470475

Trip Blank(s) Provided?
Y / (N)

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B_	VG9W	VSG		 Comments
1		24									_						 
2																	 
3									1								
4																	 
5																 	
6		1	!													 	
77		21															 
88		4				_											
9																	
10						. <u>.</u>										 	
11		V							<u> </u>							 	 
12		4							<u> </u>							<u> </u>	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

CLIENT: BNSF - AECOM

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Pace Analytical -

COC PAGE 2 of 3

Trip Blank(s) Provided?
Y / N

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG			Comments
1		44																
2		10																
3		0																
4																		
5																		
6																		
7																		
8																		
9													<u></u>	<u>.</u>		<u> </u>	;	
10																	_	
11		V																
12		ž V							:			_	<u></u>					

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	_	Wipe/Swab	υ	Summa Can

CLIENT:	BNSF	- AECOW	1

2510337-

Pace Analytical -

coc page 3 of 3 coc id# 1471303

Trip Blank(s) Provided?

Sample Line Item	VCOH	AG1H	AG111	DD411	וופסם	DD211	DD3N	DD36	WCKH	WCELL	WCOLL	DCOM	DCOR	VG9W	VSG			Comments
Cine item	<u> </u>			DF 10	DFZU	DESU	DESIN	DF33	WGNU	WGFU	WGZU	DGBIN	<u> </u>	VGSVV	VOG	-	 	Comments
11		20	<u>[</u>		<u> </u>	<u> </u>							_				 <u> </u>	
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9																		
10												i.						
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12																		

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

## Sample Condition Upon Receipt

Face Analytical Client Nam	e: BNSF-	AEcom	Project #
Courier: Fed Ex UPS USPS VCIII	ent Commercial	Pace Other	
Custody Seal on Cooler/Box Present:	s No Seals	s intact:    Yes	No
Packing Material: Bubble Wrap Bubb	le Bags None	Other	Temp. Blank Yes No
Thermometer Used 132013 or 101731962 or 2260 $2.5^{\circ}$ C, $1.3^{\circ}$ C, $0.6^{\circ}$ C, $0.3^{\circ}$ C, $0.9^{\circ}$	Biological Tissue	Blue None  is Frozen: Yes No Comments:	Date and Initials of person examining contents: PC [251]
Chain of Custody Present:	Nes □No □N/A	1.	
Chain of Custody Filled Out:	Yes ONO ON/A	2.	
Chain of Custody Relinquished:	ØYeş □No □N/A	3.	
Sampler Name & Signature on COC:	ØYes □No □N/A	4.	
Samples Arrived within Hold Time:	Des ONO ONA	5.	
Short Hold Time Analysis (<72hr):	□Yes □No □N/A	6.	
Rush Turn Around Time Requested:	□Yes Ūwo □N/A	7.	
Follow Up / Hold Analysis Requested:	□Yes ☑Mo □N/A	8.	
Sufficient Volume:	Pres DNo DNA	9.	
Correct Containers Used:	Des □No □N/A	10.	
-Pace Containers Used:	Pres ONO ONA	0.055.00	
Containers Intact:	BYes □No □N/A	11.	
Filtered volume received for Dissolved tests	□Yes □No □N/A	12.	
Sample Labels match COC:	©Yes □No □N/A	13.	
-Includes date/time/ID/Analysis Matrix:	WT		
All containers needing preservation have been checked.	Dres DNo DNA	14.	
All containers needing preservation are found to be in compliance with EPA recommendation.	Eyes ONO ONA		
Exceptions: VOA, coliform, TOC, O&G		Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	□Yes □No □N/A	15.	
Headspace in VOA Vials ( >6mm):	□Yes □No □N/A	16.	
Trip Blanks Present:	□Yes □No □NA	17.	
Trip Blank Custody Seals Present	□Yes □No □N/A		
Pace Trip Blank Creation Date:			
Client Notification/ Resolution:  Person Contacted:  Comments/ Resolution:	Date/	Time:	Field Data Required? Y / N
Project Manager Review:	ORB		Date: /2/16/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





February 11, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: BNSF-Skykomish

Pace Project No.: 2510713

### Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on February 01, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Andy Brownfield

andy Brownfield

andy.brownfield@pacelabs.com Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







### **CERTIFICATIONS**

Project: BNSF-Skykomish

Pace Project No.: 2510713

Washington Certification IDs
940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



### **SAMPLE ANALYTE COUNT**

Project: BNSF-Skykomish

Pace Project No.: 2510713

				Analytes	
Lab ID	Sample ID	Method	Analysts	Reported	Laboratory
2510713001	IC-W-1-0112	NWTPH-Dx	AY1	4	PASI-S
2510713002	IC-W-8-0112	NWTPH-Dx	AY1	4	PASI-S
2510713003	IC-W-7-0112	NWTPH-Dx	AY1	4	PASI-S
2510713004	IC-W-70-0112	NWTPH-Dx	AY1	4	PASI-S



Project: BNSF-Skykomish

Pace Project No.: 2510713

Sample: IC-W-1-0112	Lab ID: 2510	713001	Collected: 0	1/31/12 10:3	O Received: (	02/01/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Li	imit DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Preparati	on Method:	EPA 3510			
Diesel Range	<b>0.038</b> mg	/L	0	.019 1	02/07/12 09:2	0 02/08/12 15:3	0	
Motor Oil Range	ND mg	/L	0	.094 1	02/07/12 09:2	0 02/08/12 15:3	0 64742-65-0	
Surrogates	04.0/		50	150 1	00/07/40 00:0	00 00/00/40 45.0	0 000 00 4	
n-Octacosane (S) o-Terphenyl (S)	94 % 91 %			-150 1 -150 1		0 02/08/12 15:3 0 02/08/12 15:3		
o-Terphenyr (o)	91 70		30	-130 1	02/01/12 09.2	.0 02/00/12 13.3	0 04-13-1	
Sample: IC-W-8-0112	Lab ID: 2510	713002	Collected: 0	1/31/12 11:2	5 Received: (	02/01/12 09:30	Matrix: Water	
Parameters	Results	Units	Report L	imit DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Preparati	on Method:	EPA 3510			
Diesel Range	<b>0.29</b> mg	/L	0	.019 1	02/07/12 09:2	0 02/08/12 16:0	4	
Motor Oil Range	<b>0.13</b> mg			.095 1		0 02/08/12 16:0		
Surrogates	J							
n-Octacosane (S)	91 %		50-	-150 1	02/07/12 09:2	0 02/08/12 16:0	4 630-02-4	
o-Terphenyl (S)	90 %		50-	-150 1	02/07/12 09:2	0 02/08/12 16:0	4 84-15-1	
Sample: IC-W-7-0112	Lab ID: 2510	713003	Collected: 0	1/31/12 12:2	0 Received: 0	02/01/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Li	imit DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Preparati	on Method:	EPA 3510			
Diesel Range	<b>0.12</b> mg	/L	0	.019 1	02/07/12 09:2	0 02/08/12 16:2	1	
Motor Oil Range	ND mg		0	.094 1	02/07/12 09:2	0 02/08/12 16:2	1 64742-65-0	
<u>-</u>	•							
Surrogates								
•	82 %			-150 1		0 02/08/12 16:2		
n-Octacosane (S)	82 % 81 %			-150 1 -150 1		20 02/08/12 16:2 20 02/08/12 16:2		
n-Octacosane (S) o-Terphenyl (S)		713004		-150 1	02/07/12 09:2			
n-Octacosane (S) o-Terphenyl (S)	81 %	<b>713004</b> Units	50-	-150 1 1/31/12 13:0	02/07/12 09:2	0 02/08/12 16:2	1 84-15-1	Qua
n-Octacosane (S) p-Terphenyl (S)  Sample: IC-W-70-0112  Parameters	81 % Lab ID: 2510	Units	Collected: 0  Report Li	-150 1 1/31/12 13:0 imit DF	02/07/12 09:2 0 Received: 0	0 02/08/12 16:2	1 84-15-1 Matrix: Water	Qua
n-Octacosane (S) p-Terphenyl (S)  Sample: IC-W-70-0112  Parameters  NWTPH-Dx GCS	Lab ID: 2510  Results	Units	Collected: 0  Report Li  H-Dx Preparati	-150 1 1/31/12 13:0 imit DF	02/07/12 09:2  0 Received: 0  Prepared  EPA 3510	00 02/08/12 16:2 02/01/12 09:30 Analyzed	1 84-15-1  Matrix: Water  CAS No.	Qua
n-Octacosane (S) p-Terphenyl (S)  Sample: IC-W-70-0112 Parameters  NWTPH-Dx GCS  Diesel Range	Lab ID: 2510 Results Analytical Meth 0.14 mg	Units od: NWTP	Collected: 0  Report Li  H-Dx Preparati	-150 1 1/31/12 13:0 imit DF on Method:	02/07/12 09:2  0 Received: 0  Prepared  EPA 3510  02/07/12 09:2	0 02/08/12 16:2	1 84-15-1  Matrix: Water  CAS No.	Qua
n-Octacosane (S) p-Terphenyl (S)  Sample: IC-W-70-0112 Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range	Lab ID: 2510  Results  Analytical Meth	Units od: NWTP	Collected: 0  Report Li  H-Dx Preparati	-150 1 -1/31/12 13:0	02/07/12 09:2  0 Received: 0  Prepared  EPA 3510  02/07/12 09:2	00 02/08/12 16:2 02/01/12 09:30 Analyzed 00 02/08/12 16:3	1 84-15-1  Matrix: Water  CAS No.	Qua
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: IC-W-70-0112  Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range Surrogates n-Octacosane (S)	Lab ID: 2510 Results Analytical Meth 0.14 mg	Units od: NWTP	Collected: 0  Report Li  H-Dx Preparati  0 0	-150 1 -1/31/12 13:0	02/07/12 09:2  0 Received: 0  Prepared  EPA 3510  02/07/12 09:2  02/07/12 09:2	00 02/08/12 16:2 02/01/12 09:30 Analyzed 00 02/08/12 16:3	1 84-15-1  Matrix: Water  CAS No.  8 8 64742-65-0	Qua

Date: 02/11/2012 03:35 PM



### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish

Pace Project No.: 2510713

QC Batch: OEXT/5063 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2510713001, 2510713002, 2510713003, 2510713004

METHOD BLANK: 102031 Matrix: Water

Associated Lab Samples: 2510713001, 2510713002, 2510713003, 2510713004

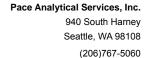
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	02/08/12 14:56	
Motor Oil Range	mg/L	ND	0.10	02/08/12 14:56	
n-Octacosane (S)	%	102	50-150	02/08/12 14:56	
o-Terphenyl (S)	%	98	50-150	02/08/12 14:56	

LABORATORY CONTROL SAMPLE: 102032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
						Qualificity
Diesel Range	mg/L	1	0.80	80	51-114	
Motor Oil Range	mg/L	1	0.95	95	62-120	
n-Octacosane (S)	%			95	50-150	
o-Terphenyl (S)	%			96	50-150	

SAMPLE DUPLICATE: 102033

		2510713001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.038	0.036	6	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	94	90	4	
o-Terphenyl (S)	%	91	85	7	





### **QUALIFIERS**

Project: BNSF-Skykomish

Pace Project No.: 2510713

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### **LABORATORIES**

Date: 02/11/2012 03:35 PM

PASI-S Pace Analytical Services - Seattle



### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF-Skykomish

Pace Project No.: 2510713

Date: 02/11/2012 03:35 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2510713001	IC-W-1-0112	EPA 3510	OEXT/5063	NWTPH-Dx	GCSV/3292
2510713002	IC-W-8-0112	EPA 3510	OEXT/5063	NWTPH-Dx	GCSV/3292
2510713003	IC-W-7-0112	EPA 3510	OEXT/5063	NWTPH-Dx	GCSV/3292
2510713004	IC-W-70-0112	EPA 3510	OEXT/5063	NWTPH-Dx	GCSV/3292



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2510713

Section 6  Register Clear Information: Register Clear Info		www.pacelabs.com																											
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101-101-101-101

2510713

AECOM CLIENT: COC PAGE



Trip Blank(s) Provided?
Y / N

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG		Comments
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AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGEU	4 oz amber glass soil jar
AG1U		BP2U	500mL unpreserved plastic		8 oz clear glass soil jar
	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac		4 oz clear glass soil jar
			250mL NaOH plastic		2 oz clear glass soil jar
	500mL unpreserved amber glass				
	250mL H2SO4 amber glass		250mL HNO3 plastic		4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

COC ID# \_

	Sample Condi	tion Upon Receip	25 1 0 7 1
Pace Analytical Client	Name: AECOM		Project #
Courier: Fed Ex UPS USPS Tracking #:			N.
Custody Seal on Cooler/Box Present:	2	intact: Yes	No
Packing Material: Bubble Wrap		Other	Temp. Blank YesNo
Thermometer Used 132013 of 1017319	63 or 226099 Type of Ice: Wet	Blue None	Samples on ice, cooling process has begun  Date and Initials of person examining
Cooler Temperature 0.7  Temp should be above freezing ≤ 6°C	Biological Tissue	is Frozen: Yes No Comments:	contents: QLO[12 CW
Chain of Custody Present:	ØYes □No □N/A	1.	
Chain of Custody Filled Out:	ØYes □No □N/A	2.	
Chain of Custody Relinquished:	ØYes □No □N/A	3.	
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.	
Samples Arrived within Hold Time:	ØYes □No □N/A	5.	
Short Hold Time Analysis (<72hr):	□Yes ☑No □N/A	6.	
Rush Turn Around Time Requested:	□Yes ☑No □N/A	7.	
Follow Up / Hold Analysis Requested:	□Yes ☑No □N/A	8.	
Sufficient Volume:	Øyes □No □N/A	9.	
Correct Containers Used:	☑Yes □No □N/A	10.	
-Pace Containers Used:	ØY95 □No □N/A		
Containers Intact:	ØYes □No □N/A	11.	
Filtered volume received for Dissolved tes	sts 🗆 Yes 🗆 No 🖾 N/A	12.	
Sample Labels match COC:	☑Yes ☐No ☐N/A	13.	
-Includes date/time/ID/Analysis Ma	atrix:		
All containers needing preservation have been of	hecked.	14.	
All containers needing preservation are found compliance with EPA recommendation.	to be in Yes □No □N/A		
Exceptions: VOA, coliform, TOC, O&G	Yes No QM/A	Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	□Yes □No □N/A	15.	
Headspace in VOA Vials ( >6mm):	□Yes □No ☑N/A	16.	
Trip Blanks Present:	□Yes □No MNA	17.	
Trip Blank Custody Seals Present	□Yes □No ☑N/A		
Pace Trip Blank Creation Date:			
Client Notification/ Resolution:  Person Contacted:  Comments/ Resolution:	Date/	Time:	Field Data Required? Y / N
Project Manager Review:	arb		Date: 2/1//2

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Project Manager Review:

Date: 2//





March 14, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: BNSF-Skykomish Pace Project No.: 2511010

### Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on February 29, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Mariah Peronto for Andy Brownfield

Mariah K Pento

andy.brownfield@pacelabs.com

Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)





Pace Analytical Services, Inc. 940 South Harney Seattle, WA 98108 (206)767-5060

### **CERTIFICATIONS**

Project: BNSF-Skykomish

Pace Project No.: 2511010

**Washington Certification IDs** 

940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555

**REPORT OF LABORATORY ANALYSIS** 

Page 2 of 7

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### **SAMPLE ANALYTE COUNT**

Project: BNSF-Skykomish

Pace Project No.: 2511010

			Analytes						
Lab ID	Sample ID	Method	Analysts	Reported	Laboratory				
2511010001	IC-W-1-0212	NWTPH-Dx	AY1	4	PASI-S				
2511010002	IC-W-8-0212	NWTPH-Dx	AY1	4	PASI-S				
2511010003	IC-W-80-0212	NWTPH-Dx	AY1	4	PASI-S				
2511010004	IC-W-7-0212	NWTPH-Dx	AY1	4	PASI-S				

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Project: BNSF-Skykomish

Pace Project No.: 2511010

Sample: IC-W-1-0212	Lab ID: 25110	10001	Collected: 02/28/1	2 14:50	Received: 02	/29/12 09:05	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Method	d: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.089</b> mg/L	-	0.019	1	03/02/12 13:10	03/02/12 18:12	2	
Motor Oil Range	ND mg/L	-	0.094	1	03/02/12 13:10	03/02/12 18:12	2 64742-65-0	
Surrogates								
n-Octacosane (S)	110 %		50-150	1	03/02/12 13:10			
o-Terphenyl (S)	103 %		50-150	1	03/02/12 13:10	03/02/12 18:12	2 84-15-1	
Sample: IC-W-8-0212	Lab ID: 25110	10002	Collected: 02/28/1	2 16:00	Received: 02	2/29/12 09:05	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Method	d: NWTP	H-Dx Preparation Mo	ethod: E	PA 3510		_	
Diesel Range	<b>0.33</b> mg/L	_	0.019	1	03/02/12 13:10	03/06/12 03:58	3	
Motor Oil Range	<b>0.12</b> mg/L		0.095	1	03/02/12 13:10			
Surrogates	511 <u> </u>	-		-				
n-Octacosane (S)	103 %		50-150	1	03/02/12 13:10	03/06/12 03:58	3 630-02-4	
o-Terphenyl (S)	93 %		50-150	1	03/02/12 13:10	03/06/12 03:58	84-15-1	
Sample: IC-W-80-0212	Lab ID: 25110	10003	Collected: 02/28/1	2 17:00	Received: 02	2/29/12 09:05	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Method	d: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.31</b> mg/L	_	0.019	1	03/02/12 13:10	03/06/12 04:15	5	
Motor Oil Range	<b>0.12</b> mg/L		0.095	1	03/02/12 13:10	03/06/12 04:15	64742-65-0	
Surrogates								
n-Octacosane (S)	105 %		50-150	1	03/02/12 13:10			
o-Terphenyl (S)	93 %		50-150	1	03/02/12 13:10	03/06/12 04:1	5 84-15-1	
Sample: IC-W-7-0212	Lab ID: 25110	10004	Collected: 02/28/1	2 17:10	Received: 02	2/29/12 09:05	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Method	d: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
	<b>0.16</b> mg/L	_	0.019	1	03/02/12 13:10	03/02/12 19:04	1	
Diesel Range			0.094	1	03/02/12 13:10	03/02/12 19:04	4 64742-65-0	
•	ND mg/L	-	0.001					
Motor Oil Range	ND mg/L	-	0.001					
Diesel Range Motor Oil Range <b>Surrogates</b> n-Octacosane (S)	ND mg/L 112 %	-	50-150	1	03/02/12 13:10	03/02/12 19:04	1 630-02-4	

Date: 03/14/2012 02:13 PM

### **REPORT OF LABORATORY ANALYSIS**

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2511010 4 of 10



### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish

Pace Project No.: 2511010

QC Batch: OEXT/5162 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2511010001, 2511010002, 2511010003, 2511010004

METHOD BLANK: 104872 Matrix: Water

Associated Lab Samples: 2511010001, 2511010002, 2511010003, 2511010004

Units	Result	Limit	Analyzed	Qualifiers
mg/L	ND	0.020	03/06/12 03:07	
mg/L	ND	0.10	03/06/12 03:07	
%	99	50-150	03/06/12 03:07	
%	92	50-150	03/06/12 03:07	
	mg/L %	Units         Result           mg/L         ND           mg/L         ND           %         99	Units         Result         Limit           mg/L         ND         0.020           mg/L         ND         0.10           %         99         50-150	Units         Result         Limit         Analyzed           mg/L         ND         0.020         03/06/12 03:07           mg/L         ND         0.10         03/06/12 03:07           %         99         50-150         03/06/12 03:07

LABORATORY CONTROL SAMPLE: 104873

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		0.81	81	51-114	
Motor Oil Range	mg/L	1	0.90	90	62-120	
n-Octacosane (S)	%			99	50-150	
o-Terphenyl (S)	%			93	50-150	

SAMPLE DUPLICATE: 104874

		2511010001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.089	0.089	.005	
Motor Oil Range	mg/L	ND	.063J		
n-Octacosane (S)	%	110	110	.04	
o-Terphenyl (S)	%	103	90	13	

Date: 03/14/2012 02:13 PM

**REPORT OF LABORATORY ANALYSIS** 

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Pace Analytical Services, Inc. 940 South Harney Seattle, WA 98108 (206)767-5060

### **QUALIFIERS**

Project: BNSF-Skykomish

Pace Project No.: 2511010

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### **LABORATORIES**

Date: 03/14/2012 02:13 PM

PASI-S Pace Analytical Services - Seattle

**REPORT OF LABORATORY ANALYSIS** 

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### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF-Skykomish

Pace Project No.: 2511010

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2511010001	IC-W-1-0212	EPA 3510	OEXT/5162	NWTPH-Dx	GCSV/3345
2511010002	IC-W-8-0212	EPA 3510	OEXT/5162	NWTPH-Dx	GCSV/3345
2511010003	IC-W-80-0212	EPA 3510	OEXT/5162	NWTPH-Dx	GCSV/3345
2511010004	IC-W-7-0212	EPA 3510	OEXT/5162	NWTPH-Dx	GCSV/3345

Date: 03/14/2012 02:13 PM REPORT OF LABORATORY ANALYSIS

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2511010 7 of 10

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

	Section I		t de la constante de la consta	2a v						ion C										e da		Pa	ige:	1	oits	of 1		
Company: A FCOMA	Required Report To	Mo	11	Hav	igher.	sF	. 0		Attent	-	rmatio	n:						-4	1			4.49		15	3	260	2	
Address: 710 2nd Ave. Swite 1000, Seattle :WA 98104 Email To: Mark . Havighors Paccomed Phone: 206-624-9349 [206-623-3793] Requested Due Date/TAT: Standard	Сору То:	20	ne	Hav e kne	ont.				Comp	any N	lame:								REG	ULATO	DRY	AGENO	Y					
Suite 1000, Seattle WA 98104	611. n	Fruit	eti. I	oto mbay	Transfer	yila.	II.	198	Addre	ess:	11.1	JU"	TT	s plat		275	10	_ [[1]	П	NPDES	П	GRO	UND W	/ATER	П	DRINKIN	IG WATER	2
Email To: Mark. Havighors Togecome	Purchase	Order	No.:				Bull		Pace ( Refere										Г	UST	F	RCR	A III		-	OTHER		
Phone: 624-9349 Fax: 6-623-3793	Project Na	me:	SK	y Ko	mis	h BA	ISF		Pace f Manag	Project ger:									Site	Locatio	on S	KYK!	Linc	4				
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Section D Matrix Co Required Client Information MATRIX / (	CODE	to left)	C=COMP)	nd om	COLLE	CTED	octio	Q.	lgri	se l	Pre	serva	atives	s	N	2	it	12	/gr	épo)	rita	2 7		Desig		12		
Drinking Water Water Waste Water Product Soil/Solid	WT WW P SL	(see valid codes to left)	(G=GRAB C=C	COMPO STAR		COMPO END/GR		COLLECTION	S	ita	1 41	30	gii.	gradj		÷ 20	4	n io	ignig.	tal n		V.195						
SAMPLE ID  (A-Z, 0-9 / ,-)  Sample IDs MUST BE UNIQUE  Tissue Other	OL WP AR TS OT	MATRIX CODE (s	SAMPLE TYPE (G=	mpen igilik ud blor	eu falo A stano Constru	iri b(ta pasa) parti)	w asy stored storega	SAMPLE TEMP AT 0	# OF CONTAINERS	Jupreserved	H2SO4 HNO3	HCI	Va2S <sub>2</sub> O <sub>3</sub>	Methanol	Analysis Tost		)	pilo Bili I	di di di di			dra en de din driv el		esidual Cr	ed who	B o	la (I ali I	
1011111	100	W	_	2/28/12	1450	DATE	TIME	59	2	171	+	X		2	-	X		-	+	1	+		11	-	Pace	Project N	lo./ Lab I.	D.
1 1C-W-1-0212 2 1C-W-8-0212		W		2/28/12		ales :	7d Yr	3.8	2	13	T E	X		an d		1		(t or	Jan J	4 53 1	n a	17:11	125	6 10 11	(d)	1/4 V		_
2 1C-W-8-0212 3 1C-W-80-0212 4 1C-W-7-0212		W		2/28/12				3,7	2			X		$\sqcap$	1	X							$\top$					
4 IC-W-7-0212	analy is	W		2/28/12		plin day	mon.	5.4	2	14	1) (0)	X	0 0	1111		X			1110	1 511		13,34	1111		on.	1M 7		
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9	7.1	$\vdash$						-	-	+		H			+	-	101	mire.	951	TOP I	-		+	-	111	++		
10		$\vdash$					11-11-1	-		$\vdash$	+		-		-	-	+	7 17		7 (12)	+		+	-				
12		$\vdash$						T		Н	$\top$		$\top$	$\vdash$			$\Box$	+		11	+	+	$\top$	+			7.	
ADDITIONAL COMMENTS		REI	LINQU	ISHED BY /	AFFILIATION	ON	DAT	Έ	Т	IME			AC	CEPT	ED B	BY / A	FFILIA	TION		DATE		TIME	T		SAMP	LE CONDIT	IONS	
without SGCU	Ab	An	lal	and "	Sell.	ave	2/291	12	00	705	C	olet	de	we	ai	vea	2/PA	CF_	1	22917	2 6	99.05	0.6	Dh	4	N	Y	
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		174																						ST.	.18			
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ORI	GINA	1			SAMPLE	R NAME A	ND SIGN	ATUR	E														O	u <sub>o</sub>	_	oler	tact	
On	CIIVA	lana.				PRINT Nan	ne of SAM	PLER	1	16	de	60	10	1.	1	Se	4	~	_				Temp in °C	Received on	S	ad Cor	yes In	
0744040						SIGNATUR	RE of SAM	PLER		20	le/	Lea	9,	150	14		DATE S	igned /YY):	02	124	11	2.	Ten	Rece	30	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)	

2511010

1	U	Name of Street	0	Pace Analytical
				) - viet i i i i i i i i i i i i i i i i i i

0.00	CLIENT:	BNSF_ AFOM	
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COC PAGE 1 of 1532/02

Trip Blank(s) Provided?

Sample	1/0011	10411	A 0 411	DD4H	DDOLL	DDOLL	DDON	DDAG	WOKL	WOELL	WOOL	DOOM	D00D	1/0014/	1/00		•
Line Item	VG9H			BP10	BPZU	BP3U	BP3N	BP35	WGKU	WGFU	WGZU	DG9IVI	DG9B	VG9W	VSG	 	Comments
1		200															
2																	
3																	
4		44															
5																	45
6																	
7																	
8																	
9																	
10																	
11																	
12																	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

### Sample Condition Upon Receipt 251 Pace Analytical Client Name: BNSI Project # Courier: Fed Ex UPS USPS VClient Commercial Pace Other Tracking #: Custody Seal on Cooler/Box Present: Yes Seals intact: Packing Material: Bubble Wrap Bubble Bags None Other Temp. Blank Yes 132013 or 101731962 of 226099 Type of Ice: Wet Blue None Samples on ice, cooling process has begun Thermometer Used Date and Initials of person examining Biological Tissue is Frozen: Yes No **Cooler Temperature** contents: 022912 OW Temp should be above freezing ≤ 6°C Comments: Yes □No □N/A Chain of Custody Present: MYes □No □N/A Chain of Custody Filled Out: Yes DNo □N/A Chain of Custody Relinquished: ØYes □No □N/A Sampler Name & Signature on COC: Yes □No □N/A Samples Arrived within Hold Time: □Yes ☑Nø □N/A Short Hold Time Analysis (<72hr): □Yes ☑No □N/A Rush Turn Around Time Requested: □Yes ☑No □N/A Follow Up / Hold Analysis Requested: Yes DNo DN/A Sufficient Volume: Yes □No □N/A Correct Containers Used: Myes ONo ON/A -Pace Containers Used: MYes □No □N/A Containers Intact: □Yes □No MN/A Filtered volume received for Dissolved tests Yes No □N/A 13. Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: All containers needing preservation have been checked. □xes □No □N/A All containers needing preservation are found to be in Yes DNo □N/A compliance with EPA recommendation. Initial when Lot # of added □Yes □No □N/A completed preservative Exceptions: VOA, coliform, TOC, O&G □Yes □No □NA Samples checked for dechlorination: MyA □Yes □No Headspace in VOA Vials ( >6mm): □Yes □No Trip Blanks Present: EN/A ☐Yes ☐No Trip Blank Custody Seals Present Pace Trip Blank Creation Date: Client Notification/ Resolution: Field Data Required? Person Contacted: Date/Time: Comments/ Resolution:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

F-SEA-C-021-rev.04 26Jan2012

Pace Analytical Services, Inc - SEA Lab

Project Manager Review:





April 11, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: Skykomish 60241075 Pace Project No.: 2511401

### Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on March 28, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett for Andy Brownfield andy.brownfield@pacelabs.com Project Manager

**Enclosures** 

cc: Sarah Albano, AECOM (BNSF)
Cynthia Jennings, BNSF\_AECOM-WA
Eric Storkerson, AECOM (BNSF)
Jennifer Wald, AECOM (BNSF)







### **CERTIFICATIONS**

Project: Skykomish 60241075

Pace Project No.: 2511401

Washington Certification IDs
940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



### **SAMPLE ANALYTE COUNT**

Project: Skykomish 60241075

Pace Project No.: 2511401

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2511401001	S1-AU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401002	S1-AD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401003	S1-BU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401004	S1-BD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401005	S2-AU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401006	S2-AD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401007	S2-BU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401008	S20-BU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401009	S2-BD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401010	S3-AU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401011	S3-AD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401012	S3-BU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401013	S3-BD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401014	S3-CU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401015	S3-CD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401016	S30-CU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401017	S4-AU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401018	S4-AD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401019	S4-BU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401020	S4-BD-0312	NWTPH-Dx	AY1	4	PASI-S
2511401021	S4-CU-0312	NWTPH-Dx	AY1	4	PASI-S
2511401022	S4-CD-0312	NWTPH-Dx	AY1	4	PASI-S



### **PROJECT NARRATIVE**

Project: Skykomish 60241075

Pace Project No.: 2511401

Method: NWTPH-Dx
Description: NWTPH-Dx GCS
Client: BNSF\_AECOM-WA
Date: April 11, 2012

### **General Information:**

22 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: OEXT/5309

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 109202)
  - Diesel Range

### **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



Project: Skykomish 60241075

Pace Project No.: 2511401

Sample: S1-AU-0312	Lab ID: 251	1401001	Collected: 03/27/	12 08:30	Received: 03	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	ND m	g/L	0.019	1	04/03/12 10:25	04/03/12 16:01	1	
Motor Oil Range	ND m	g/L	0.095	1	04/03/12 10:25	04/03/12 16:01	1 64742-65-0	
Surrogates n-Octacosane (S)	82 %		50-150	1	04/03/12 10:25	04/03/12 16:01	1 630-02-4	
o-Terphenyl (S)	73 %		50-150	1		04/03/12 16:01		
Sample: S1-AD-0312	Lab ID: 251	1401002	Collected: 03/27/	12 08:35	Received: 03	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metl	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510	_		
Diesel Range	ND m	n/l	0.019	1	04/03/12 10:25	04/03/12 16:35	5	
Motor Oil Range	ND m	•	0.096	1		04/03/12 16:35		
Surrogates	·	J						
n-Octacosane (S)	95 %		50-150	1	04/03/12 10:25	04/03/12 16:35	5 630-02-4	
o-Terphenyl (S)	83 %		50-150	1	04/03/12 10:25	04/03/12 16:35	5 84-15-1	
Sample: S1-BU-0312	Lab ID: 251	1401003	Collected: 03/27/	12 08:50	Received: 03	2/28/12 08:40	Matrix: Water	
•			Collected. 03/21/	12 00.50	Neceived. 00	0/20/12 00.40	IVIALITA. VVALEI	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
Parameters		Units		DF	Prepared			Qua
Parameters NWTPH-Dx GCS	Analytical Met	Units	Report Limit	DF	Prepared PA 3510		CAS No.	Qua
Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range		Units hod: NWTP	Report Limit H-Dx Preparation M	DF ethod: E	Prepared PA 3510 04/03/12 10:25	Analyzed	CAS No.	Qua
Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates	Analytical Meti	Units hod: NWTP	Report Limit H-Dx Preparation M 0.019	DF ethod: E	Prepared PA 3510 04/03/12 10:25 04/03/12 10:25	Analyzed 04/03/12 17:27	CAS No. 7 7 64742-65-0	Qua
Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates  n-Octacosane (S)	Analytical Meti  0.019 mg	Units hod: NWTP	H-Dx Preparation M 0.019 0.095	DF ethod: E 1 1	Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25	Analyzed 04/03/12 17:27	CAS No. 7 7 64742-65-0 7 630-02-4	Qua
-	Analytical Meti  0.019 mg  ND mg	Units hod: NWTP g/L g/L	H-Dx Preparation M 0.019 0.095	DF ethod: E	Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25	Analyzed  04/03/12 17:27 04/03/12 17:27 04/03/12 17:27	CAS No. 7 7 64742-65-0 7 630-02-4	Qua
Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates  n-Octacosane (S) o-Terphenyl (S)	Analytical Meti  0.019 m  ND m  83 %  77 %	Units hod: NWTP g/L g/L	Report Limit  H-Dx Preparation M  0.019 0.095 50-150 50-150	DF ethod: E	Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25	Analyzed  04/03/12 17:27 04/03/12 17:27 04/03/12 17:27	CAS No.  7 7 64742-65-0 7 630-02-4 7 84-15-1	Qua
Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: S1-BD-0312	Analytical Methodology O.019 mg ND mg 83 % 77 %  Lab ID: 251	Units hod: NWTP g/L g/L 1401004 Units	Report Limit  H-Dx Preparation M  0.019 0.095 50-150 50-150 Collected: 03/27/	DF ethod: E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  Received: 03  Prepared	Analyzed  04/03/12 17:27 04/03/12 17:27 04/03/12 17:27 04/03/12 17:27	CAS No.  7 7 7 64742-65-0 7 630-02-4 7 84-15-1  Matrix: Water	
Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: S1-BD-0312 Parameters  NWTPH-Dx GCS	Analytical Methodology O.019 mg ND mg 83 % 77 %  Lab ID: 251	Units hod: NWTP g/L g/L 1401004 Units hod: NWTP	Report Limit  H-Dx Preparation M  0.019 0.095 50-150 50-150  Collected: 03/27/	DF ethod: E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  Received: 03  Prepared  PA 3510	Analyzed  04/03/12 17:27 04/03/12 17:27 04/03/12 17:27 04/03/12 17:27	CAS No.  7 7 64742-65-0 7 630-02-4 7 84-15-1  Matrix: Water CAS No.	
Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: S1-BD-0312 Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range	Analytical Methodology O.019 mg ND mg 83 % 77 %  Lab ID: 251  Results  Analytical Methodology	Units hod: NWTP g/L g/L 1401004 Units hod: NWTP	Report Limit  H-Dx Preparation M  0.019 0.095 50-150 50-150  Collected: 03/27/2 Report Limit  H-Dx Preparation M	DF ethod: E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  Received: 03  Prepared  PA 3510  04/03/12 10:25	Analyzed  04/03/12 17:27 04/03/12 17:27 04/03/12 17:27 04/03/12 17:27 8/28/12 08:40 Analyzed	CAS No.  7 7 64742-65-0 7 630-02-4 7 84-15-1  Matrix: Water CAS No.	
Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: S1-BD-0312  Parameters	Analytical Meti  0.019 mg  ND mg  83 %  77 %  Lab ID: 251  Results  Analytical Meti	Units hod: NWTP g/L g/L 1401004 Units hod: NWTP	Report Limit  H-Dx Preparation M  0.019 0.095 50-150 50-150  Collected: 03/27/7  Report Limit  H-Dx Preparation M  0.019	DF ethod: E  1 1 1 1 1 1 Ethod: E  DF ethod: E  1	Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25  Received: 03  Prepared  PA 3510  04/03/12 10:25  04/03/12 10:25  04/03/12 10:25	Analyzed  04/03/12 17:27 04/03/12 17:27 04/03/12 17:27 04/03/12 17:27 8/28/12 08:40 Analyzed  04/03/12 17:44	CAS No.  7 7 7 64742-65-0 7 630-02-4 7 84-15-1  Matrix: Water  CAS No.	

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Project: Skykomish 60241075

Pace Project No.: 2511401

Sample: S2-AU-0312	Lab ID: 2511401005		Collected: 03/27/	12 10:15	Received: 03	3/28/12 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua		
NWTPH-Dx GCS	Analytical Metho	od: NWTPI	H-Dx Preparation M	ethod: Ef	PA 3510					
Diesel Range	ND mg/	L	0.019	1	04/03/12 10:25	04/03/12 18:02	2			
Motor Oil Range	ND mg/	L	0.095	1	04/03/12 10:25	04/03/12 18:02	2 64742-65-0			
Surrogates n-Octacosane (S)	83 %		50-150	1	04/03/12 10:25	04/03/12 18:01	2 630-02-4			
o-Terphenyl (S)	76 %		50-150	1	04/03/12 10:25					
o respiratify (e)	70 70		00 100	•	0 1/00/12 10:20	0 17007 12 10:01	2 01 10 1			
Sample: S2-AD-0312	Lab ID: 2511401006		Collected: 03/27/12 10:20		Received: 03/28/12 08:40		Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua		
NWTPH-Dx GCS	Analytical Metho	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	ND mg/	L	0.019	1	04/03/12 10:25	04/03/12 18:19	9			
Motor Oil Range	ND mg/		0.095	1	04/03/12 10:25	04/03/12 18:19	9 64742-65-0			
Surrogates										
n-Octacosane (S)	89 %		50-150	1	04/03/12 10:25					
o-Terphenyl (S)	81 %		50-150	1	04/03/12 10:25	04/03/12 18:19	9 84-15-1			
Sample: S2-BU-0312	Lab ID: 2511	401007	Collected: 03/27/	12 10:40	Received: 03	3/28/12 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua		
NWTPH-Dx GCS	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510									
Diesel Range	<b>0.041</b> mg/	1	0.010	1	04/03/12 10:25	04/03/12 18:36	3			
J	ND mg/L		0.019							
Motor Oil Range	•		0.019	1	04/03/12 10:25	04/03/12 18:36	6 64742-65-0			
Surrogates	ND mg/		0.095	1	04/03/12 10:25					
Surrogates n-Octacosane (S)	ND mg/ 97 %		0.095 50-150	1	04/03/12 10:25 04/03/12 10:25	04/03/12 18:36	6 630-02-4			
Surrogates n-Octacosane (S)	ND mg/		0.095	1	04/03/12 10:25	04/03/12 18:36	6 630-02-4			
Surrogates n-Octacosane (S) o-Terphenyl (S)	ND mg/ 97 %	L	0.095 50-150	1 1 1	04/03/12 10:25 04/03/12 10:25	04/03/12 18:36 04/03/12 18:36	6 630-02-4			
Surrogates n-Octacosane (S) o-Terphenyl (S)	ND mg/ 97 % 88 %	L	0.095 50-150 50-150	1 1 1	04/03/12 10:25 04/03/12 10:25 04/03/12 10:25	04/03/12 18:36 04/03/12 18:36	6 630-02-4 6 84-15-1	Qua		
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: S20-BU-0312  Parameters	ND mg/ 97 % 88 % Lab ID: 2511  Results	401008 Units	0.095 50-150 50-150 Collected: 03/27/	1 1 1 12 10:50 DF	04/03/12 10:25 04/03/12 10:25 04/03/12 10:25 Received: 03 Prepared	04/03/12 18:36 04/03/12 18:36 3/28/12 08:40	6 630-02-4 6 84-15-1 Matrix: Water	Qua		
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: S20-BU-0312 Parameters  NWTPH-Dx GCS	ND mg/ 97 % 88 %  Lab ID: 2511  Results  Analytical Methor	401008 Units  Dod: NWTPF	0.095 50-150 50-150  Collected: 03/27/ Report Limit	1 1 1 12 10:50 DF	04/03/12 10:25 04/03/12 10:25 04/03/12 10:25 Received: 03 Prepared	04/03/12 18:36 04/03/12 18:36 8/28/12 08:40 Analyzed	6 630-02-4 6 84-15-1 Matrix: Water CAS No.	Qua		
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: S20-BU-0312 Parameters  NWTPH-Dx GCS  Diesel Range	ND mg/ 97 % 88 % Lab ID: 2511  Results	401008 Units od: NWTPF	0.095 50-150 50-150  Collected: 03/27/ Report Limit H-Dx Preparation M	1 1 1 12 10:50 DF	04/03/12 10:25 04/03/12 10:25 04/03/12 10:25 Received: 03 Prepared	04/03/12 18:36 04/03/12 18:36 8/28/12 08:40 Analyzed	6 630-02-4 6 84-15-1 Matrix: Water CAS No.	Qua		
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: S20-BU-0312 Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range	ND mg/ 97 % 88 %  Lab ID: 2511  Results  Analytical Metho	401008 Units od: NWTPF	0.095 50-150 50-150  Collected: 03/27/ Report Limit H-Dx Preparation M 0.019	1 1 1 12 10:50 DF ethod: El	04/03/12 10:25 04/03/12 10:25 04/03/12 10:25 Received: 03 Prepared PA 3510 04/03/12 10:25	04/03/12 18:36 04/03/12 18:36 8/28/12 08:40 Analyzed	6 630-02-4 6 84-15-1 Matrix: Water CAS No.	Qua		
Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: S20-BU-0312 Parameters  NWTPH-Dx GCS Diesel Range Motor Oil Range Surrogates n-Octacosane (S)	ND mg/ 97 % 88 %  Lab ID: 2511  Results  Analytical Metho	401008 Units od: NWTPF	0.095 50-150 50-150  Collected: 03/27/ Report Limit H-Dx Preparation M 0.019	1 1 1 12 10:50 DF ethod: El	04/03/12 10:25 04/03/12 10:25 04/03/12 10:25 Received: 03 Prepared PA 3510 04/03/12 10:25	04/03/12 18:36 04/03/12 18:36 8/28/12 08:40 Analyzed 04/03/12 18:53 04/03/12 18:53	6 630-02-4 6 84-15-1 Matrix: Water CAS No.	Qua		

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Project: Skykomish 60241075

Pace Project No.: 2511401

Sample: S2-BD-0312	Lab ID: 2511401009		Collected: 03/27	/12 10:55	Received: 03	3/28/12 08:40	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua	
NWTPH-Dx GCS	Analytical Metho	d: NWTPH	-Dx Preparation	Method: E	PA 3510				
Diesel Range	<b>0.022</b> mg/l	_	0.019	1	04/03/12 10:25	04/03/12 19:1	0		
Motor Oil Range	ND mg/l	-	0.098	1	04/03/12 10:25	04/03/12 19:1	0 64742-65-0		
Surrogates n-Octacosane (S)	97 %		50-150	1	04/03/12 10:25	04/03/12 19:1	0 630-02-4		
o-Terphenyl (S)	83 %		50-150			04/03/12 19:1			
Sample: S3-AU-0312	Lab ID: 25114	01010	Collected: 03/27	/12 13:15	Received: 0	3/28/12 08:40	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua	
NWTPH-Dx GCS	Analytical Metho	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range	<b>0.085</b> mg/l	_	0.019	1	04/03/12 10:25	04/03/12 19:2	8		
Motor Oil Range	ND mg/L		0.098			04/03/12 19:2			
Surrogates	ŭ								
n-Octacosane (S)	94 %		50-150	1	04/03/12 10:25	04/03/12 19:2	8 630-02-4		
o-Terphenyl (S)	84 %		50-150	1	04/03/12 10:25	04/03/12 19:2	8 84-15-1		
Sample: S3-AD-0312	Lab ID: 25114	01011	Collected: 03/27	/12 13:20	Received: 03	3/28/12 08:40	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua	
NWTPH-Dx GCS	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	ND mg/l	_	0.019	1	04/03/12 10:25	04/03/12 20:5	3		
Motor Oil Range <b>Surrogates</b>	ND mg/L		0.09	1	04/03/12 10:25	04/03/12 20:5	3 64742-65-0		
n-Octacosane (S)	99 %		50-150	1	04/03/12 10:25	04/03/12 20:5	3 630-02-4		
o-Terphenyl (S)	87 %		50-150	1		04/03/12 20:5			
Sample: S3-BU-0312	Lab ID: 25114	01012	Collected: 03/27	/12 13:35	Received: 00	3/28/12 08:40	Matrix: Water		
• Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua	
	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510					-			
NWTPH-Dx GCS	Analytical Metho	u. INVVIII II							
	Analytical Metho <b>0.042</b> mg/l		0.019	1	04/03/12 10:25	04/03/12 21:1	1		
Diesel Range Motor Oil Range	•	-	0.019 0.099			04/03/12 21:1 04/03/12 21:1			
Diesel Range Motor Oil Range <i>Surrogates</i>	<b>0.042</b> mg/l ND mg/l	-	0.09	1	04/03/12 10:25	04/03/12 21:1	1 64742-65-0		
NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates  n-Octacosane (S)  o-Terphenyl (S)	<b>0.042</b> mg/l	-		1	04/03/12 10:25 04/03/12 10:25		1 64742-65-0 1 630-02-4		

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Project: Skykomish 60241075

Pace Project No.: 2511401

Sample: S3-BD-0312	Lab ID: 2511401013		Collected: 03/27/	12 13:40	Received: 03	3/28/12 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua		
NWTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Preparation M	ethod: E	PA 3510					
Diesel Range	<b>0.022</b> mg/	/L	0.019	1	04/03/12 10:25	04/03/12 21:28	3			
Motor Oil Range <b>Surrogates</b>	ND mg/	/L	0.095	1	04/03/12 10:25	04/03/12 21:28	8 64742-65-0			
n-Octacosane (S)	102 %		50-150	1	04/03/12 10:25	04/03/12 21:28	8 630-02-4			
p-Terphenyl (S)	91 %		50-150	1	04/03/12 10:25	04/03/12 21:28	84-15-1			
Sample: S3-CU-0312	Lab ID: 2511401014		Collected: 03/27/12 13:50		Received: 03/28/12 08:40		Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua		
NWTPH-Dx GCS	Analytical Meth	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	ND mg	/L	0.019	1	04/04/12 13:05	04/05/12 00:0	1			
Motor Oil Range	ND mg		0.095	1	04/04/12 13:05	04/05/12 00:0	1 64742-65-0			
Surrogates										
n-Octacosane (S)	72 %		50-150	1	04/04/12 13:05					
o-Terphenyl (S)	69 %		50-150	1	04/04/12 13:05	04/05/12 00:0	1 84-15-1			
Sample: S3-CD-0312	Lab ID: 2511	401015	Collected: 03/27/	12 14:00	Received: 03	3/28/12 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua		
NWTPH-Dx GCS	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510									
Diesel Range	ND mg	/L	0.019	1	04/04/12 13:05	04/05/12 00:36	3			
Motor Oil Range <b>Surrogates</b>	ND mg/L		0.095	1	04/04/12 13:05	04/05/12 00:36	6 64742-65-0			
n-Octacosane (S)	94 %		50-150	1	04/04/12 13:05	04/05/12 00:36	630-02-4			
						0.440=440.00.00	3 84-15-1			
` '	88 %		50-150	1	04/04/12 13:05	04/05/12 00:36	0 04 10 1			
o-Terphenyl (S)	88 % Lab ID: 2511	401016	50-150 Collected: 03/27/				Matrix: Water			
o-Terphenyl (S)		<b>401016</b> Units						Qua		
Sample: S30-CU-0312 Parameters	Lab ID: 2511  Results	Units	Collected: 03/27/	12 13:55 DF	Received: 03 Prepared	3/28/12 08:40	Matrix: Water	Qua		
Sample: S30-CU-0312 Parameters NWTPH-Dx GCS	Lab ID: 2511  Results	Units	Collected: 03/27/	12 13:55 DF	Received: 03 Prepared	3/28/12 08:40 Analyzed	Matrix: Water  CAS No.	Qua		
Sample: S30-CU-0312 Parameters  NWTPH-Dx GCS  Diesel Range	Lab ID: 2511  Results  Analytical Methor	Units od: NWTP	Collected: 03/27/  Report Limit  H-Dx Preparation M	12 13:55 DF ethod: E	Received: 03 Prepared PA 3510	3/28/12 08:40 Analyzed 04/05/12 00:5	Matrix: Water  CAS No.	Qua		
Sample: S30-CU-0312 Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range	Lab ID: 2511  Results  Analytical Methors  ND mg.	Units od: NWTP	Collected: 03/27/  Report Limit  H-Dx Preparation M  0.019	12 13:55 DF ethod: E	Received: 03 Prepared PA 3510 04/04/12 13:05	3/28/12 08:40 Analyzed 04/05/12 00:5	Matrix: Water  CAS No.	Qua		
Sample: S30-CU-0312	Lab ID: 2511  Results  Analytical Methors  ND mg.	Units od: NWTP	Collected: 03/27/  Report Limit  H-Dx Preparation M  0.019	12 13:55 DF ethod: E	Received: 03 Prepared PA 3510 04/04/12 13:05	Analyzed  04/05/12 00:53	Matrix: Water  CAS No.  3 3 64742-65-0	Qua		

Date: 04/11/2012 04:40 PM



Project: Skykomish 60241075

Pace Project No.: 2511401

Sample: S4-AU-0312	Lab ID: 251	1401017	Collected:	U3/27/12	2 15:00	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report	Report Limit DF		Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
Diesel Range	ND m	g/L		0.019	1	04/04/12 13:05	04/05/12 01:1	0	
Motor Oil Range <b>Surrogates</b>	ND m	g/L		0.095	1	04/04/12 13:05	04/05/12 01:1	0 64742-65-0	
n-Octacosane (S)	68 %		5	0-150	1	04/04/12 13:05	04/05/12 01:1	0 630-02-4	
p-Terphenyl (S)	64 %			0-150	1		04/05/12 01:1		
Sample: S4-AD-0312	Lab ID: 251	1401018	Collected:	03/27/12	2 15:05	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metl	hod: NWTP	H-Dx Prepara	tion Me	thod: Ef	PA 3510			
Diesel Range	<b>0.061</b> mg	n/l		0.019	1	04/04/12 13:05	04/05/12 01:2	7	
Motor Oil Range	ND m	•		0.095	1		04/05/12 01:2		
Surrogates	·	5							
n-Octacosane (S)	68 %		5	0-150	1	04/04/12 13:05	04/05/12 01:2	7 630-02-4	
o-Terphenyl (S)	65 %		5	0-150	1	04/04/12 13:05	04/05/12 01:2	7 84-15-1	
Sample: S4-BU-0312	Lab ID: 251	1401019	Collected:	03/27/12	2 15:25	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report	Limit _	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ation Me	thod: El	PA 3510			
Diesel Range	<b>0.040</b> mg	g/L		0.019	1	04/04/12 13:05	04/05/12 02:0	1	
Motor Oil Range <b>Surrogates</b>	ND m			0.094	1	04/04/12 13:05	04/05/12 02:0	1 64742-65-0	
n-Octacosane (S)	58 %		5	0-150	1	04/04/12 13:05	04/05/12 02:0	1 630-02-4	
o-Terphenyl (S)	55 %		5	0-150	1	04/04/12 13:05	04/05/12 02:0	1 84-15-1	
Sample: S4-BD-0312	Lab ID: 251	1401020	Collected:	03/27/12	2 15:30	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
		had. NIM/TDI	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
NWTPH-Dx GCS	Analytical Met	noa: NWIP							
	Analytical Metl			0.019	1	04/04/12 13:05	04/05/12 02:1	8	
Diesel Range	·	g/L		0.019 0.095	1 1		04/05/12 02:1 04/05/12 02:1		
Diesel Range Motor Oil Range <i>Surrogates</i>	<b>0.024</b> m <sub>2</sub> ND m <sub>3</sub>	g/L		0.095	1	04/04/12 13:05	04/05/12 02:1	8 64742-65-0	
NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates  n-Octacosane (S)  o-Terphenyl (S)	<b>0.024</b> mg	g/L	5			04/04/12 13:05 04/04/12 13:05		8 64742-65-0 8 630-02-4	

Date: 04/11/2012 04:40 PM

# **REPORT OF LABORATORY ANALYSIS**



Project: Skykomish 60241075

Sample: S4-CU-0312	Lab ID: 251	1401021	Collected: 03/27	/12 15:50	Received: 03	3/28/12 08:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation N	/lethod: E	PA 3510			
Diesel Range	<b>0.034</b> m	g/L	0.019	1	04/04/12 13:05	04/05/12 03:09		
Motor Oil Range Surrogates	ND m	g/L	0.095	1	04/04/12 13:05	04/05/12 03:09	64742-65-0	
n-Octacosane (S)	87 %	1	50-150	1	04/04/12 13:05	04/05/12 03:09	630-02-4	
o-Terphenyl (S)	82 %	50-150	1	04/04/12 13:05	04/05/12 03:09	84-15-1		
Sample: S4-CD-0312	Lab ID: 251	1401022	Collected: 03/27	/12 15:55	Received: 03	5/28/12 08:40 N	Matrix: Water	
	Lab ID: 251	<b>1401022</b> Units	Collected: 03/27	/12 15:55 DF	Received: 03	3/28/12 08:40 N Analyzed	Matrix: Water  CAS No.	Qua
Sample: S4-CD-0312	Results	Units		DF	Prepared			Qua
Sample: S4-CD-0312 Parameters	Results	Units	Report Limit	DF Method: E	Prepared PA 3510		CAS No.	Qua
Sample: S4-CD-0312 Parameters  NWTPH-Dx GCS	Results  Analytical Met	Units hod: NWTP	Report Limit H-Dx Preparation N	DF Method: E	Prepared PA 3510	Analyzed 04/05/12 03:26	CAS No.	Qua
Sample: S4-CD-0312 Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range	Results  Analytical Met	Units hod: NWTP g/L g/L	Report Limit H-Dx Preparation N	DF Method: E	Prepared PA 3510 04/04/12 13:05	Analyzed 04/05/12 03:26 04/05/12 03:26	CAS No.	Qua



#### **QUALITY CONTROL DATA**

Project: Skykomish 60241075

Pace Project No.: 2511401

QC Batch: OEXT/5309 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2511401001, 2511401002, 2511401003, 2511401004, 2511401005, 2511401006, 2511401007, 2511401008,

2511401009, 2511401010, 2511401011, 2511401012, 2511401013

METHOD BLANK: 109199 Matrix: Water

Associated Lab Samples: 2511401001, 2511401002, 2511401003, 2511401004, 2511401005, 2511401006, 2511401007, 2511401008,

2511401009, 2511401010, 2511401011, 2511401012, 2511401013

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	04/03/12 20:36	
Motor Oil Range	mg/L	ND	0.10	04/03/12 20:36	
n-Octacosane (S)	%	96	50-150	04/03/12 20:36	
o-Terphenyl (S)	%	87	50-150	04/03/12 20:36	

LABORATORY CONTROL SAMPLE: 109200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.88	88	51-114	
Motor Oil Range	mg/L	1	0.98	98	62-120	
n-Octacosane (S)	%			104	50-150	
o-Terphenyl (S)	%			96	50-150	

SAMPLE DUPLICATE: 109201

		2511401001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.018J		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	82	90	10	
o-Terphenyl (S)	%	73	80	10	

SAMPLE DUPLICATE: 109202

Parameter	Units	2511401010 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.085	0.049	54	D6
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	94	96	2	
o-Terphenyl (S)	%	84	86	2	

Date: 04/11/2012 04:40 PM REPORT OF LABORATORY ANALYSIS



#### **QUALITY CONTROL DATA**

Project: Skykomish 60241075

Pace Project No.: 2511401

QC Batch: OEXT/5321 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2511401014, 2511401015, 2511401016, 2511401017, 2511401018, 2511401019, 2511401020, 2511401021,

2511401022

METHOD BLANK: 109404 Matrix: Water

Associated Lab Samples: 2511401014, 2511401015, 2511401016, 2511401017, 2511401018, 2511401019, 2511401020, 2511401021,

2511401022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.020	04/04/12 22:53	
Motor Oil Range	mg/L	ND	0.10	04/04/12 22:53	
n-Octacosane (S)	%	89	50-150	04/04/12 22:53	
o-Terphenyl (S)	%	84	50-150	04/04/12 22:53	

LABORATORY CONTROL SAMPLE: 109405

	.00.100	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Diesel Range	mg/L		0.83	83	51-114	
Motor Oil Range	mg/L	1	0.92	92	62-120	
n-Octacosane (S)	%			93	50-150	
o-Terphenyl (S)	%			89	50-150	

SAMPLE DUPLICATE: 109406

Parameter	Units	2511401014 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L		0.033		_
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	72	96	29	
o-Terphenyl (S)	%	69	91	28	

SAMPLE DUPLICATE: 109407

Parameter	Units	2511401018 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.061	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	68	73	7	
o-Terphenyl (S)	%	65	71	9	

Date: 04/11/2012 04:40 PM REPORT OF LABORATORY ANALYSIS



#### **QUALIFIERS**

Project: Skykomish 60241075

Pace Project No.: 2511401

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

PASI-S Pace Analytical Services - Seattle

# **ANALYTE QUALIFIERS**

Date: 04/11/2012 04:40 PM

D6 The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Skykomish 60241075

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2511401001	S1-AU-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401002	S1-AD-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401003	S1-BU-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401004	S1-BD-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401005	S2-AU-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401006	S2-AD-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401007	S2-BU-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401008	S20-BU-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401009	S2-BD-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401010	S3-AU-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401011	S3-AD-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401012	S3-BU-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401013	S3-BD-0312	EPA 3510	OEXT/5309	NWTPH-Dx	GCSV/3429
2511401014	S3-CU-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401015	S3-CD-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401016	S30-CU-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401017	S4-AU-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401018	S4-AD-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401019	S4-BU-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401020	S4-BD-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401021	S4-CU-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511401022	S4-CD-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433

# 5211401

# CHAIN-OF-CUSTODY / Analytical Request Document



Samples Intact (Y/N)	Custody Sealed Cooler (Y/N)	Received on Ice (Y/N)	Temp in *C	21/9	37/50	DATE Signed (MM/DD/YY):	the second secon		6 of SAMPLER:				1.06.0 128.	3.35, 1.43, 0.1 3.06, 3.69 3.	
Intact	ody Cooler N)	N)	°C			AUTANDIS GIVA EMPLER NAME AND SIGNATURE					5	JANIÐIAC	156.612	3.32,436,0.10	
<u></u>	7	K		0480 7	(18750	124/7 am	am sage	CH80	याविदे	ASCER ASCER	hindy grade		<i>C</i>	7HM-17753 9/m	
SNO	ге соиріці	4MA2		3MIT	<b>BTAG</b>	NOITALINA V YER	ACCEPTE	BMIT	BTAG	NOITALIATION	MONISHED BY !	BELLI	The second secon	JANOITIQAA	
o./ Lab I.D.	Project N	Ьзсе	Residual Chlorine (Y/N)			#Analysis Test #  XXXXXXXXXXXXXXVVVVVVVVVVVVVVVVVVVVVV	HNO <sub>3</sub> HCI NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	N N N N N W # OF CONTAINERS  Unpreserved  H <sub>2</sub> SO <sub>4</sub>	SAMPLE TEMP AT COLLEG	ENDIGHE DATE	SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid god	Air NIGUE Tissue Other	1 BLAMAR  1 BB TRUM adl elqme8  - 52  - 12  - 52  - 13  - 52  - 14  - 52  - 15  - 52  - 52  - 54  - 55  - 54  - 55  - 55  - 55  - 56  - 57  - 58  - 58  - 58  - 58  - 58  - 58  - 58  - 58  - 58  - 58  - 58  - 68  - 68  - 68  - 68  - 78	
	11/10			(N/T) belei	Hill sisylsnA	TNIX	sevitevnesen	i qiza (bila	1 mg(	COLLECTED	)MP)	seboo)		Section D Required Client Information	
				₩ :	Site Locatio	Der forestanden	A STATE OF THE STA	Pace Profile #:		+1075 Kowlsh	175	Project Name:	P+S	Sequested Due Date/TAT:	
	ЯЭНТО	J	A PRO	Ч ВСВР	Tau ¬			Pace Quote Reference:		20M-50			4 MODE A DIS	Mer En Hauseher	
S WATER	DBINKIN	_J 83		к свои	and the second s	ngo pi ni		:ssəıpp4	PQ T	Conff (million			\$0186 t	TM 9HP05	
				RY AGENCY	рталиезя	an Vedd all		Company Nan		these	6.1	Control	0001 45 =	AND POZ OIL: SSEUPPY	
	035	897	T	lagran areas	. Den	hopacd	S DINIS	Invoice Inform Attention:	4	+= 204P	ack Hav	Report To: M		Company: ALTON	
	7 10	e south	SE TIME	Page			.aoqe	Section C			.uojieunojuj	Section B		Section A Required Client Information:	



# CHAIN-OF-CUSTODY / Analytical Request Document 25 1 1 4 0 1

2 Page: Section A Section C Section B Required Client Information Required Project Information: Invoice Information 1471304 Report To: ALLON Address Company Name REGULATORY AGENCY Address: K GROUND WATER DRINKING WATER Purchase Order No.: Pace Quote RCRA OTHER UST TTO100-M06 Reference: Pace Project Site Location Manager: Requested Due Date/TAT: Project Number: STATE: Requested Analysis Filtered (Y/N) Section D **Matrix Codes** C=COMP) COLLECTED Preservatives Required Client Information MATRIX / CODE 0 **Drinking Water** COLLECTION WT Water COMPOSITE COMPOSITE ww Waste Water (G=GRAB Chlorine (Y/N) END/GRAB START Product SL OL WP Soil/Solid # OF CONTAINERS SAMPLE ID Analysis Test Wipe MATRIX CODE (A-Z, 0-9/,-) SAMPLE TYPE Sample IDs MUST BE UNIQUE Tissue Residual Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> Methanol Other SAMPLE H2SO4 NaOH HNO3 무 Pace Project No./ Lab I.D. DATE TIME TIME -031Z 1200 Z 2 4 10 12 SAMPLE CONDITIONS ADDITIONAL COMMENTS RELINQUISHED BY / AFFILIATION DATE ACCEPTED BY / AFFILIATION SAMPLER NAME AND SIGNATURE Custody aled Cool (Y/N) ORIGINAL (Y/N) = PRINT Name of SAMPLER: SIGNATURE of SAMPLERAGE 16 of 19 **DATE Signed** (MM/DD/YY):

# Sample Container Count

2511401

Pace Analytical "

CLIENT: AECOM

COC PAGE of 2 COC ID# 14 68032 Trip Blank(s) Provided?

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG				Comments
1		2 12																	
2																- 72			
3																			
4																	-		
5														-			-	-	
6																	-	-	
7																		-	
8																			
9									-					-		-		-	
10													-					-	
11		1								-			-				-	-	
12		V																	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	A CAN HISTORIAN TO	40mL unpreserved clear vial
	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U		DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z			40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

# Sample Container Count

CLIENT: AECOM

25 1 1 4 0 1

Pace Analytical

WAVE DEPOLITE COTS

COC PAGE 2 of 2 COC ID# 141 304

Trip Blank(s) Provided?

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG			Comments
1		202																
2	1																	
3																		
4																-		
5																		
6		42																
7		202															-	
8																		
9														-				
10		V												-				
11											-							
12																		

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP20	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

# Sample Condition Upon Receipt 25114

Yes No  Temp. Blank Yes No  Samples on ice, cooling process has begun  Date and Initials of person examining contents: 3/28//2
Temp. Blank Yes No  Samples on ice, cooling process has beginn
ne Samples on ice, cooling process has begun
ne Samples on ice, cooling process has begun
Lot # of added preservative
Field Data Required? Y / N

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





April 11, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: Skykomish 60241075 Pace Project No.: 2511402

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on March 28, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett for
Andy Brownfield
andy.brownfield@pacelabs.com

Project Manager

**Enclosures** 

cc: Sarah Albano, AECOM (BNSF)
Cynthia Jennings, BNSF\_AECOM-WA
Eric Storkerson, AECOM (BNSF)
Jennifer Wald, AECOM (BNSF)







#### **CERTIFICATIONS**

Project: Skykomish 60241075

Pace Project No.: 2511402

Washington Certification IDs
940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



# **SAMPLE ANALYTE COUNT**

Project: Skykomish 60241075

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2511402001	2B-W-4-0312	NWTPH-Dx	AY1	4	PASI-S
2511402002	5-W-43-0312	NWTPH-Dx	AY1	4	PASI-S
2511402003	GW-1-0312	NWTPH-Dx	AY1	4	PASI-S
2511402004	MW-38R-0312	NWTPH-Dx	AY1	4	PASI-S
2511402005	GW-4-0312	NWTPH-Dx	AY1	4	PASI-S
2511402006	IB-W-2-0312	NWTPH-Dx	AY1	4	PASI-S
2511402007	GW-3-0312	NWTPH-Dx	AY1	4	PASI-S
2511402008	GW-2-0312	NWTPH-Dx	AY1	4	PASI-S
2511402009	5-W-50-0312	NWTPH-Dx	AY1	4	PASI-S
2511402010	5-W-56-0312	NWTPH-Dx	AY1	4	PASI-S
2511402011	5-W-55-0312	NWTPH-Dx	AY1	4	PASI-S
2511402012	IC-W-1-0312	NWTPH-Dx	AY1	4	PASI-S
2511402013	IC-W-8-0312	NWTPH-Dx	AY1	4	PASI-S
2511402014	IC-W-3-0312	NWTPH-Dx	AY1	4	PASI-S
2511402015	IC-W-4-0312	NWTPH-Dx	AY1	4	PASI-S
2511402016	IC-W-7-0312	NWTPH-Dx	AY1	4	PASI-S
2511402017	ZA-W-42-0312	NWTPH-Dx	AY1	4	PASI-S
2511402018	ZA-W-41-0312	NWTPH-Dx	AY1	4	PASI-S
2511402019	ZA-W-40-0312	NWTPH-Dx	AY1	4	PASI-S
2511402020	5-W-54-0312	NWTPH-Dx	AY1	4	PASI-S
2511402021	ZA-W-400-0312	NWTPH-Dx	AY1	4	PASI-S



#### **PROJECT NARRATIVE**

Project: Skykomish 60241075

Pace Project No.: 2511402

Method: NWTPH-Dx
Description: NWTPH-Dx GCS
Client: BNSF\_AECOM-WA
Date: April 11, 2012

#### **General Information:**

21 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

#### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



Project: Skykomish 60241075

Sample: 2B-W-4-0312	Lab ID: 2511	402001	Collected:	03/26/12	2 15:25	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	od: NWTPI	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
Diesel Range	ND mg	ı/L		0.019	1	04/04/12 13:05	04/05/12 03:4	2	
Motor Oil Range	ND mg	ı/L		0.095	1	04/04/12 13:05	04/05/12 03:4	2 64742-65-0	
Surrogates n-Octacosane (S)	88 %		5	50-150	1	04/04/12 13:05	5 04/05/12 03:4	2 630-02-4	
o-Terphenyl (S)	82 %			50-150	1		04/05/12 03:4		
Sample: 5-W-43-0312	Lab ID: 2511	402002	Collected:	03/26/12	2 16:05	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	od: NWTPI	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
Diesel Range	<b>0.035</b> mg	ı/L		0.019	1	04/04/12 13:05	04/05/12 03:5	9	
Motor Oil Range	ND mg	ı/L		0.097	1	04/04/12 13:05	04/05/12 03:5	9 64742-65-0	
Surrogates									
n-Octacosane (S)	91 %		_	0-150	1		04/05/12 03:5		
o-Terphenyl (S)	84 %		5	50-150	1	04/04/12 13:05	04/05/12 03:5	9 84-15-1	
Sample: GW-1-0312	Lab ID: 2511	402003	Collected:	03/26/12	2 16:25	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	od: NWTPI	H-Dx Prepara	ation Me	thod: Ef	PA 3510			
Diesel Range	<b>0.063</b> mg	ı/L		0.019	1	04/04/12 13:05	04/05/12 04:1	6	
Motor Oil Range <b>Surrogates</b>	ND mg			0.095	1	04/04/12 13:05	04/05/12 04:1	6 64742-65-0	
n-Octacosane (S)	70 %		5	50-150	1	04/04/12 13:05	5 04/05/12 04:1	6 630-02-4	
p-Terphenyl (S)	66 %		5	50-150	1		04/05/12 04:1		
Sample: MW-38R-0312	Lab ID: 2511	402004	Collected:	03/26/1:	2 17:00	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report		DF	Prepared	Analyzed	CAS No.	Qua
			<u> </u>			·			
NWTPH-Dx GCS	Analytical Meth	od: NWTPI	H-Dx Prepara	ation Me					
Diesel Range	<b>0.049</b> mg			0.020	1		04/05/12 04:3		
Motor Oil Range	ND mg	ı/L		0.099	1	04/04/12 13:05	04/05/12 04:3	3 64742-65-0	
•	00.0/		_	0.450	4	04/04/40 40:05	04/05/40 04:0	2 620 02 4	
Surrogates n-Octacosane (S) o-Terphenyl (S)	62 % 59 %			50-150 50-150	1 1		5 04/05/12 04:3 5 04/05/12 04:3		



Project: Skykomish 60241075

Sample: GW-4-0312	Lab ID: 251	1402005	Collected: 03/	27/12 09:10	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report Lin	nit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparatio	n Method: E	EPA 3510			
Diesel Range	<b>0.16</b> m	g/L	0.0	)21 1	04/04/12 13:05	5 04/05/12 04:50	0	
Motor Oil Range <b>Surrogates</b>	<b>0.11</b> m	g/L	0	.10 1	04/04/12 13:05	5 04/05/12 04:50	0 64742-65-0	
n-Octacosane (S)	93 %	1	50-1	50 1	04/04/12 13:05	04/05/12 04:50	0 630-02-4	
o-Terphenyl (S)	87 %	1	50-1	50 1	04/04/12 13:05	5 04/05/12 04:50	0 84-15-1	
Sample: IB-W-2-0312	Lab ID: 251	1402006	Collected: 03/	27/12 09:50	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report Lin	nit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparatio	n Method: E	EPA 3510			
Diesel Range	<b>0.051</b> m	g/L	0.0	)21 1	04/04/12 13:05	5 04/05/12 05:0	7	
Motor Oil Range <b>Surrogates</b>	ND m	g/L	0.	.10 1	04/04/12 13:05	5 04/05/12 05:0	7 64742-65-0	
n-Octacosane (S)	86 %	1	50-1	50 1	04/04/12 13:05	04/05/12 05:0	7 630-02-4	
o-Terphenyl (S)	78 %	1	50-1	50 1	04/04/12 13:05	5 04/05/12 05:0	7 84-15-1	
Sample: GW-3-0312	Lab ID: 251	1402007	Collected: 03/	27/12 10:50	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report Lin	nit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparatio	n Method: E	EPA 3510			
Diesel Range	<b>0.047</b> m	g/L	0.0	)21 1	04/04/12 13:05	5 04/05/12 05:23	3	
Motor Oil Range <b>Surrogates</b>	ND m	g/L	0	.10 1	04/04/12 13:05	5 04/05/12 05:23	3 64742-65-0	
n-Octacosane (S)	96 %	ı	50-1	50 1	04/04/12 13:05	5 04/05/12 05:23	3 630-02-4	
o-Terphenyl (S)	89 %	1	50-1	50 1	04/04/12 13:05	5 04/05/12 05:23	3 84-15-1	
Sample: GW-2-0312	Lab ID: 251	1402008	Collected: 03/	27/12 11:40	Received: 0	3/28/12 08:40	Matrix: Water	
Parameters	Results	Units	Report Lin	nit DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparatio	n Method: E	EPA 3510			
Diesel Range	<b>0.33</b> m	g/L	0.0	20 1	04/05/12 09:30	0 04/05/12 14:2	1	
Motor Oil Range	<b>0.17</b> m	-	0.0	99 1	04/05/12 09:30	04/05/12 14:2	1 64742-65-0	
•								
Surrogates n-Octacosane (S)	96 %	ı	50-1	50 1	04/05/12 09:30	04/05/12 14:2	1 630-02-4	



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Pace Project No.: 2511402								
Sample: 5-W-50-0312	Lab ID: 251	11402009	Collected: 03/27/1	2 13:30	Received: 03	/28/12 08:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	thod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>2.0</b> m	ıg/L	0.021	1	04/05/12 09:30	04/05/12 14:55		
Motor Oil Range <b>Surrogates</b>	<b>0.66</b> m	ıg/L	0.10	1	04/05/12 09:30	04/05/12 14:55	64742-65-0	
n-Octacosane (S)	92 %	)	50-150	1	04/05/12 09:30	04/05/12 14:55	630-02-4	
o-Terphenyl (S)	87 %	)	50-150	1	04/05/12 09:30	04/05/12 14:55	84-15-1	
Sample: 5-W-56-0312	Lab ID: 251	11402010	Collected: 03/27/1	2 14:15	Received: 03	/28/12 08:40 <b>N</b>	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	thod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.42</b> m	ıg/L	0.020	1	04/05/12 09:30	04/05/12 15:12		
Motor Oil Range <b>Surrogates</b>	<b>0.41</b> m	ıg/L	0.099	1	04/05/12 09:30	04/05/12 15:12	64742-65-0	
n-Octacosane (S)	99 %	)	50-150	1	04/05/12 09:30	04/05/12 15:12	630-02-4	
o-Terphenyl (S)	89 %	)	50-150	1	04/05/12 09:30	04/05/12 15:12	84-15-1	
Sample: 5-W-55-0312	Lab ID: 251	11402011	Collected: 03/27/1	2 15:10	Received: 03	3/28/12 08:40 M	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	thod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.040</b> m	ıg/L	0.021	1	04/05/12 09:30	04/05/12 15:29		
Motor Oil Range <b>Surrogates</b>	ND m	ıg/L	0.10	1	04/05/12 09:30	04/05/12 15:29	64742-65-0	
n-Octacosane (S)	100 %	)	50-150	1	04/05/12 09:30	04/05/12 15:29	630-02-4	
o-Terphenyl (S)	88 %	)	50-150	1	04/05/12 09:30	04/05/12 15:29	84-15-1	
Sample: IC-W-1-0312	Lab ID: 251	11402012	Collected: 03/27/1	2 09:40	Received: 03	3/28/12 08:40 M	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	thod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.091</b> m	ıg/L	0.019	1	04/05/12 09:30	04/05/12 15:47		
Motor Oil Range <b>Surrogates</b>	ND m	ig/L	0.094	1	04/05/12 09:30	04/05/12 15:47	64742-65-0	
n-Octacosane (S)	98 %	)	50-150	1	04/05/12 09:30	04/05/12 15:47	630-02-4	



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Sample: IC-W-8-0312	Lab ID: 2511	402013	Collected: 03/2	//12 10:30	Received: 0	3/28/12 08:40	Matrix: Water		
Parameters	Results	Units	Report Limi	DF	Prepared	Analyzed	CAS No.	Qua	
NWTPH-Dx GCS	Analytical Meth	od: NWTPł	H-Dx Preparation	Method: E	EPA 3510				
Diesel Range	<b>0.21</b> mg	/L	0.01	9 1	04/05/12 09:30	04/05/12 16:0	4		
Motor Oil Range <b>Surrogates</b>	<b>0.14</b> mg	/L	0.09	4 1	04/05/12 09:30	04/05/12 16:0	4 64742-65-0		
n-Octacosane (S)	101 %		50-15	0 1	04/05/12 09:30	04/05/12 16:0	4 630-02-4		
o-Terphenyl (S)	92 %		50-15	0 1	04/05/12 09:30	04/05/12 16:0	4 84-15-1		
Sample: IC-W-3-0312	Lab ID: 2511	402014	Collected: 03/2	7/12 11:55	Received: 0	3/28/12 08:40	Matrix: Water		
Parameters	Results	Units	Report Limi	DF	Prepared	Analyzed	CAS No.	Qua	
NWTPH-Dx GCS	Analytical Meth	od: NWTPI	H-Dx Preparation	Method: E	PA 3510				
Diesel Range	<b>0.030</b> mg	/L	0.01	9 1	04/05/12 09:30	04/05/12 16:5	6		
Motor Oil Range	ND mg		0.09			04/05/12 16:5			
Surrogates									
n-Octacosane (S)	106 %		50-15	-		04/05/12 16:5			
o-Terphenyl (S)	95 %		50-15	0 1	04/05/12 09:30	04/05/12 16:5	6 84-15-1		
Sample: IC-W-4-0312	Lab ID: 2511	402015	Collected: 03/2	7/12 13:00	Received: 0	3/28/12 08:40	Matrix: Water		
Parameters	Results	Units	Report Limi	DF	Prepared	Analyzed	CAS No.	Qua	
NWTPH-Dx GCS	Analytical Meth	od: NWTPł	H-Dx Preparation	Method: E	EPA 3510				
Diesel Range	<b>0.26</b> mg	/L	0.01	9 1	04/05/12 09:30	04/05/12 17:1	3		
Motor Oil Range <b>Surrogates</b>	<b>0.16</b> mg		0.09	5 1	04/05/12 09:30	04/05/12 17:1	3 64742-65-0		
n-Octacosane (S)	102 %		50-15	0 1	04/05/12 09:30	04/05/12 17:1	3 630-02-4		
o-Terphenyl (S)	91 %		50-15	0 1	04/05/12 09:30	04/05/12 17:1	3 84-15-1		
Sample: IC-W-7-0312	Lab ID: 2511	402016	Collected: 03/2	7/12 14:15	Received: 0	3/28/12 08:40	Matrix: Water		
Parameters	Results	Units	Report Limi	DF	Prepared	Analyzed	CAS No.	Qua	
	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
NWTPH-Dx GCS	Analytical Meth	ou. NVVII I							
	Analytical Meth  0.077 mg		0.01	9 1	04/05/12 09:30	04/05/12 17:3	0		
Diesel Range	•	/L	0.01 0.09			) 04/05/12 17:3 ) 04/05/12 17:3			
Diesel Range Motor Oil Range <i>Surrogates</i>	<b>0.077</b> mg	/L	0.09	5 1	04/05/12 09:30	04/05/12 17:3	0 64742-65-0		
NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates  n-Octacosane (S)  o-Terphenyl (S)	<b>0.077</b> mg	/L		5 1 0 1	04/05/12 09:30 04/05/12 09:30		0 64742-65-0 0 630-02-4		



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Sample: ZA-W-42-0312	Lab ID:	2511402017	Collected:	03/27/12	15:10	Received: 03	/28/12 08:40 N	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical	Method: NWTP	H-Dx Prepara	ation Met	hod: El	PA 3510			
Diesel Range	0.1	<b>1</b> mg/L		0.019	1	04/05/12 09:30	04/05/12 17:47		
Motor Oil Range	N	D mg/L		0.094	1	04/05/12 09:30	04/05/12 17:47	64742-65-0	
Surrogates	10	2 %		50-150	1	04/05/12 00:20	04/05/12 17:47	620 02 4	
n-Octacosane (S) o-Terphenyl (S)		2 %		50-150	1		04/05/12 17:47		
o-respicitlys (o)	V	2 70		70-100	•	04/03/12 03:00	04/03/12 17.47	04-10-1	
Sample: ZA-W-41-0312	Lab ID:	2511402018	Collected:	03/27/12	16:00	Received: 03	/28/12 08:40 N	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical	Method: NWTP	H-Dx Prepara	ation Met	hod: El	PA 3510			
Diesel Range	0.05	2 mg/L		0.019	1	04/05/12 09:30	04/05/12 18:04		
Motor Oil Range		D mg/L		0.095	1		04/05/12 18:04	64742-65-0	
Surrogates		J							
n-Octacosane (S)	8	2 %	5	50-150	1	04/05/12 09:30	04/05/12 18:04	630-02-4	
o-Terphenyl (S)	7	3 %	5	50-150	1	04/05/12 09:30	04/05/12 18:04	84-15-1	
Sample: ZA-W-40-0312	Lab ID:	2511402019	Collected:	03/27/12	2 16:50	Received: 03	/28/12 08:40 N	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical	Method: NWTP	H-Dx Prepara	ation Met	hod: Ef	PA 3510			
Diesel Range	0.03	6 mg/L		0.019	1	04/05/12 09:30	04/05/12 18:21		
Motor Oil Range	N	D "		0.004	4	04/05/12 00:20	04/05/12 18:21	64742 65 0	
meter en riange	11	D mg/L		0.094	1	04/03/12 09.30	04/03/12 10.21	04742-03-0	
Surrogates		· ·							
Surrogates n-Octacosane (S)	10	4 %		50-150	1	04/05/12 09:30	04/05/12 18:21	630-02-4	
Surrogates	10	· ·				04/05/12 09:30		630-02-4	
Surrogates n-Octacosane (S)	10 9	4 %		50-150 50-150	1 1	04/05/12 09:30	04/05/12 18:21 04/05/12 18:21	630-02-4	
Surrogates n-Octacosane (S) o-Terphenyl (S)	10 9	4 % 2 %	Ę	50-150 50-150 03/27/12	1 1	04/05/12 09:30 04/05/12 09:30	04/05/12 18:21 04/05/12 18:21	630-02-4 84-15-1	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: 5-W-54-0312	Lab ID:	4 % 2 % <b>2511402020</b>	Collected:	50-150 50-150 03/27/12	1 1 2 16:20 DF	04/05/12 09:30 04/05/12 09:30 Received: 03 Prepared	04/05/12 18:21 04/05/12 18:21 /28/12 08:40 M	630-02-4 84-15-1 Matrix: Water	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: 5-W-54-0312  Parameters  NWTPH-Dx GCS	Lab ID: Results Analytical	4 % 2 %  2511402020  Units  Method: NWTP	Collected:	50-150 50-150 03/27/12	1 1 2 16:20 DF	04/05/12 09:30 04/05/12 09:30 Received: 03 Prepared	04/05/12 18:21 04/05/12 18:21 /28/12 08:40 M Analyzed	630-02-4 84-15-1 Matrix: Water	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: 5-W-54-0312 Parameters  NWTPH-Dx GCS  Diesel Range	Lab ID: Results Analytical 0.03	4 % 2 %  2511402020  Units  Method: NWTP 0 mg/L	Collected:	50-150 50-150 03/27/12 Limitation Met	1 1 2 16:20 DF	04/05/12 09:30 04/05/12 09:30 Received: 03 Prepared PA 3510 04/05/12 09:30	04/05/12 18:21 04/05/12 18:21 /28/12 08:40 M Analyzed	630-02-4 84-15-1 Matrix: Water CAS No.	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: 5-W-54-0312 Parameters  NWTPH-Dx GCS  Diesel Range	Lab ID: Results Analytical 0.03	4 % 2 %  2511402020  Units  Method: NWTP	Collected:	50-150 50-150 03/27/12 Limitation Metion 0.020	1 1 2 16:20 DF hod: EF	04/05/12 09:30 04/05/12 09:30 Received: 03 Prepared PA 3510 04/05/12 09:30	04/05/12 18:21 04/05/12 18:21 /28/12 08:40 M Analyzed 04/05/12 18:39	630-02-4 84-15-1 Matrix: Water CAS No.	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: 5-W-54-0312 Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range	Lab ID: Results Analytical 0.03	4 % 2 %  2511402020  Units  Method: NWTP 0 mg/L	Collected: Report H-Dx Prepara	50-150 50-150 03/27/12 Limitation Metion 0.020	1 1 2 16:20 DF hod: EF	04/05/12 09:30 04/05/12 09:30 Received: 03 Prepared PA 3510 04/05/12 09:30 04/05/12 09:30	04/05/12 18:21 04/05/12 18:21 /28/12 08:40 M Analyzed 04/05/12 18:39	630-02-4 84-15-1 Matrix: Water CAS No.	Qual



Project: Skykomish 60241075

Sample: ZA-W-400-0312	Lab ID: 251	1402021	Collected: 03/27/1	2 17:10	Received: 03	/28/12 08:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	nod: NWTPH-	-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.025</b> m	g/L	0.019	1	04/05/12 09:30	04/05/12 19:13		
Motor Oil Range	ND m	g/L	0.095	1	04/05/12 09:30	04/05/12 19:13	64742-65-0	
Surrogates n-Octacosane (S)	106 %		50-150	1	04/05/12 09:30	04/05/12 19:13	630-02-4	
o-Terphenyl (S)	95 %		50-150	1	04/05/12 09:30	04/05/12 19:13	84-15-1	



#### **QUALITY CONTROL DATA**

Project: Skykomish 60241075

Pace Project No.: 2511402

QC Batch: OEXT/5321 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2511402001, 2511402002, 2511402003, 2511402004, 2511402005, 2511402006, 2511402007

METHOD BLANK: 109404 Matrix: Water

Associated Lab Samples: 2511402001, 2511402002, 2511402003, 2511402004, 2511402005, 2511402006, 2511402007

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.020	04/04/12 22:53	
Motor Oil Range	mg/L	ND	0.10	04/04/12 22:53	
n-Octacosane (S)	%	89	50-150	04/04/12 22:53	
o-Terphenyl (S)	%	84	50-150	04/04/12 22:53	

LABORATORY CONTROL SAMPLE: 109405

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		0.83	83	51-114	
Motor Oil Range	mg/L	1	0.92	92	62-120	
n-Octacosane (S)	%			93	50-150	
o-Terphenyl (S)	%			89	50-150	

SAMPLE DUPLICATE: 109406

Parameter	Units	2511401014 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L		0.033		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	72	96	29	
o-Terphenyl (S)	%	69	91	28	

SAMPLE DUPLICATE: 109407

		2511401018	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.061	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	68	73	7	
o-Terphenyl (S)	%	65	71	9	



#### **QUALITY CONTROL DATA**

Project: Skykomish 60241075

Pace Project No.: 2511402

QC Batch: OEXT/5327 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2511402008, 2511402009, 2511402010, 2511402011, 2511402012, 2511402013, 2511402014, 2511402015,

2511402016, 2511402017, 2511402018, 2511402019, 2511402020, 2511402021

METHOD BLANK: 109590 Matrix: Water

Associated Lab Samples: 2511402008, 2511402009, 2511402010, 2511402011, 2511402012, 2511402013, 2511402014, 2511402015,

2511402016, 2511402017, 2511402018, 2511402019, 2511402020, 2511402021

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	04/05/12 13:47	
Motor Oil Range	mg/L	ND	0.10	04/05/12 13:47	
n-Octacosane (S)	%	96	50-150	04/05/12 13:47	
o-Terphenyl (S)	%	85	50-150	04/05/12 13:47	

LABORATORY CONTROL SAMPLE: 109591

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.74	74	51-114	
Motor Oil Range	mg/L	1	0.81	81	62-120	
n-Octacosane (S)	%			84	50-150	
o-Terphenyl (S)	%			77	50-150	

SAMPLE DUPLICATE: 109592

		2511402008	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.33	0.25	28	
Motor Oil Range	mg/L	0.17	0.13	25	
n-Octacosane (S)	%	96	67	32	
o-Terphenyl (S)	%	87	63	30	

SAMPLE DUPLICATE: 109593

Parameter	Units	2511402020 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.030	0.034	14	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	106	104	2	
o-Terphenyl (S)	%	94	94	4	



#### **QUALIFIERS**

Project: Skykomish 60241075

Pace Project No.: 2511402

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 04/11/2012 03:15 PM

PASI-S Pace Analytical Services - Seattle



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Skykomish 60241075

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2511402001	2B-W-4-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511402002	5-W-43-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511402003	GW-1-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511402004	MW-38R-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511402005	GW-4-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511402006	IB-W-2-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511402007	GW-3-0312	EPA 3510	OEXT/5321	NWTPH-Dx	GCSV/3433
2511402008	GW-2-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402009	5-W-50-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402010	5-W-56-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402011	5-W-55-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402012	IC-W-1-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402013	IC-W-8-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402014	IC-W-3-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402015	IC-W-4-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402016	IC-W-7-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402017	ZA-W-42-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402018	ZA-W-41-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402019	ZA-W-40-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402020	5-W-54-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437
2511402021	ZA-W-400-0312	EPA 3510	OEXT/5327	NWTPH-Dx	GCSV/3437





April 12, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett for Andy Brownfield andy.brownfield@pacelabs.com

Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







#### **CERTIFICATIONS**

Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

Washington Certification IDs
940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



# **SAMPLE ANALYTE COUNT**

Project: BNSF-Skykomish 60241075

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2511414001	MW-16-0312	NWTPH-Dx	AY1	4	PASI-S
2511414002	ZA-W-9-0312	NWTPH-Dx	AY1	4	PASI-S
2511414003	ZA-W-10-0312	NWTPH-Dx	AY1	4	PASI-S
2511414004	ZA-W-100-0312	NWTPH-Dx	AY1	4	PASI-S
2511414005	MW-4-0312	NWTPH-Dx	AY1	4	PASI-S
2511414006	MW-3-0312	NWTPH-Dx	AY1	4	PASI-S
2511414007	1B-W-3-0312	NWTPH-Dx	AY1	4	PASI-S
2511414008	1B-W-23-0312	NWTPH-Dx	AY1	4	PASI-S
2511414009	1A-W-4-0312	NWTPH-Dx	AY1	4	PASI-S
2511414010	1A-W-40-0312	NWTPH-Dx	AY1	4	PASI-S
2511414011	EW-2A-0312	NWTPH-Dx	AY1	4	PASI-S
2511414012	EW-1-0312	NWTPH-Dx	AY1	4	PASI-S
2511414013	5-W-17-0312	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2511414014	5-W-18-0312	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2511414015	5-W-16-0312	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2511414016	5-W-160-0312	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2511414017	5-W-19-0312	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2511414018	5-W-14-0312	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2511414019	5-W-15-0312	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2511414020	5-W-51-0312	NWTPH-Dx	AY1	4	PASI-S



Project: BNSF-Skykomish 60241075

Complete MW 46 0242	1.4.10 0544	14.4004	Callagte # 20/00/	40.00:45	Danabarda 22	100/40 00:07	Madeiro Marter	
Sample: MW-16-0312	Lab ID: 25114	114001	Collected: 03/28/	12 08:45	Received: 03	729/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	<b>0.020</b> mg/	L	0.019	1	04/05/12 14:05	04/06/12 00:3	8	
Motor Oil Range	ND mg/	L	0.095	1	04/05/12 14:05	04/06/12 00:3	8 64742-65-0	
Surrogates n-Octacosane (S)	101 %		50-150	1	04/05/12 14:05	04/06/12 00:3	8 630-02-4	
o-Terphenyl (S)	92 %		50-150	1	04/05/12 14:05			
o 10.p.10.1.j. (0)	32 %		33 .33	·	0 00. 12 1 00	0 1/00/ 12 0010		
Sample: ZA-W-9-0312	Lab ID: 25114	114002	Collected: 03/28/	12 09:15	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	<b>0.60</b> mg/	L	0.019	1	04/05/12 14:05	04/06/12 00:5	6	
Motor Oil Range	<b>0.46</b> mg/	L	0.095	1	04/05/12 14:05	04/06/12 00:5	6 64742-65-0	
Surrogates	00.0/		50.450		04/05/40 44 05	04/00/40 00 5		
n-Octacosane (S)	92 % 85 %		50-150 50-150	1 1	04/05/12 14:05 04/05/12 14:05			
o-Terphenyl (S)	65 %		50-150	'	04/05/12 14.05	04/00/12 00.5	0 04-10-1	
Sample: ZA-W-10-0312	Lab ID: 25114	114003	Collected: 03/28/	12 10:05	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	<b>0.26</b> mg/	L	0.019	1	04/05/12 14:05	04/06/12 01:3	0	
Motor Oil Range	<b>0.35</b> mg/	L	0.095	1	04/05/12 14:05	04/06/12 01:3	0 64742-65-0	
Surrogates	404.0/		50.450	_	04/05/40 44 05	0.4/0.0/4.0.04.0		
n-Octacosane (S)	101 %		50-150	1	04/05/12 14:05			
o-Terphenyl (S)	93 %		50-150	1	04/05/12 14:05	04/06/12 01:3	0 84-15-1	
Sample: ZA-W-100-0312	Lab ID: 25114	114004	Collected: 03/28/	12 10:15	Received: 03	/29/12 09:37	Matrix: Water	
	Lub ID. 2011-	114004						
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
	Results	Units	Report Limit H-Dx Preparation M		· ·	Analyzed	CAS No.	Qual
	Results	Units	<u> </u>		· ·			Qual
NWTPH-Dx GCS	Results  Analytical Metho	Units od: NWTPI	H-Dx Preparation M	lethod: E	PA 3510	04/06/12 02:2	1	Qual
NWTPH-Dx GCS Diesel Range	Results  Analytical Metho  0.20 mg/	Units od: NWTPI	H-Dx Preparation M	lethod: E	PA 3510 04/05/12 14:05	04/06/12 02:2	1	Qual
NWTPH-Dx GCS  Diesel Range  Motor Oil Range	Results  Analytical Metho  0.20 mg/	Units od: NWTPI	H-Dx Preparation M	lethod: E	PA 3510 04/05/12 14:05	04/06/12 02:2 04/06/12 02:2 04/06/12 02:2	1 1 64742-65-0 1 630-02-4	Qual



Project: BNSF-Skykomish 60241075

Sample: MW-4-0312	Lab ID: 2511	414005	Collected: 03/28/1	2 10:45	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.16</b> mg	ı/L	0.019	1	04/05/12 14:05	04/06/12 02:38	3	
Motor Oil Range	<b>0.22</b> mg	ı/L	0.095	1	04/05/12 14:05	04/06/12 02:38	8 64742-65-0	
Surrogates n-Octacosane (S)	84 %		50-150	1	04/05/12 14:05	04/06/12 02:3:	8 630-02-4	
p-Terphenyl (S)	78 %		50-150	1	04/05/12 14:05			
, , ,								
Sample: MW-3-0312	Lab ID: 2511	414006	Collected: 03/28/1	2 12:20	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
IWTPH-Dx GCS	Analytical Meth	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.078</b> mg	ı/L	0.019	1	04/05/12 14:05	04/06/12 02:5	5	
Motor Oil Range	<b>0.11</b> mg	ı/L	0.095	1	04/05/12 14:05	04/06/12 02:5	5 64742-65-0	
Surrogates	0/							
n-Octacosane (S)	75 %		50-150	1	04/05/12 14:05			
p-Terphenyl (S)	68 %		50-150	1	04/05/12 14:05	04/06/12 02:5	5 84-15-1	
Sample: 1B-W-3-0312	Lab ID: 2511	414007	Collected: 03/28/1	2 10:00	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
WTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.035</b> mg	ı/L	0.019	1	04/05/12 14:05	04/06/12 03:13	3	
Motor Oil Range	ND mg	ı/L	0.095	1	04/05/12 14:05	04/06/12 03:13	3 64742-65-0	
Surrogates n-Octacosane (S)	99 %		50-150	1	04/05/12 14:05	04/06/12 02:1	2 620 02 4	
p-Terphenyl (S)	99 %		50-150	1	04/05/12 14:05			
- reiphenyi (3)	91 /0		30-130	'	04/03/12 14.03	04/00/12 03.1	04-10-1	
Sample: 1B-W-23-0312	Lab ID: 2511	414008	Collected: 03/28/1	2 11:45	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
WTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.039</b> mg	ı/L	0.019	1	04/05/12 14:05	04/06/12 03:30	)	
Motor Oil Range	ND mg	ı/L	0.095	1	04/05/12 14:05	04/06/12 03:30	0 64742-65-0	
Surrogates								
	95 %		50-150	1	04/05/12 14:05	04/06/12 03:30	1 630-02-4	
n-Octacosane (S) o-Terphenyl (S)	86 %		50-150	1	04/05/12 14:05			



Project: BNSF-Skykomish 60241075

Sample: 1A-W-4-0312	Lab ID: 2511	1414009	Collected: 03/28/1	12 09:00	Received: 03	/29/12 09:37 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Meth	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg	<sub>J</sub> /L	0.019	1	04/05/12 14:05	04/06/12 03:47		
Motor Oil Range <b>Surrogates</b>	ND mg	J/L	0.095	1	04/05/12 14:05	04/06/12 03:47	64742-65-0	
n-Octacosane (S)	105 %		50-150	1	04/05/12 14:05	04/06/12 03:47	630-02-4	
o-Terphenyl (S)	97 %		50-150	1	04/05/12 14:05	04/06/12 03:47	84-15-1	
Sample: 1A-W-40-0312	Lab ID: 2511	1414010	Collected: 03/28/1	12 09:30	Received: 03	3/29/12 09:37 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Meth	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg	ı/L	0.019	1	04/05/12 14:05	04/06/12 19:02		
Motor Oil Range <b>Surrogates</b>	ND mg		0.094	1	04/05/12 14:05	04/06/12 19:02	64742-65-0	
n-Octacosane (S)	112 %		50-150	1	04/05/12 14:05	04/06/12 19:02	630-02-4	
o-Terphenyl (S)	104 %		50-150	1	04/05/12 14:05	04/06/12 19:02	84-15-1	
Sample: EW-2A-0312	Lab ID: 2511	1414011	Collected: 03/28/1	12 10:55	Received: 03	3/29/12 09:37 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Meth	od: NWTP	PH-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.020</b> mg	ı/L	0.019	1	04/05/12 14:05	04/06/12 19:37		
Motor Oil Range <i>Surrogates</i>	ND mg		0.094	1	04/05/12 14:05	04/06/12 19:37	64742-65-0	
n-Octacosane (S)	102 %		50-150	1		04/06/12 19:37		
o-Terphenyl (S)	95 %		50-150	1	04/05/12 14:05	04/06/12 19:37	84-15-1	
Sample: EW-1-0312	Lab ID: 2511	1414012	Collected: 03/28/1	12 13:15	Received: 03	/29/12 09:37 N	latrix: Water	
	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Parameters			Analytical Method: NWTPH-Dx Preparation Method: EPA 3510					
Parameters  NWTPH-Dx GCS		nod: NWTP	PH-Dx Preparation Me	ethod: E	PA 3510			
	Analytical Meth		PH-Dx Preparation Me	ethod: E		04/06/12 19:54		
NWTPH-Dx GCS  Diesel Range  Motor Oil Range		ı/L			04/05/12 14:05	04/06/12 19:54 04/06/12 19:54	64742-65-0	
NWTPH-Dx GCS	Analytical Meth	ı/L	0.019	1	04/05/12 14:05 04/05/12 14:05			



Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

Sample: 5-W-17-0312	Lab ID: 2511	414013	Collected:	03/28/1	12 13:05	Received: 0	3/29/12 09:37 N	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Prepara	ation M	ethod: El	PA 3510			
Diesel Range	ND mg.	/L		0.019	1	04/05/12 14:05	04/06/12 06:04		
Motor Oil Range	ND mg	/L		0.094	1	04/05/12 14:05	04/06/12 06:04	64742-65-0	
Surrogates									
n-Octacosane (S)	74 %			0-150	1		04/06/12 06:04		
o-Terphenyl (S)	70 %		5	0-150	1	04/05/12 14:05	04/06/12 06:04	84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Meth	od: NWTP	H-Dx Prepara	ation M	ethod: El	PA 3510			
Diesel Range SG	ND mg	/L		0.019	1	04/02/12 11:30	04/06/12 18:00	)	
Motor Oil Range SG Surrogates	ND mg.	/L		0.094	1	04/02/12 11:30	04/06/12 18:00	64742-65-0	
n-Octacosane (S) SG	104 %		5	0-150	1	04/02/12 11:30	04/06/12 18:00	630-02-4	
o-Terphenyl (S) SG	100 %		5	60-150	1	04/02/12 11:30	04/06/12 18:00	84-15-1	
Sample: 5-W-18-0312	Lab ID: 2511	414014	Collected:	03/28/1	12 13:40	Received: 0	3/29/12 09:37 N	Matrix: Water	
Parameters	Results	Units	Report		DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Meth	od: NIM/TP	H-Dy Prepar	ation M	ethod: El	· PΔ 3510		_	
	-		TI-DX TTCpare						
Diesel Range	<b>0.095</b> mg.			0.019	1		04/06/12 06:21		
Motor Oil Range Surrogates	<b>0.095</b> mg.	/L		0.094	1	04/05/12 14:05	04/06/12 06:21	64742-65-0	
n-Octacosane (S)	72 %		5	0-150	1	04/05/12 14:05	04/06/12 06:21	630-02-4	
o-Terphenyl (S)	68 %			0-150	1		04/06/12 06:21		
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range SG	<b>0.022</b> mg	/I		0.019	1	04/02/12 11:30	04/06/12 18:42	)	
Motor Oil Range SG	ND mg			0.013	1		04/06/12 18:42		
Surrogates	112 1119			0.000	•	0 1702712 11.00	0 1/00/12 10:12	. 017 12 00 0	
n-Octacosane (S) SG	128 %		5	0-150	1	04/02/12 11:30	04/06/12 18:42	630-02-4	
o-Terphenyl (S) SG	120 %		5	60-150	1	04/02/12 11:30	04/06/12 18:42	84-15-1	
Sample: 5-W-16-0312	Lab ID: 2511	414015	Collected:	03/28/1	12 14:30	Received: 0	3/29/12 09:37 N	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Meth	od: NWTP	H-Dx Prepara	ation M	ethod: El	PA 3510			
	<b>0.027</b> mg		•				. 04/06/12 06:29		
Diesel Range Motor Oil Range	<b>0.027</b> mg. ND mg.			0.019	1 1		5 04/06/12 06:38 5 04/06/12 06:38		
Surrogates	חאו שאו uig.	<i>,</i> ∟		0.034	1	0+/05/12 14.05	04/00/12 00.30	04142-00-0	
n-Octacosane (S)	77 %		5	0-150	1	04/05/12 14:05	04/06/12 06:38	630-02-4	
o-Terphenyl (S)	70 %			0-150	1		04/06/12 06:38		
NWTPH-Dx GCS Silica Gel	Analytical Meth	od: NWTP	H-Dx Prepara	ation M	ethod: El	PA 3510			
Diesel Range SG	ND mg	/I		0.019	1	04/02/12 11:30	04/06/12 19:04	L	
Motor Oil Range SG	ND mg			0.019	1		04/06/12 19:04		
	14D IIIg.	-		J.JJ7	•	5 17 SET 12 11.00	5 1, 50/ 12 10:0 <del>1</del>	5 17 <del>12</del> -00-0	
Date: 04/12/2012 11:27 AM	REPORT OF LABORATORY ANALYSIS								Page 7 of 1

#### REPORT OF LABORATORY ANALYSIS



Project: BNSF-Skykomish 60241075

Sample: 5-W-16-0312	Lab ID: 251	1414015	Collected:	03/28/1	2 14:30	Received: 0	3/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Prepara	ation Me	thod: EF	PA 3510			
Surrogates									
n-Octacosane (S) SG	126 %		_	0-150	1		04/06/12 19:0		
o-Terphenyl (S) SG	123 %		5	0-150	1	04/02/12 11:30	04/06/12 19:0	4 84-15-1	
Sample: 5-W-160-0312	Lab ID: 251	1414016	Collected:	03/28/1	2 14:45	Received: 0	3/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ation Me	thod: EF	PA 3510			
Diesel Range	<b>0.027</b> m	g/L		0.019	1	04/05/12 14:05	04/06/12 06:5	5	
Motor Oil Range	ND m	-		0.094	1	04/05/12 14:05	04/06/12 06:5	5 64742-65-0	
Surrogates									
n-Octacosane (S)	83 %			0-150	1		04/06/12 06:5		
o-Terphenyl (S)	76 %		5	0-150	1	04/05/12 14:05	04/06/12 06:5	5 84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range SG	ND m	g/L		0.019	1	04/03/12 13:15	04/04/12 00:3	7	
Motor Oil Range SG	ND m	g/L		0.095	1	04/03/12 13:15	04/04/12 00:3	7 64742-65-0	
Surrogates			_						
n-Octacosane (S) SG	70 %		_	0-150	1		04/04/12 00:3		
o-Terphenyl (S) SG	66 %		5	50-150	1	04/03/12 13:18	5 04/04/12 00:3	7 84-15-1	
Sample: 5-W-19-0312	Lab ID: 251	1414017	Collected:	03/28/1	2 14:20	Received: 0	3/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ation Me	thod: EF	PA 3510			
Diesel Range	ND m	g/L		0.019	1	04/05/12 15:05	04/06/12 07:1	2	
Motor Oil Range	ND m	g/L		0.094	1	04/05/12 15:05	04/06/12 07:1	2 64742-65-0	
Surrogates	00.0/		F	0.450	4	04/05/40 45:00	04/00/40 07:4	0 000 00 4	
n-Octacosane (S) o-Terphenyl (S)	96 % 88 %			60-150 60-150	1 1		5 04/06/12 07:1 5 04/06/12 07:1		
o-respirently (3)	00 /0			00-130	'	04/03/12 13.00	04/00/12 07.1	2 04-13-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Prepara	ation Me	thod: EF	PA 3510			
Diesel Range SG	ND m	g/L		0.019	1	04/03/12 13:15	04/04/12 00:5	4	
Motor Oil Range SG	ND m	g/L		0.095	1	04/03/12 13:15	04/04/12 00:5	4 64742-65-0	
Surrogates	400.04		_			04/00/40 40 4	- 04/04/40 00 -		
n-Octacosane (S) SG	109 %			0-150	1		04/04/12 00:5		
o-Terphenyl (S) SG	98 %		_	0-150	1	04/00/40 40 41	04/04/12 00:5	'A OA AF A	



Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

Sample: 5-W-14-0312	Lab ID: 251	1414018	Collected: 03/28/	12 15:10	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	ND m	g/L	0.019	1	04/05/12 15:05	04/06/12 07:29	9	
Motor Oil Range Surrogates	ND m	g/L	0.095	1	04/05/12 15:05	04/06/12 07:29	9 64742-65-0	
n-Octacosane (S)	97 %		50-150	1	04/05/12 15:05	04/06/12 07:29	9 630-02-4	
o-Terphenyl (S)	89 %		50-150	1	04/05/12 15:05	04/06/12 07:29	9 84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range SG	ND m	g/L	0.019	1	04/03/12 13:15	04/04/12 01:10	)	
Motor Oil Range SG	ND m	g/L	0.094	1	04/03/12 13:15	04/04/12 01:10	0 64742-65-0	
Surrogates	05.0/		50.450		04/00/40 40:45	04/04/40 04:4/		
n-Octacosane (S) SG o-Terphenyl (S) SG	95 % 83 %		50-150 50-150	1 1	04/03/12 13:15 04/03/12 13:15			
o-reiphenyl (3) 33	03 /0		30-130	'	04/03/12 13.13	04/04/12 01.10	04-15-1	
Sample: 5-W-15-0312	Lab ID: 251	1414019	Collected: 03/28/	12 15:25	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	<b>0.57</b> m	g/L	0.019	1	04/05/12 15:05	04/06/12 07:46	3	
Motor Oil Range	<b>0.33</b> m	g/L	0.094	1	04/05/12 15:05	04/06/12 07:46	6 64742-65-0	
Surrogates	05.0/		50.450	4	04/05/40 45:05	04/00/40 07:4/		
n-Octacosane (S) o-Terphenyl (S)	95 % 88 %		50-150 50-150	1 1	04/05/12 15:05 04/05/12 15:05			
o- respirently (3)	00 %		50-150	'	04/05/12 15.05	04/00/12 07.40	0 04-10-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range SG	<b>0.14</b> m	g/L	0.019	1	04/03/12 13:15	04/04/12 01:44	4	
Motor Oil Range SG	ND m	g/L	0.095	1	04/03/12 13:15	04/04/12 01:44	4 64742-65-0	
Surrogates								
n-Octacosane (S) SG	105 %		50-150	1	04/03/12 13:15			
o-Terphenyl (S) SG	97 %		50-150	1	04/03/12 13:15	04/04/12 01:44	4 84-15-1	
Sample: 5-W-51-0312	Lab ID: 251	1414020	Collected: 03/28/	12 15:45	Received: 03	/29/12 09:37	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	<b>14.1</b> m	a/l	0.19	10	04/05/12 15:05	04/06/12 20:13	1	
Motor Oil Range	13.3 m	-	0.95	10	04/05/12 15:05			
Surrogates		5	0.00		33.12.13.00			
n-Octacosane (S)	102 %		50-150	10	04/05/12 15:05	04/06/12 20:13	1 630-02-4	
( - )				10	04/05/12 15:05			

Date: 04/12/2012 11:27 AM

# **REPORT OF LABORATORY ANALYSIS**



#### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

SAMPLE DUDLICATE: 100630

SAMPLE DUDLICATE: 100640

Date: 04/12/2012 11:27 AM

QC Batch: OEXT/5331 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2511414001, 2511414002, 2511414003, 2511414004, 2511414005, 2511414006, 2511414007, 2511414008,

2511414009, 2511414010, 2511414011, 2511414012, 2511414013, 2511414014, 2511414015, 2511414016,

2511414017, 2511414018, 2511414019, 2511414020

METHOD BLANK: 109637 Matrix: Water

Associated Lab Samples: 2511414001, 2511414002, 2511414003, 2511414004, 2511414005, 2511414006, 2511414007, 2511414008,

2511414009, 2511414010, 2511414011, 2511414012, 2511414013, 2511414014, 2511414015, 2511414016,

2511414017, 2511414018, 2511414019, 2511414020

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	04/06/12 00:04	
Motor Oil Range	mg/L	ND	0.10	04/06/12 00:04	
n-Octacosane (S)	%	99	50-150	04/06/12 00:04	
o-Terphenyl (S)	%	93	50-150	04/06/12 00:04	

LABORATORY CONTROL SAMPLE:	109638					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Diesel Range	mg/L	1	0.89	89	51-114	
Motor Oil Range	mg/L	1	0.97	97	62-120	
n-Octacosane (S)	%			95	50-150	
o-Terphenyl (S)	%			88	50-150	

Parameter	Units	2511414002 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.60	0.66	9	
Motor Oil Range	mg/L	0.46	0.50	9	
n-Octacosane (S)	%	92	93	1	
o-Terphenyl (S)	%	85	84	.3	

SAMPLE DOFLICATE. 109040		2511414010	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	112	103	8	
o-Terphenyl (S)	%	104	96	8	



#### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

QC Batch: OEXT/5299 Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS SG

Associated Lab Samples: 2511414013, 2511414014, 2511414015

METHOD BLANK: 109062 Matrix: Water

Associated Lab Samples: 2511414013, 2511414014, 2511414015

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.020	04/06/12 17:17	
Motor Oil Range SG	mg/L	ND	0.10	04/06/12 17:17	
n-Octacosane (S) SG	%	132	50-150	04/06/12 17:17	
o-Terphenyl (S) SG	%	134	50-150	04/06/12 17:17	

LABORATORY CONTROL S	AMPLE:	109063
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Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L		4.5	113	59-114	
Motor Oil Range SG	mg/L	4	4.8	120	69-124	
n-Octacosane (S) SG	%			100	50-150	
o-Terphenyl (S) SG	%			110	50-150	

SAMPLE DUPLICATE: 109064

Parameter	Units	2511390012 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	ND		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	86	84	1	
o-Terphenyl (S) SG	%	93	89	4	

SAMPLE DUPLICATE: 109065

		2511414013	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	.014J		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	104	130	22	
o-Terphenyl (S) SG	%	100	126	23	



#### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

QC Batch: OEXT/5313 Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS SG

Associated Lab Samples: 2511414016, 2511414017, 2511414018, 2511414019

METHOD BLANK: 109241 Matrix: Water

Associated Lab Samples: 2511414016, 2511414017, 2511414018, 2511414019

Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND ND	0.020	04/03/12 21:45	
Motor Oil Range SG	mg/L	ND	0.10	04/03/12 21:45	
n-Octacosane (S) SG	%	115	50-150	04/03/12 21:45	
o-Terphenyl (S) SG	%	104	50-150	04/03/12 21:45	

LABORATORY CONTROL SAMPLE: 109242

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L	1	0.91	91	59-114	
Motor Oil Range SG	mg/L	1	1.0	100	69-124	
n-Octacosane (S) SG	%			105	50-150	
o-Terphenyl (S) SG	%			95	50-150	

SAMPLE DUPLICATE: 109243

Parameter	Units	2511463001 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	ND		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	112	110	2	
o-Terphenyl (S) SG	%	101	99	3	

SAMPLE DUPLICATE: 109244

		2511414018	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	.012J		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	95	97		3
o-Terphenyl (S) SG	%	83	86		4



#### **QUALIFIERS**

Project: BNSF-Skykomish 60241075

Pace Project No.: 2511414

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## **LABORATORIES**

Date: 04/12/2012 11:27 AM

PASI-S Pace Analytical Services - Seattle



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF-Skykomish 60241075

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2511414001	MW-16-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414002	ZA-W-9-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414003	ZA-W-10-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414004	ZA-W-100-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414005	MW-4-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414006	MW-3-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414007	1B-W-3-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414008	1B-W-23-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414009	1A-W-4-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414010	1A-W-40-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414011	EW-2A-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414012	EW-1-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414013	5-W-17-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414014	5-W-18-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414015	5-W-16-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414016	5-W-160-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414017	5-W-19-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414018	5-W-14-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414019	5-W-15-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414020	5-W-51-0312	EPA 3510	OEXT/5331	NWTPH-Dx	GCSV/3439
2511414013	5-W-17-0312	EPA 3510	OEXT/5299	NWTPH-Dx	GCSV/3426
2511414014	5-W-18-0312	EPA 3510	OEXT/5299	NWTPH-Dx	GCSV/3426
2511414015	5-W-16-0312	EPA 3510	OEXT/5299	NWTPH-Dx	GCSV/3426
2511414016	5-W-160-0312	EPA 3510	OEXT/5313	NWTPH-Dx	GCSV/3430
2511414017	5-W-19-0312	EPA 3510	OEXT/5313	NWTPH-Dx	GCSV/3430
2511414018	5-W-14-0312	EPA 3510	OEXT/5313	NWTPH-Dx	GCSV/3430
2511414019	5-W-15-0312	EPA 3510	OEXT/5313	NWTPH-Dx	GCSV/3430





May 08, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: BNSF-Skykomish

Pace Project No.: 2511926

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on April 26, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

**Project Manager** 

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







# **CERTIFICATIONS**

Project: BNSF-Skykomish

Pace Project No.: 2511926

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



# **SAMPLE ANALYTE COUNT**

Project: BNSF-Skykomish

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
- Lab ID	— ————————————————————————————————————			———	Laboratory
2511926001	1C-W-1-0412	NWTPH-Dx	AY1	4	PASI-S
2511926002	1C-W-8-0412	NWTPH-Dx	AY1	4	PASI-S
2511926003	1C-W-80-0412	NWTPH-Dx	AY1	4	PASI-S
2511926004	1C-W-7-0412	NWTPH-Dx	AY1	4	PASI-S
2511926005	GW-2-0412	NWTPH-Dx	AY1	4	PASI-S



Project: BNSF-Skykomish

Pace Project No.: 2511926

Sample: 1C-W-1-0412	Lab ID: 25119	926001	Collected:	04/24/12	09:05	Received: 0	4/26/12 09:45	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTPI	H-Dx Prepara	ation Met	hod: Ef	PA 3510			
Diesel Range	ND mg/	L		0.019	1	05/01/12 10:00	05/02/12 00:07	7	
Motor Oil Range	ND mg/	L		0.094	1	05/01/12 10:00	05/02/12 00:07	7 64742-65-0	
Surrogates	89 %		_	60-150	1	05/01/12 10:00	05/02/12 00:07	7 620 02 4	
n-Octacosane (S) o-Terphenyl (S)	78 %			50-150 50-150	1		05/02/12 00:0		
o-resplicitly (O)	70 70		J	0-100	•	00/01/12 10:00	03/02/12 00:0	04-10-1	
Sample: 1C-W-8-0412	Lab ID: 25119	926002	Collected:	04/24/12	09:50	Received: 0	4/26/12 09:45	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTPI	H-Dx Prepara	ation Met	hod: Ef	PA 3510			
Diesel Range	<b>0.22</b> mg/	L		0.019	1	05/01/12 10:00	05/02/12 00:24	4	
Motor Oil Range	ND mg/			0.094	1		05/02/12 00:24		
Surrogates	_								
n-Octacosane (S)	93 %		_	0-150	1		05/02/12 00:24		
o-Terphenyl (S)	80 %		5	50-150	1	05/01/12 10:00	05/02/12 00:24	4 84-15-1	
Sample: 1C-W-80-0412	Lab ID: 2511	926003	Collected:	04/24/12	10:30	Received: 0-	4/26/12 09:45	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTPI	H-Dx Prepara	ation Met	hod: Ef	PA 3510			
Diesel Range	<b>0.24</b> mg/	L		0.019	1	05/01/12 10:00	05/02/12 00:42	2	
· ·	•						0=100110 00 11	2 64742-65-0	
Motor Oil Range	ND mg/	L		0.094	1	05/01/12 10:00	05/02/12 00:42	2 04/42-03-0	
•	ND mg/	L		0.094		05/01/12 10:00	05/02/12 00:42	2 04/42-03-0	
Surrogates	90 %	L	5	50-150	1	05/01/12 10:00	05/02/12 00:42	2 630-02-4	
Surrogates n-Octacosane (S)		L	5			05/01/12 10:00		2 630-02-4	
Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: 1C-W-7-0412	90 %		5	60-150 60-150	1 1	05/01/12 10:00 05/01/12 10:00	05/02/12 00:42 05/02/12 00:42	2 630-02-4	
Surrogates n-Octacosane (S) o-Terphenyl (S)	90 % 81 %		5 5	50-150 50-150 04/24/12	1 1	05/01/12 10:00 05/01/12 10:00	05/02/12 00:42 05/02/12 00:42	2 630-02-4 2 84-15-1	Qua
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: 1C-W-7-0412  Parameters	90 % 81 % Lab ID: 25119	<b>926004</b> Units	Collected:	04/24/12 Limit	1 1 10:50 DF	05/01/12 10:00 05/01/12 10:00 Received: 0-	05/02/12 00:42 05/02/12 00:42 4/26/12 09:45	2 630-02-4 2 84-15-1 Matrix: Water	Qua
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: 1C-W-7-0412 Parameters  NWTPH-Dx GCS	90 % 81 %  Lab ID: 25119  Results  Analytical Metho	<b>926004</b> Units  od: NWTPI	Collected: Report H-Dx Prepara	04/24/12 Limit	1 1 10:50 DF	05/01/12 10:00 05/01/12 10:00 Received: 0- Prepared	05/02/12 00:42 05/02/12 00:42 4/26/12 09:45 Analyzed	2 630-02-4 2 84-15-1 Matrix: Water CAS No.	Qua
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: 1C-W-7-0412 Parameters  NWTPH-Dx GCS  Diesel Range	90 % 81 %  Lab ID: 25119  Results  Analytical Methor  0.13 mg/	<b>926004</b> Units od: NWTPI	Collected: Report H-Dx Prepara	50-150 50-150 04/24/12 Limitation Met	1 10:50 DF	05/01/12 10:00 05/01/12 10:00 Received: 0- Prepared PA 3510 05/01/12 10:00	05/02/12 00:42 05/02/12 00:42 4/26/12 09:45	2 630-02-4 2 84-15-1 Matrix: Water CAS No.	Qua
Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: 1C-W-7-0412 Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range	90 % 81 %  Lab ID: 25119  Results  Analytical Metho	<b>926004</b> Units od: NWTPI	Collected: Report H-Dx Prepara	04/24/12 Limitation Metion.	1 10:50 DF hod: EF	05/01/12 10:00 05/01/12 10:00 Received: 0- Prepared PA 3510 05/01/12 10:00	05/02/12 00:42 05/02/12 00:42 4/26/12 09:45 Analyzed	2 630-02-4 2 84-15-1 Matrix: Water CAS No.	Qua
Surrogates n-Octacosane (S) p-Terphenyl (S) Sample: 1C-W-7-0412	90 % 81 %  Lab ID: 25119  Results  Analytical Methor  0.13 mg/	<b>926004</b> Units od: NWTPI	Collected: Report H-Dx Prepara	04/24/12 Limitation Metion.	1 10:50 DF hod: EF	05/01/12 10:00 05/01/12 10:00 Received: 0- Prepared PA 3510 05/01/12 10:00 05/01/12 10:00	05/02/12 00:42 05/02/12 00:42 4/26/12 09:45 Analyzed	2 630-02-4 2 84-15-1 Matrix: Water CAS No.	Qua

Date: 05/08/2012 11:44 AM

# **REPORT OF LABORATORY ANALYSIS**



Project: BNSF-Skykomish

Sample: GW-2-0412	Lab ID: 25	Lab ID: 2511926005		Collected: 04/24/12 12:20		Received: 04/26/12 09:45 M		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTPH	-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	<b>0.14</b> m	ıg/L	0.019	1	05/01/12 10:00	05/02/12 01:50		
Motor Oil Range	<b>0.10</b> m	ıg/L	0.094	1	05/01/12 10:00	05/02/12 01:50	64742-65-0	
Surrogates	00.04		50.450		05/04/40 40 00	05/00/40 04 50	000 00 4	
n-Octacosane (S)	83 %	)	50-150	1	05/01/12 10:00	05/02/12 01:50	630-02-4	
o-Terphenyl (S)	74 %	)	50-150	1	05/01/12 10:00	05/02/12 01:50	84-15-1	



#### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish

Pace Project No.: 2511926

QC Batch: OEXT/5443 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2511926001, 2511926002, 2511926003, 2511926004, 2511926005

METHOD BLANK: 113171 Matrix: Water

Associated Lab Samples: 2511926001, 2511926002, 2511926003, 2511926004, 2511926005

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	05/01/12 22:58	
Motor Oil Range	mg/L	ND	0.10	05/01/12 22:58	
n-Octacosane (S)	%	97	50-150	05/01/12 22:58	
o-Terphenyl (S)	%	84	50-150	05/01/12 22:58	

LABORATORY CONTROL SAMPLE: 113172

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		1.1	106	51-114	
Motor Oil Range	mg/L	1	0.99	99	62-120	
n-Octacosane (S)	%			108	50-150	
o-Terphenyl (S)	%			102	50-150	

SAMPLE DUPLICATE: 113173

Parameter	Units	2511928001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.095	.061J		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	88	87	2	
o-Terphenyl (S)	%	77	76	3	

SAMPLE DUPLICATE: 113174

		2511926005	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.14	0.11	19	
Motor Oil Range	mg/L	0.10	.052J		
n-Octacosane (S)	%	83	71	15	
o-Terphenyl (S)	%	74	63	17	

Date: 05/08/2012 11:44 AM



#### **QUALIFIERS**

Project: BNSF-Skykomish

Pace Project No.: 2511926

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 05/08/2012 11:44 AM

PASI-S Pace Analytical Services - Seattle



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF-Skykomish

Pace Project No.: 2511926

Date: 05/08/2012 11:44 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2511926001	1C-W-1-0412	EPA 3510	OEXT/5443	NWTPH-Dx	GCSV/3491
2511926002	1C-W-8-0412	EPA 3510	OEXT/5443	NWTPH-Dx	GCSV/3491
2511926003	1C-W-80-0412	EPA 3510	OEXT/5443	NWTPH-Dx	GCSV/3491
2511926004	1C-W-7-0412	EPA 3510	OEXT/5443	NWTPH-Dx	GCSV/3491
2511926005	GW-2-0412	EPA 3510	OEXT/5443	NWTPH-Dx	GCSV/3491



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2511926

	Section B							Secti	on C										Pa	ge:	1	of (	
	Required Pr	_			Control of		714	Invoic		mation:	_			_					- 10	1	171	220	
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Seattle, W4 98104			- Marte A					Addre	ss:		rla i						☐ NE	PDES	GRO	UND WAT	TER	DRINKIN	IG WATER
Email To: Mark. Havighors to accom. (	urchase Or	der No.	:					Pace Quote Reference:							┌ US	ST	☐ RCRA	4		OTHER			
Phone: 624-9349 Fax: F	Project Name	: 5	KYKO	mist	1.BA	JS F		Pace Project Manager:							Site L	ocation	SKYKO	om ish	1				
Requested Due Date/TAT:			60241				4	Pace Profile #:						W		STATE:	w	4	ALL IN				
						10		_				_			Rec	uested	Analysi	s Filter	red (Y/N)	- In	14		
Section D Matrix Co Required Client Information MATRIX / C Drinking Water Water Waste Waste Waste	DW WT WW	(see valid codes to left)	СОМРО		COMPO		CTION		T	Prese	ervati	ives	5	YIN	12 55 c	ten za			E and		ayas t		
SAMPLE ID Oil Wipe	P SL OL WP	(see valid	STAR	1.196.1	END/G	RAB	AT COLLECTION	ERS				n k		Test	Dx wlo	31	g= • ;		1 2 11	ine (Y/N	oteles		
(A-Z, 0-9 /,-) Sample IDs MUST BE UNIQUE Tissue Other	AR TS OT	MATRIX CODE SAMPLE TYPE	DATE	TIME	DATE	TIME	SAMPLE TEMP A	# OF CONTAINERS	Unpreserved H <sub>2</sub> SO,	HNO <sub>3</sub>	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	S	UW TPH-1	95 H				Residual Chlorine (Y/N)	Pace		No./ Lab I.D.
1 1C-W-1-0412			4/24/12				66	2			1		T		X								
			4/24/12			79 -	7.8	2							X		1-15		- 15 P	100	(0 1E)P	P.7-4	
2 1C-W-8-04/2 3 1C-W-80-04/2 4 1C-W-7-04/2 5 GW-2-04/2 6 7 8			4/24/12				7	2			X				X								(V)
4 1C-W-7-0412	952		4/24/12		o Let Til	To setting	7.4	2	0						X		10, 40	OF L	10 16	100	Die Mi		16
4 1C-W-7-0412 5 GW-2-0412	1100	TILL	4/24/12	1220	fam d	37-113	7.6	_	1 1					1	X		16 16		atu office	-111 07	1	CRIA	
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ADDITIONAL COMMENTS	1	RELINC	QUISHED BY /	AFFILIATIO	ИС	DATE		Т	ME			ACCE	EPTE	BY	AFFIL	ATION	1	DATE	TIME		SAMI	PLE CONDIT	TONS
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OR	GINAL		t		PRINT Nan	e of SAMP	LER:		21	x	16	.(_	av	N	80	64	_			o in °	(W/N)	stody J Coc	es Int
						E of SAMP					eco	212	che	200	DATE (MM/	Signed DD/YY):	04/2	26/1	2	Temp in	Received or Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

# Sample Container Count

2511926

CLIENT:	AECOM

COC PAGE \_\_\_\_\_ of \_\_\_\_ COC ID# \_\_\_\_\_\_ 147 1228

Trip Blank(s) Provided?

Sample Line Item	VGQH	AG1H	AG111	RP1LI	RP2U	BP311	RP3N	BP3S	WGKII	WGFU	WG2U	DG9M	DG9B	VG9W	VSG			Comments
Line item	1	2 2	AOTO	BI 10	DI 20	DI 00	DI OIN	DI 00	Worke	77010	WOLU	DOUN	D00B	1.001				
			24														-	
2		2 22																
3		2 12																
4		242																
5		200																
6																		
7																		
8										1								
9																		
10																		
11																		
12																		

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic		Wipe/Swab	U	Summa Can

# Sample Condition Upon Receipt

Pace Analytical Client Name	E: AECOM	Project # 25119
Courier: Fed Ex UPS USPS VClier	nt Commercial Pace Other	
Tracking #:		
Custody Seal on Cooler/Box Present: Yes		∐ No
Packing Material: Bubble Wrap Bubble	Bags None Other	Temp. Blank YesNo
Thermometer Used 132013 6 101731962 or 22609	99 Type of Ice: Wet Blue None	Samples on ice, cooling process has begun
Cooler Temperature 0.0℃  Temp should be above freezing ≤ 6°C	Biological Tissue is Frozen: Yes N Comments:	Date and Initials of person examining contents: 042612 CW
Chain of Custody Present:	MYes □No □N/A 1.	
Chain of Custody Filled Out:	Mys ONo ONA 2.	
Chain of Custody Relinquished:	MYes, □No □N/A 3.	
Sampler Name & Signature on COC:	DYes □No □N/A 4.	
Samples Arrived within Hold Time:	MYes ONG ONA 5.	
Short Hold Time Analysis (<72hr):	□Yes ☑No □N/A 6.	
Rush Turn Around Time Requested:	□Yes ☑No □N/A 7.	
Follow Up / Hold Analysis Requested:	□Yes ☑No □N/A 8.	
Sufficient Volume:	MYes □No □N/A 9.	
Correct Containers Used:	MYes □No □N/A 10.	
-Pace Containers Used:	ØYes □No □N/A	
Containers Intact:	∐Yes □No □N/A 11.	
Filtered volume received for Dissolved tests	□Yes □No ☑NA 12.	
Sample Labels match COC:	EYes □No □N/A 13.	
-Includes date/time/ID/Analysis Matrix: All containers needing preservation have been checked.	WT  Nes □No □N/A 14.	
All containers needing preservation are found to be in compliance with EPA recommendation.	Lyes DNo DN/A	
Exceptions: VOA, coliform, TOC, O&G	□Yes □No □N/A Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	□Yes □No □N/A 15.	
Headspace in VOA Vials ( >6mm):	□Yes □No □N/A 16.	
Trip Blanks Present:	□Yes □No □NA 17.	
Trip Blank Custody Seals Present	DYes DNo DNA	
Pace Trip Blank Creation Date:		
Client Notification/ Resolution: Person Contacted:	Date/Time:	Field Data Required? Y / N
Comments/ Resolution:		
Project Manager Review:	072	Date: 4/7.6
,	V)	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





June 12, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: Skykomish

Pace Project No.: 2512392

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on May 31, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







# **CERTIFICATIONS**

Project: Skykomish Pace Project No.: 2512392

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



# **SAMPLE ANALYTE COUNT**

Project: Skykomish Pace Project No.: 2512392

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2512392001	IC-W-1-0512	NWTPH-Dx	AY1	4	PASI-S
2512392002	IC-W-8-0512	NWTPH-Dx	AY1	4	PASI-S
2512392003	IC-W-7-0512	NWTPH-Dx	AY1	4	PASI-S
2512392004	IC-W-70-0512	NWTPH-Dx	AY1	4	PASI-S



Project: Skykomish
Pace Project No.: 2512392

Sample: IC-W-1-0512	Lab ID: 2512	392001	Collected:	05/30/1	2 11:45	Received: 0	5/31/12 08:30	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Prepa	ration Me	ethod: El	PA 3510			
Diesel Range	ND mg/	'L		0.076	1	06/06/12 09:30	06/07/12 05:09	9	
Motor Oil Range <i>Surrogates</i>	ND mg/	Ľ		0.38	1	06/06/12 09:30	06/07/12 05:09	9 64742-65-0	
n-Octacosane (S)	89 %			50-150	1	06/06/12 09:30	06/07/12 05:09	9 630-02-4	
o-Terphenyl (S)	84 %			50-150	1	06/06/12 09:30	06/07/12 05:09	9 84-15-1	
Sample: IC-W-8-0512	Lab ID: 2512	392002	Collected:	05/30/1	2 12:35	Received: 0	5/31/12 08:30	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Prepa	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.10</b> mg/	'L		0.076	1	06/06/12 09:30	06/07/12 05:23	7	
Motor Oil Range <i>Surrogates</i>	ND mg/			0.38	1	06/06/12 09:30	06/07/12 05:27	7 64742-65-0	
n-Octacosane (S)	90 %			50-150	1	06/06/12 09:30	06/07/12 05:27	7 630-02-4	
o-Terphenyl (S)	86 %			50-150	1	06/06/12 09:30	06/07/12 05:27	7 84-15-1	
Sample: IC-W-7-0512	Lab ID: 2512	392003	Collected:	05/30/1	2 14:00	Received: 0	5/31/12 08:30	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Prepa	ration Me	ethod: El	PA 3510			
Diesel Range	ND mg/	'L		0.076	1	06/06/12 09:30	06/07/12 05:44	4	
Motor Oil Range <i>Surrogates</i>	ND mg/	Ľ		0.38	1	06/06/12 09:30	06/07/12 05:44	4 64742-65-0	
n-Octacosane (S)	87 %			50-150	1		06/07/12 05:44		
o-Terphenyl (S)	82 %			50-150	1	06/06/12 09:30	06/07/12 05:44	4 84-15-1	
Sample: IC-W-70-0512	Lab ID: 2512	392004	Collected:	05/30/1	2 14:15	Received: 0	5/31/12 08:30	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
			H-Dy Prenai	ration Me	ethod: El	PA 3510			
NWTPH-Dx GCS	Analytical Metho	oa: NWIP	II-DX I ICPAI	audii we					
	Analytical Metho ND mg/		п-вх пера	0.076	1	06/06/12 09:30	06/07/12 06:3	5	
Diesel Range Motor Oil Range	j	Ľ	п-вх пера		1 1		06/07/12 06:39 06/07/12 06:39		
NWTPH-Dx GCS Diesel Range Motor Oil Range Surrogates n-Octacosane (S)	ND mg/	Ľ	·	0.076		06/06/12 09:30 06/06/12 09:30		5 64742-65-0 5 630-02-4	

Date: 06/12/2012 09:52 AM

# **REPORT OF LABORATORY ANALYSIS**



#### **QUALITY CONTROL DATA**

Project: Skykomish Pace Project No.: 2512392

QC Batch: OEXT/5614 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2512392001, 2512392002, 2512392003, 2512392004

METHOD BLANK: 117903 Matrix: Water

Associated Lab Samples: 2512392001, 2512392002, 2512392003, 2512392004

Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.080	06/07/12 01:58	
Motor Oil Range	mg/L	ND	0.40	06/07/12 01:58	
n-Octacosane (S)	%	87	50-150	06/07/12 01:58	
o-Terphenyl (S)	%	83	50-150	06/07/12 01:58	

LABORATORY CONTROL SAMPLE: 117904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		3.7	92	51-114	
Motor Oil Range	mg/L	4	4.0	100	62-120	
n-Octacosane (S)	%			97	50-150	
o-Terphenyl (S)	%			93	50-150	

SAMPLE DUPLICATE: 117905

Parameter	Units	2512366001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	93	94	6	
o-Terphenyl (S)	%	86	90	2	

SAMPLE DUPLICATE: 117909

Parameter	Units	2512392004 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.055J		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	90	97	8	
o-Terphenyl (S)	%	85	93	9	

Date: 06/12/2012 09:52 AM



#### **QUALIFIERS**

Project: Skykomish
Pace Project No.: 2512392

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 06/12/2012 09:52 AM

PASI-S Pace Analytical Services - Seattle



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Skykomish Pace Project No.: 2512392

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2512392001	IC-W-1-0512	EPA 3510	OEXT/5614	NWTPH-Dx	GCSV/3593
2512392002	IC-W-8-0512	EPA 3510	OEXT/5614	NWTPH-Dx	GCSV/3593
2512392003	IC-W-7-0512	EPA 3510	OEXT/5614	NWTPH-Dx	GCSV/3593
2512392004	IC-W-70-0512	EPA 3510	OEXT/5614	NWTPH-Dx	GCSV/3593



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2512392

									12	==	10	9	8	7	6	C)	4	u	2	_	ITEM#		-	Req	OF OF	Ema		Add	Con	Req
*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.		Ş	O.	curout	China in	Sillia os	Mosacu - without	ADDITIONAL COMMENTS			The second secon			M. B. C.		Charles Benediction 2	10-W-7	レードーゲーン	1K-W-8-	10-11-0	SAMPLE ID  (A-Z, 0-9 / -)  Sample IDs MUST BE UNIQUE  Sollicolid  Other  Other			Requested Due Date/TAT:	236) 624-93+4 Fax:	,	sentle WA 92104	0001 at INA ANS 01 Creation	Company: AE Co	Section A Required Client Information:
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r month for any invoices	STEEL STEEL	PLER: Dean	TURE				12 0830	E TIME								20	10.9 2	10,9 2	1142	2 83	# OF CONTAINERS Unpreserved H <sub>2</sub> SO <sub>4</sub>			Pace Profile #:	Pace Project Manager:	Pace Quote Reference:	Address:	Company Name:	Attention:	Section C Invoice Information:
not paid within 30 days	1	21.2					M Apples	ACCEP									1	X	×	×	HNO <sub>3</sub> HCI NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol	Preservatives					Trade and the Color		Bruce	ation:
	(MM/DD/YY):	inner					Jake PRE	ACCEPTED BY / AFFILIATION									X	X	X	X	Other  ♣ Analysis Test ♣  NWTPH-D  Wo XC	Z I	Request				THE SAME OF	-	Shappand	
	21/18/5 31/12					The second	053112	DATE											11 N 20 11				Requested Analysis Filtered (Y/N)	STATE:	Site Location	□ UST	☐ NPDES	REGULATORY AGENCY		
	1.					0 11116	0220	TIME								7			2				ed (Y/N)	INA	1.10	RCRA	GROU	AGENCY		9
F-ALL-Q-020rev	Red	mp in	d on				12	SAM					1	and the second			DE LOS BEEN		THE REAL PROPERTY.		Residual Chlorine (Y/N)	Table 1				11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	GROUND WATER		14/1	
F-ALL-Q-020rev.07, 15-May-2007	Sea	Custoriled C (Y/N	(cooler )				Z	SAMPLE CONDITIONS									100 S		Pa	ge 8	Pace Project No./ Lab I.版					OTHER	DRINKING WATER		1231	)

# Sample Container Count

2512392

COC PAGE COC ID#\_

Trip Blank(s) Provided?

Sa	m	pl	е
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CLIENT:

Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG		Comments
1		2 2															
2		11															
3																	
4		81															
5																	
6																	
7																	
8																	
9																	
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12																	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP20	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

#### Sample Condition Upon Receipt Project #25 1 2 3 9 2 Pace Analytical Client Name: Atrow Courier: Fed Ex UPS USPS Client Commercial Pace Other Tracking #: Custody Seal on Cooler/Box Present: Yes No Seals intact: Packing Material: Bubble Wrap MBubble Bags None Other Temp. Blank Yes 132013 or 101731962 or 226099 Type of Ice: (Wet Blue None Samples on ice, cooling process has begun Thermometer Used Date and Initials of person examining contents: 053 | 2 CW Biological Tissue is Frozen: Yes No Cooler Temperature Comments: Temp should be above freezing ≤ 6°C MY95 DNO DNA 1. Chain of Custody Present: EYes DNo DNA Chain of Custody Filled Out: DYes DNo DN/A Chain of Custody Relinquished: MYes No □N/A 4. Sampler Name & Signature on COC: PYes | No □N/A Samples Arrived within Hold Time: DYes VINO DNA 6. Short Hold Time Analysis (<72hr): Yes DNo. □N/A Rush Turn Around Time Requested: □Yes ☑No □N/A 8. Follow Up / Hold Analysis Requested: DYes DNo □N/A Sufficient Volume: MY96 DNO DN/A Correct Containers Used: □No □N/A -Pace Containers Used: Yes DNo □N/A Containers Intact: □Yes □No 12N/A Filtered volume received for Dissolved tests 12 Yes No □N/A Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: All containers needing preservation have been checked. TYPES NO NO NA All containers needing preservation are found to be in TYes DNo □N/A compliance with EPA recommendation. Initial when Lot # of added □Yes □No □N/A Exceptions: VOA, coliform, TOC, O&G completed preservative □Yes □No MNA Samples checked for dechlorination: □Yes □No DINA Headspace in VOA Vials ( >6mm): 16 □Yes □No DIVA Trip Blanks Present: □Yes □No ⅢN/A Trip Blank Custody Seals Present Pace Trip Blank Creation Date:

Client Notification/ Resolution:		Field Data Required?	Y / N
Person Contacted:	Date/Time:		
Comments/ Resolution:			
Project Manager Review:	01	Date: 5/-	7 /

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





July 18, 2012

Mark Havighorst AECOM - BNSF 333 SW 5th Avenue, Suite 225 Portland, OR 97204

RE: Project: BNSF-Skykomish

Pace Project No.: 2512751

# Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on June 28, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 

cc: Renee Knecht, AECOM (BNSF) Jennifer Wald, AECOM (BNSF)







# **CERTIFICATIONS**

Project: BNSF-Skykomish

Pace Project No.: 2512751

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



# **SAMPLE ANALYTE COUNT**

Project: BNSF-Skykomish

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2512751001	2B-W-4-0612	NWTPH-Dx	AY1	4	PASI-S
2512751002	5-W-43-0612	NWTPH-Dx	AY1	4	PASI-S
2512751003	EW-1-0612	NWTPH-Dx	AY1	4	PASI-S
2512751004	GW-4-0612	NWTPH-Dx	AY1	4	PASI-S
2512751005	EW-2A-0612	NWTPH-Dx	AY1	4	PASI-S
2512751006	2A-W-9-0612	NWTPH-Dx	AY1	4	PASI-S
2512751007	2A-W-10-0612	NWTPH-Dx	AY1	4	PASI-S
2512751008	2A-W-100-0612	NWTPH-Dx	AY1	4	PASI-S
2512751009	MW-4-0612	NWTPH-Dx	AY1	4	PASI-S
2512751010	MW-3-0612	NWTPH-Dx	AY1	4	PASI-S
2512751011	GW-1-0612	NWTPH-Dx	AY1	4	PASI-S
2512751012	GW-2-0612	NWTPH-Dx	AY1	4	PASI-S
2512751013	1C-W-1-0612	NWTPH-Dx	AY1	4	PASI-S
2512751014	1C-W-8-0612	NWTPH-Dx	AY1	4	PASI-S
2512751015	1C-W-7-0612	NWTPH-Dx	AY1	4	PASI-S
2512751016	2A-W-40-0612	NWTPH-Dx	AY1	4	PASI-S
2512751017	2A-W-400-0612	NWTPH-Dx	AY1	4	PASI-S
2512751018	GW-3-0612	NWTPH-Dx	AY1	4	PASI-S
2512751019	2A-W-41-0612	NWTPH-Dx	AY1	4	PASI-S
2512751020	2A-W-42-0612	NWTPH-Dx	AY1	4	PASI-S
2512751021	1B-W-23-0612	NWTPH-Dx	AY1	4	PASI-S
2512751022	5-W-17-0612	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	MTJ	4	PASI-S
2512751023	5-W-18-0612	NWTPH-Dx	MTJ	4	PASI-S
		NWTPH-Dx	MTJ	4	PASI-S
2512751024	5-W-180-0612	NWTPH-Dx	MTJ	4	PASI-S
		NWTPH-Dx	MTJ	4	PASI-S
2512751025	5-W-14-0612	NWTPH-Dx	MTJ	4	PASI-S
		NWTPH-Dx	MTJ	4	PASI-S
2512751026	5-W-15-0612	NWTPH-Dx	MTJ	4	PASI-S
		NWTPH-Dx	MTJ	4	PASI-S
2512751027	5-W-16-0612	NWTPH-Dx	MTJ	4	PASI-S
		NWTPH-Dx	MTJ	4	PASI-S
2512751028	5-W-19-0612	NWTPH-Dx	MTJ	4	PASI-S
		NWTPH-Dx	MTJ	4	PASI-S



Project: BNSF-Skykomish

Sample: 2B-W-4-0612	Lab ID: 251	2751001	Collected: 06/2	2//12 08:40	Received: 0	06/28/12 15:20	Matrix: Water	
Parameters	Results	Units	Report Lim	t DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation	Method: E	EPA 3510			
Diesel Range	ND mg	g/L	0.0	9 1	07/10/12 09:35	5 07/16/12 19:0	7	
Motor Oil Range	ND mg	g/L	0.09	94 1	07/10/12 09:35	5 07/16/12 19:0	7 64742-65-0	
Surrogates	98 %		50-1	50 1	07/10/12 00:28	5 07/16/12 19:0	7 620 02 4	
n-Octacosane (S) o-Terphenyl (S)	97 %		50-15 50-15			5		
o resplicitly (O)	37 78		00 10	,0 1	07710712 00:00	0.07710712 10.0	7 04 10 1	
Sample: 5-W-43-0612	Lab ID: 251	2751002	Collected: 06/2	7/12 09:25	Received: 0	06/28/12 15:20	Matrix: Water	
Parameters	Results	Units	Report Lim	t DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation	Method: E	EPA 3510			
Diesel Range	ND mg	a/L	0.0	9 1	07/10/12 09:35	5 07/16/12 19:4	2	
Motor Oil Range	ND mg		0.09			5 07/16/12 19:4		
Surrogates	·							
n-Octacosane (S)	93 %		50-1	50 1	07/10/12 09:35	5 07/16/12 19:4	2 630-02-4	
o-Terphenyl (S)	91 %		50-1	50 1	07/10/12 09:35	5 07/16/12 19:4	2 84-15-1	
Sample: EW-1-0612	Lab ID: 251	2751003	Collected: 06/2	7/12 10:10	Received: 0	06/28/12 15:20	Matrix: Water	
Parameters	Results	Units	Report Lim	t DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation	Method: E	EPA 3510			
	•		H-Dx Preparation			5 07/16/12 20:3	3	
Diesel Range	ND mg	g/L	•	9 1	07/10/12 09:35	5 07/16/12 20:3 5 07/16/12 20:3		
NWTPH-Dx GCS Diesel Range Motor Oil Range Surrogates	•	g/L	0.0	9 1	07/10/12 09:35			
Diesel Range Motor Oil Range <b>Surrogates</b>	ND mg	g/L	0.0	9 1 95 1	07/10/12 09:38 07/10/12 09:38		3 64742-65-0	
Diesel Range Motor Oil Range <i>Surrogates</i> n-Octacosane (S)	ND mọ	g/L	0.09	9 1 95 1	07/10/12 09:35 07/10/12 09:35 07/10/12 09:35	5 07/16/12 20:3	3 64742-65-0 3 630-02-4	
Diesel Range Motor Oil Range	ND mg ND mg 56 %	g/L g/L	0.0 <sup>-</sup> 0.0 <sup>-</sup> 50-1	19 1 95 1 50 1 50 1	07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 07/10/12 09:38	5 07/16/12 20:3 5 07/16/12 20:3 5 07/16/12 20:3	3 64742-65-0 3 630-02-4	
Diesel Range Motor Oil Range <b>Surrogates</b> n-Octacosane (S) o-Terphenyl (S)	ND mg ND mg 56 % 57 %	g/L g/L	0.0° 0.0° 50-18	9 1 95 1 50 1 60 1 27/12 11:30	07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 07/10/12 09:38	5 07/16/12 20:3 5 07/16/12 20:3 5 07/16/12 20:3	3 64742-65-0 3 630-02-4 3 84-15-1	Qua
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: GW-4-0612  Parameters	ND mg ND mg 56 % 57 %  Lab ID: 251	g/L g/L 2751004 Units	0.0° 0.09 50-19 50-19 Collected: 06/2	9 1 95 1 60 1 60 1 27/12 11:30	07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 0 Received: 0	5 07/16/12 20:3 5 07/16/12 20:3 5 07/16/12 20:3 06/28/12 15:20	3 64742-65-0 3 630-02-4 3 84-15-1 Matrix: Water	Qua
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: GW-4-0612 Parameters	ND mg ND mg 56 % 57 %  Lab ID: 251: Results  Analytical Meth	g/L g/L 2751004 Units nod: NWTP	0.0° 0.09 50-19 50-19 Collected: 06/2	9 1 95 1 50 1 27/12 11:30 t DF Method: E	07/10/12 09:35 07/10/12 09:35 07/10/12 09:35 07/10/12 09:35 0 Received: 0 Prepared	5 07/16/12 20:3 5 07/16/12 20:3 5 07/16/12 20:3 06/28/12 15:20 Analyzed	3 64742-65-0 3 630-02-4 3 84-15-1 Matrix: Water CAS No.	Qua
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: GW-4-0612 Parameters  NWTPH-Dx GCS Diesel Range	ND mg ND mg 56 % 57 %  Lab ID: 251  Results  Analytical Meth	g/L 2751004 Units nod: NWTP	0.0° 0.09 50-19 50-19 Collected: 06/2 Report Lim H-Dx Preparation	9 1 95 1 50 1 17/12 11:30 t DF Method: E	07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 0 Received: 0 Prepared EPA 3510 07/10/12 09:38	5 07/16/12 20:3 5 07/16/12 20:3 5 07/16/12 20:3 06/28/12 15:20 Analyzed 5 07/16/12 20:5	3 64742-65-0 3 630-02-4 3 84-15-1 Matrix: Water CAS No.	Qua
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) p-Terphenyl (S)  Sample: GW-4-0612 Parameters  NWTPH-Dx GCS Diesel Range Motor Oil Range	ND mg ND mg 56 % 57 %  Lab ID: 251: Results  Analytical Meth	g/L 2751004 Units nod: NWTP	0.0° 0.09 50-19 50-19 Collected: 06/2 Report Lim H-Dx Preparation 0.0°	9 1 95 1 50 1 27/12 11:30 t DF Method: E	07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 0 Received: 0 Prepared EPA 3510 07/10/12 09:38	5 07/16/12 20:3 5 07/16/12 20:3 5 07/16/12 20:3 06/28/12 15:20 Analyzed	3 64742-65-0 3 630-02-4 3 84-15-1 Matrix: Water CAS No.	Qua
Diesel Range Motor Oil Range Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: GW-4-0612	ND mg ND mg 56 % 57 %  Lab ID: 251  Results  Analytical Meth	g/L 2751004 Units nod: NWTP	0.0° 0.09 50-19 50-19 Collected: 06/2 Report Lim H-Dx Preparation 0.0°	9 1 95 1 50 1 17/12 11:30 t DF Method: E	07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 07/10/12 09:38 0 Received: 0 Prepared EPA 3510 07/10/12 09:38 07/10/12 09:38	5 07/16/12 20:3 5 07/16/12 20:3 5 07/16/12 20:3 06/28/12 15:20 Analyzed 5 07/16/12 20:5	3 64742-65-0 3 630-02-4 3 84-15-1  Matrix: Water  CAS No. 0 0 64742-65-0	Qua



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Sample: EM 24 0612	Lab ID: 25127	754005	Callested: 00/07	/10 10:10	Donaired: 00	2/20/42 45:20	Motrice Motor	
Sample: EW-2A-0612	Lab ID: 25121	51005	Collected: 06/27	/12 13:10	Received: 06	0/28/12 15:20	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPF	I-Dx Preparation N	/lethod: E	PA 3510			
Diesel Range	ND mg/l	L	0.019	1	07/10/12 09:35	07/16/12 21:0	8	
Motor Oil Range Surrogates	<b>0.11</b> mg/l	L	0.095	1	07/10/12 09:35	07/16/12 21:0	8 64742-65-0	
n-Octacosane (S)	76 %		50-150	1	07/10/12 09:35	07/16/12 21:0	8 630-02-4	
o-Terphenyl (S)	74 %		50-150	1	07/10/12 09:35	07/16/12 21:0	8 84-15-1	
Sample: 2A-W-9-0612	Lab ID: 25127	751006	Collected: 06/27	/12 14:15	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPF	H-Dx Preparation N	/lethod: E	PA 3510			
Diesel Range	<b>0.23</b> mg/l	L	0.019	1	07/10/12 09:35	07/16/12 21:2	5	
Motor Oil Range Surrogates	<b>0.12</b> mg/l		0.095	1	07/10/12 09:35	07/16/12 21:2	5 64742-65-0	
n-Octacosane (S)	77 %		50-150	-	07/10/12 09:35	07/16/12 21:2	5 630-02-4	
o-Terphenyl (S)	76 %		50-150	1	07/10/12 09:35	07/16/12 21:2	5 84-15-1	
Sample: 2A-W-10-0612	Lab ID: 25127	751007	Collected: 06/27	/12 14:50	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPF	H-Dx Preparation N	/lethod: E	PA 3510			
Diesel Range	<b>0.17</b> mg/l	L	0.019	1	07/10/12 09:35	07/16/12 21:4	2	
Motor Oil Range Surrogates	<b>0.15</b> mg/l	L	0.095	1	07/10/12 09:35	07/16/12 21:4	2 64742-65-0	
n-Octacosane (S)	73 %		50-150	1	07/10/12 09:35	07/16/12 21:4	2 630-02-4	
o-Terphenyl (S)	73 %		50-150	1	07/10/12 09:35	07/16/12 21:4	2 84-15-1	
Sample: 2A-W-100-0612	Lab ID: 25127	751008	Collected: 06/27	/12 15:00	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPF	H-Dx Preparation N	/lethod: E	PA 3510			
NWIFH-DX GCS					0=//0//0 00 0=	07/40/40 04:5		
	<b>0.15</b> mg/l	L	0.019	1	07/10/12 09:35	07/16/12 21:5	9	
Diesel Range	<b>0.15</b> mg/l <b>0.14</b> mg/l		0.019 0.095		07/10/12 09:35 07/10/12 09:35			
Diesel Range Motor Oil Range	•			1 1		07/16/12 21:5 07/16/12 21:5	9 64742-65-0 9 630-02-4	



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Sample: MW-4-0612	Lab ID: 25127510	09 Collecte	ed: 06/27/1	2 15:35	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results Ui	nits Rep	port Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: N	WTPH-Dx Pre	paration Me	thod: El	PA 3510		•	
Diesel Range	<b>0.052</b> mg/L		0.019	1	07/10/12 09:35	07/16/12 22:16	6	
Motor Oil Range Surrogates	ND mg/L		0.095	1	07/10/12 09:35	07/16/12 22:16	6 64742-65-0	
n-Octacosane (S)	80 %		50-150	1	07/10/12 09:35	07/16/12 22:16	6 630-02-4	
o-Terphenyl (S)	79 %		50-150	1	07/10/12 09:35	07/16/12 22:16	84-15-1	
Sample: MW-3-0612	Lab ID: 25127510	10 Collecte	ed: 06/27/1	2 16:05	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results U	nits Rep	port Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: N	WTPH-Dx Pre	paration Me	thod: El	PA 3510			
Diesel Range	<b>0.033</b> mg/L		0.019	1	07/10/12 09:35	07/16/12 22:51	1	
Motor Oil Range	ND mg/L		0.095	1	07/10/12 09:35	07/16/12 22:51	64742-65-0	
Surrogates n-Octacosane (S)	47 %		50-150	1	07/10/12 09:35	07/16/12 22:51	1 630-02-4	S0
o-Terphenyl (S)	45 %		50-150	1		07/16/12 22:51		S0
Sample: GW-1-0612	Lab ID: 25127510		ed: 06/27/1		Received: 06		Matrix: Water	
Parameters Parameters	Results Ui	nits Rep	port Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: N	WTPH-Dx Pre	paration Me	thod: El	PA 3510			
Diesel Range	<b>0.030</b> mg/L							
Motor Oil Range	•		0.019	1	07/10/12 09:35	07/16/12 23:42	2	
Surrogates	ND mg/L		0.019 0.095	1		07/16/12 23:42 07/16/12 23:42		
Surrogates	•				07/10/12 09:35		2 64742-65-0	
Surrogates n-Octacosane (S)	ND mg/L		0.095	1	07/10/12 09:35 07/10/12 09:35	07/16/12 23:42	2 64742-65-0 2 630-02-4	
ŭ	ND mg/L 90 %	12 Collecte	0.095 50-150	1 1 1	07/10/12 09:35 07/10/12 09:35	07/16/12 23:42 07/16/12 23:42 07/16/12 23:42	2 64742-65-0 2 630-02-4	
Surrogates n-Octacosane (S) o-Terphenyl (S)	ND mg/L 90 % 88 % Lab ID: 25127510		0.095 50-150 50-150	1 1 1	07/10/12 09:35 07/10/12 09:35 07/10/12 09:35	07/16/12 23:42 07/16/12 23:42 07/16/12 23:42	2 64742-65-0 2 630-02-4 2 84-15-1	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: GW-2-0612  Parameters	ND mg/L 90 % 88 % Lab ID: 25127510	nits Rep	0.095 50-150 50-150 ed: 06/27/1:	1 1 1 2 12:55 DF	07/10/12 09:35 07/10/12 09:35 07/10/12 09:35 Received: 06 Prepared	07/16/12 23:42 07/16/12 23:42 07/16/12 23:42 6/28/12 15:20	2 64742-65-0 2 630-02-4 2 84-15-1 Matrix: Water	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: GW-2-0612	ND mg/L 90 % 88 %  Lab ID: 25127510  Results U	nits Rep	0.095 50-150 50-150 ed: 06/27/1:	1 1 1 2 12:55 DF	07/10/12 09:35 07/10/12 09:35 07/10/12 09:35 Received: 06 Prepared	07/16/12 23:42 07/16/12 23:42 07/16/12 23:42 6/28/12 15:20	2 64742-65-0 2 630-02-4 2 84-15-1 Matrix: Water CAS No.	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: GW-2-0612 Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range	ND mg/L 90 % 88 %  Lab ID: 25127510  Results Un  Analytical Method: N	nits Rep	0.095 50-150 50-150 ed: 06/27/1: port Limit eparation Me	1 1 1 2 12:55 DF	07/10/12 09:35 07/10/12 09:35 07/10/12 09:35 Received: 06 Prepared PA 3510 07/10/12 09:35	07/16/12 23:42 07/16/12 23:42 07/16/12 23:42 6/28/12 15:20 Analyzed	2 64742-65-0 2 630-02-4 2 84-15-1 Matrix: Water CAS No.	Qual
Surrogates n-Octacosane (S) o-Terphenyl (S)  Sample: GW-2-0612 Parameters  NWTPH-Dx GCS  Diesel Range	ND mg/L 90 % 88 %  Lab ID: 25127510  Results Un  Analytical Method: N 0.028 mg/L	nits Rep	0.095 50-150 50-150 ed: 06/27/1: port Limit eparation Me 0.019	1 1 1 2 12:55 DF ethod: EF	07/10/12 09:35 07/10/12 09:35 07/10/12 09:35 Received: 06 Prepared PA 3510 07/10/12 09:35 07/10/12 09:35	07/16/12 23:42 07/16/12 23:42 07/16/12 23:42 6/28/12 15:20 Analyzed	2 64742-65-0 2 630-02-4 2 84-15-1 Matrix: Water CAS No.	Qual



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Sample: 1C-W-1-0612	Lab ID:	2512751013	Collecte	ed: 06/27/	12 09:30	Received: 06	6/28/12 15:20 M	latrix: Water	
Parameters	Results	Units	Rep	oort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical I	Method: NWTF	H-Dx Pre	paration M	lethod: E	PA 3510			
Diesel Range	ND	mg/L		0.019	1	07/10/12 09:35	07/17/12 00:16		
Motor Oil Range	ND	) mg/L		0.095	1	07/10/12 09:35	07/17/12 00:16	64742-65-0	
Surrogates									
n-Octacosane (S)		2 %		50-150	1		07/17/12 00:16		
o-Terphenyl (S)	80	) %		50-150	1	07/10/12 09:35	07/17/12 00:16	84-15-1	
Sample: 1C-W-8-0612	Lab ID:	2512751014	Collecte	ed: 06/27/	12 10:10	Received: 06	5/28/12 15:20 M	latrix: Water	
Parameters	Results	Units	Rep	oort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical I	Method: NWTF	H-Dx Pre	paration M	lethod: E	PA 3510			
Diesel Range	0.083	3 mg/L		0.019	1	07/10/12 09:35	07/17/12 00:33		
Motor Oil Range		mg/L		0.095	1		07/17/12 00:33	64742-65-0	
Surrogates		9.=		0.000	•	017.107.12.001.00	0.7.1.7.12	02000	
n-Octacosane (S)	95	5 %		50-150	1	07/10/12 09:35	07/17/12 00:33	630-02-4	
o-Terphenyl (S)	93	3 %		50-150	1	07/10/12 09:35	07/17/12 00:33	84-15-1	
Sample: 1C-W-7-0612	Lob ID:	2512751015	Collocto	ed: 06/27/	12 11:05	Received: 06	1/20/12 15:20 N	latrix: Water	
Sample: 10-W-7-0012	Lab ID.	2312731013	Collecte	u. 00/2//	12 11.03	Neceived. 00	1/20/12 13.20 IV	ialiix. Vval <del>c</del> i	
Parameters	Results	Units	Rep	oort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical I	Method: NWTF	H-Dx Pre	paration M	lethod: E	PA 3510			
Diesel Range	0.057	mg/L		0.019	1	07/10/12 09:35	07/17/12 00:51		
Motor Oil Range	ND	) mg/L		0.094	1	07/10/12 09:35	07/17/12 00:51	64742-65-0	
Surrogates		J							
n-Octacosane (S)	92	2 %		50-150	1	07/10/12 09:35	07/17/12 00:51	630-02-4	
o-Terphenyl (S)	91	<b>%</b>		50-150	1	07/10/12 09:35	07/17/12 00:51	84-15-1	
Sample: 2A-W-40-0612	Lab ID:	2512751016	Collecte	ed: 06/27/	12 14:30	Received: 06	6/28/12 15:20 M	latrix: Water	
Parameters	Results	Units	Rep	oort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical I	- Method: NWTF	H-Dx Pre	paration M	lethod: E		-	-	
Diesel Range	•	) mg/L		0.019	1		07/17/12 01:08		
Motor Oil Range		mg/L		0.019	1		07/17/12 01:08	64742 65 0	
Surrogates	INL	, my/L		0.094	1	01/10/12 08.33	01/11/12 01.00	04142-00-0	
n-Octacosane (S)	70	) %		50-150	1	07/10/12 00:35	07/17/12 01:08	630-02-4	
o-Terphenyl (S)		7 %		50-150	1		07/17/12 01:08		
	//	/n				01110117 09 33	UIIIIII UN UN		



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Sample: 2A-W-400-0612	Lab ID: 2512751	<b>017</b> Co	llected: 06/27/1	2 15:10	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results L	Jnits	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/L		0.019	1	07/10/12 09:35	07/17/12 01:2	5	
Motor Oil Range Surrogates	ND mg/L		0.094	1	07/10/12 09:35	07/17/12 01:2	5 64742-65-0	
n-Octacosane (S)	87 %		50-150	1	07/10/12 09:35	07/17/12 01:2	5 630-02-4	
o-Terphenyl (S)	85 %		50-150	1	07/10/12 09:35	07/17/12 01:2	5 84-15-1	
Sample: GW-3-0612	Lab ID: 2512751	<b>018</b> Co	ollected: 06/27/1	2 15:25	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results L	Jnits	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.022</b> mg/L		0.019	1	07/10/12 09:35	07/17/12 01:4	2	
Motor Oil Range Surrogates	ND mg/L		0.094	1	07/10/12 09:35	07/17/12 01:4	2 64742-65-0	
n-Octacosane (S)	96 %		50-150	1	07/10/12 09:35	07/17/12 01:4	2 630-02-4	
o-Terphenyl (S)	94 %		50-150	1	07/10/12 09:35	07/17/12 01:4	2 84-15-1	
Sample: 2A-W-41-0612	Lab ID: 2512751	<b>019</b> Co	ollected: 06/27/1	2 16:15	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results U	Jnits	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/L		0.019	1	07/10/12 09:35	07/17/12 01:5	9	
Motor Oil Range Surrogates	ND mg/L		0.094	1	07/10/12 09:35	07/17/12 01:5	9 64742-65-0	
n-Octacosane (S)	93 %		50-150	1	07/10/12 09:35	07/17/12 01:5	9 630-02-4	
o-Terphenyl (S)	91 %		50-150	1	07/10/12 09:35	07/17/12 01:5	9 84-15-1	
Sample: 2A-W-42-0612	Lab ID: 2512751	<b>020</b> Co	ollected: 06/28/1	2 10:00	Received: 06	6/28/12 15:20	Matrix: Water	
Parameters	Results L	Jnits	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.054</b> mg/L		0.019	1	07/10/12 09:35	07/17/12 02:5	0	
Motor Oil Range Surrogates	ND mg/L		0.094	1		07/17/12 02:5		
n-Octacosane (S)	96 %		50-150	1	07/10/12 09:35	07/17/12 02:5	0 630-02-4	
o-Terphenyl (S)	95 %		50-150	1	07/10/12 09:35	07/17/12 02:5	0 84-15-1	



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Pace Project No.: 2512751

Sample: 1B-W-23-0612	Lab ID: 251	2751021	Collected:	06/28/1	2 09:05	Received: 0	6/28/12 15:20	Matrix: Water		
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual	
NWTPH-Dx GCS	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510									
Diesel Range	<b>0.023</b> mg	g/L		0.019	1	07/10/12 12:10	0 07/11/12 00:1	8		
Motor Oil Range	ND mg			0.095	1	07/10/12 12:10	0 07/11/12 00:1	8 64742-65-0		
Surrogates										
n-Octacosane (S)	66 %			0-150	1		07/11/12 00:1			
o-Terphenyl (S)	63 %		5	0-150	1	07/10/12 12:10	07/11/12 00:1	8 84-15-1		
Sample: 5-W-17-0612	Lab ID: 251	2751022	Collected:	06/28/1	2 08:45	Received: 0	6/28/12 15:20	Matrix: Water		
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual	
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Prepara	ation Me	ethod: El	PA 3510				
Diesel Range	ND mg	a/L		0.019	1	07/10/12 12:10	07/11/12 00:3	5		
Motor Oil Range Surrogates	ND mg			0.095	1		0 07/11/12 00:3			
n-Octacosane (S)	71 %		5	0-150	1	07/10/12 12:10	07/11/12 00:3	5 630-02-4		
o-Terphenyl (S)	66 %		5	0-150	1	07/10/12 12:10	07/11/12 00:3	5 84-15-1		
NWTPH-Dx GCS Silica Gel	Analytical Meth	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range SG	ND mg	a/L		0.019	1	07/11/12 15:00	07/13/12 12:3	3		
Motor Oil Range SG Surrogates	ND mọ			0.095	1	07/11/12 15:00	07/13/12 12:3	3 64742-65-0		
n-Octacosane (S)	100 %		5	0-150	1	07/11/12 15:00	07/13/12 12:3	3 630-02-4		
o-Terphenyl (S)	87 %		5	0-150	1	07/11/12 15:00	07/13/12 12:3	3 84-15-1		
Sample: 5-W-18-0612	Lab ID: 251	2751023	Collected:	06/28/1	2 09:45	Received: 0	6/28/12 15:20	Matrix: Water		
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual	
NWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Prepara	ation Me	ethod: El	PA 3510				
Diesel Range	<b>0.094</b> mg	a/L		0.019	1	07/10/12 12:10	07/13/12 10:3	3		
Motor Oil Range	<b>0.13</b> mg	•		0.095	1	07/10/12 12:10	07/13/12 10:3	3 64742-65-0		
Surrogates										
n-Octacosane (S)	90 %			0-150	1		07/13/12 10:3			
o-Terphenyl (S)	83 %		5	0-150	1	07/10/12 12:10	07/13/12 10:3	3 84-15-1		
NWTPH-Dx GCS Silica Gel	Analytical Meth	nod: NWTP	H-Dx Prepara	ation Me	ethod: El	PA 3510				
Diesel Range SG	ND mg	g/L		0.019	1	07/11/12 15:00	07/13/12 13:2	5		
Motor Oil Range SG	ND mg	g/L		0.095	1	07/11/12 15:00	07/13/12 13:2	5 64742-65-0		
Surrogates	A= 4:		=	0.450		07/44/20 17 77	07/10/10 15 5	- 000 cc :		
n-Octacosane (S) o-Terphenyl (S)	85 %			0-150	1		07/13/12 13:2			
o Jornhonyl (C)	74 %		5	0-150	1	07/11/12 15:00	1 - ロノ/13/12 13・2	5 X/L-15_1		

Date: 07/18/2012 08:55 AM

# **REPORT OF LABORATORY ANALYSIS**



Project: BNSF-Skykomish

Pace Project No.: 2512751

Sample: 5-W-180-0612	Lab ID: 2512751024		Collected: 06/28/	12 10:00	Received: 06	6/28/12 15:20 N	/latrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual		
NWTPH-Dx GCS	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510									
Diesel Range	<b>0.092</b> mg/L		0.019	1	07/10/12 12:10	07/13/12 10:50				
Motor Oil Range	<b>0.13</b> mg	g/L	0.094	1	07/10/12 12:10	07/13/12 10:50	64742-65-0			
Surrogates										
n-Octacosane (S)	80 %		50-150	1		07/13/12 10:50				
o-Terphenyl (S)	71 %		50-150	1	07/10/12 12:10	07/13/12 10:50	84-15-1			
NWTPH-Dx GCS Silica Gel	Analytical Meth	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510					
Diesel Range SG	ND mg	g/L	0.019	1	07/11/12 15:00	07/13/12 13:59				
Motor Oil Range SG	ND mg	g/L	0.095	1	07/11/12 15:00	07/13/12 13:59	64742-65-0			
Surrogates										
n-Octacosane (S)	88 %		50-150	1		07/13/12 13:59				
o-Terphenyl (S)	77 %		50-150	1	07/11/12 15:00	07/13/12 13:59	84-15-1			
Sample: 5-W-14-0612	Lab ID: 251	2751025	Collected: 06/28/	12 10:45	Received: 06	6/28/12 15:20 N	Matrix: Water			
·										
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual		
NWTPH-Dx GCS	Analytical Meth	hod: NWTP	H-Dx Preparation M	ethod: E	PA 3510					
Diesel Range	ND mg	a/l	0.019	1	07/10/12 12:10	07/13/12 11:07				
Motor Oil Range	ND mg	-	0.094	1		07/13/12 11:07	64742-65-0			
Surrogates	142	9, =	0.001	•	07710712 12:10	07710712 11.07	011 12 00 0			
n-Octacosane (S)	95 %		50-150	1	07/10/12 12:10	07/13/12 11:07	630-02-4			
o-Terphenyl (S)	87 %		50-150	1		07/13/12 11:07				
NWTPH-Dx GCS Silica Gel	Analytical Meth	hod: NWTP	PH-Dx Preparation Method: EPA 3510							
Diesel Range SG	ND mg	n/l	0.019	1	07/11/12 15:00	07/13/12 14:16				
Motor Oil Range SG	ND mg	-	0.094	1		07/13/12 14:16	64742-65-0			
Surrogates	ווע אווע	g/L	0.004	'	07/11/12 15:00	07/10/12 14:10	04742-00-0			
n-Octacosane (S)	90 %		50-150	1	07/11/12 15:00	07/13/12 14:16	630-02-4			
o-Terphenyl (S)	79 %		50-150	1		07/13/12 14:16				
	70 70		00 100	·	0771712 10:00	07710712 11.10	0.101			
Sample: 5-W-15-0612	Lab ID: 251	2751026	Collected: 06/28/	12 12:05	Received: 06	6/28/12 15:20 N	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual		
NWTPH-Dx GCS	Analytical Meth	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	<b>0.11</b> mg	a/L	0.019	1	07/10/12 12:10	07/13/12 11:24				
Motor Oil Range	<b>0.13</b> mg	-	0.094	1		07/13/12 11:24	64742-65-0			
Surrogates	<b>0.10</b> mg	<i>∃.</i> <b>–</b>	0.004	•	517 157 1Z 1Z.10	517 157 1Z 11.ZT	311 12 00 0			
n-Octacosane (S)	86 %		50-150	1	07/10/12 12:10	07/13/12 11:24	630-02-4			
o-Terphenyl (S)	80 %		50-150	1		07/13/12 11:24				
NWTPH-Dx GCS Silica Gel	Analytical Meth	hod: NWTP	PH-Dx Preparation M	ethod: E	PA 3510					
Diesel Range SG	ND mg	a/l	0.019	1	07/11/12 15:00	07/13/12 14:34				
_		-	0.019	1		07/13/12 14:34	64742 65 0			
Motor Oil Range SG	ND mọ	y/L	0.094	1	07/11/12 15:00	01/13/12 14.34	04142-00-0			
Date: 07/18/2012 08:55 AM	REPORT OF LABORATORY ANALYSIS						Pa	age 10 of 1		

### REPORT OF LABORATORY ANALYSIS



Project: BNSF-Skykomish

Sample: 5-W-15-0612	Lab ID: 2512751	026 Collected:	: 06/28/12 12:0	5 Received: 0	6/28/12 15:20 N	Matrix: Water				
Parameters	Results U	Jnits Repo	rt Limit DF	Prepared	Analyzed	CAS No.	Qual			
NWTPH-Dx GCS Silica Gel	Analytical Method:	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Surrogates										
n-Octacosane (S)	108 %		50-150 1		07/13/12 14:34					
o-Terphenyl (S)	96 %		50-150 1	07/11/12 15:00	07/13/12 14:34	84-15-1				
Sample: 5-W-16-0612	Lab ID: 2512751	027 Collected:	: 06/28/12 11:1	0 Received: 0	6/28/12 15:20 N	Matrix: Water				
Parameters	Results U	Jnits Repo	ort Limit DF	Prepared	Analyzed	CAS No.	Qual			
NWTPH-Dx GCS	Analytical Method:	NWTPH-Dx Prepa	aration Method:	EPA 3510						
Diesel Range	<b>0.022</b> mg/L		0.019 1	07/10/12 12:10	07/13/12 11:41					
Motor Oil Range	ND mg/L		0.095 1	07/10/12 12:10	07/13/12 11:41	64742-65-0				
Surrogates										
n-Octacosane (S)	84 %		50-150 1		07/13/12 11:41					
o-Terphenyl (S)	79 %		50-150 1	07/10/12 12:10	07/13/12 11:41	84-15-1				
NWTPH-Dx GCS Silica Gel	Analytical Method:	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range SG	ND mg/L		0.019 1	07/11/12 15:00	07/13/12 14:51					
Motor Oil Range SG	ND mg/L		0.095 1	07/11/12 15:00	07/13/12 14:51	64742-65-0				
Surrogates										
n-Octacosane (S)	103 %		50-150 1		07/13/12 14:51					
o-Terphenyl (S)	90 %		50-150 1	07/11/12 15:00	07/13/12 14:51	84-15-1				
Sample: 5-W-19-0612	Lab ID: 2512751	028 Collected:	: 06/28/12 10:4	Received: 0	6/28/12 15:20 N	Matrix: Water				
Parameters	Results I	Jnits Repo	rt Limit DF	Prepared	Analyzed	CAS No.	Qual			
NWTPH-Dx GCS	Analytical Method:	NWTPH-Dx Prepa	aration Method:	EPA 3510						
Diesel Range	ND mg/L		0.019 1	07/10/12 12:10	07/13/12 11:59					
Motor Oil Range <b>Surrogates</b>	ND mg/L		0.095 1	07/10/12 12:10	07/13/12 11:59	64742-65-0				
n-Octacosane (S)	82 %		50-150 1	07/10/12 12:10	07/13/12 11:59	630-02-4				
o-Terphenyl (S)	77 %		50-150 1	07/10/12 12:10	07/13/12 11:59	84-15-1				
NWTPH-Dx GCS Silica Gel	Analytical Method:	NWTPH-Dx Prepa	aration Method:	EPA 3510						
Diesel Range SG	ND mg/L		0.019 1	07/11/12 15:00	07/13/12 15:08					
Motor Oil Range SG	ND mg/L		0.015		07/13/12 15:08					
•	HD IIIg/L		3.000	0.77.17.12.10.00	31713712 10.00	311 12 00 0				
Surrogates										
Surrogates n-Octacosane (S)	99 %		50-150 1	07/11/12 15:00	07/13/12 15:08	630-02-4				



#### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish

Pace Project No.: 2512751

QC Batch: OEXT/5750 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2512751001, 2512751002, 2512751003, 2512751004, 2512751005, 2512751006, 2512751007, 2512751008,

2512751009, 2512751010, 2512751011, 2512751012, 2512751013, 2512751014, 2512751015, 2512751016,

2512751017, 2512751018, 2512751019, 2512751020

METHOD BLANK: 121919 Matrix: Water

Associated Lab Samples: 2512751001, 2512751002, 2512751003, 2512751004, 2512751005, 2512751006, 2512751007, 2512751008,

2512751009, 2512751010, 2512751011, 2512751012, 2512751013, 2512751014, 2512751015, 2512751016,

2512751017, 2512751018, 2512751019, 2512751020

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.020	07/16/12 18:33	
Motor Oil Range	mg/L	ND	0.10	07/16/12 18:33	
n-Octacosane (S)	%	92	50-150	07/16/12 18:33	
o-Terphenyl (S)	%	91	50-150	07/16/12 18:33	

LABORATORY CONTROL SAMPLE: 121920

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.84	84	51-114	_
Motor Oil Range	mg/L	1	0.84	84	62-120	
n-Octacosane (S)	%			90	50-150	
o-Terphenyl (S)	%			89	50-150	

SAMPLE DUPLICATE: 121921

		2512751001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	 mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	98	100	2	
o-Terphenyl (S)	%	97	99	2	

SAMPLE DUPLICATE: 121922

		2512751009	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.052	0.067	25	
Motor Oil Range	mg/L	ND	0.11		
n-Octacosane (S)	%	80	85	6	
o-Terphenyl (S)	%	79	83	4	



#### **QUALITY CONTROL DATA**

Project: BNSF-Skykomish

Pace Project No.: 2512751

QC Batch: OEXT/5751 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2512751021, 2512751022, 2512751023, 2512751024, 2512751025, 2512751026, 2512751027, 2512751028

METHOD BLANK: 121926 Matrix: Water

Associated Lab Samples: 2512751021, 2512751022, 2512751023, 2512751024, 2512751025, 2512751026, 2512751027, 2512751028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.020	07/10/12 23:43	
Motor Oil Range	mg/L	ND	0.10	07/10/12 23:43	
n-Octacosane (S)	%	94	50-150	07/10/12 23:43	
o-Terphenyl (S)	%	92	50-150	07/10/12 23:43	

LABORATORY CONTROL SAMPLE: 121927 LCS LCS % Rec Spike Parameter Units Conc. Result % Rec Limits Qualifiers Diesel Range mg/L 1 0.95 51-114 Motor Oil Range mg/L 1 0.87 87 62-120 n-Octacosane (S) % 92 50-150 o-Terphenyl (S) % 91 50-150

SAMPLE DUPLICATE: 121928

		2512751022	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	71	71	.5	
o-Terphenyl (S)	%	66	66	.3	



## **QUALITY CONTROL DATA**

Project: BNSF-Skykomish

Pace Project No.: 2512751

QC Batch: OEXT/5763 Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS SG

Associated Lab Samples: 2512751022, 2512751023, 2512751024, 2512751025, 2512751026, 2512751027, 2512751028

METHOD BLANK: 122197 Matrix: Water

Associated Lab Samples: 2512751022, 2512751023, 2512751024, 2512751025, 2512751026, 2512751027, 2512751028

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.020	07/13/12 11:59	
Motor Oil Range SG	mg/L	ND	0.10	07/13/12 11:59	
n-Octacosane (S)	%	100	50-150	07/13/12 11:59	
o-Terphenyl (S)	%	87	50-150	07/13/12 11:59	

LABORATORY CONTROL SAMPLE: 122198

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L		0.71	71	59-114	
Motor Oil Range SG	mg/L	1	0.86	86	69-124	
n-Octacosane (S)	%			84	50-150	
o-Terphenyl (S)	%			74	50-150	

SAMPLE DUPLICATE: 122199

		2512751023	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND ND	.01J		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S)	%	85	101	17	
o-Terphenyl (S)	%	74	87	17	



#### **QUALIFIERS**

Project: BNSF-Skykomish

Pace Project No.: 2512751

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

PASI-S Pace Analytical Services - Seattle

#### **ANALYTE QUALIFIERS**

S0 Surrogate recovery outside laboratory control limits.



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF-Skykomish

Pace Project No.: 2512751

2512751001	2B-W-4-0612			Analytical Method	Batch
		EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751002	5-W-43-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751003	EW-1-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751004	GW-4-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751005	EW-2A-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751006	2A-W-9-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751007	2A-W-10-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751008	2A-W-100-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751009	MW-4-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751010	MW-3-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751011	GW-1-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751012	GW-2-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751013	1C-W-1-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751014	1C-W-8-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751015	1C-W-7-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751016	2A-W-40-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751017	2A-W-400-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751018	GW-3-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751019	2A-W-41-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751020	2A-W-42-0612	EPA 3510	OEXT/5750	NWTPH-Dx	GCSV/3672
2512751021	1B-W-23-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751022	5-W-17-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751023	5-W-18-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751024	5-W-180-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751025	5-W-14-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751026	5-W-15-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751027	5-W-16-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751028	5-W-19-0612	EPA 3510	OEXT/5751	NWTPH-Dx	GCSV/3674
2512751022	5-W-17-0612	EPA 3510	OEXT/5763	NWTPH-Dx	GCSV/3680
2512751023	5-W-18-0612	EPA 3510	OEXT/5763	NWTPH-Dx	GCSV/3680
2512751024	5-W-180-0612	EPA 3510	OEXT/5763	NWTPH-Dx	GCSV/3680
2512751025	5-W-14-0612	EPA 3510	OEXT/5763	NWTPH-Dx	GCSV/3680
2512751026	5-W-15-0612	EPA 3510	OEXT/5763	NWTPH-Dx	GCSV/3680
2512751027	5-W-16-0612	EPA 3510	OEXT/5763	NWTPH-Dx	GCSV/3680
2512751028	5-W-19-0612	EPA 3510	OEXT/5763	NWTPH-Dx	GCSV/3680

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

	tion B						Sec	tion C								Pa	ge:	1	of 3	
Company: AECOM Rep	ort To:	200	02 1	(00)	-h+			ice Inforr ntion:		ce	Sho	ann.	and	7		11010		143	8820	2
Address: 10 7 ALE CAR IDAD COP	To:	To	n/ Fer	lala	.11		Com	pany Na	ime: 1	ME	F	TY	ara	RE	GULATOR	Y AGENC				
Address: 710 2nd AVE, Sta 1000 Cop Southle, WA 98104 Email To: Renea, Knecht & ASCOM, Compense	-	JEA	NI CE		VICE		Addi	ess:		N			i ini	Г	NPDES	-	JND WAT	TER [	DRINKIN	G WATER
Email To: Roage Knocht & ASCAM Com	hase Orde	r No.:	TTOI	00-	MDG			Quote rence:						Г	UST	RCRA		Г	OTHER	
Phone: C24-9349 Fax: Proj. Requested Due Date/TAT: Proj.	ct Name:		BNSK.	- Sk	UFAR	Ish	_	Project						Si	te Location					
Requested Due Date/TAT: Std Proj	ect Numbe		5074					Profile #:	11-1		21			1	STATE:	MA		in la		
206			5027	-101			_						Request	ed Ana	lysis Filte	red (Y/N)		7		
Section D Matrix Codes Required Client Information MATRIX / COD	leti)	MP)	a m	COLL	ECTED	a la jala	2,1	101	Prese	vative	s	TN/A	N	mari			le le			
Water Waste Water Product Soil/Soild	DW WT WW P SL OL	3AB	COMPO STAR		COMP END/0		S					1	1/0 SCU				(Y/N)	itro	H. O.	
(A-Z, 0-9 / ,-) Wipe Air Sample IDs MUST BE UNIQUE Other	MP AR TS OT	TYPE		10 1	(Cast	TEMP AT	NTAINEF	Unpreserved H <sub>2</sub> SO <sub>4</sub>	33	H 3,0,1	Methanol	Analysis Test	NWTPH-DX	L L			Residual Chlorine (Y/N)			
#	MATRIX	SAMPLE	DATE	TIME	DATE	SAMPLE SAMPLE	# OF	Unpr	H S	NaOH Na <sub>2</sub> S <sub>2</sub> (	Meth	An	N.				Resi	Pace	Project N	lo./ Lab I.D.
1 2B-W-4 =061	_					08407	_		X				X							
2 5-W-43 - 1			Canoni	15571	1,1	0975 A	1 2		1		3 1		MII	d n	L 10 7					
2 5-W-43 - 1 3 GW-1						1016 81	2	-	X				X							
4 GN-4 -					174	1130 98	2		X				X		7					
5 EW-ZA -			100			1310 45	12		X				$\times$					OF ST		
6 ZA-W-9 -						1415 10,	82	-	X											
7 ZA-W-10 -						1950 14.	7	-	X				$\times$					MIN		
8 3A-W-100 -						1500 11	Z		X				$\times$			5 6 11		1		
9 MW-4 -						1535 10,5	2		X											
10 MW - 3 -			7-1-11			16053	12		l X		7		$\bowtie$							
11 GW-1 -						1205 8	12						X		(1)					
12 GW-Z -		MAL			1	1255 95	12		X				$\times$							
ADDITIONAL COMMENTS	RE	LINQU	ISHED BY /	AFFILIATI	ION	DATE		TIME		AC	CEPTE	D BY	AFFILIATION	1	DATE	TIME		SAMP	LE CONDIT	ONS
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	Part of													1			1.4	3.5	2.5	2.3
											100				72.		1.6	4.3	0.5	1.3
0.010	1014			SAMPLE	R NAME A	ND SIGNATUR	RE		1				, +1 W		77 - 19		D.			
ORIG	NAL		f		PRINT Na	ne of SAMPLER	:					_					ni q	ved (N/Y)	Custody saled Cooler (Y/N)	mples Intact (Y/N)
			ŀ			RE of SAMPLER							DATE Signe				Tempin	Received on Ice (Y/N)	Sealed	(у



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:	Section B		Infor-					ection C									Pag	ge:	2	of 3	
Company: ACCAM	Report To:	1	201	noe Ko	echt			voice Infor ention:			C	M C	De D		٦			-	158	001	9
Address: 710 200 AVE, \$1000  Souther, WA 98104  Email Jo: Renes Knecht ACCOM. (0)  Phone: 706)624-9249  Requested Due Date/TAT: Std	Сору То:		Ter	nee Kn	Vald		Co	ention: mpany N	ame: p	NS			year	4—	REGULAT	ORY AGE	ENC.	_		1911	
Southe, WA 98104				III			Ad	dress:		100					☐ NPDES	s F G	ROL	JND WA	TER	DRINKI	NG WATER
Email To: Renne Kneck+ OAECOM. COI	Purchase C	Order N	lo.:	TTOIDD	-MO	Š		ce Quote ference:							□ UST	FR	CRA		Г	OTHER	
Phone: 706)624-9249 Fax:	Project Nan	ne:	BN	SF -Sk	ukom	sh	Pad	ce Project nager:							Site Locati	ion				N. P.	
Requested Due Date/TAT:	Project Nun	nber.	6	02410	2		_	ce Profile #	:				197		STAT	re:	NA		7		
													Requ	ueste	d Analysis Fi	Itered (Y/	(N)	T			
Section D Matrix C Required Client Information MATRIX /		o left)	(AW	CO	LECTED		Γ		Prese	rvative	s	N/A	NN								Hall I
Drinking Wate Water Waste Water Product Soil/Solid	WT WW P SL		(G=GRAB C=COMP)	COMPOSITE START	COMP END/		· ·				lg: L		WSG(1)				na	(Y/N)	of an		
SAMPLE ID  (A-Z, 0-9 /,-) Sample IDs MUST BE UNIQUE  ##  ##  ##  ##  ##  ##  ##  ##  ##	OL WP AR TS OT	CODE	SAMPLE TYPE (G=	DATE TIME	DATE	BAMPLE TEMP AT C	ONTAINE	Unpreserved	HNO <sub>3</sub>	NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	is Test	NWTP1+0x W				Lo Loc	Residual Chlorine (Y/N)	Pac	Project	No./ Lab I.D.
1 1C-W-1 - DE	312					0930 8	_						V				T		1 40	, roject	10.7 Edb 1.D.
2 IC-W-8 - 3 IC-W-7 -				H1 () =	1	1010 12	-		X								T				
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6 GW-3 -	-	_	_			1525 9,9	12	-	X				X								
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8 2A-W-4Z-		-	+		6/28/12	MODOL	2	-	1 X	1			X				-				
9   B-W-ZZ -			+			0905	14		$+ \lambda$	-	-		X,				_				
10 5-W-17 -	-	+	+			084 8	41		1	+	-		$\langle \dot{\chi} \dot{\chi} \rangle$								
11 S-W-18 - 12 S-W-180 -	+	+	+			094570	_		10		$\vdash$	1		_							
12 5-W-180 -	1	DELIA	IOIIIE	HED BY / AFFILIA	TION	DATE	14	TIME	17		CERTE	D BY	AFFILIA	TION	DATE	TIM	-				
			0.000-000		YESTER		10			E(			AFFILIA	HON	DATE	Tim	_		SAMI	LE CONDIT	IONS
SGCU - Sillcagel clean	NO MA	all	gu	001 3600	ne	6/28/12	1:	520	1			_	7		1 )			1			
5-W-17-06125									-	/	S	$\leq$			6/29/12	15.0	20	3.4	1/		Y
extra sample volume																		1.4	3.5	2.5	2.3
S-W-17-06125 extra sample volume for MS/MSD																		1.6	4.3	0.5	1.3
				SAMPL	ER NAME A	ND SIGNATUR	E											Ç.		oler	
O	RIGINA	L			PRINT Nar	ne of SAMPLER	:											⊆ .	Received on Ice (Y/N)	Custody saled Cool (Y/N)	(Y/N)
					SIGNATUR	E of SAMPLER							DATE S					Тетр	Rec	Seale	Gampl



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A	Section I	B	41.2						ction C											Pa	ge:	3	of 3	
Required Client Information:  Company: AFCOM	Required Report To:	C	infor	mation;	Vac	-1+			oice Info ention:	Po		, <	Sla	0-		D	٦					158	002	)
Company: AECOM  Address: 710 20d AVE, Sto 100  Seattle, WA 98104  Email To: Renee Kneckt GAECOM,  Phone: 206 624-9349  Requested Due Date/TAT: C. 1	Copy To:	T	200	162-	10/0	1		Co	mpany N	Name:	RA	ISE	=	PP	ogra	1—	REG	ULATO	RYA	GENC			002	
South MA GOING		- 01	111	1142	VVa	4		Ad	dress:		) · v	-1					Г	NPDES	Г	GRO	UND WA	TER [	DRINKIN	IG WATER
Email To: Panga Konsht GATTON	Purchase	Order	No.: -	TOU	20 -	MAG	,		e Quote									UST	Г	RCRA	A	Г	OTHER	
Phone: 624 9349 Fax:	Project Na	me:	R	NSF	-5	kuk	mich	Pac	e Project								Site	Locatio	n	7				WWW.7750
Requested Due Date/TAT:	Project Nu	mber:	1	502	410	25			e Profile	#:			TRAIL			HA-GO	J. P. H	STATE		WA		office to		
- 74			- 4		+10			_							Req	ueste	d Anal	ysis Filt	ered	(Y/N)				
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Water Waste Wa		lid cod	B C	COMPO		COMPO END/G									SG.CU						9			
Product Soil/Solid	P SL OL	see va	(G=GRAB	3174			5	0			-			-	10 M					1005	Residual Chlorine (Y/N)			
SAMPLE ID Oil Wipe (A-Z, 0-9 /,-) Air	WP	ш					TA	i ii				Ш		Test	XX						orine			
Sample IDs MUST BE UNIQUE Tissue Other	AR TS OT	CODE	TYPE				TEME	ATM	rved					S	11						5			
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<b>E</b>	19	MA	SAMPL	DATE	TIME	DATE	TIME N	# OH	5	H₂SO₄ HNO₃	Nac HC	Naz	Methanol	<b>‡</b> ∀i	NWTOH	301					Res	Pace	Project I	No./ Lab I.D.
1 5-W-14 - 06 2 5-W-15 - 3 5-W-16 -	5/2					6/28/13	10459	44	-		X			1	XX									
2 5-W-15-	1						1705 1	2			X				XX				1		$\perp$		Mila	
3 5-W-16-	,						1110 9	44		12	Κ		-		XX		+	++		_	$\vdash$	-		
4 5-W-19 - 5	<u> </u>				-	Y	1040 8.	94		+	X	H	+	-	XX		++		-	_	+	-		
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ADDITIONAL COMMENTS	-	,	_	SHED BY /			DATE	-	TIME	-		Manage .			AFFILIA	TION		DATE	1	TIME		SAM	LE CONDIT	IONS
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					SAMPLE	R NAME A	ND SIGNATUR	RE													Ç		y	ntact
	ORIGINA	\L		[		PRINT Nan	e of SAMPLER	1:													Temp in "	Received on Ice (Y/N)	Custody ealed Cool	Samples Intact (Y/N)
						SIGNATUR	E of SAMPLER	1:							DATE :						Ten	Rec	Seale	Samp

CLIENT:	BNSF	AECOM		
COC PAGE	1 of 3			

2512751 Trip Blank(s) Provided? Y / N



AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP20	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

COC ID#\_

CLIENT: BNSF AECOM	
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2512751

Pace Analytical www.cocsata.com

COC PAGE 2 of 3

Trip Blank(s) Provided?

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG		Comments
1		2															
2																	
3																	
4			7.														
5																	
6																	
7																	
8																	
9		V															
10		10															
11		4															
12		1															

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP20	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

CLIENT: BNSF AECOM

2512751

Pace Analytical WHYLDBOSIALA COP

COC PAGE 3 of 3

Trip Blank(s) Provided?
Y / N

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG	27		Comments
1		4																
2																		
3																		
4		V																
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial '
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP20	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

# Paga Analytical

## Sample Condition Upon Receipt

Face Analytical Client Name	: BNSF	AECOM	Project #	25127
Courier: Fed Ex UPS USPS Clie	nt Commercial	Pace Other		
Custody Seal on Cooler/Box Present: Yes	No Seals in	ntact: Yes	No	
Packing Material: Bubble Wrap Bubble	e Bags None	Other	Temp. Blank Yes	No
Thermometer Used 132013 o 101731982 or 2260			Samples on ice, cooling	
Cooler Temperature 3.4.1.4,1.6,3.5,4.3,2.5 Temp should be above freezing ≤ 6°C 0.5,2.3,1.		s Frozen: Yes No Comments:	Date and Initials of contents:	parson examining
Chain of Custody Present:	₽Yes □No □N/A 1			
Chain of Custody Filled Out:	Tres ONO ON/A 2			
Chain of Custody Relinquished:	Dres ONO ONA 3	i		
Sampler Name & Signature on COC:	✓Yes □No □N/A 4	l		
Samples Arrived within Hold Time:	Yes □No □N/A 5	i		
Short Hold Time Analysis (<72hr):	□Yes ☑Ng □NA 6	i.		
Rush Turn Around Time Requested:	□Yes ☑No □N/A 7	·.		
Follow Up / Hold Analysis Requested:	□Yes □No □N/A 8	3.		
Sufficient Volume:	Dres ONO ON/A 9	).		
Correct Containers Used:	Pygs □No □N/A 1	10.		
-Pace Containers Used:	DYes DNO DNA			
Containers Intact:	EYes DNo DNA 1	1.		
Filtered volume received for Dissolved tests	□Yes □No ☑N/A 1			
Sample Labels match COC:	DYes □No □N/A 1	3.		
-Includes date/time/ID/Analysis Matrix: All containers needing preservation have been checked.	Dyes DNo ZN/A 1	14.		
All containers needing preservation are found to be in compliance with EPA recommendation.	□Yes □No ☑N/A		<b>&gt;</b>	
Exceptions: VOA, coliform, TOC, O&G		nitial when completed	Lot # of added preservative	
Samples checked for dechlorination:	□Yes □No □N/A 1	5.		
Headspace in VOA Vials ( >6mm):	□Yes □No □NUK 1	6.		
Trip Blanks Present:	□Yes □No ☑N/A 1	17.		
Trip Blank Custody Seals Present	□Yes □No ☑N/A			
Pace Trip Blank Creation Date:				
Client Notification/ Resolution: Person Contacted:	Date/Tii	me:	Field Data Required?	Y / N
Comments/ Resolution:				
				/7,
Project Manager Review:	2/		Date: 10 l	CF

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

F-SEA-C-021-rev.04 26Jan2012





August 10, 2012

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaquah, WA 98027

RE: Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

## Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on July 27, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 







## **CERTIFICATIONS**

Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

Washington Certification IDs
940 South Harney Street, Seattle, WA 98108
Alaska CS Certification #: UST-025
Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



## **SAMPLE ANALYTE COUNT**

Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2513117001	1C-W-7-0712	NWTPH-Dx	AY1	4	PASI-S
2513117002	1C-W-70-0712	NWTPH-Dx	AY1	4	PASI-S
2513117003	1C-W-8-0712	NWTPH-Dx	AY1	4	PASI-S
2513117004	1C-W-1-0712	NWTPH-Dx	AY1	4	PASI-S





#### **PROJECT NARRATIVE**

Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

Method: NWTPH-Dx
Description: NWTPH-Dx GCS
Client: BNSF\_Farallon - WA
Date: August 10, 2012

#### **General Information:**

4 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

## Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

## **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: OEXT/5908

D8: The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.

DUP (Lab ID: 125989)Diesel Range

## Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



## **ANALYTICAL RESULTS**

Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

Sample: 1C-W-7-0712	Lab ID: 251	3117001	Collected:	07/26/1	2 10:45	Received: 0	7/27/12 13:15	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.031</b> m	g/L		0.019	1	08/06/12 09:40	08/06/12 17:55	5	
Motor Oil Range <b>Surrogates</b>	ND m	g/L		0.095	1	08/06/12 09:40	08/06/12 17:55	64742-65-0	
n-Octacosane (S)	87 %	)		50-150	1	08/06/12 09:40	08/06/12 17:55	5 630-02-4	
o-Terphenyl (S)	82 %	)	;	50-150	1	08/06/12 09:40	08/06/12 17:55	5 84-15-1	
Sample: 1C-W-70-0712	Lab ID: 251	3117002	Collected:	07/26/1	2 12:00	Received: 0	7/27/12 13:15	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range	<b>0.044</b> m	g/L		0.019	1	08/06/12 09:40	08/06/12 18:13	3	
Motor Oil Range <b>Surrogates</b>	ND m	g/L		0.095	1	08/06/12 09:40	08/06/12 18:13	3 64742-65-0	
n-Octacosane (S)	71 %	)		50-150	1	08/06/12 09:40	08/06/12 18:13	3 630-02-4	
o-Terphenyl (S)	69 %	)	•	50-150	1	08/06/12 09:40	08/06/12 18:13	84-15-1	
Sample: 1C-W-8-0712	Lab ID: 251	3117003	Collected:	07/26/1	2 11:36	Received: 0	7/27/12 13:15	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	ethod: Ef	PA 3510			
Diesel Range	<b>0.078</b> m	g/L		0.019	1	08/06/12 09:40	08/06/12 18:30	)	
Motor Oil Range <b>Surrogates</b>	ND m	-		0.095	1	08/06/12 09:40	08/06/12 18:30	64742-65-0	
n-Octacosane (S)	80 %		;	50-150	1	08/06/12 09:40	08/06/12 18:30	630-02-4	
o-Terphenyl (S)	76 %	)	;	50-150	1	08/06/12 09:40	08/06/12 18:30	) 84-15-1	
Sample: 1C-W-1-0712	Lab ID: 251	13117004	Collected:	07/26/1	2 12:16	Received: 0	7/27/12 13:15	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	ethod: El	PA 3510			
Diesel Range	ND m	g/L		0.019	1	08/06/12 09:40	08/06/12 19:05	5	
Motor Oil Range	ND m	-		0.096	1	08/06/12 09:40	08/06/12 19:05	64742-65-0	
Surrogates									
<b>Surrogates</b> n-Octacosane (S)	52 %	)		50-150	1	08/06/12 09:40	08/06/12 19:05	630-02-4	

Date: 08/10/2012 08:41 AM

## **REPORT OF LABORATORY ANALYSIS**



## **QUALITY CONTROL DATA**

Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

QC Batch: OEXT/5908 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2513117001, 2513117002, 2513117003, 2513117004

METHOD BLANK: 125986 Matrix: Water
Associated Lab Samples: 2513117001, 2513117002, 2513117003, 2513117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.020	08/06/12 17:21	
Motor Oil Range	mg/L	ND	0.10	08/06/12 17:21	
n-Octacosane (S)	%	77	50-150	08/06/12 17:21	
o-Terphenyl (S)	%	74	50-150	08/06/12 17:21	

LABORATORY CONTROL SAMPLE: 125987

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		0.84	84	51-114	
Motor Oil Range	mg/L	1	0.95	95	62-120	
n-Octacosane (S)	%			83	50-150	
o-Terphenyl (S)	%			81	50-150	

SAMPLE DUPLICATE: 125989

		2513117001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	 mg/L	0.031	0.049	46	D8
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	87	76	14	
o-Terphenyl (S)	%	82	71	15	



#### **QUALIFIERS**

Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

PASI-S Pace Analytical Services - Seattle

#### **ANALYTE QUALIFIERS**

D8 The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.

Date: 08/10/2012 08:41 AM



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: SKYKOMISH ONGOING CLEANUP

Pace Project No.: 2513117

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2513117001	1C-W-7-0712	EPA 3510	OEXT/5908	NWTPH-Dx	GCSV/3747
2513117002	1C-W-70-0712	EPA 3510	OEXT/5908	NWTPH-Dx	GCSV/3747
2513117003	1C-W-8-0712	EPA 3510	OEXT/5908	NWTPH-Dx	GCSV/3747
2513117004	1C-W-1-0712	EPA 3510	OEXT/5908	NWTPH-Dx	GCSV/3747



## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Secti	on B							Secti	on C										P	age:	1		of	
Required Client Information: Requ	red Proje	W. C. C. C. C. C. C.	A1000000000000000000000000000000000000			and the second	_		e Informati	on:	1370									-	10	AOC	222	
Company: FARALLON CONSULTING Report	TO: TP	DC	LINE	JERR	Y POR	TELE	1	Attenti	on:												LO	489	122	
Address: 975 5th AVENUE NORTHWEST COPY	To:							Comp	any Name:							REG	ULAT	ORY	AGEN	CY				
1554QUAH, WA 98027		y.10	Dia 1	THE PLANE		TT seeps	-	Addre	ss:	90	ora li	mor	iem	111111		Г	NPDES	s N	GRO	) DNU	JND WATER DRINKING WATER			
Email To: TCLINER FARALLONCONSULTING.COM	ase Orde	r No.:						Pace C Referen								Г	UST	Γ	RCR	A		Г	OTHER	
Phone: 425-295-0249   Fax: 425-295-0250   Project	t Name:	CV	(V nm	CH att	( = 1 × V	CLEAN		Pace P	roject							Site	Locati	ion						
Phone: 425-295-0849   Fax: 425-295-0850   Project   Requested Due Date/TAT:   Project   Project	t Number	5-	33-04	12	GOING	CLEAN		Manag Pace P	er: rofile #:	n/C)		. 33	d Lead	oluu	U IT US	-	STAT	200	w	rA.				
Requested Due Date/TAT: STINUARD Project		68	33-04	13				ar Alberta Hill						De	quested	Anali	7733366	(888)						
	_												-	Re	questea	Analy	ysis Fi	nere	d (T/N)					
Section D Matrix Codes Required Client Information MATRIX / CODE	left)	(AIA)	TET HOW	COLL	ECTED	10-16		bork	Pr	eserv	atives		Y/N		1		e dis		del	1	1013			
Drinking Water D Water V Waste Water W	W D	(G=GRAB C=COMP)	COMP	OSITE	COMPO END/G		COLLECTION														î	ro lega	(chi	
SAMPLE ID Oil S		G=GRA	www.ii		in the	LCOLL		RS		82		st 🕇	ž	61.00		ra uti		-		ne (Y/				
(A-Z, 0-9 / ,-) Air Ar Sample IDs MUST BE UNIQUE Tissue Other	R S T	IYPE	on spe	tig test	en uu ka	or boy	E TEMP AT	# OF CONTAINERS	served		03	lor	Analysis Test	J-H2		of the	engri Nou				Residual Chlorine (Y/N)			
## Jisonyenia aa may saasananii	MATRIX	SAMPLE TYPE	DATE	TIME	DATE	TIME	SAMPLE	-	Unpreserved H <sub>2</sub> SO <sub>4</sub>	HG	Na <sub>2</sub> S <sub>2</sub> (	Methanol	4 Anal	_			T AT			H	Residu	Pace	Project N	lo./ Lab I.D.
1 1C-W-7-0712	W	_	7/26	1045				2		×				X						$\perp$	$\vdash$			
2 1C-W-70-071Z 3 1C-W-8-071Z	W		7/26		31.	W. W.	1	2	14 3 5	X				X	Sint of	$\sqcup$		111	21 11 18	G ITE	$\perp$	in in	(Veral)	
3 1C-W-8-0712	w			1136				2		X				X					$\perp$		$\vdash$			
4 11-W-1-0712	W	r	7/26	1216	Make	LIMBER	79	2	fail i	X	0 1	m i		X		(0)					$\sqcup$		24 1	
5			1800.00		21 1, 30,		11			Ш	1 2		3		011		4 2	131	- La r	10		18 (III	klati	
6				10								I U				$\sqcup$				$\perp$	$\vdash$			
7 ALLES ASSESSED TO PROPERTY OF STREET	100	1 2	700	an tall	9 1	alta an	ral!	1251	1 6			11	33								$\sqcup$		THE ST	
8		_							17						6 19				11	$\perp$	Н	A III	111	
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12																				$\perp$				
ADDITIONAL COMMENTS	RE	LINQ	ISHED BY	/ AFFILIATI	ON	DATE		Т	IME		ACC	CEPTE	DBY	/ AFFI	LIATION		DATE		TIME			SAMP	LE CONDIT	IONS
The Chapter of the state of the	1				_	7/27	12	10	14 (	'olet	teV	Ull	uc	P/	PACE	2 0	7271	2	1315	4	1	4	4	7
		_													to all the		ylon.	211		14			Car	
THE RESIDENCE OF THE PARTY OF T			TVIII IV		or dis	25/10		74 ()										141	y Tilly	1/	2110	v Director	No.	
				SAMPLE	R NAME A	ND SIGNAT	TURE													\$	ပ္	5 F	dy poler	ntact
ORIGI	VAL				PRINT Nar	ne of SAMPI	LER:	DI	NUE	21	KA	THE	3N							- 1	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	(Y/N)
					SIGNATU	RE of SAMPI	LEB	age 9	of 11	4		_	-	DAT (MN	E Signed M/DD/YY):	07/	27/1	2		1,5	Te	Rec	Seal	Samples Intact (Y/N)

CLIENT: BNSF

2513117

Pace Analytical www.pocelata.com

COC PAGE \_\_\_\_ of \_\_\_\_ COC ID# \_\_\_\_\_ |648022 Trip Blank(s) Provided?

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG			Comments
1		202			,													
2		212																
3		200																
4		200																
5																		
6																		
7																		
8																		
9																		
10																		
11																	-	
12																		

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP20	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

# Pace Analytical

## Sample Condition Upon Receipt

2513117

Pace Analytical Client Name	BNSF		Project #
Courier: Fed Ex UPS USPS Clie	nt Commercial	Pace Other	
Tracking #:			
Custody Seal on Cooler/Box Present: Yes	No Seals	intact: Yes	No
Packing Material: Bubble Wrap Bubble	e Bags None	Other	Temp. Blank YesNo
Thermometer Used 132013 or 101731962 or 22609	99 Type of Ice: We	Blue None	Samples on ice, cooling process has begun
Cooler Temperature 4,1≥ Temp should be above freezing ≤ 6°C	Biological Tissue	is Frozen: Yes No Comments:	Date and Initials of person examining contents: 07.2712 CW
Chain of Custody Present:	DYes DNo DNA	1.	
Chain of Custody Filled Out:	Yes DNo DN/A	2.	
Chain of Custody Relinquished:	Yes DNo DN/A	3.	
Sampler Name & Signature on COC:	Ves DNo DNA	4.	
Samples Arrived within Hold Time:	MYes □No □N/A	5.	
Short Hold Time Analysis (<72hr):	□Yes ₩No □N/A	6.	
Rush Turn Around Time Requested:	□Yes □No □N/A	7.	
Follow Up / Hold Analysis Requested:	□Yes ☑No □N/A	8.	
Sufficient Volume:	Nes ONO ONA	9.	
Correct Containers Used:	BYes □No □N/A	10.	
-Pace Containers Used:	DYes □No □N/A	(	
Containers Intact:	Nes □No □N/A	11.	
Filtered volume received for Dissolved tests	□Yes □No ĐNA	12.	
Sample Labels match COC:	MYes ONO ON/A	13.	
-Includes date/time/ID/Analysis Matrix: All containers needing preservation have been checked.	DYes DNO DNA	14	
All containers needing preservation are found to be incompliance with EPA recommendation.	TYES NO NA	//CV-S1	
Exceptions: VOA, coliform, TOC, O&G	□Yes □No □N/A	Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	□Yes □No □N/A	15.	
Headspace in VOA Vials ( >6mm):	□Yes □No □N/A	16.	
Trip Blanks Present:	□Yes □No □N/A	17.	
Trip Blank Custody Seals Present	□Yes □No □N/A		
Pace Trip Blank Creation Date:			
Client Notification/ Resolution:			Field Data Required? Y / N
Person Contacted:	Date	/Time:	
Comments/ Resolution:			
	0		
Project Manager Review:	00		Date: 7/3

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





September 04, 2012

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaquah, WA 98027

RE: Project: SKYKOMISH

Pace Project No.: 2513365

## Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on August 21, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 

cc: Desiree Clement, Farallon
Kristin Darnell, BNSF\_Farallon - WA
Emerald Erickson-Mulanax, Farallon
Jerry Portele, Farallon
Javan Ruark, Farallon Consulting LLC







## **CERTIFICATIONS**

Project: SKYKOMISH Pace Project No.: 2513365

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



## **SAMPLE ANALYTE COUNT**

Project: SKYKOMISH Pace Project No.: 2513365

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2513365001	IC-W-7-082012	NWTPH-Dx	AY1	4	PASI-S
2513365002	IC-W-70-082012	NWTPH-Dx	AY1	4	PASI-S
2513365003	IC-W-8-082012	NWTPH-Dx	AY1	4	PASI-S
2513365004	IC-W-1-082012	NWTPH-Dx	AY1	4	PASI-S



#### **PROJECT NARRATIVE**

Project: SKYKOMISH Pace Project No.: 2513365

Method:NWTPH-DxDescription:NWTPH-Dx GCSClient:BNSF\_Farallon - WADate:September 04, 2012

#### **General Information:**

4 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

## Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

## Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

## Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

## Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



## **ANALYTICAL RESULTS**

Project: SKYKOMISH Pace Project No.: 2513365

Sample: IC-W-7-082012	Lab ID: 2513365	5001 Call	lected: 08/20/1	2 12.20	Received: 08	R/21/12 11·1F	Matrix: Water	
·								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method:	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.027</b> mg/L		0.019	1	08/24/12 09:55	08/25/12 07:2	9	
Motor Oil Range	ND mg/L		0.095	1	08/24/12 09:55	08/25/12 07:2	9 64742-65-0	
Surrogates n-Octacosane (S)	76 %		50-150	1	08/24/12 09:55	00/25/12 07:2	0 620 02 4	
o-Terphenyl (S)	66 %		50-150 50-150	1	08/24/12 09:55			
5 15.p.15.131 (5)	00 70		00 100	·	00/2 // 12 00:00	00/20/12 07:2		
Sample: IC-W-70-082012	Lab ID: 2513365	<b>5002</b> Col	lected: 08/20/1	2 18:00	Received: 08	3/21/12 14:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method:	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.034</b> mg/L		0.019	1	08/24/12 09:55	08/25/12 08:3	7	
Motor Oil Range	ND mg/L		0.095	1	08/24/12 09:55	08/25/12 08:3	7 64742-65-0	
Surrogates	<b>77</b> 0/		50.450		00/04/40 00 55	00/05/40 00 0	7 000 00 4	
n-Octacosane (S)	77 % 69 %		50-150 50-150	1 1	08/24/12 09:55 08/24/12 09:55			
o-Terphenyl (S)	69 %		50-150	ı	06/24/12 09.55	00/25/12 00.3	04-15-1	
Sample: IC-W-8-082012	Lab ID: 2513365	5003 Col	lected: 08/20/1	2 13:13	Received: 08	3/21/12 14:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method:	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.072</b> mg/L		0.019	1	08/24/12 09:55	08/25/12 08:5	4	
Motor Oil Range	ND mg/L		0.095	1	08/24/12 09:55	08/25/12 08:5	4 64742-65-0	
Surrogates	00.0/		50.450		00/04/40 00 55	00/05/40 00 5		
n-Octacosane (S)	92 %		50-150	1	08/24/12 09:55			
o-Terphenyl (S)	82 %		50-150	1	08/24/12 09:55	08/25/12 08:5	4 84-15-1	
Sample: IC-W-1-082012	Lab ID: 2513365	5004 Col	lected: 08/20/1	2 13:59	Received: 08	3/21/12 14:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method:	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.021</b> mg/L		0.019	1	08/24/12 09:55	08/25/12 09:1	0	
Motor Oil Range	ND mg/L		0.095	1	08/24/12 09:55			
	ŭ							
Surrogates								
Surrogates n-Octacosane (S) o-Terphenyl (S)	85 % 75 %		50-150 50-150	1 1	08/24/12 09:55 08/24/12 09:55			

Date: 09/04/2012 03:38 PM

## **REPORT OF LABORATORY ANALYSIS**



## **QUALITY CONTROL DATA**

Project: SKYKOMISH Pace Project No.: 2513365

QC Batch: OEXT/6002 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2513365001, 2513365002, 2513365003, 2513365004

METHOD BLANK: 128298 Matrix: Water

Associated Lab Samples: 2513365001, 2513365002, 2513365003, 2513365004

Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	08/25/12 06:55	
Motor Oil Range	mg/L	ND	0.10	08/25/12 06:55	
n-Octacosane (S)	%	95	50-150	08/25/12 06:55	
o-Terphenyl (S)	%	85	50-150	08/25/12 06:55	

LABORATORY CONTROL SAMPLE: 128299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		0.84	84	51-114	
Motor Oil Range	mg/L	1	0.90	90	62-120	
n-Octacosane (S)	%			90	50-150	
o-Terphenyl (S)	%			80	50-150	

SAMPLE DUPLICATE: 128300

		2513365001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.027	0.034	23	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	76	85	11	
o-Terphenyl (S)	%	66	77	14	



#### **QUALIFIERS**

Project: SKYKOMISH Pace Project No.: 2513365

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

Date: 09/04/2012 03:38 PM

PASI-S Pace Analytical Services - Seattle



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: SKYKOMISH Pace Project No.: 2513365

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2513365001	IC-W-7-082012	EPA 3510	OEXT/6002	NWTPH-Dx	GCSV/3796
2513365002	IC-W-70-082012	EPA 3510	OEXT/6002	NWTPH-Dx	GCSV/3796
2513365003	IC-W-8-082012	EPA 3510	OEXT/6002	NWTPH-Dx	GCSV/3796
2513365004	IC-W-1-082012	EPA 3510	OEXT/6002	NWTPH-Dx	GCSV/3796



## **CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Required Client Information:	Required I	Projec								e Infon	mation	n:											Г	_	<del>-</del>	400	4.0		
Company: FARALLON CONSULTING Address:	Report To:	1 617	> (	LINE				]	Attent	ion:									1648848										
Address: 9755"AVE NW	Сору То:								Comp	any Na	ame:								REGULATORY AGENCY										
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Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U_	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG		<b>.</b>	,—	Comments
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AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	ı	Wipe/Swab	U	Summa Can

Dibble Bags   None  Richard Tissu  Dives   No   No  Dives   No	Is intact: Yes No Other Temp. Blank Yes No Blue None Samples on ice, cooling process has begun Date and Initiate preson examining contents:  A 1.  A 2.  A 3.  A 4.  A 5.  A 6.  A 7.  A 8.  A 9.
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□Yes □No ☑N	A 16.
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Date	Field Data Required? Y / N e/Time:
	in Yes ONO ON  OYES ONO ON

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

F-SEA-C-021-rev.04 26Jan2012





October 12, 2012

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaquah, WA 98027

RE: Project: BNSF Skykomish Pace Project No.: 2513615

## Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on September 19, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 

cc: Desiree Clement, Farallon
Kristin Darnell, BNSF\_Farallon - WA
Emerald Erickson-Mulanax, Farallon
Jerry Portele, Farallon
Javan Ruark, Farallon Consulting LLC







## **CERTIFICATIONS**

Project: BNSF Skykomish

Pace Project No.: 2513615

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



## **SAMPLE ANALYTE COUNT**

Project: BNSF Skykomish

Pace Project No.: 2513615

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2513615001	5-W-14-091812	NWTPH-Dx	AY1	4	PASI-S
2513615002	5-W-15-091812	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2513615003 5-W	5-W-16-091812	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2513615004	5-W-17-091812	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2513615005	5-W-18-091812	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2513615006 5-W-19-	5-W-19-091812	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
2513615007	5-W-54-091812	NWTPH-Dx	AY1	4	PASI-S
2513615008	5-W-55-091812	NWTPH-Dx	AY1	4	PASI-S
2513615009	5-W-550-091812	NWTPH-Dx	AY1	4	PASI-S
2513615010	5-W-56-091812	NWTPH-Dx	AY1	4	PASI-S
2513615011	S4-BD-091812	NWTPH-Dx	AY1	4	PASI-S
2513615012	S4-CD-091812	NWTPH-Dx	AY1	4	PASI-S
2513615013	S4-BU-091812	NWTPH-Dx	AY1	4	PASI-S
2513615014	S4-CU-091812	NWTPH-Dx	AY1	4	PASI-S
2513615015	S4-AU-091812	NWTPH-Dx	AY1	4	PASI-S
2513615016	S4-AD-091812	NWTPH-Dx	AY1	4	PASI-S
2513615017	S3-BD-091812	NWTPH-Dx	AY1	4	PASI-S
2513615018	S3-CD-091812	NWTPH-Dx	AY1	4	PASI-S
2513615019	S3-CU-091812	NWTPH-Dx	AY1	4	PASI-S
2513615020	S3-AD-091812	NWTPH-Dx	AY1	4	PASI-S
2513615021	S30-AD-091812	NWTPH-Dx	AY1	4	PASI-S





#### **PROJECT NARRATIVE**

Project: BNSF Skykomish

Pace Project No.: 2513615

Method:NWTPH-DxDescription:NWTPH-Dx GCSClient:BNSF\_Farallon - WADate:October 12, 2012

#### **General Information:**

20 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

#### Additional Comments:





#### **PROJECT NARRATIVE**

Project: BNSF Skykomish

Pace Project No.: 2513615

Method: NWTPH-Dx

Description: NWTPH-Dx GCS Silica Gel
Client: BNSF\_Farallon - WA
Date: October 12, 2012

#### **General Information:**

6 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

QC Batch: OEXT/6109

CU: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.

- 5-W-19-091812 (Lab ID: 2513615006)
  - Diesel Range SG

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

#### **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



Project: BNSF Skykomish

Pace Project No.: 2513615

Sample: 5-W-14-091812	Lab ID: 251	3615001	Collected: 09/18	12 09:50	Received: 09	/19/12 09:15 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Preparation N	1ethod: E	EPA 3510			
Diesel Range SG	ND m	g/L	0.038	1	09/21/12 09:40	09/25/12 13:54	ļ	
Motor Oil Range SG	ND m	g/L	0.19	1	09/21/12 09:40	09/25/12 13:54	64742-65-0	
Surrogates	400.0/		50.450		00/04/40 00 40	00/05/40 40 5		
n-Octacosane (S) SG	102 % 95 %		50-150 50-150		09/21/12 09:40 09/21/12 09:40			
o-Terphenyl (S) SG	95 %		50-150	ı	09/21/12 09.40	09/25/12 13.54	1 0 <del>4</del> -10-1	
Sample: 5-W-15-091812	Lab ID: 251	3615002	Collected: 09/18	/12 10:25	Received: 09	/19/12 09:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation N	lethod: E	PA 3510			
Diesel Range	<b>0.37</b> m	g/L	0.038	1	09/28/12 11:55	10/02/12 15:14	<b>,</b>	
Motor Oil Range	<b>0.21</b> m		0.19		09/28/12 11:55	10/02/12 15:14	64742-65-0	
Surrogates								
n-Octacosane (S)	98 %		50-150	1	09/28/12 11:55			
o-Terphenyl (S)	85 %		50-150	1	09/28/12 11:55	10/02/12 15:14	84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND m	g/L	0.038	1	09/21/12 12:00	09/25/12 14:31		
Motor Oil Range SG	ND m	g/L	0.19	1	09/21/12 12:00	09/25/12 14:31	64742-65-0	
Surrogates	400.0/		50.450		00/04/40 40 00	00/05/40 44 04		
n-Octacosane (S) SG	100 %		50-150		09/21/12 12:00			
o-Terphenyl (S) SG	93 %		50-150	1	09/21/12 12:00	09/25/12 14:31	1 84-15-1	
Sample: 5-W-16-091812	Lab ID: 251	3615003	Collected: 09/18	/12 11:15	Received: 09	/19/12 09:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation N	lethod: E	PA 3510			
Diesel Range	ND m	g/L	0.038	1	09/28/12 11:55	10/02/12 15:32	2	
Motor Oil Range	ND m	-	0.19		09/28/12 11:55			
Surrogates		-						
n-Octacosane (S)	85 %		50-150		09/28/12 11:55			
o-Terphenyl (S)	73 %		50-150	1	09/28/12 11:55	10/02/12 15:32	2 84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Preparation N	lethod: E	PA 3510			
Diesel Range SG	ND m	g/L	0.038	1	09/21/12 12:00	09/25/12 14:49	)	
Motor Oil Range SG	ND m	g/L	0.19	1	09/21/12 12:00	09/25/12 14:49	64742-65-0	
Surrogates								
	00.0/				00/24/42 42:00	00/05/40 44.40	000 00 4	
n-Octacosane (S) SG o-Terphenyl (S) SG	96 % 91 %		50-150 50-150		09/21/12 12:00	09/25/12 14:49		

Date: 10/12/2012 01:55 PM REPORT OF LABORATORY ANALYSIS

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Project: BNSF Skykomish

Pace Project No.: 2513615

Sample: 5-W-17-091812	Lab ID: 251	3615004	Collected: 09/18/1	12 12:15	Received: 09	9/19/12 09:15 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	PH-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND m	g/L	0.038	1	09/28/12 11:55	09/30/12 02:15		
Motor Oil Range Surrogates	ND m	•	0.19	1		09/30/12 02:15	64742-65-0	
n-Octacosane (S)	91 %		50-150	1	09/28/12 11:55	09/30/12 02:15	630-02-4	
o-Terphenyl (S)	78 %		50-150	1	09/28/12 11:55	09/30/12 02:15	84-15-1	
NWTPH-Dx GCS Silica Gel	Analytical Met	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND m	g/L	0.038	1	09/21/12 12:00	09/25/12 15:07		
Motor Oil Range SG <i>Surrogates</i>	ND m	g/L	0.19	1	09/21/12 12:00	09/25/12 15:07	64742-65-0	
n-Octacosane (S) SG	106 %		50-150	1	09/21/12 12:00	09/25/12 15:07	630-02-4	
o-Terphenyl (S) SG	102 %		50-150	1	09/21/12 12:00	09/25/12 15:07	84-15-1	
Sample: 5-W-18-091812	Lab ID: 251	3615005	Collected: 09/18/1	12 12:55	Received: 09	9/19/12 09:15 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	PH-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	<b>0.17</b> m	a/l	0.038	1	09/28/12 11:55	10/02/12 15:50		
Motor Oil Range <b>Surrogates</b>	ND m		0.19	1		10/02/12 15:50	64742-65-0	
n-Octacosane (S)	100 %		50-150	1	09/28/12 11:55	10/02/12 15:50	630-02-4	
o-Terphenyl (S)	84 %		50-150	1		10/02/12 15:50		
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	PH-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range SG	ND m	a/L	0.038	1	09/21/12 12:00	09/25/12 15:25		
Motor Oil Range SG <b>Surrogates</b>	ND m	-	0.19	1		09/25/12 15:25		
n-Octacosane (S) SG	105 %		50-150	1	09/21/12 12:00	09/25/12 15:25	630-02-4	
o-Terphenyl (S) SG	100 %		50-150	1	09/21/12 12:00	09/25/12 15:25	84-15-1	
Sample: 5-W-19-091812	Lab ID: 251	3615006	Collected: 09/18/1	12 13:30	Received: 09	0/19/12 09:15 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	PH-Dx Preparation M	ethod: E	PA 3510		•	
Diesel Range	ND m	a/L	0.038	1	09/28/12 11:55	09/30/12 02:50		
Motor Oil Range  Surrogates	ND m	•	0.19	1		09/30/12 02:50		
n-Octacosane (S)	67 %		50-150	1	09/28/12 11:55	09/30/12 02:50	630-02-4	
o-Terphenyl (S)	61 %		50-150	1		09/30/12 02:50		
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	PH-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range SG	ND m	g/L	0.038	1	09/21/12 12:00	09/25/12 16:20		CU
Motor Oil Range SG	ND m	-	0.19	1		09/25/12 16:20		
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Project: BNSF Skykomish

Pace Project No.: 2513615

Sample: 5-W-19-091812	Lab ID: 251	3615006	Collected: 09/18/	12 13:30	Received: 09	/19/12 09:15 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Met	hod: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Surrogates n-Octacosane (S) SG o-Terphenyl (S) SG	99 % 94 %		50-150 50-150	1 1		09/25/12 16:20 09/25/12 16:20		
Sample: 5-W-54-091812	Lab ID: 251	3615007	Collected: 09/18/	12 14:20	Received: 09	/19/12 09:15 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	ND mg	g/L	0.038	1	09/28/12 11:55	10/02/12 16:08		
Motor Oil Range	ND m	•	0.19	1	09/28/12 11:55	10/02/12 16:08	64742-65-0	
Surrogates								
n-Octacosane (S)	97 %		50-150	1		10/02/12 16:08		
o-Terphenyl (S)	83 %		50-150	1	09/28/12 11:55	10/02/12 16:08	84-15-1	
Sample: 5-W-55-091812	Lab ID: 251	3615008	Collected: 09/18/	12 14:50	Received: 09	/19/12 09:15 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation M	lethod: E	PA 3510	-		
Diesel Range	<b>0.28</b> mg	n/l	0.038	1	09/28/12 11:55	10/02/12 16:45		
Motor Oil Range	ND m	•	0.19	1		10/02/12 16:45	64742-65-0	
Surrogates		<b>5</b> . –						
n-Octacosane (S)	98 %		50-150	1	09/28/12 11:55	10/02/12 16:45	630-02-4	
o-Terphenyl (S)	84 %		50-150	1	09/28/12 11:55	10/02/12 16:45	84-15-1	
Sample: 5-W-550-091812	Lab ID: 251	3615009	Collected: 09/18/	12 14:55	Received: 09	/19/12 09:15 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation M	lethod: E	PA 3510			
Diesel Range	<b>0.26</b> mg	a/L	0.038	1	09/28/12 11:55	10/02/12 17:22		
Motor Oil Range Surrogates	ND m	_	0.19	1		10/02/12 17:22	64742-65-0	
n-Octacosane (S)	95 %		50-150	1	09/28/12 11:55	10/02/12 17:22	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	09/28/12 11:55	10/02/12 17:22	84-15-1	
Sample: 5-W-56-091812	Lab ID: 251	3615010	Collected: 09/18/	12 15:45	Received: 09	/19/12 09:15 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
	Analytical Met	hod: NWTP	H-Dx Preparation M	lethod: E		·		
NWTPH-Dx GCS								
NWTPH-Dx GCS Diesel Range	<b>2.7</b> m		0.038	1	09/28/12 11:55	10/02/12 08:59		



Project: BNSF Skykomish

Pace Project No.: 2513615

Sample: 5-W-56-091812	Lab ID: 251	3615010	Collected: 09/18/1	12 15:45	Received: 09	/19/12 09:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Motor Oil Range <b>Surrogates</b>	<b>0.84</b> mg	g/L	0.19	1	09/28/12 11:55	10/02/12 08:5	9 64742-65-0	
n-Octacosane (S)	107 %		50-150	1	09/28/12 11:55	10/02/12 08:5	9 630-02-4	
o-Terphenyl (S)	95 %		50-150	1	09/28/12 11:55	10/02/12 08:5	9 84-15-1	
Sample: S4-BD-091812	Lab ID: 251	3615011	Collected: 09/18/1	12 14:54	Received: 09	/19/12 09:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510		•	
Diesel Range	ND m	a/L	0.038	1	09/28/12 11:55	09/30/12 05:20	3	
Motor Oil Range	ND m	-	0.19	1	09/28/12 11:55			
Surrogates		-	- 1-				•	
n-Octacosane (S)	88 %		50-150	1	09/28/12 11:55			
o-Terphenyl (S)	75 %		50-150	1	09/28/12 11:55	09/30/12 05:2	84-15-1	
Sample: S4-CD-091812	Lab ID: 251	3615012	Collected: 09/18/1	12 15:14	Received: 09	/19/12 09:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metl	hod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.086</b> mg	a/L	0.040	1	09/28/12 11:55	10/02/12 09:1	7	
Motor Oil Range	<b>0.25</b> mg	•	0.20	1	09/28/12 11:55			
Surrogates								
n-Octacosane (S)	91 %		50-150	1	09/28/12 11:55	10/02/12 09:1	7 630-02-4	
o-Terphenyl (S)	78 %		50-150	1	09/28/12 11:55	10/02/12 09:1	7 84-15-1	
Sample: S4-BU-091812	Lab ID: 251	3615013	Collected: 09/18/1	12 15:28	Received: 09	/19/12 09:15	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND m	g/L	0.038	1	09/28/12 11:55	10/02/12 09:3	5	
Motor Oil Range	ND m	-	0.19	1	09/28/12 11:55			
Surrogates		-						
n-Octacosane (S)	84 %		50-150	1	09/28/12 11:55	10/02/12 09:3	5 630-02-4	

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Project: BNSF Skykomish

Pace Project No.: 2513615

Sample: S4-CU-091812	Lab ID: 2513615	<b>6014</b> Coll	ected: 09/18/1	2 15:30	Received: 09	9/19/12 09:15	Matrix: Water	
Parameters	Results L	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range Motor Oil Range	ND mg/L ND mg/L		0.039 0.20	1 1	09/28/12 11:55 09/28/12 11:55			
Surrogates n-Octacosane (S)	77 %		50-150	1	09/28/12 11:55	09/30/12 06:1	8 630-02-4	
o-Terphenyl (S)	68 %		50-150	1	09/28/12 11:55	09/30/12 06:1	8 84-15-1	
Sample: S4-AU-091812	Lab ID: 2513615	<b>6015</b> Coll	ected: 09/18/1	2 15:52	Received: 09	9/19/12 09:15	Matrix: Water	
Parameters	Results l	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/L		0.039	1	09/28/12 11:55	09/30/12 06:3	5	
Motor Oil Range Surrogates	ND mg/L		0.19	1	09/28/12 11:55	09/30/12 06:3	5 64742-65-0	
n-Octacosane (S)	81 %		50-150	1	09/28/12 11:55	09/30/12 06:3	5 630-02-4	
o-Terphenyl (S)	68 %		50-150	1	09/28/12 11:55	09/30/12 06:3	5 84-15-1	
Sample: S4-AD-091812	Lab ID: 2513615	<b>6016</b> Coll	ected: 09/18/1	2 15:56	Received: 09	9/19/12 09:15	Matrix: Water	
Parameters	Results L	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/L		0.038	1	09/28/12 11:55	09/30/12 07:2	7	
Motor Oil Range Surrogates	ND mg/L		0.19	1	09/28/12 11:55	09/30/12 07:2	7 64742-65-0	
n-Octacosane (S)	84 %		50-150	1	09/28/12 11:55	09/30/12 07:2	7 630-02-4	
o-Terphenyl (S)	72 %		50-150	1	09/28/12 11:55	09/30/12 07:2	7 84-15-1	
Sample: S3-BD-091812	Lab ID: 2513615	<b>6017</b> Coll	ected: 09/18/1	2 16:50	Received: 09	9/19/12 09:15	Matrix: Water	
Parameters	Results L	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
	Analytical Method: I	NWTPH-Dx	Preparation Me	ethod: E	PA 3510	•		
NWTPH-Dx GCS					00/00/40 44:55	00/20/12 07:4	4	
NWTPH-Dx GCS Diesel Range	ND mg/L		0.038	1	09/28/12 11:55	09/30/12 07.4	4	
Diesel Range Motor Oil Range	ND mg/L ND mg/L		0.038 0.19	1 1	09/28/12 11:55			
Diesel Range	•					09/30/12 07:4	4 64742-65-0	

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Project: BNSF Skykomish

Pace Project No.: 2513615

Sample: S3-CD-091812	Lab ID: 25130	615018	Collected: 09/18	/12 16:50	Received: 09	/19/12 09:15 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPH	-Dx Preparation I	Method: E	PA 3510			
Diesel Range	ND mg/	L	0.042	. 1	10/02/12 09:00	10/02/12 23:08		
Motor Oil Range Surrogates	ND mg/	L	0.21	1	10/02/12 09:00	10/02/12 23:08	64742-65-0	
n-Octacosane (S)	77 %		50-150	1	10/02/12 09:00	10/02/12 23:08	630-02-4	
o-Terphenyl (S)	66 %		50-150	1	10/02/12 09:00	10/02/12 23:08	84-15-1	
Sample: S3-CU-091812	Lab ID: 2513	615019	Collected: 09/18	/12 17:10	Received: 09	/19/12 09:15 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPH	-Dx Preparation I	Method: E	PA 3510	•		
Diesel Range	ND mg/	L	0.038	1	10/02/12 09:00	10/02/12 23:44		
Motor Oil Range	ND mg/		0.19			10/02/12 23:44	64742-65-0	
Surrogates								
n-Octacosane (S)	95 %		50-150			10/02/12 23:44		
o-Terphenyl (S)	81 %		50-150	1	10/02/12 09:00	10/02/12 23:44	84-15-1	
Sample: S3-AD-091812	Lab ID: 2513	615020	Collected: 09/18	/12 17:36	Received: 09	/19/12 09:15 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPH	-Dx Preparation I	Лethod: Е	PA 3510			
Diesel Range	ND mg/	L	0.042	! 1	10/02/12 09:00	10/03/12 00:56		
Motor Oil Range Surrogates	ND mg/		0.2	1	10/02/12 09:00	10/03/12 00:56	64742-65-0	
n-Octacosane (S)	76 %		50-150	1	10/02/12 09:00	10/03/12 00:56	630-02-4	
o-Terphenyl (S)	67 %		50-150	1	10/02/12 09:00	10/03/12 00:56	84-15-1	
Sample: S30-AD-091812	Lab ID: 2513	615021	Collected: 09/18	/12 16:00	Received: 09	/19/12 09:15 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Metho	d: NWTPH	-Dx Preparation I	Method: E	PA 3510			
Diesel Range	ND mg/	L	0.042	. 1	10/02/12 09:00	10/03/12 01:14		
•	ND mg/		0.2			10/03/12 01:14	64742-65-0	
Motor Oil Range Surrogates								
Surrogates n-Octacosane (S)	77 %		50-150	1	10/02/12 09:00	10/03/12 01:14	630-02-4	

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Project: BNSF Skykomish

Pace Project No.: 2513615

QC Batch: OEXT/6141 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2513615002, 2513615003, 2513615004, 2513615005, 2513615006, 2513615007, 2513615008, 2513615009,

2513615010, 2513615011, 2513615012, 2513615013, 2513615014, 2513615015, 2513615016, 2513615017

METHOD BLANK: 132149 Matrix: Water

Associated Lab Samples: 2513615002, 2513615003, 2513615004, 2513615005, 2513615006, 2513615007, 2513615008, 2513615009,

2513615010, 2513615011, 2513615012, 2513615013, 2513615014, 2513615015, 2513615016, 2513615017

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.040	09/30/12 01:03	
Motor Oil Range	mg/L	ND	0.20	09/30/12 01:03	
n-Octacosane (S)	%	86	50-150	09/30/12 01:03	
o-Terphenyl (S)	%	75	50-150	09/30/12 01:03	

LABORATORY CONTROL SAMPLE: 132150

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		1.0	102	51-114	
Motor Oil Range	mg/L	1	1.0	101	62-120	
n-Octacosane (S)	%			93	50-150	
o-Terphenyl (S)	%			80	50-150	

SAMPLE DUPLICATE: 132151

Parameter	Units	2513615007 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	97	89	8	
o-Terphenyl (S)	%	83	74	10	

SAMPLE DUPLICATE: 132152

		2513615008	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	0.28	0.26	5	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	98	106	7	
o-Terphenyl (S)	%	84	92	9	

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Project: BNSF Skykomish

Pace Project No.: 2513615

QC Batch: OEXT/6149 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2513615018, 2513615019, 2513615020, 2513615021

METHOD BLANK: 132451 Matrix: Water

Associated Lab Samples: 2513615018, 2513615019, 2513615020, 2513615021

Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.040	10/02/12 22:31	
Motor Oil Range	mg/L	ND	0.20	10/02/12 22:31	
n-Octacosane (S)	%	91	50-150	10/02/12 22:31	
o-Terphenyl (S)	%	80	50-150	10/02/12 22:31	

LABORATORY CONTROL SAMPLE: 132452

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		0.87	87	51-114	
Motor Oil Range	mg/L	1	0.87	87	62-120	
n-Octacosane (S)	%			77	50-150	
o-Terphenyl (S)	%			68	50-150	

SAMPLE DUPLICATE: 132453

Parameter	Units	2513615018 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	77	71	18	
o-Terphenyl (S)	%	66	60	19	

SAMPLE DUPLICATE: 132454

		2513615019	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	95	78	14	
o-Terphenyl (S)	%	81	69	12	

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Project: BNSF Skykomish

Pace Project No.: 2513615

QC Batch: OEXT/6109 Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS SG Associated Lab Samples: 2513615001, 2513615002, 2513615003, 2513615004, 2513615005, 2513615006

METHOD BLANK: 131197 Matrix: Water

Associated Lab Samples: 2513615001, 2513615002, 2513615003, 2513615004, 2513615005, 2513615006

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.040	09/25/12 08:20	
Motor Oil Range SG	mg/L	ND	0.20	09/25/12 08:20	
n-Octacosane (S) SG	%	90	50-150	09/25/12 08:20	
o-Terphenyl (S) SG	%	86	50-150	09/25/12 08:20	

LABORATORY CONTROL SAMPLE: 131198

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L		0.94	94	59-114	
Motor Oil Range SG	mg/L	1	1.0	100	69-124	
n-Octacosane (S) SG	%			100	50-150	
o-Terphenyl (S) SG	%			95	50-150	

SAMPLE DUPLICATE: 131199

Parameter	Units	2513602001 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	0.18	0.24	33	_
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	99	98	1	
o-Terphenyl (S) SG	%	92	93	.1	

SAMPLE DUPLICATE: 131200

		2513615001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range SG	mg/L		ND		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	102	94	7	7
o-Terphenyl (S) SG	%	95	88	8	3

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#### **QUALIFIERS**

Project: BNSF Skykomish

Pace Project No.: 2513615

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

PASI-S Pace Analytical Services - Seattle

#### **ANALYTE QUALIFIERS**

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CU The continuing calibration for this compound is outside of Pace Analytical acceptance limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.



#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF Skykomish

Pace Project No.: 2513615

Date: 10/12/2012 01:55 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2513615002	5-W-15-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615003	5-W-16-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615004	5-W-17-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615005	5-W-18-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615006	5-W-19-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615007	5-W-54-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615008	5-W-55-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615009	5-W-550-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615010	5-W-56-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615011	S4-BD-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615012	S4-CD-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615013	S4-BU-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615014	S4-CU-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615015	S4-AU-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615016	S4-AD-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615017	S3-BD-091812	EPA 3510	OEXT/6141	NWTPH-Dx	GCSV/3869
2513615018	S3-CD-091812	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513615019	S3-CU-091812	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513615020	S3-AD-091812	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513615021	S30-AD-091812	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513615001	5-W-14-091812	EPA 3510	OEXT/6109	NWTPH-Dx	GCSV/3850
2513615002	5-W-15-091812	EPA 3510	OEXT/6109	NWTPH-Dx	GCSV/3850
2513615003	5-W-16-091812	EPA 3510	OEXT/6109	NWTPH-Dx	GCSV/3850
2513615004	5-W-17-091812	EPA 3510	OEXT/6109	NWTPH-Dx	GCSV/3850
2513615005	5-W-18-091812	EPA 3510	OEXT/6109	NWTPH-Dx	GCSV/3850
2513615006	5-W-19-091812	EPA 3510	OEXT/6109	NWTPH-Dx	GCSV/3850



## **CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2513615

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l	SolVSolid	SL	90 A	(G=GRAB	6	brew	۱ ۱	5	R	Ö	ဟ	П			H	1		-	3	3		1				- [		Residual Chlorine (Y/N)				
l	SAMPLE ID Oil Wipe (A-Z, 0-9 / ,-) Air	OL WP		Ü		Ì				₹	CONTAINERS	H			Ш			is a	Ą	77%								퉏				
	Sample IDs MUST BE UNIQUE Tissue	AR TS	Ö	TYPE		1	ł			TEMP	Ι¥	8			Н			18	Z	131					11			욹				
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			—			s	AMPLER	NAME A	ND SIGNA	GNATURE 2.0					<u>_</u>	4																
	OR!	GINAL				-								_			ֈ՝ ¦	o- midwei	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples intact (Y/N)											
										SIGNATURE of SAMPLER AGE OF SAMPLE SIGNATURE OF SAMPLER AGE OF SAM							[		lce (	Cost See See	aldur S											
						L		SIGNATUR	E of SAMP	LERD	age	1/2	96						(M	M/DD/	YY):	7/	19/1	12_			⊥ '	-	œ	Š	Š	-



### **CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2513615

Section A Section B Section C Required Client Information: Required Project Information: Invoice Information 1649129 FARALLON CENSULTING CLIAND Сопралу Нале REGULATORY AGENCY 935 5 MAYENW Address: NPDES OR GROUND WATER DRINKING WATER 155 MRUGH, WA Purchase Order No.: r ust RCRA OTHER TCLINE@ FARALLONCONSVLTINGEM Reference: Phone: 255 0800 Pace Project FEX 2950850 Site Location BUSF SKYROMYSH Monager: Requested Due Date/TAT: STBNDARS[STA Poce Profile #: STATE 683-043 Requested Analysis Filtered (Y/N) Section D **Matrix Codes** N /A C=COMP) (see valid codes to left) COLLECTED Preservatives Required Client Information MATRIX / CODE Drinking Water DW SAMPLE TEMP AT COLLECTION WT Water COMPOSITE COMPOSITE **Waste Water** ww (G=GRAB END/GRAB Residual Chlorine (Y/N) START **Product** P SL Soil/Solid # OF CONTAINERS **SAMPLE ID** Oil OL WP Analysis Test 11077011-6 Wipe MATRIX CODE (A-Z, 0-9/,-) AR TS Unpreserved H<sub>2</sub>SO<sub>4</sub> HNO<sub>3</sub> SAMPLE TYPE Sample IDs MUST BE UNIQUE TISSUE ITEM# DATE TIME Pace Project No./ Lab I.D. DATE TIME 54-BN-09/8/7 G 2 09/8/7 53-AD-091812 530- AD -011812 ACCEPTED BY / AFFILIATION **SAMPLE CONDITIONS** TIME DATE TIME ADDITIONAL COMMENTS RELINQUISHED BY / AFFILIATION DATE PQŒ 0800 SAMPLER NAME AND SIGNATURE Received on Ice (Y/N) Temp in °C Custody Sealed Cools (Y/N) **ORIGINAL** PRINT Name of SAMPLER: **DATE Signed** SIGNATURE of SAMPLERPAGE (MM/DD/YY):

## **Sample Container Count**

2513615

CLIENT:	BNSF_Farallon	
COC PAGE of	2	Trip Blank(s), Provided?
coc ID# 16491	<u>30</u>	Y (N)

Sample																	
Line Item	VG9H	AG1F	I AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG	 	 Comments
1		2"	2														
2		11															
3												_					
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9		1 1/8				•											
10		2 "	1														
11																	
12																	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic		8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

## **Sample Container Count**

2513615

Pace Analytical

CLIENT: BNSF\_ Farallon

COC PAGE 2 of 2 coc ID# 1649129

Trip Blank(s) Provided?
Y / N

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U,	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B_	VG9W	vsg		 Comments
1		2 22										_					
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AC1H	1 liter HCL amber alone	ppge	500mL H2SO4 plastic	IGELL	4 oz amber glass soil jar
	1 liter HCL amber glass		·		
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	l	Wipe/Swab	υ	Summa Can

## Pace Analytical

## Sample Condition Upon Receipt

Pace Analytical Client Name	: <u>BNS</u>	F- FC	crallon	Project #	25136
Courier: Fed Ex UPS USPS Clien	nt 🗆 Commi	ercial	Pace Other		
Custody Seal on Cooler/Box Present:	□ No	Seals i	intact: Yes	□ No	
Packing Material: Daubble Wrap Bubble	Bags 🔲 N	None [	Other	Temp. Blank Yes	₩ No
Thermometer Used 132013 of 101731962 or 22609	9 Type of Ice	:~ <del>\Ve</del> b	Blue None	Samples on ice, coolin	
Cooler Temperature 396, 4.00, 5.00, 2.0 Temp should be above freezing s 6°C		Tissue i			f person examining
Chain of Custody Present:	DYes □No	□N⁄A	1.		
Chain of Custody Filled Out:	QYes □No	□n/a	2		
Chain of Custody Relinquished:	12/Yes □No	□N⁄A	3.		
Sampler Name & Signature on COC:	127yes □No	□N⁄A	4.		
Samples Arrived within Hold Time:	ØYes □No	□N⁄A	5.		
Short Hold Time Analysis (<72hr):	□Yes 12No	□N⁄A	6.		
Rush Turn Around Time Requested:	□Yes 12No	□n/a	7.		
Follow Up / Hold Analysis Requested:	□Yes 12No	□N⁄A	<b>8</b> .		
Sufficient Volume:	DYes 🗆 No	□n/a	9.		
Correct Containers Used:	Dyes Ono	□N⁄A	10.		
-Pace Containers Used:	12/yes □No	□N⁄A			
Containers Intact:	ØYes □No	□Ŋ⁄A	11		
iltered volume received for Dissolved tests	□Yes □No	<b>E</b> INA	12.		
Sample Labels match COC:	☑Yes □No	□N⁄A	13.		
-Includes date/time/ID/Analysis Matrix:	WI				
All containers needing preservation have been checked.	Ūyes □No	□N⁄A	14.		
All containers needing preservation are found to be in compliance with EPA recommendation.	ØYes □No	□N/A			
Exceptions: VOA, coliform, TOC, O&G	□Yes □No		Initial when completed	Lot # of added preservative	
Samples checked for dechlorination:	□Yes □No	<del>- /  </del>			
Headspace in VOA Vials ( >6mm):	□Yes □No	/			
Frip Blanks Present:	□Yes □No	$\overline{}$			<del></del>
Frip Blank Custody Seals Present	□Yes □N≎	/ 1	•••		
Pace Trip Blank Creation Date:					
Client Notification/ Resolution:				Field Data Required?	Y / N
Person Contacted:		_Date/T	ime:	<del></del>	
Comments/ Resolution:					
Project Manager Review:	uB_			Date:	12042

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)





October 04, 2012

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaquah, WA 98027

RE: Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

#### Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on September 20, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 

cc: Desiree Clement, Farallon
Kristin Darnell, BNSF\_Farallon - WA
Emerald Erickson-Mulanax, Farallon
Jerry Portele, Farallon
Javan Ruark, Farallon Consulting LLC







#### **CERTIFICATIONS**

Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



### **SAMPLE ANALYTE COUNT**

Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2513621001	2A-W-9-091912	NWTPH-Dx	AY1	4	PASI-S
2513621002	2A-W-10-091912	NWTPH-Dx	AY1	4	PASI-S
2513621003	MW-4-091912	NWTPH-Dx	AY1	4	PASI-S
2513621004	MW-3-091912	NWTPH-Dx	AY1	4	PASI-S
2513621005	2B-W-4-091912	NWTPH-Dx	AY1	4	PASI-S
2513621006	MW-16-091912	NWTPH-Dx	AY1	4	PASI-S
2513621007	EW-43-091912	NWTPH-Dx	AY1	4	PASI-S
2513621008	EW-1-091912	NWTPH-Dx	AY1	4	PASI-S
2513621009	MW-38R-091912	NWTPH-Dx	AY1	4	PASI-S
2513621010	5-W-50-091912	NWTPH-Dx	AY1	4	PASI-S
2513621011	GW-4-091912	NWTPH-Dx	AY1	4	PASI-S
2513621012	EW-2A-091912	NWTPH-Dx	AY1	4	PASI-S
2513621013	2A-W-42-091912	NWTPH-Dx	AY1	4	PASI-S
2513621014	1B-W-3-091912	NWTPH-Dx	AY1	4	PASI-S
2513621015	GW-3-091912	NWTPH-Dx	AY1	4	PASI-S
2513621016	1B-W-2-091912	NWTPH-Dx	AY1	4	PASI-S
2513621017	1B-W-23-091912	NWTPH-Dx	AY1	4	PASI-S
2513621018	2A-W-41-091912	NWTPH-Dx	AY1	4	PASI-S
2513621019	1A-W-4-091912	NWTPH-Dx	AY1	4	PASI-S
2513621020	1A-W-40-091912	NWTPH-Dx	AY1	4	PASI-S
2513621021	2A-W-40-091912	NWTPH-Dx	AY1	4	PASI-S
2513621022	S3-BU-091912	NWTPH-Dx	AY1	4	PASI-S
2513621023	S30-BU-091912	NWTPH-Dx	AY1	4	PASI-S
2513621024	S3-AU-091912	NWTPH-Dx	AY1	4	PASI-S
2513621025	S2-AU-091912	NWTPH-Dx	AY1	4	PASI-S
2513621026	S2-BD-091912	NWTPH-Dx	AY1	4	PASI-S
2513621027	S2-AD-091912	NWTPH-Dx	AY1	4	PASI-S
2513621028	S2-BU-091912	NWTPH-Dx	AY1	4	PASI-S
2513621029	S20-BU-091912	NWTPH-Dx	AY1	4	PASI-S
2513621030	S1-BD-091912	NWTPH-Dx	AY1	4	PASI-S
2513621031	S1-AD-091912	NWTPH-Dx	AY1	4	PASI-S
2513621032	S1-AU-091912	NWTPH-Dx	AY1	4	PASI-S
2513621033	S1-BU-091912	NWTPH-Dx	AY1	4	PASI-S





#### **PROJECT NARRATIVE**

Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

Method:NWTPH-DxDescription:NWTPH-Dx GCSClient:BNSF\_Farallon - WADate:October 04, 2012

#### **General Information:**

33 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

#### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



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Sample: 2A-W-9-091912	Lab ID: 25	13621001	Collected:	09/19/1	2 10:45	Received: 0	9/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Prepar	ration Me	thod: EF	PA 3510			
Diesel Range	<b>0.21</b> m	ng/L		0.038	1	10/02/12 09:00	10/03/12 01:3	2	
Motor Oil Range	<b>0.29</b> m	ng/L		0.19	1	10/02/12 09:00	10/03/12 01:3	2 64742-65-0	
Surrogates n-Octacosane (S)	74 %	, D		50-150	1	10/02/12 09:00	0 10/03/12 01:3	2 630-02-4	
o-Terphenyl (S)	65 %	ò	!	50-150	1	10/02/12 09:00	10/03/12 01:3	2 84-15-1	
Sample: 2A-W-10-091912	Lab ID: 25	13621002	Collected:	09/19/1	2 11:30	Received: 0	9/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Prepar	ration Me	thod: EF	PA 3510			
Diesel Range	<b>0.12</b> m	ng/L		0.038	1	10/02/12 09:00	0 10/03/12 08:18	8	
Motor Oil Range <b>Surrogates</b>	ND m	ng/L		0.19	1	10/02/12 09:00	10/03/12 08:18	8 64742-65-0	
n-Octacosane (S)	99 %	, D	!	50-150	1	10/02/12 09:00	10/03/12 08:18	8 630-02-4	
o-Terphenyl (S)	84 %	Ď		50-150	1	10/02/12 09:00	10/03/12 08:18	8 84-15-1	
Sample: MW-4-091912	Lab ID: 25	13621003	Collected:	09/19/1	2 12:05	Received: 0	9/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Prepar	ration Me	thod: EF	PA 3510			
Diesel Range	<b>0.041</b> m	ng/L		0.038	1	10/02/12 09:00	10/03/12 09:0	1	
Motor Oil Range <b>Surrogates</b>	ND m	ng/L		0.19	1	10/02/12 09:00	10/03/12 09:0	1 64742-65-0	
n-Octacosane (S)	80 %	, D	!	50-150	1	10/02/12 09:00	10/03/12 09:0	1 630-02-4	
o-Terphenyl (S)	70 %	Ď	;	50-150	1	10/02/12 09:00	10/03/12 09:0	1 84-15-1	
Sample: MW-3-091912	Lab ID: 25	13621004	Collected:	09/19/1	2 12:40	Received: 0	9/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	t Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Prepar	ration Me	thod: EF	PA 3510			
Diesel Range	<b>0.093</b> m	ng/L		0.038	1	10/02/12 09:00	0 10/03/12 09:19	9	
	ND m	•		0.19	1	10/02/12 09:00	10/03/12 09:19	9 64742-65-0	
•	ND II	·9/ =		0.15					
Motor Oil Range <b>Surrogates</b> n-Octacosane (S)	92 %	•	!	50-150	1	10/02/12 09:00	10/03/12 09:1	9 630-02-4	

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Sample: 2B-W-4-091912	Lab ID: 251	3621005	Collected: 09/19/1	2 13:10	Received: 09	/20/12 09:30 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND m	g/L	0.038	1	10/02/12 09:00	10/03/12 09:37		
Motor Oil Range <b>Surrogates</b>	ND m	g/L	0.19	1	10/02/12 09:00	10/03/12 09:37	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	10/02/12 09:00	10/03/12 09:37	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	10/02/12 09:00	10/03/12 09:37	84-15-1	
Sample: MW-16-091912	Lab ID: 251	3621006	Collected: 09/19/1	2 13:45	Received: 09	/20/12 09:30 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation Me	thod: E	PA 3510			
Diesel Range	ND m	g/L	0.038	1	10/02/12 09:00	10/03/12 09:54		
Motor Oil Range <b>Surrogates</b>	ND m	g/L	0.19	1	10/02/12 09:00	10/03/12 09:54	64742-65-0	
n-Octacosane (S)	74 %		50-150	1	10/02/12 09:00	10/03/12 09:54	630-02-4	
o-Terphenyl (S)	66 %		50-150	1	10/02/12 09:00	10/03/12 09:54	84-15-1	
Sample: EW-43-091912	Lab ID: 251	3621007	Collected: 09/19/1	2 14:35	Received: 09	/20/12 09:30 M	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND m	g/L	0.042	1	10/02/12 09:00	10/03/12 10:12		
Motor Oil Range <b>Surrogates</b>	ND m	g/L	0.21	1	10/02/12 09:00	10/03/12 10:12	64742-65-0	
n-Octacosane (S)	88 %		50-150	1	10/02/12 09:00	10/03/12 10:12	630-02-4	
o-Terphenyl (S)	75 %		50-150	1	10/02/12 09:00	10/03/12 10:12	84-15-1	
Sample: EW-1-091912	Lab ID: 251	3621008	Collected: 09/19/1	2 14:55	Received: 09	/20/12 09:30 N	Matrix: Water	
Sample: EW-1-091912 Parameters	Lab ID: 251	<b>3621008</b> Units	Collected: 09/19/1	2 14:55 DF	Received: 09 Prepared	/20/12 09:30 M	Matrix: Water CAS No.	Qual
Parameters	Results	Units		DF	Prepared			Qual
Parameters  NWTPH-Dx GCS	Results  Analytical Met	Units	Report Limit	DF	Prepared PA 3510		CAS No.	Qual
Parameters  NWTPH-Dx GCS  Diesel Range  Motor Oil Range	Results	Units hod: NWTP g/L	Report Limit  H-Dx Preparation Me	DF ethod: E	Prepared PA 3510	Analyzed 10/03/12 14:47	CAS No.	Qual
·	Results  Analytical Met	Units hod: NWTP g/L g/L	Report Limit  H-Dx Preparation Me  0.041	DF ethod: E	Prepared PA 3510 10/02/12 09:00 10/02/12 09:00	Analyzed 10/03/12 14:47	CAS No.	Qual

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Sample: MW-38R-091912	Lab ID: 2513	3621009	Collected: 09/19/1	12 15:25	Received: 09	/20/12 09:30 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
IWTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	<b>0.17</b> mg	g/L	0.038	1	10/02/12 09:00	10/03/12 15:05	5	
Motor Oil Range	<b>0.21</b> mg	g/L	0.19	1	10/02/12 09:00	10/03/12 15:05	64742-65-0	
Surrogates	90 %		50-150	1	10/02/12 09:00	10/02/12 15:05	620.02.4	
n-Octacosane (S) o-Terphenyl (S)	78 %		50-150	1	10/02/12 09:00			
resplicitly (0)	70 70		00 100	•	10/02/12 00:00	10/00/12 10:00	04 10 1	
Sample: 5-W-50-091912	Lab ID: 251	3621010	Collected: 09/19/1	12 16:00	Received: 09	/20/12 09:30 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
WTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation Mo	ethod: E	PA 3510			
Diesel Range	<b>1.0</b> mg	ą/L	0.042	1	10/02/12 09:00	10/03/12 15:23	3	
Motor Oil Range	<b>0.48</b> mg	•	0.21	1	10/02/12 09:00	10/03/12 15:23	8 64742-65-0	
Surrogates								
n-Octacosane (S)	100 %		50-150	1	10/02/12 09:00			
o-Terphenyl (S)	89 %		50-150	1	10/02/12 09:00	10/03/12 15:23	3 84-15-1	
Sample: GW-4-091912	Lab ID: 2513	3621011	Collected: 09/19/1	12 11:12	Received: 09	/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
WTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg	ą/L	0.043	1	10/02/12 09:00	10/03/12 15:42	2	
Motor Oil Range	ND mg		0.22	1	10/02/12 09:00	10/03/12 15:42	2 64742-65-0	
Surrogates	00.0/		50.450		40/00/40 00:00	40/00/40 45:40		
n-Octacosane (S)	80 % 68 %		50-150 50-150	1 1	10/02/12 09:00			
o-Terphenyl (S)	00 %		50-150	ı	10/02/12 09:00	10/03/12 15.42	2 04-10-1	
Sample: EW-2A-091912	Lab ID: 2513	3621012	Collected: 09/19/1	12 11:25	Received: 09	/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
WTPH-Dx GCS	Analytical Meth	nod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg	g/L	0.038	1	10/02/12 09:00	10/03/12 16:00	)	
Notor Oil Range	ND mg	•	0.19	1	10/02/12 09:00	10/03/12 16:00	64742-65-0	
Surrogates								
O-4 (C)	86 %		50-150	1	10/02/12 09:00	10/03/12 16:00	630-02-4	
n-Octacosane (S) o-Terphenyl (S)	73 %		50-150	1	10/02/12 09:00			

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Sample: 2A-W-42-091912	Lab ID: 25	13621013	Collected: 09/19/1	2 12:12	Received: 09	/20/12 09:30 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.11</b> m	ıg/L	0.044	1	10/02/12 09:00	10/03/12 16:18		
Motor Oil Range <b>Surrogates</b>	ND m	ıg/L	0.22	1	10/02/12 09:00	10/03/12 16:18	64742-65-0	
n-Octacosane (S)	97 %	)	50-150	1	10/02/12 09:00	10/03/12 16:18	630-02-4	
o-Terphenyl (S)	83 %	)	50-150	1	10/02/12 09:00	10/03/12 16:18	84-15-1	
Sample: 1B-W-3-091912	Lab ID: 25	13621014	Collected: 09/19/1	2 12:20	Received: 09	/20/12 09:30 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND m	ıg/L	0.038	1	10/03/12 08:50	10/03/12 23:53		
Motor Oil Range <b>Surrogates</b>	ND m	ıg/L	0.19	1	10/03/12 08:50	10/03/12 23:53	64742-65-0	
n-Octacosane (S)	97 %		50-150	1	10/03/12 08:50	10/03/12 23:53	630-02-4	
o-Terphenyl (S)	83 %	)	50-150	1	10/03/12 08:50	10/03/12 23:53	84-15-1	
Sample: GW-3-091912	Lab ID: 25	13621015	Collected: 09/19/1	2 12:55	Received: 09	/20/12 09:30 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND m	ıg/L	0.043	1	10/03/12 08:50	10/04/12 00:47		
Motor Oil Range <i>Surrogates</i>	ND m	ıg/L	0.21	1	10/03/12 08:50	10/04/12 00:47	64742-65-0	
n-Octacosane (S)	79 %	,	50-150	1	10/03/12 08:50	10/04/12 00:47	630-02-4	
` ,			30-130					
o-Terphenyl (S)	71 %		50-150	1	10/03/12 08:50	10/04/12 00:47	84-15-1	
o-Terphenyl (S)  Sample: 1B-W-2-091912	71 % Lab ID: 25	)		1			84-15-1 latrix: Water	
		)	50-150	1				Qual
Sample: 1B-W-2-091912	Lab ID: 25	13621016 Units	50-150 Collected: 09/19/1	1 2 13:58 DF	Received: 09 Prepared	/20/12 09:30 M	latrix: Water	Qual
Sample: 1B-W-2-091912 Parameters	Lab ID: 25	13621016 Units	50-150  Collected: 09/19/1  Report Limit	1 2 13:58 DF	Received: 09 Prepared PA 3510	/20/12 09:30 M	latrix: Water	Qual
Sample: 1B-W-2-091912 Parameters  NWTPH-Dx GCS  Diesel Range Motor Oil Range	Lab ID: 25  Results  Analytical Me	Units thod: NWTP	50-150  Collected: 09/19/1  Report Limit  H-Dx Preparation Me	1 2 13:58 DF ethod: E	Received: 09 Prepared PA 3510 10/03/12 08:50	/20/12 09:30 M Analyzed	CAS No.	Qual
Sample: 1B-W-2-091912 Parameters  NWTPH-Dx GCS	Lab ID: 25  Results  Analytical Me  0.12 m	Units thod: NWTP	Collected: 09/19/1  Report Limit PH-Dx Preparation Me 0.053	1 2 13:58 DF ethod: E	Received: 09 Prepared PA 3510 10/03/12 08:50 10/03/12 08:50	/20/12 09:30 M Analyzed 	CAS No. 64742-65-0	Qual

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Sample: 1B-W-23-091912	Lab ID: 25	13621017	Collected: 09/19/1	2 13:45	Received: 09	/20/12 09:30 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	ethod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.084</b> r	ng/L	0.056	1	10/03/12 08:50	10/04/12 01:21		
Motor Oil Range	ND r	ng/L	0.28	1	10/03/12 08:50	10/04/12 01:21	64742-65-0	
Surrogates	_							
n-Octacosane (S)	77 9		50-150	1		10/04/12 01:21		
o-Terphenyl (S)	66 %	<b>/</b> o	50-150	1	10/03/12 08:50	10/04/12 01:21	84-15-1	
Sample: 2A-W-41-091912	Lab ID: 25	13621018	Collected: 09/19/1	2 14:55	Received: 09	/20/12 09:30 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	ethod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	<b>0.065</b> r	ng/L	0.045	1	10/03/12 08:50	10/04/12 01:39		
Motor Oil Range	ND r	· ·	0.22	1	10/03/12 08:50	10/04/12 01:39	64742-65-0	
Surrogates		•						
n-Octacosane (S)	89 9		50-150	1	10/03/12 08:50	10/04/12 01:39	630-02-4	
o-Terphenyl (S)	78 %	%	50-150	1	10/03/12 08:50	10/04/12 01:39	84-15-1	
Sample: 1A-W-4-091912	Lab ID: 25	13621019	Collected: 09/19/1	2 15:20	Received: 09	/20/12 09:30 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	ethod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND r	ma/L	0.038	1	10/03/12 08:50	10/04/12 02:13		
Motor Oil Range	ND r	-	0.19	1		10/04/12 02:13	64742-65-0	
Surrogates		Ü						
n-Octacosane (S)	79 %	%	50-150	1	10/03/12 08:50	10/04/12 02:13	630-02-4	
o-Terphenyl (S)	67 %	%	50-150	1	10/03/12 08:50	10/04/12 02:13	84-15-1	
Sample: 1A-W-40-091912	Lab ID: 25	13621020	Collected: 09/19/1	2 20:00	Received: 09	/20/12 09:30 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	ethod: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND r	ma/L	0.038	1	10/03/12 08:50	10/04/12 02:48		
Motor Oil Range	ND r	-	0.19	1		10/04/12 02:48	64742-65-0	
	1,01	··	0.10	•	. 5. 55 2 55.56		00 0	
Surrogates								
Surrogates n-Octacosane (S)	87 9	%	50-150	1	10/03/12 08:50	10/04/12 02:48	630-02-4	

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Sample: 2A-W-40-091912	Lab ID: 251	3621021	Collected:	09/19/12 15:	40 Received	1: 09/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	Limit DF	Prepare	ed Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ition Method	: EPA 3510			
Diesel Range	ND m	g/L		0.043 1	10/03/12 0	8:50 10/04/12 03:	05	
Motor Oil Range <b>Surrogates</b>	ND m	g/L		0.22 1	10/03/12 0	8:50 10/04/12 03:	05 64742-65-0	
n-Octacosane (S)	97 %	1	5	0-150 1	10/03/12 0	8:50 10/04/12 03:	05 630-02-4	
o-Terphenyl (S)	86 %	1	5	0-150 1	10/03/12 0	8:50 10/04/12 03:	05 84-15-1	
Sample: S3-BU-091912	Lab ID: 251	3621022	Collected:	09/19/12 16:	22 Received	1: 09/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	Limit DF	Prepare	ed Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ition Method	: EPA 3510			
Diesel Range	<b>0.082</b> m	g/L		0.038 1	10/03/12 0	8:50 10/04/12 03:	57	
Motor Oil Range <i>Surrogates</i>	ND m	g/L		0.19 1	10/03/12 0	8:50 10/04/12 03:	57 64742-65-0	
n-Octacosane (S)	85 %		5	0-150 1	10/03/12 0	8:50 10/04/12 03:	57 630-02-4	
o-Terphenyl (S)	72 %	1	5	0-150 1	10/03/12 0	8:50 10/04/12 03:	57 84-15-1	
Sample: S30-BU-091912	Lab ID: 251	3621023	Collected:	09/19/12 23:	59 Received	1: 09/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	Limit DF	Prepare	ed Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ition Method	: EPA 3510			
Diesel Range	ND m	g/L		0.038 1	10/03/12 0	8:50 10/04/12 04:	14	
Motor Oil Range <b>Surrogates</b>	ND m	g/L		0.19 1	10/03/12 0	8:50 10/04/12 04:	14 64742-65-0	
n-Octacosane (S)	80 %	1	5	0-150 1	10/03/12 0	8:50 10/04/12 04:	14 630-02-4	
o-Terphenyl (S)	73 %		5	0-150 1	10/03/12 0	8:50 10/04/12 04:	14 84-15-1	
Sample: S3-AU-091912	Lab ID: 251	3621024	Collected:	09/19/12 16:	25 Received	1: 09/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report	Limit DF	Prepare	ed Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepara	ition Method	: EPA 3510			- <del></del>
Diesel Range	ND m	g/L		0.042 1	10/03/12 0	8:50 10/04/12 04:	32	
		•		0.21 1	10/03/12 0	8:50 10/04/12 04:	32 64742-65-0	
•	ND m	9/-		0.21				
Motor Oil Range Surrogates n-Octacosane (S)	91 %	_	5	0-150 1	10/03/12 0	8:50 10/04/12 04:	32 630-02-4	

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Sample: S2-AU-091912	Lab ID: 2513	621025	Collected: 09/19/1	12 16:56	Received: 09	/20/12 09:30 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
IWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation Mo	ethod: E	PA 3510			
Diesel Range	ND mg/	'L	0.039	1	10/03/12 08:50	10/04/12 04:49	9	
Motor Oil Range	ND mg/	Ľ	0.19	1	10/03/12 08:50	10/04/12 04:49	9 64742-65-0	
Surrogates n-Octacosane (S)	87 %		50-150	1	10/03/12 08:50	10/04/12 04:40	630-02-4	
p-Terphenyl (S)	75 %		50-150	1	10/03/12 08:50			
Sample: S2-BD-091912	Lab ID: 2513	621026	Collected: 09/19/1	12 16:55	Received: 09	1/20/12 09:30 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	ND mg/	'L	0.042	1	10/03/12 08:50	10/04/12 05:06	6	
Motor Oil Range	ND mg/		0.21	1	10/03/12 08:50			
Surrogates n-Octacosane (S)	94 %		50-150	1	10/03/12 08:50	10/04/12 05:06	630-02-4	
p-Terphenyl (S)	84 %		50-150	1	10/03/12 08:50			
Sample: S2-AD-091912	Lab ID: 2513	621027	Collected: 09/19/1	12 17:10	Received: 09	/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation Mo	ethod: E	PA 3510			
Diesel Range	ND mg/	'L	0.038	1	10/03/12 08:50	10/04/12 05:24	1	
Motor Oil Range Surrogates	ND mg/		0.19	1	10/03/12 08:50	10/04/12 05:24	4 64742-65-0	
n-Octacosane (S)	96 %		50-150	1	10/03/12 08:50	10/04/12 05:24	1 630-02-4	
p-Terphenyl (S)	86 %		50-150	1	10/03/12 08:50	10/04/12 05:24	84-15-1	
Sample: S2-BU-091912	Lab ID: 2513	621028	Collected: 09/19/1	12 17:15	Received: 09	1/20/12 09:30 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
WTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	<b>0.045</b> mg/	'L	0.043	1	10/03/12 08:50	10/04/12 05:41	1	
Motor Oil Range Surrogates	ND mg/	'L	0.22	1	10/03/12 08:50	10/04/12 05:41	64742-65-0	
n-Octacosane (S)	91 %		50-150	1	10/03/12 08:50	10/04/12 05:41	1 630-02-4	
i odladodano (o)								

Date: 10/04/2012 04:29 PM



Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

Sample: S20-BU-091912	Lab ID: 2513	621029	Collected: 09/19/1	2 17:00	Received: 09	/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
IWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/	′L	0.041	1	10/03/12 08:50	10/04/12 05:58	3	
Motor Oil Range	ND mg/	'L	0.20	1	10/03/12 08:50	10/04/12 05:58	8 64742-65-0	
Surrogates n-Octacosane (S)	87 %		50-150	1	10/03/12 08:50	10/04/12 05:59	8 630 03 4	
o-Terphenyl (S)	79 %		50-150 50-150	1	10/03/12 08:50			
, respirency, (e)			33 .33	·	. 0. 00. 12 00.00			
Sample: S1-BD-091912	Lab ID: 2513	621030	Collected: 09/19/1	2 17:41	Received: 09	/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
WTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/	L'L	0.041	1	10/03/12 08:50	10/04/12 06:15	5	
Motor Oil Range	ND mg/	′L	0.20	1	10/03/12 08:50	10/04/12 06:15	64742-65-0	
Surrogates								
n-Octacosane (S)	86 %		50-150	1	10/03/12 08:50			
p-Terphenyl (S)	75 %		50-150	1	10/03/12 08:50	10/04/12 06:15	84-15-1	
Sample: S1-AD-091912	Lab ID: 2513	621031	Collected: 09/19/1	2 17:42	Received: 09	/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/	′L	0.044	1	10/03/12 08:50	10/04/12 07:07	7	
Motor Oil Range	ND mg/		0.22	1	10/03/12 08:50	10/04/12 07:07	64742-65-0	
Surrogates	00.0/		50.450	4	10/02/12 00:50	10/04/10 07:07	7 020 02 4	
n-Octacosane (S)	88 % 76 %		50-150 50-150	1 1	10/03/12 08:50			
o-Terphenyl (S)	76 %		50-150	ı	10/03/12 08:50	10/04/12 07.07	04-10-1	
Sample: S1-AU-091912	Lab ID: 2513	621032	Collected: 09/19/1	2 17:55	Received: 09	/20/12 09:30	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
IWTPH-Dx GCS	Analytical Metho	od: NWTP	H-Dx Preparation Me	ethod: E	PA 3510			
Diesel Range	ND mg/	′L	0.044	1	10/03/12 08:50	10/04/12 07:25	5	
Notor Oil Range	ND mg/	′L	0.22	1	10/03/12 08:50	10/04/12 07:25	64742-65-0	
Surrogates								
n-Octacosane (S)	84 %		50-150 50-150	1 1	10/03/12 08:50 10/03/12 08:50			
o-Terphenyl (S)	75 %							

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Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

Sample: S1-BU-091912	Lab ID: 25	13621033	Collected: 09/19/1	12 17:55	Received: 09	/20/12 09:30 N	/latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTPH	-Dx Preparation M	ethod: E	PA 3510			
Diesel Range	ND m	ıg/L	0.042	1	10/03/12 08:50	10/04/12 07:42		
Motor Oil Range	ND m	ıg/L	0.21	1	10/03/12 08:50	10/04/12 07:42	64742-65-0	
Surrogates	00.00		50.450		40/00/40 00:50	40/04/40 07:40	000 00 4	
n-Octacosane (S)	90 %	)	50-150	1	10/03/12 08:50	10/04/12 07:42	630-02-4	
o-Terphenyl (S)	79 %	)	50-150	1	10/03/12 08:50	10/04/12 07:42	84-15-1	



Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

QC Batch: OEXT/6149 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2513621001, 2513621002, 2513621003, 2513621004, 2513621005, 2513621006, 2513621007, 2513621008,

2513621009, 2513621010, 2513621011, 2513621012, 2513621013

METHOD BLANK: 132451 Matrix: Water

Associated Lab Samples: 2513621001, 2513621002, 2513621003, 2513621004, 2513621005, 2513621006, 2513621007, 2513621008,

2513621009, 2513621010, 2513621011, 2513621012, 2513621013

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.040	10/02/12 22:31	
Motor Oil Range	mg/L	ND	0.20	10/02/12 22:31	
n-Octacosane (S)	%	91	50-150	10/02/12 22:31	
o-Terphenyl (S)	%	80	50-150	10/02/12 22:31	

LABORATORY CONTROL SAMPLE: 132452

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	 mg/L		0.87	87	51-114	
Motor Oil Range	mg/L	1	0.87	87	62-120	
n-Octacosane (S)	%			77	50-150	
o-Terphenyl (S)	%			68	50-150	

SAMPLE DUPLICATE: 132453

		2513615018	Dup	555	0 115
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	77	71	18	
o-Terphenyl (S)	%	66	60	19	

SAMPLE DUPLICATE: 132454

Date: 10/04/2012 04:29 PM

Parameter	Units	2513615019 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	95	78	14	
o-Terphenyl (S)	%	81	69	12	



BNSF Skykomish 683-043 Project:

Pace Project No.: 2513621

QC Batch: OEXT/6157 Analysis Method: NWTPH-Dx QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

2513621014, 2513621015, 2513621016, 2513621017, 2513621018, 2513621019, 2513621020, 2513621021, Associated Lab Samples:

2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, 2513621028, 2513621029,

2513621030, 2513621031, 2513621032, 2513621033

METHOD BLANK: 132596 Matrix: Water

 $2513621014, 2513621015, 2513621016, 2513621017, 2513621018, 2513621019, 2513621020, 2513621021, \\2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, 2513621028, 2513621029, \\2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, 2513621028, 2513621029, \\2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, 2513621028, \\2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, 2513621028, \\2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, \\2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, \\2513621022, 2513621023, 2513621024, 2513621025, 2513621026, 2513621027, \\2513621022, 2513621022, 2513621024, 2513621025, 2513621026, 2513621027, \\2513621022, 2513621024, 2513621024, 2513621026, 2513621027, 2513621028, \\2513621022, 2513621024, 2513621024, 2513621026, 2513621027, 2513621028, \\2513621022, 2513621024, 2513621024, 2513621026, \\2513621022, 2513621024, 2513621024, \\2513621022, 2513621024, 2513621024, \\2513621022, 2513621024, 2513621024, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621024, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\2513621022, \\251362102, \\251362102, \\251362102, \\251362102, \\251362102, \\251362102, \\251362102, \\251362102, \\251362102, \\251362102, \\251$ Associated Lab Samples:

2513621030, 2513621031, 2513621032, 2513621033

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.040	10/03/12 23:17	
Motor Oil Range	mg/L	ND	0.20	10/03/12 23:17	
n-Octacosane (S)	%	65	50-150	10/03/12 23:17	
o-Terphenyl (S)	%	59	50-150	10/03/12 23:17	

LABORATORY CONTROL SAMPLE: 132597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		1.1	106	51-114	
Motor Oil Range	mg/L	1	1.0	102	62-120	
n-Octacosane (S)	%			98	50-150	
o-Terphenyl (S)	%			89	50-150	

SAMPLE DUPLICATE: 132598

Parameter	Units	2513621018 Result	Dup Result	RPD	Qualifiers
Diesel Range	 mg/L	0.065	0.052	24	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	89	95	3	
o-Terphenyl (S)	%	78	81	.4	

SAMPLE DUPLICATE: 132599

		2513621019	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	79	72	8	
o-Terphenyl (S)	%	67	64	4	

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#### **QUALIFIERS**

Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 10/04/2012 04:29 PM

PASI-S Pace Analytical Services - Seattle



#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF Skykomish 683-043

Pace Project No.: 2513621

Date: 10/04/2012 04:29 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2513621001	2A-W-9-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621002	2A-W-10-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621003	MW-4-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621004	MW-3-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621005	2B-W-4-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621006	MW-16-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621007	EW-43-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621008	EW-1-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621009	MW-38R-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621010	5-W-50-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621011	GW-4-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621012	EW-2A-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621013	2A-W-42-091912	EPA 3510	OEXT/6149	NWTPH-Dx	GCSV/3870
2513621014	1B-W-3-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621015	GW-3-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621016	1B-W-2-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621017	1B-W-23-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621018	2A-W-41-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621019	1A-W-4-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621020	1A-W-40-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621021	2A-W-40-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621022	S3-BU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621023	S30-BU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621024	S3-AU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621025	S2-AU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621026	S2-BD-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621027	S2-AD-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621028	S2-BU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621029	S20-BU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621030	S1-BD-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621031	S1-AD-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621032	S1-AU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874
2513621033	S1-BU-091912	EPA 3510	OEXT/6157	NWTPH-Dx	GCSV/3874

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ISSAGUAD WA			Address:		NPDES Y	GROU	ITAW DI	ER   DRINK	NG WATER
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Phone: 425-295-0900 Fax: 2-295-0450 Project	ct Name: PACT S	uk omish	Pace Project Manager:		Site Location				
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3171	K 00-0	7/	<u> </u>	Requested /	Inalysis Filtere	d (Y/N)	┱┸		
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1 2 A-W-9 -091912	WT 6 310112	1045	2						
2 2A-W-10-091912		1130							
3 MW-4-091912	wt 6	205							
4 MW-3-091912	WT 6	240							
5 CBB 2B-W-4-091912	wr 6	1310							
6 MW-16-091912	WT 6	1345				$\perp \perp \perp$	$\bot$		· · ·
7 EW-43-001012	WT G	435							
8 EW-1-091912	w 6	1455					$\perp \perp$		
9 MW-38R-091912	ME	1525				$\bot$	44		
10 5-W-50-091912	WT & V	1600				444			
11 GW-4-0919/2	446	1/12				444	$\bot\!\!\!\!\bot$		
12 EW-24-09,19/2	UNG L	1/25	<u> </u>				Щ		
ADDITIONAL COMMENTS	RELINQUISHED BY	AFFILIATION DATE	TIME ACCEPTED	BY / AFFILIATION	DATE	TIME	<del>/. /</del>	SAMPLE COND	ITIONS
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*Important Note: By signing this form you are accepting Pace	colo NET 20 dell'accionant torres or	SIGNATURE of SAMPLEB		(MM/DD/YY):	4 2011	<u>C</u>		ලි Q-020rev.07, 15-M	

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Section A Sec	ction B		Section C			Page	: /	7, 0	<sup>1</sup> 3	
Required Client Information: Rec	quired Project Information:	<del>,</del>	Invoice Information:	,	<b>!</b>		1	649	9133	
Address and Copy Copy	py To:	-ne	Company Name:	phara	REGULATORY	AGENCY		- 0 - 1		
1/3 3/4 400 1/0			Address:	VSF			ND WAT	ER I	DRINKING	WATER
Email To: Pur	chase Order No.:		Pace Quote		L UST L	RCRA			OTHER .	
TCL'HER COMPLIANCONSULTIAN COM	ject Name: A / OT	ch Va. I	Reference: Pace Project		Site Location					
425-295-0800   425-291-085		- Skykomen	Manager: Pace Profile #:		STATE:	_W	1_			
SIAL	683	-043		Requested .	Analysis Filtere		┯┸			
Section D Matrix Code				KINT		Ì	_			
Required Client Information MATRIX / COL	E   19   0	COLLECTED	Preservatives	ž ()		+++	-			
Drinking Water Water	E (Sa es) DW pipu ses CCOMP WT P COMP P ST. COLORDO COMP ST. SL SE COMP P ST. SL SE COMP ST. SL	POSITE COMPOSITE ENDIGRAB		25.						
Waste Water Product Soil/Soild	ST & SO STA	URT END/GRAB		den			Residual Chlorine (Y/N)			
SAMPLE ID Soli Soli Soli Soli Soli Soli Soli Soli		<del>                                     </del>		<b>1 1 1 1 1 1 1 1 1 1</b>			- Pi			
(A-Z, 0-9 / ,-) Air Sample IDs MUST BE UNIQUE Tissue	40 IWI I		M TAIN   B	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		111	용			
Other	ᅋᆝᄽᆲᄩ					111	lual			
ITEM #	MATRIX COD SA SAMPLE TYPE		# OF CONTAINERS  # OF CONTAINERS Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCI NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Analysis Test			?esic	Paca	Project N	o <i>J</i> Lab l.D.
1 24-41-47-09/9/2	UT G DATE	TIME DATE TIME OF	2					1 000	r tojoci i	00 Cubb.
2 1B-W-3-0719/2		1220	<del>                                      </del>				$\Box$			
3 6W-3-0919/7	1/1/1	1255								
4 /B-W-2-09/9/2		1358								
5 1B-W-23-091912		1345					$\sqcup \sqcup$			
6 2A-W41-09/9/2		1455		} -		4-1-1				
7 14w-4-091912		/520	╂┼┼┼┼┼	┨ <del>┋┋</del> ┪	<del>├</del>	+++	╌┼╌┨			
8 1A-W-40-09/9/2		1540	<del>┨╏╏╏╏┞╬</del> ┼┼┼	l <del>III                                   </del>	┞┼┼┼┼	+++	╌┼╌╂			
9 24-40-40-09/9/2 10 53-84-09/9/2	<del>-         -</del>	1622	<del>┨┠┦╏╏┩╬┼╏</del> ┼	┨╴┠ <del>┠┼┼╌</del> ┤╶┼╌	┝┼┼┼┼	++-	$\dashv \dashv$		_	
10 53-84-09/9/2 11 530-84-09/9/2		2359	╂┼┼┼┼┼┼┼	ſ <del>᠄▐</del> <del>▍</del>		111				
12 53-44-091912		1625				1				
ADDITIONAL COMMENTS	RELINQUISHED BY		TIME ACCEPTE	BY / AFFILIATION	DATE	TIME		SAMPI	E CONDITI	ONS
	And I	rasallan 9/2di:	20230 Bue	< pace	9/20/2	730	4.3			
	// (-)		0930 Shopi S	Swan / PAC	= 9/10/12	0930	5.4	И	u	4
	Posch	1 - TIPOTH	150 3000	)   (	1/~/7		3,9			
	<del>-</del>	<del></del>	<del> </del>				5.8			
		SAMPLER NAME AND SIGNATU	 RE				4:0		<del>_</del>	tact
ORIG	SINAL	PRINT Name of SAMPLE					_ ⊆	Received on Ice (Y/N)	Custody Sealed Cool (Y/N)	Somples Intact (YIN)
	- <del>-</del>	SIGNATURE of SAMPLE		DATE Signed (MM/DD/YY):	9/20/13		Temp	Rece 52	Seale	Samp )
*Important Note: By siming this form you are accepting P	Popole NET 20 dour powerent terms			(mmcom11):	4241		F-ALL-		7, 15-May	

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A	Section B		Section C			Pag	e:	3	of 7	
Regulard Client Information:	Regulated Project Information:		Invoice Information:			-	4 6	A \ 1	22	
company. For a low Couse/fing	Report To: Tad Cla	ne	Attention: Rruce Ju	anard			Тр	491	.32	
Address: 975 5th Ave 1/W	Сору То:		Company Name: RIISE		REGULATORY	AGENCY	<i>'</i>			
Issanyah, WA 98027			Address:		□ NPDES J	Z GROU	IND WAT	TER [	DRINKIN	G WATER
	Purchase Order No.:		Page Cupte Reference:		r ust r	RCRA		г	OTHER	
	Project Name: DICE	SKy/com. Vo	Pace Project		Site Location		,			
Requested Due Date/TAT: CTAT	Project Number: 683		Manager: Pece Profile #:		STATE:	Wo	1_			
3171	000	77		Requested	Analysis Filtere	d (Y/N)		<u> </u>		
Section D Matrix Co	Mar.	т	TI		The same	1 1	Н			
Required Client Information MATRIX / C	COOE 6 5 6	COLLECTED	Preservatives	70g						
Drinking Water Water	WT   18   25		<u> </u>							
Waste Water Product	WW P S COMP	OSITE COMPOSITE RT ENDIGRAB		12			(V/N)			
SoiVSotid SAMPLE ID Oil	P ST					1 1	اح			
(A-Z, 0-9 / ,-) Wipe	*** I m I I	1	CONTAINERS SERVED  4  20  20  20  30  30  4	Test			Chlorine			
Sample IDs MUST BE UNIQUE Tissue Other	TS   0   2					11	<u> </u> [5			
	MATRIX	i I I	SAMPLE TEMP AT COLLECTION # OF CONTAINERS Unpreserved H-SO <sub>4</sub> HNO <sub>3</sub> HCI NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	maty (CT)			Residual			
#	SAMPLE SAMPLE	TIME DATE TIME	# OF CON Unpresen HASO4 HCI NaOH NaOH NaOH Methanol Other Other	Analysis Next PH			Res	Pace	Project N	lo./ Lab I.D.
1 52-44-09/917	w 6	9/19/12 /656	2 1				$\Box$		<b>!</b>	
2 52-BD-09/9/7	Mi	1 1/4.55	19 17 11							
3 52-AD-09/912		17/0		1 171 1 1						
4 52-84-09/9/7		175		1 1111111						
5 520-RU-09/9/2		1700								
6 51-RA-09/9/2		1741								
1 5/- 20-09/912		1742					$oxed{oxed}$			
8 SI-AU-091912		1755				$\perp \perp$				
o 5 1- BU-091912		1755				$\perp \perp \perp$				
10										
11		- 1 <i>) [</i> ]		┠ <del>┈╏</del> ╌ <del>╏</del> ╌╏╌╏						
12			<u> </u>					<u> </u>		
ADDITIONAL COMMENTS	RELINQUISHED BY		TIME ACCEPTE	D BY / AFFILIATION	DATE	TIME		SAMP	LE CONDITI	ONS
	And To	10/01 9/20/	2 0730 500	K Pace	7/2912	<b>730</b>	4.0			
	Buck		20930 Justi Sa	Jan/PACE	9/20/12	1930	5.9	4	1	4
	100	THE THEOLE	7	1//	7/		3.9			1
		<del></del>	<del>                                     </del>		<del> </del>		4.9	$\vdash$	_	
	1	SAMPLER NAME AND SIGNATI	JRE							<u> </u>
ORI	GINAL	PRINT Name of SAMPLE		. ()			Temp in *C	Ö ( )	<u> </u>	S Intr
Of the		SIGNATURE of SAMPLE	0 00000 1100	DATE Signed (MM/DD/YY):	9/20/13		F E	Received on Ice (Y/N)	Custody Sealed Cocler (Y/N)	Semples Intact (Y/N)
*Important Note: By signing this form you are accepting	g Pace's NET 30 day payment terms			(mayoutt):	<del>// 29/ 8</del>		F-ALL		07, 15-May	

### **Sample Container Count**

CLIENT: Farallon

Pace Analytical

coc.page 1 of 3 coc id# 1649135

Trip Blank(s) Provided?
Y / N

Sample Line Item	VG9H	AG1H	ΔG1U	RP1II	RP2U	BP311	RP3N	BP3S	WGKU	WGFU	WG2H	DG9M	DG9B	VG9W	VSG			Comments
1	1	242	7.0.0	<u> </u>	DI 20	B. 00	DI 014	<u> </u>	W GRO	WOID	WOLU	<u> </u>	0000					
2		1									_							
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12		7														 ł	<u></u> ,	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic		Wipe/Swab	U	Summa Can

### **Sample Container Count**

25 1 3 6 2 1

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	Popo Applytical
1	Pace Analytical

CLIENT: Favallon

coc.page 2 of 3 coc id# 1649 131

Trip Blank(s) Provided?

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG		Comments
1		202															
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AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic		Wipe/Swab	U	Summa Can

CLIENT:  $\begin{array}{c} \text{COC.PAGE} \xrightarrow{3} \text{ of } \xrightarrow{3} \\ \text{COC.ID#} \xrightarrow{1649132} \end{array}$ 

Trip Blank(s) Provided?
Y / N

Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG	· 	<b>4</b> -		Comments
1		242																	
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AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	i	Wipe/Swab	U	Summa Can

	Sample C	onai	tion Upon Receipt 2 J 1 J 0 Z
Face Analytical Client Na	me: Far	all	on Project #
Courier:	Client Commo	ercial	Pace Olher
Custody Seal on Cooler/Box Present:	Yes 🗌 No	Seals	intact: Tyes No
Packing Material: 🔲 Bubble Wrap 🔀 Bu	ibble Bags 🔲 N	lone	Other Temp. Blank Yes No
Thermometer Used 132013 or 101731962 or 2	226099 Type of ice	Wet	Blue None Samples on ice, cooling process has begun
	12065 Biological . 9 , 5 - 8 , 4 .		is Frozen: Yes No  Comments:  Date and initials of person examining contents: NO 910 12
Chain of Custody Present:	Yes □No	□n/a	1.
Chain of Custody Filled Out:	Ø?es □No	□n/a	2.
Chain of Custody Relinquished:	ØYes □No	□n⁄a	3.
Sampler Name & Signature on COC:	ØYes □No	□n⁄a	4.
Samples Arrived within Hold Time:	ØYes □No	□N⁄A	5.
Short Hold Time Analysis (<72hr):	□Yes ⊠No	□N⁄A	6.
Rush Turn Around Time Requested:	□Yes ØNo	□n/A	7.
Follow Up / Hold Analysis Requested:	□yes ØNo	□n⁄a	8.
Sufficient Volume:	<del></del>		
Correct Containers Used:	∕úyes □no	□N⁄A	10.
-Pace Containers Used:	,ØYes □No	□n/a	
Containers Intact:	ZYes □No	□n/A	11.
Filtered volume received for Dissolved tests	□Yes □No	ØÑ⁄A	12.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix:	ÆYes □No,	le/	13.
All containers needing preservation have been checked		□N/A	14.
All containers needing preservation are found to be compliance with EPA recommendation.			
Exceptions: VOA, coliform, TOC, O&G	□Yes □No	DWA	Initial when Lot # of added completed preservative
Samples checked for dechlorination:	□Yes □No		
Headspace in VOA Vials ( >6mm):	□Yes □No	ÐN⁄A	
Trip Blanks Present:	□Yes ØNo		
Trip Blank Custody Seals Present	□Yes □No	BINVA	
Pace Trip Blank Creation Date:			
Client Notification/ Resolution:  Person Contacted:  Comments/ Resolution:	lad:Au	<del>-</del>	Field Data Required? Y / N  Time: 912012017  Daupks to be run NWTPH-Dx
	· - · · · · · · · · · · · · · · · · · ·		
Project Manager Review:	Cub		Date: 9/2011
rrolect Manager Keylew: 1/ C.	* ~\\ \~^		Date: VIIIAU

2517624.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





October 05, 2012

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaquah, WA 98027

RE: Project: BNSF Skykomish Pace Project No.: 2513629

Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 

cc: Desiree Clement, Farallon
Kristin Darnell, BNSF\_Farallon - WA
Emerald Erickson-Mulanax, Farallon
Jerry Portele, Farallon
Javan Ruark, Farallon Consulting LLC







#### **CERTIFICATIONS**

Project: BNSF Skykomish

Pace Project No.: 2513629

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555

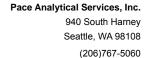


#### **SAMPLE ANALYTE COUNT**

Project: BNSF Skykomish

Pace Project No.: 2513629

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2513629001	IC-W-8-092012	NWTPH-Dx	AY1	4	PASI-S
2513629002	IC-WO-8-092012	NWTPH-Dx	AY1	4	PASI-S
2513629003	IC-W-7-092012	NWTPH-Dx	AY1	4	PASI-S
2513629004	W-1-092012	NWTPH-Dx	AY1	4	PASI-S
2513629005	IC-W-3-092012	NWTPH-Dx	AY1	4	PASI-S
2513629006	IC-W-4-092012	NWTPH-Dx	AY1	4	PASI-S
2513629007	GW-2-092012	NWTPH-Dx	AY1	4	PASI-S
2513629008	GW-1-092012	NWTPH-Dx	AY1	4	PASI-S





#### **PROJECT NARRATIVE**

Project: BNSF Skykomish

Pace Project No.: 2513629

Method:NWTPH-DxDescription:NWTPH-Dx GCSClient:BNSF\_Farallon - WADate:October 05, 2012

#### **General Information:**

8 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

#### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



Project: BNSF Skykomish

Pace Project No.: 2513629

Lab ID:	2513629001	Collected	: 09/20/1	12 09:30	Received: 09	/21/12 11:40 N	latrix: Water	
Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical	Method: NWTP	H-Dx Prepa	aration M	ethod: El	PA 3510			
NE	) mg/L		0.038	1	10/04/12 12:40	10/05/12 05:43		
NE	) mg/L		0.19	1	10/04/12 12:40	10/05/12 05:43	64742-65-0	
76	6 %		50-150	1	10/04/12 12:40	10/05/12 05:43	84-15-1	
Lab ID:	2513629002	Collected	: 09/20/	12 09:40	Received: 09	/21/12 11:40 M	latrix: Water	
Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical	Method: NWTP	H-Dx Prepa	aration M	ethod: El	PA 3510			
NΓ	) ma/L		0.038	1	10/04/12 12:40	10/05/12 06:19		
			0.19	1			64742-65-0	
	·g/ =		00	·			02 00 0	
70	) %		50-150	1	10/04/12 12:40	10/05/12 06:19	630-02-4	
64	1 %		50-150	1	10/04/12 12:40	10/05/12 06:19	84-15-1	
I ah ID:	2513620003	Collected	I: 09/20/-	12 10:30	Paceived: 00	/21/12 11·40 N	latriv: Water	
Lab ID.	2313029003	Collected	. 03/20/	12 10.50	Neceived. 03	721/12 11. <del>4</del> 0 IV	iatrix. Water	
Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical	Method: NWTP	H-Dx Prepa	aration M	ethod: El	PA 3510			
0.059	mg/L		0.041	1	10/04/12 12:40	10/05/12 06:53		
NE	) mg/L		0.20	1	10/04/12 12:40	10/05/12 06:53	64742-65-0	
	-							
83	3 %		50-150	1	10/04/12 12:40	10/05/12 06:53	630-02-4	
75	5 %		50-150	1	10/04/12 12:40	10/05/12 06:53	84-15-1	
Lab ID:	2513629004	Collected	: 09/20/	12 11:15	Received: 09	/21/12 11:40 M	latrix: Water	
Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical	- ————————————————————————————————————	H-Dx Prepa	aration M	ethod: El	PA 3510	,		•
NΓ	) ma/l		0.038	1	10/04/12 12:40	10/05/12 07:11		
	) mg/L		0.19	1		10/05/12 07:11	64742-65-0	
KII					10/07/12 12.40	10/00/12 01.11	0 T I T T T T T T T T T T T T T T T T T	
NL	) IIIg/L		0.10					
	) %		50-150	1	10/04/12 12:40	10/05/12 07:11	630-02-4	
	Results  Analytical  NE NE Results  Analytical  NE NE Analytical  NE NE Analytical  Lab ID: Results  Analytical  Lab ID: Results  Analytical  Analytical  Analytical  Analytical  Analytical  Analytical  Analytical	Analytical Method: NWTP  ND mg/L ND mg/L 84 % 76 %  Lab ID: 2513629002  Results Units  Analytical Method: NWTP ND mg/L ND mg/L 70 % 64 %  Lab ID: 2513629003  Results Units  Analytical Method: NWTP  0.059 mg/L ND mg/L ND mg/L  ND mg/L  Analytical Method: NWTP  1.059 mg/L ND mg/L  1.050 mg/L ND mg/L  1.050	Analytical Method: NWTPH-Dx Prepared ND mg/L ND mg/L 84 % 76 %  Lab ID: 2513629002 Collected Results Units Report ND mg/L ND m	Results         Units         Report Limit           Analytical Method: NWTPH-Dx         Preparation M           ND mg/L         0.038           ND mg/L         0.19           84 %         50-150           76 %         50-150           Lab ID: 2513629002 Collected: 09/20/-           Results         Units         Report Limit           Analytical Method: NWTPH-Dx         Preparation M           ND mg/L         0.038         ND mg/L           ND mg/L         0.19         50-150           64 %         50-150         50-150           Lab ID: 2513629003 Collected: 09/20/-           Results         Units         Report Limit           Analytical Method: NWTPH-Dx         Preparation M           0.059 mg/L         0.041         ND mg/L         0.20           83 %         50-150         50-150           75 %         50-150         50-150           Collected: 09/20/-           Results         Units         Report Limit           Analytical Method: NWTPH-Dx         Preparation M	Results	Results         Units         Report Limit         DF         Prepared           Analytical Method: NWTPH-Dx         Preparation Method: EPA 3510           ND mg/L         0.038         1         10/04/12 12:40           ND mg/L         0.19         1         10/04/12 12:40           84 %         50-150         1         10/04/12 12:40           76 %         50-150         1         10/04/12 12:40           Results         Units         Report Limit         DF         Prepared           Analytical Method: NWTPH-Dx         Preparation Method: EPA 3510         ND mg/L         0.038         1         10/04/12 12:40           ND mg/L         0.19         1         10/04/12 12:40         10/04/12 12:40           T0 %         50-150         1         10/04/12 12:40           Eab ID: 2513629003         Collected: 09/20/12 10:30         Received: 09           Results         Units         Report Limit         DF         Prepared           Analytical Method: NWTPH-Dx         Preparation Method: EPA 3510         1         10/04/12 12:40           B3 %         50-150         1         10/04/12 12:40           B3 %         50-150         1         10/04/12 12:40           B3 %	Results	Results

Date: 10/05/2012 01:53 PM

#### **REPORT OF LABORATORY ANALYSIS**



Project: BNSF Skykomish

Pace Project No.: 2513629

Sample: IC-W-3-092012	Lab ID:	2513629005	Collected	d: 09/20/	12 12:00	Received: 09	/21/12 11:40 N	latrix: Water	
Parameters	Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical	Method: NWTP	H-Dx Prep	aration M	ethod: El	PA 3510			
Diesel Range	NI	D mg/L		0.038	1	10/04/12 12:40	10/05/12 07:28		
Motor Oil Range	NI	D mg/L		0.19	1	10/04/12 12:40	10/05/12 07:28	64742-65-0	
Surrogates									
n-Octacosane (S)		2 %		50-150	1		10/05/12 07:28		
o-Terphenyl (S)	8	3 %		50-150	1	10/04/12 12:40	10/05/12 07:28	84-15-1	
Sample: IC-W-4-092012	Lab ID:	2513629006	Collected	d: 09/20/	12 13:00	Received: 09	/21/12 11:40 M	latrix: Water	
Parameters	Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical	Method: NWTP	H-Dx Prep	aration M	ethod: El	PA 3510	•		
Diesel Range	0.04	9 mg/L		0.038	1	10/04/12 12:40	10/05/12 07:45		
Motor Oil Range		D mg/L		0.19	1		10/05/12 07:45	64742-65-0	
Surrogates		3							
n-Octacosane (S)	8:	2 %		50-150	1	10/04/12 12:40	10/05/12 07:45	630-02-4	
o-Terphenyl (S)	7-	4 %		50-150	1	10/04/12 12:40	10/05/12 07:45	84-15-1	
Sample: GW-2-092012	Lab ID:	2513629007	Collected	d: 09/20/	12 13:50	Received: 09	/21/12 11:40 M	latrix: Water	
Parameters	Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical	Method: NWTP	H-Dx Prep	aration M	ethod: El	PA 3510	•		
Diesel Range	NI	) mg/L		0.038	1	10/04/12 12:40	10/05/12 08:03		
Motor Oil Range		D mg/L		0.19	1	10/04/12 12:40	10/05/12 08:03	64742-65-0	
Surrogates		J							
n-Octacosane (S)	9	1 %		50-150	1	10/04/12 12:40	10/05/12 08:03	630-02-4	
o-Terphenyl (S)	8	4 %		50-150	1	10/04/12 12:40	10/05/12 08:03	84-15-1	
Sample: GW-1-092012	Lab ID:	2513629008	Collected	d: 09/20/	12 14:40	Received: 09	/21/12 11:40 M	latrix: Water	
Parameters	Results	Units	Repo	ort Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical	Method: NWTP	H-Dx Prep	aration M	ethod: El	PA 3510			
Diesel Range	0.06	<b>0</b> mg/L		0.038	1	10/04/12 12:40	10/05/12 08:54		
Motor Oil Range		D mg/L		0.19	1		10/05/12 08:54	64742-65-0	
<u> </u>		- ··· <i>ɔ</i> ·=		50	•			- · · · - · · · ·	
Surrogates									
Surrogates n-Octacosane (S)	8	0 %		50-150	1	10/04/12 12:40	10/05/12 08:54	630-02-4	

Date: 10/05/2012 01:53 PM

#### **REPORT OF LABORATORY ANALYSIS**



#### **QUALITY CONTROL DATA**

Project: BNSF Skykomish

Pace Project No.: 2513629

QC Batch: OEXT/6160 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2513629001, 2513629002, 2513629003, 2513629004, 2513629005, 2513629006, 2513629007, 2513629008

METHOD BLANK: 132713 Matrix: Water

Associated Lab Samples: 2513629001, 2513629002, 2513629003, 2513629004, 2513629005, 2513629006, 2513629007, 2513629008

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND ND	0.040	10/05/12 04:31	
Motor Oil Range	mg/L	ND	0.20	10/05/12 04:31	
n-Octacosane (S)	%	87	50-150	10/05/12 04:31	
o-Terphenyl (S)	%	80	50-150	10/05/12 04:31	

LABORATORY CONTROL SAMPLE: 132714

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L		0.97	97	51-114	
Motor Oil Range	mg/L	1	0.97	97	62-120	
n-Octacosane (S)	%			85	50-150	
o-Terphenyl (S)	%			78	50-150	

SAMPLE DUPLICATE: 132715

Parameter	Units	2513629001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	84	78	7	
o-Terphenyl (S)	%	76	71	7	

SAMPLE DUPLICATE: 132716

		2513629002	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	70	82	16	
o-Terphenyl (S)	%	64	75	15	

Date: 10/05/2012 01:53 PM REPORT OF LABORATORY ANALYSIS





#### **QUALIFIERS**

Project: BNSF Skykomish

Pace Project No.: 2513629

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 10/05/2012 01:53 PM

PASI-S Pace Analytical Services - Seattle



#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF Skykomish

Pace Project No.: 2513629

Date: 10/05/2012 01:53 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2513629001	IC-W-8-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878
2513629002	IC-WO-8-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878
2513629003	IC-W-7-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878
2513629004	W-1-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878
2513629005	IC-W-3-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878
2513629006	IC-W-4-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878
2513629007	GW-2-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878
2513629008	GW-1-092012	EPA 3510	OEXT/6160	NWTPH-Dx	GCSV/3878



### **CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2513629

www.pacelabs.com					0= 4						
Section A Section				Section C		3629		Page:		of	!
	TAD CLING	<del></del>		Invoice Information:	ation: LUCE SHET	PPAON	1		16	4913	3
Address: 975 5+h Ave NW Copy To	0:			Сотралу Nал	** BNSF	REGULATORY	AGENCY				
			<del>  </del> ,	Address:	DN31-				D WATER	DRINKIN	G WATER
IS SAQUAL, WA 98027 Purchas	se Order No.:			Page Quoto			•	RCRA	) 		
Phone: Property Property Property	Name:			Reference: Pace Project			1 00.	NOIN	<del></del>	OTHER	
Phone: 415-295-0850   Fax: 425-295-0850   Project				Menagor:			Site Location	WA			
Requested Due Date/TAT: STAT Project	Number: 683-64	3	<u></u>	Pace Profile #:			STATE:				
							Analysis Filtere	d (Y/N)			
Section D Matrix Codes Required Client Information MATRIX / CODE	(£)	COLLECTED			Preservatives	Z X			1		
Drinking Water DW	O-COMP)		<sub>₹</sub>			3		<del>-    -  -</del>	1		-
Water WT Waste Water WW	W B G GOWAN	COMPOSITE END/GRAB	TEMP AT COLLECTION				1 1 1 1 1		5		
Product P Soil/Soild SL	1 2 1 2 1			_		3 3	1111		S S		
Soil/Soild SL SAMPLE ID Oil OL Wipe WP (A-Z, 0-9 / ,-) Air AR Sample IDs MUST BE UNIQUE TISSUE TS Other OT			[월	笳		DX X	1111		Chlorine		
(A-Z, 0-9 / ,-) Al AR AR Sample IDs MUST BE UNIQUE Tissue TS	CODE		M M	8 3			1111	]	[옷]		
	,   Q   E				<u>6</u>	[ 로   L	1111				
#	MATRIX COD		SAMPLE	# OF CONTAINERS Unpreserved H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub> HCI NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	LAnalysis N⊍TPH	]	1 1 1	Residual G		
						<u>⇒</u> 2			Pa Pa	ce Project N	io./ Lab I.D.
1 FC-W-8-092012	W 6 3/2912			2							
2 IC-WO-6-092012	W 6		740	2	N N			$\bot \bot \bot$			
3 IC-W-7-092012	W G	<del></del>	1030	2	IXI I I I	7					
4 W-1-092012	WT 6	111.5   11	115	2	*	X			<b>↓↓</b>		
5 ICW-3-092012	vot 6 /		200	2	<u> </u>	X	<del>                                     </del>	$\perp \downarrow \downarrow$			
6 IC-W-4-692012	WTG /		300	2	X			$\perp \downarrow \downarrow$	<del>     </del>		
1 GW-2-092012	WHG /		350	2	X	X					
8 GW-1-092012	WIG /	1440 1	440	2	X	<b>X</b>			11		
8	(30)		$\perp \perp \downarrow \downarrow$						$\bot \bot$		
10					4111	$N_{\perp \perp \perp \perp}$		<del></del>	<del>-</del>		
11		<i>V</i> <sup>1</sup>			$\bot$			$\bot$	11_		
12								Щ.			
ADDITIONAL COMMENTS	RELINOUTHED BY	AFFILIATION	DATE	TIME		D BY / AFFILIATION	DATE	TIME		MPLE CONDIT	IONS
	1	1	1/21/12	1140	Colette Me	aver / PACE	- 1921121	1140 3	3.6 Y	7	ナ
								L	t:7-		,
							+-+	<del>-                                    </del>			
							$\dashv$			+	<del></del>
	<u> </u>	SAMPLER NAME AND	SIGNATURE	1				$\neg \neg \uparrow$	υ <b>δ</b>	, jeg	tact
ORIGINAL PRINT Name of SAMPLE					on Rucall		,		Temp in °C Received or Ice (Y/N)	d Cody	des tn Y/N)
		SIGNATURE o	SAMPLER			DATE Signed (MM/DD/YY):	9/21/17		Temp in *C Received on Ice (Y/N)	Custedy Sealed Coole (Y/N)	Semples Intact (Y/N)
*Important Note: By signing this form you are accepting Peco's	) s NET 30 day payment terms د						<del>-1-4-</del>		F-ALL-Q-020r		

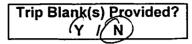
### **Sample Container Count**

2513629

Paci	e Analytical -
1-14	way pacsacs core

CLIENT:	BNSF-	Faraller
		· · · · · · · · · · · · · · · · · · ·

COC.PAGE 1649133



Sample Line Item	VG9H	AG1H	AG1U	BP1U	BP2U	BP3U	BP3N	BP3S	WGKU	WGFU	WG2U	DG9M	DG9B	VG9W	VSG	<u>-</u>	,		Comments
1		2,2	. =-																
2		1																	
3													 						A CAN
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11																			
12								<u> </u>	<u></u>									<u> </u>	

AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic	1	Wipe/Swab	U	Summa Can

## Sample Condition Upon Receipt

Pace Analytical Client Name	BNSF	<u> </u>	arallon	Project #	25136
Courier: Fed Ex UPS USPS Client	t 🗆 Comme	ercial	Pace Other _	<del></del>	
Custody Seal on Cooler/Box Present: Yes	□ No	Seals	intact: Yes	□ No	
Packing Material: Y Bubble Wrap Y Bubble	Bags   N	lone	Other	Temp. Blank Yes	
Thermometer Used 101731942	Type of Ice:			Samples on ice, cooling	<del></del>
Cooler Temperature 3.00, 4.70 Temp should be above freezing \$6°C	Biological 1	lissue	Is Frozen: Yes No Comments:	Date and Initials of contents: <u>CG</u> :	
Chain of Custody Present:	ØYes □No	□n/a	1.		
Chain of Custody Filled Out:	ØYes □No	□N/A	2.		
Chain of Custody Relinquished:	ØYes □No	□n/a	3.		
Sampler Name & Signature on COC:	☑Yes □No	□n/a	4.		
Samples Arrived within Hold Time:	ØYes □No	□n/a	5.		
Short Hold Time Analysis (<72hr):	□Yes ŒNo	□n/a	6.		
Rush Turn Around Time Requested:	□Yes DNo	□N/A	7.		
Follow Up / Hold Analysis Requested:	□Yes 12No	□N/A	8.	<u></u>	
Sufficient Volume:	ØYes □No	□n/a	9.		
Correct Containers Used:	12√es □No	□n/a	10.		
-Pace Containers Used:	ØYøs □No	□n/a			
Containers Intact:	ØYes □No	□n/a	11.		
Filtered volume received for Dissolved tests	□Yes □No	DM/A	12.		
Sample Labels match COC:	Dros 🗆 No	□n/a	13.		
-Includes date/time/ID/Analysis Matrix: All containers needing preservation have been checked.	WT DYes □No	□n/a	14.		
All containers needing preservation are found to be in compliance with EPA recommendation.	Yes DNo	□n/a			
Exceptions: VOA, colform, TOC, O&G	□Yes □No	DAVA	Initial when completed	Lot # of added preservative	
Samples checked for dechlorination:	□Yes □No	ØN/A	15.		
Headspace in VOA Vials ( >6mm):	□Yes □No	DINIA	16.		
Trip Blanks Present:	□Yes □No	MN/A	17.		
Trip Blank Custody Seals Present	□Yes □No	€ N/A			
Pace Trip Blank Creation Date:	<del></del>				
Client Notification/ Resolution:		•		Field Data Required?	Y / N
Person Contacted:		_Date/	Time:		
Comments/ Resolution:				-	
				<del></del>	
				<u> </u>	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Date:

**Project Manager Review:** 





October 26, 2012

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaguah, WA 98027

RE: Project: BNSF SKYKOMISH Pace Project No.: 2513834

#### Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on October 12, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Dan Gossett

dan.gossett@pacelabs.com Project Manager

**Enclosures** 

cc: Desiree Clement, Farallon
Kristin Darnell, BNSF\_Farallon - WA
Emerald Erickson-Mulanax, Farallon
Jerry Portele, Farallon
Javan Ruark, Farallon Consulting LLC







#### **CERTIFICATIONS**

Project: **BNSF SKYKOMISH** 

Pace Project No.: 2513834

Washington Certification IDs 940 South Harney Street, Seattle, WA 98108 Alaska CS Certification #: UST-025 Arizona Certification #: AZ0770 California Certification #: 01153CA

Florida/NELAP Certification #: E87617 Oregon Certification #: WA200007 Washington Certification #: C555



#### **SAMPLE ANALYTE COUNT**

Project: BNSF SKYKOMISH

Pace Project No.: 2513834

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2513834001	1C-W-7-101012	NWTPH-Dx	AY1	4	PASI-S
2513834002	1C-W-8-101012	NWTPH-Dx	AY1	4	PASI-S
2513834003	1C-W-1-101012	NWTPH-Dx	AY1	4	PASI-S
2513834004	1C-W-70-101012	NWTPH-Dx	AY1	4	PASI-S





#### **PROJECT NARRATIVE**

Project: BNSF SKYKOMISH

Pace Project No.: 2513834

Method: NWTPH-Dx
Description: NWTPH-Dx GCS
Client: BNSF\_Farallon - WA
Date: October 26, 2012

#### **General Information:**

4 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

#### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



Project: BNSF SKYKOMISH

Pace Project No.: 2513834

Sample: 1C-W-7-101012	Lab ID: 251	3834001	Collected:	10/10/1	2 13:56	Received: 1	0/12/12 09:45	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	thod: El	PA 3510			
Diesel Range	ND m	g/L		0.15	1	10/18/12 13:20	) 10/18/12 20:5	5	
Motor Oil Range	ND m	g/L		0.75	1	10/18/12 13:20	10/18/12 20:5	5 64742-65-0	
Surrogates n-Octacosane (S)	101 %			50-150	1	10/19/12 12:20	) 10/18/12 20:5	5 630 02 4	
o-Terphenyl (S)	89 %			50-150 50-150	1		) 10/18/12 20:5 ) 10/18/12 20:5		
	33 /3				·				
Sample: 1C-W-8-101012	Lab ID: 251	3834002	Collected:	10/10/1	2 14:46	Received: 1	0/12/12 09:45	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	thod: El	PA 3510			
Diesel Range	<b>0.25</b> m	g/L		0.15	1	10/18/12 13:20	0 10/18/12 21:5	1	
Motor Oil Range	ND m	g/L		0.75	1	10/18/12 13:20	10/18/12 21:5	1 64742-65-0	
Surrogates									
n-Octacosane (S)	102 %			50-150	1		) 10/18/12 21:5		
o-Terphenyl (S)	93 %	•		50-150	1	10/18/12 13:20	) 10/18/12 21:5	1 84-15-1	
Sample: 1C-W-1-101012	Lab ID: 251	3834003	Collected:	10/10/1	2 15:10	Received: 1	0/12/12 09:45	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
NWTPH-Dx GCS	Analytical Met	hod: NWTP	H-Dx Prepar	ration Me	thod: El	PA 3510			
Diesel Range	ND m	g/L		0.15	1	10/18/12 13:20	) 10/18/12 22:0	9	
Motor Oil Range	ND m	g/L		0.75	1	10/18/12 13:20	10/18/12 22:0	9 64742-65-0	
Surrogates	0.4.04								
n-Octacosane (S)	94 %			50-150	1		) 10/18/12 22:0		
o-Terphenyl (S)	84 %	•		50-150	1	10/18/12 13:20	) 10/18/12 22:0	9 84-15-1	
Sample: 1C-W-70-101012	Lab ID: 251	3834004	Collected:	10/10/1	2 17:00	Received: 1	0/12/12 09:45	Matrix: Water	
Parameters	Results	Units	Repor	t Limit	DF	Prepared	Analyzed	CAS No.	Qua
			H-Dx Prepar	ration Me	thod: El	PA 3510			
NWTPH-Dx GCS	Analytical Met	nod: NVV I P							
	Analytical Met ND m			0.15	1	10/18/12 13:20	) 10/18/12 22:2	7	
Diesel Range	ND m	g/L			1 1		) 10/18/12 22:2 ) 10/18/12 22:2		
Diesel Range Motor Oil Range	•	g/L		0.15					
NWTPH-Dx GCS  Diesel Range  Motor Oil Range  Surrogates  n-Octacosane (S)  o-Terphenyl (S)	ND m	g/L g/L		0.15		10/18/12 13:20 10/18/12 13:20		7 64742-65-0 7 630-02-4	

Date: 10/26/2012 09:54 AM

#### **REPORT OF LABORATORY ANALYSIS**



#### **QUALITY CONTROL DATA**

Project: BNSF SKYKOMISH

Pace Project No.: 2513834

QC Batch: OEXT/6209 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 2513834001, 2513834002, 2513834003, 2513834004

METHOD BLANK: 134429 Matrix: Water

Associated Lab Samples: 2513834001, 2513834002, 2513834003, 2513834004

Parameter	Units	Result	Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.16	10/18/12 19:05	
Motor Oil Range	mg/L	ND	0.80	10/18/12 19:05	
n-Octacosane (S)	%.	97	50-150	10/18/12 19:05	
o-Terphenyl (S)	%.	86	50-150	10/18/12 19:05	

LABORATORY CONTROL SAMPLE: 134430

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	4	4.5	111	51-114	
Motor Oil Range	mg/L	4	4.4	109	62-120	
n-Octacosane (S)	%.			103	50-150	
o-Terphenyl (S)	%.			90	50-150	

SAMPLE DUPLICATE: 134431

Parameter	Units	2513858001 Result	Dup Result	RPD	Qualifiers
Diesel Range	 mg/L	0.49	0.50	1	
Motor Oil Range	mg/L	<0.81	ND		
n-Octacosane (S)	%.	101	102	2	
o-Terphenyl (S)	%.	87	88	1	

SAMPLE DUPLICATE: 134432

		2513892001	Dup		
Parameter	Units	Result	Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%.	103	102	;	3
o-Terphenyl (S)	%.	92	90	:	2

Date: 10/26/2012 09:54 AM



#### **QUALIFIERS**

Project: BNSF SKYKOMISH

Pace Project No.: 2513834

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 10/26/2012 09:54 AM

PASI-S Pace Analytical Services - Seattle



#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BNSF SKYKOMISH

Pace Project No.: 2513834

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2513834001	1C-W-7-101012	EPA 3510	OEXT/6209	NWTPH-Dx	GCSV/3908
2513834002	1C-W-8-101012	EPA 3510	OEXT/6209	NWTPH-Dx	GCSV/3908
2513834003	1C-W-1-101012	EPA 3510	OEXT/6209	NWTPH-Dx	GCSV/3908
2513834004	1C-W-70-101012	EPA 3510	OEXT/6209	NWTPH-Dx	GCSV/3908



### **CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2513834

		Section B							Section C									Page: { of {									
		Required P	<u> </u>	_						ce Info														10	101	2/	
Con	FARALLON CONSULTING	Report To:			LUM				Atten	ition: E	3R	vc <b>e</b>	SA	IEP	PA	r)	<u> </u>				_		<u> </u>	Т.	3492	L 3 4	
Add	TS STH AVENU R	Copy To:	Y	ZK	Y	ORT	ELIT		Company Name: BNSF							F	REGULATORY AGENCY										
ıs	SHOUAH , WA , 98027)		-						Address:							F NPDES F GRO				ROUI	OUND WATER DRINKING WATER						
Emi	CLINE COM	Purchase O	rder	No.:	Τοιο	0 -M	106		Pace Quote Reference:								L UST L RCR				CRA	RA OTHER					
P	2950800 145 2950850	Project Nan	ne: 4	9N5	FS	KYKO	MISH		Paco Project Manager:								Site Location					. 22					
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	Required Client Information MATRIX / Drinking Water		COLLECTED				$\vdash$	7/ T	reserv	atives	<u> </u>	+=	SCO		╁┼	+	╁	+	╁	┼┤	+	<u> </u>		<del></del>			
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	Product Soil/Solid	STAF	tī .	END/GR	~   j	<b> </b>				1		_	0/3						1		3						
	SAMPLE ID Oil Wine	SL OL WP	(see valid o	<u>6</u>					CONTAINERS				-		Test	ă						-		튙			
	(A-Z, 0-9 / ,-) Air Sample IDs MUST BE UNIQUE Tissue	WP AR TS	CODE	TYPE				MP.	Ž	8					耍		11		-					욹			
_	Other	OT	X	[ [ [				H	ğ	8			_ြ	힐	18	12								Ē			
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SAMPLER					PLER NAME AND SIGNATURE									-	$\neg$	v	8 -	ler	tact								
						e of SAMPLER:		120	E	_ 1	<u> </u>	( 1179	72							_	一	Temp in °C	J peg (	stody d Coo	fes In:		
	OnidivaL						SIGNATURE of SAMPLER Page 9 of 10 DATE Signed DATE Signed							ned Y): L	n: 10/12/12			$\neg$	<b>Tel</b>	Received on Ice (Y/N)	Custody Sealed Coole (Y/N)	Samples Intact (Y/N)					

## **Sample Container Count**

CLIENT: BNSF	Farallen	2513834	
COC PAGE 1 of 1		Trip Blank(s) Previded? Y / N	; 1

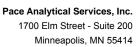


Sample Line Item	VCOL	AC1H	AC411	DD411	ווכחם	DOSLI	DD2N	ppse	WCKII	MOELL	MCOLL	DCOM	DCOB	VG9W	VEC			Comments
Line item	<u> </u>			BEIU	BPZU	DF3U	DESIA	DF33	MAGICO	WGPU	WGZU	DGalvi	DGap	VG9W	<u> </u>	,		 Comments
11		210																
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AG1H	1 liter HCL amber glass	BP2S	500mL H2SO4 plastic	JGFU	4 oz amber glass soil jar
AG1U	1liter unpreserved amber glass	BP2U	500mL unpreserved plastic	WGKU	8 oz clear glass soil jar
AG2S	500mL H2SO4 amber glass	BP2Z	500mL NaOH, Zn Ac	WGFU	4 oz clear glass soil jar
AG2U	500mL unpreserved amber glass	BP3C	250mL NaOH plastic	WG2U	2 oz clear glass soil jar
AG3S	250mL H2SO4 amber glass	BP3N	250mL HNO3 plastic	JGFM	4 oz amber glass soil jar with MeOH
BG1H	1 liter HCL clear glass	BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass	BP3U	250mL unpreserved plastic	VG9W	40mL clear vial pre-weighted with DI water
BP1N	1 liter HNO3 plastic	DG9B	40mL Na Bisulfate clear vial	VSG	Headspace septa vial
BP1S	1 liter H2SO4 plastic	DG9H	40mL HCL amber voa vial	VG9H	40mL HCL clear vial
BP1U	1 liter unpreserved plastic	DG9M	40mL MeOH clear vial	WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac	DG9T	40mL Na Thio amber vial	VG9T	40mL Na Thio. clear vial
BP2N	500mL HNO3 plastic	DG9U	40mL unpreserved amber vial	ZPLC	Ziploc Bag
BP2O	500mL NaOH plastic		Wipe/Swab	<u> </u>	Summa Can

		Jampie	COLIG	ition o	poli ne	ceih	· ·	₹ -		
. Face Analytical Cli	ent Name:	BNSF	Fo	rallor	<u> </u>	<u>-</u>	Project#_	25	1 3 8	3 4
Courier: Fed Ex UPS U	USPS Client	t 🗆 Comm	nercial	Pace	Other		<del></del>			
Custody Seal on Cooler/Box Pres	sent: Yes	☐ No	Seals	intact:	Yes		No	,		
Packing Material: Bubble Wra	p Bubble	Bags 🔲	None	Othe	r		_ Temp. Blank Ye	s 🗸	_No	
Thermometer Used · 12	2	Type of Ice	Wet	Blue	None		Samples on ice, o	cooling pro	cess has b	egun
Cooler Temperature3	.4	Biological	Tissue	is Froze	Π: Yes N	lo	Date and Init contents:		son exami	ning
Temp should be above freezing ≤ 6 °C		/		Comme	nts:			9121		<del></del>
Chain of Custody Present:		□Yes □No	□N⁄A	1						
Chain of Custody Filled Out:		Yes □No		+					<del></del>	_
Chain of Custody Relinquished:		ZYes □No		3.			<del> </del>			
Sampler Name & Signature on COC	<u> </u>	Nos □No								
Samples Arrived within Hold Time:		JZMes □No								
Short Hold Time Analysis (<72hr)		□Yes □No					<u></u>			
Rush Turn Around Time Requeste	ed:	□Yes ZNo		<del>                                     </del>	<del></del>					
Follow Up / Hold Analysis Reques	sted:	☐Yes ੴNo								
Sufficient Volume:		ZYes □No	□N/A	9.						
Correct Containers Used:		Yes □No	□N/A	10.						
-Pace Containers Used:		Ges □No	□n/a							
Containers Intact:		□X65 □No	□n/a	11.						
Filtered volume received for Dissolv	ed tests	□Yes □No	Œ, VA	12.						
Sample Labels match COC:		⊠Yes □No	□n⁄a	13.						
-Includes date/time/ID/Analysis	Matrix:	ست								
All containers needing preservation have	been checked.	ZYes □No	□n/a	14.						
All containers needing preservation are compliance with EPA recommendation.	found to be in	ZYes □No	□N⁄A				•	_		
Exceptions: VOA, coliform, TOC, O&G		□Yes □No	ØN/A	Initial whe		<u>~</u>	Lot # of added preservative			
Samples checked for dechlorination	ı <b>:</b>	□Yes □No	ZNA	15.	·					
Headspace in VOA Vials ( >6mm):		□Yes □No	EIMA	16.						
Trip Blanks Present:		□Yes □No	□yda	17.						
Trip Blank Custody Seals Present		□Yes □No	□N/A							
Pace Trip Blank Creation Date:				<u> </u>						
Client Notification/ Resolution:			•				Field Data Requir	ed?	Y / N	
Person Contacted:			_ Date/	Time:			·			
Comments/ Resolution:										
							·			
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Project Manager Review:		411					_ Date:	1 (Y	110	

Note: Whenever there is a discrepancy affecting North Garolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



(612)607-1700



December 11, 2012

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaquah, WA 98027

RE: Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

#### Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on November 28, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

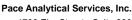
Carol Davy

Oard Day

carol.davy@pacelabs.com Project Manager

**Enclosures** 







1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

#### **CERTIFICATIONS**

Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: Pace Florida/NELAP Certification #: E87605 Georgia Certification #: 959

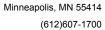
Georgia Certification #: 959
Hawaii Certification #Pace
Idaho Certification #: MN00064
Illinois Certification #: 200011
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEO Certification #: 9909

Michigan DEQ Certification #: 9909 Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT CERT0092 Nebraska Certification #: Pace

Nevada Certification #: MN\_00064
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563 Puerto Rico Certification Tennessee Certification #: 02818 Texas Certification #: T104704192 Utah Certification #: MN00064

Virginia/DCLS Certification #: 002521 Virginia/VELAP Certification #: 460163 Washington Certification #: C754 West Virginia Certification #: 382 Wisconsin Certification #: 999407970





#### **SAMPLE ANALYTE COUNT**

Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10213827001	1C-W-7-112112	NWTPH-Dx	KL1	3	PASI-M
10213827002	1C-W-70-112112	NWTPH-Dx	KL1	3	PASI-M
10213827003	1C-W-8-112112	NWTPH-Dx	KL1	3	PASI-M
10213827004	1C-W-1-112112	NWTPH-Dx	KL1	3	PASI-M



(612)607-1700



#### **PROJECT NARRATIVE**

Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

Method:NWTPH-DxDescription:NWTPH-Dx GCSClient:Farallon - WA BNSFDate:December 11, 2012

#### **General Information:**

4 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

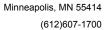
All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



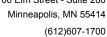


Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

Date: 12/11/2012 02:50 PM

Sample: 1C-W-7-112112	Lab ID: 10213827	7001 Collected: 11/21	12 10:10	Received: 11	/28/12 17:00 N	/latrix: Water	
Parameters	Results U	Inits Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: N	IWTPH-Dx Preparation N	lethod: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 19:45		
Motor Oil Range Surrogates	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 19:45		
n-Pentacosane (S)	82 %	50-150	1	12/04/12 13:31	12/10/12 19:45	629-99-2	



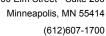


Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

Date: 12/11/2012 02:50 PM

Sample: 1C-W-70-112112	Lab ID: 102138270	02 Collected: 11/21/1	Collected: 11/21/12 17:00		/28/12 17:00 N	/latrix: Water	
Parameters	Results Uni	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NW	TPH-Dx Preparation Me	ethod: El	PA 3510			
Diesel Fuel Range	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 20:06		
Motor Oil Range Surrogates	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 20:06		
n-Pentacosane (S)	84 %	50-150	1	12/04/12 13:31	12/10/12 20:06	629-99-2	



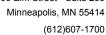


Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

Date: 12/11/2012 02:50 PM

Sample: 1C-W-8-112112	Lab ID: 102138270	03 Collected: 11/21/	Collected: 11/21/12 11:15		/28/12 17:00 N	Matrix: Water	
Parameters	Results Un	its Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NV	VTPH-Dx Preparation M	ethod: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 20:28		
Motor Oil Range Surrogates	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 20:28		
n-Pentacosane (S)	80 %	50-150	1	12/04/12 12:21	12/10/12 20:28	620 00 2	





#### **ANALYTICAL RESULTS**

Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

Date: 12/11/2012 02:50 PM

Sample: 1C-W-1-112112	Lab ID: 102138270	04 Collected: 11/21/1	2 11:42	Received: 11	/28/12 17:00 I	Matrix: Water	
Parameters	Results Uni	ts Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NV	/TPH-Dx Preparation Me	ethod: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 19:01		
Motor Oil Range Surrogates	ND mg/L	0.40	1	12/04/12 13:31	12/10/12 19:01		
n-Pentacosane (S)	78 %	50-150	1	12/04/12 13:31	12/10/12 19:01	629-99-2	



#### **QUALITY CONTROL DATA**

Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

QC Batch: OEXT/20425 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 10213827001, 10213827002, 10213827003, 10213827004

METHOD BLANK: 1344388 Matrix: Water

Associated Lab Samples: 10213827001, 10213827002, 10213827003, 10213827004

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed Diesel Fuel Range mg/L ND 0.40 12/05/12 14:39 mg/L 0.40 Motor Oil Range ND 12/05/12 14:39 n-Pentacosane (S) % 67 50-150 12/05/12 14:39

LABORATORY CONTROL SAMPLE & LCSD: 1344389 1344390 Spike LCS **LCSD** LCS LCSD % Rec Max RPD Parameter Units Conc. Result Result % Rec % Rec Limits **RPD** Qualifiers 2 Diesel Fuel Range mg/L 1.1 1.5 57 73 50-150 26 20 D6 n-Pentacosane (S) % 57 73 50-150

Date: 12/11/2012 02:50 PM



#### **QUALIFIERS**

Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

PASI-M Pace Analytical Services - Minneapolis

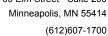
#### **ANALYTE QUALIFIERS**

Date: 12/11/2012 02:50 PM

D6 The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

**REPORT OF LABORATORY ANALYSIS** 

Page 10 of 11





#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 683-04B BNSF SKYKOMISH

Pace Project No.: 10213827

Date: 12/11/2012 02:50 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10213827001	1C-W-7-112112	EPA 3510	OEXT/20425	NWTPH-Dx	GCSV/10543
10213827002	1C-W-70-112112	EPA 3510	OEXT/20425	NWTPH-Dx	GCSV/10543
10213827003	1C-W-8-112112	EPA 3510	OEXT/20425	NWTPH-Dx	GCSV/10543
10213827004	1C-W-1-112112	EPA 3510	OEXT/20425	NWTPH-Dx	GCSV/10543

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

PRIGINAL  RELINQUISHED BY AFFILIAT  RELINQUISHED BY AFFILIAT  SAMPLE TYPE (G	Drinking Water DW st CO Waster WT CODE COMPOSITE P POSITION OL See valid OL SEE VART SAINSOID OL SEE VART START		Requested Due Date/TAT: 54/17 Project Number: 68	of besilvaconseltan	10994 NA 98027	Address: Copy To:	Section A  Required Client Information:  Report To:  Report To:
Wigher Wight Air	Drinking Water DW st CO Waster WT CODE COMPOSITE P POSITION OL See valid OL SEE VART SAINSOID OL SEE VART START	Matrix Codes MATRIX / CODE	125,0850 57AT	idlinconsulting com	V 11/4 98027	The say his	
Wigher Wight Air	Drinking Water DW st CO Waster WT CODE COMPOSITE P POSITION OL See valid OL SEE VART SAINSOID OL SEE VART START	Matrix Codes MATRIX / CODE	125,0850 57AT	rsulting com	11/4 98027	Copy To:	
Wigher Wight Air	Drinking Water DW se CO COMPOSITE WT COOL COMPOSITE P WATER PRODUCT P WATER OF COMPOSITE COMPOSI	o left)	(50820)	-	198027	Copy To:	Section E Required F Report To:
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	ter DW  ter WW  (see valid codes to COMPOSITE START)  COL START  (see Valid codes to COMPOSITE START)	o left)	CONTRACTOR OF THE PARTY OF THE	-		Copy To:	Section B Required F Report To:
	SEGRAB C=CO	o left)	CONTRACTOR OF THE PARTY OF THE	-		Copy To:	Section B Required F Report To:
	(see valid codes to COMPOSITE START	o left)	ct Number: 1803	nase Order No.: "	×	To:	tion B
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TIME TIME	RAB		2	103			
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Unpreserved			Manager; Pace Profile #:	Pace Quote Reference: Pace Project	Address:	Company Name:	Section C Invoice Information:
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HCI NaOH	***************************************	Preservatives					
Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol		ives	Manage of the state of the stat		k		
	. B					11/2	
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TIME				RCRA	GRC	GEN _	
Temp in °C Residual Chloring			1/2	A	UND	3	Page:
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Received on Ice (Y/N)				٦	R T	(	
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Ice (Y/N)  Custody Sealed Cooler (Y/N)  Clustody Sealed Cooler (Y/N)  Sample Cooler No.			OTHER .	NKIN(		y \	
Custody Sealed Cooler (Y/N)  Samples Intact (Y/N)					DRINKING WATER		
(Y/N) B					m R		
				<u> </u>	1	 2 of	13

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per monty or any involces not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

# Pace Analytical®

#### Sample Condition Upon Receipt Form

Page 1 of 1

Document No.: F-MN-L-213-rev.05 Issuing Authority: Pace Minnesota Quality Office

Sample Condition Client Name:			Project#	· IIInu	. 10010007
Upon Receipt				WUH	: 10213827
Courier: Fed Ex UPS	USPS	Пс	lient		
Commercial Pace	Other:			1021382	
Tracking Number: 7941 790 29535					
Custody Seal on Cooler/Box Present? Yes	No	Seals In	itact?	Yes \_No	Optional: Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap Bubble Ba	gs No	one [	]Other:	General Annie (1985) de la companie	Temp Blank? Yes No
Thermometer Used:	Type of I	се:	Wet [	Blue No	ne Samples on ice, cooling process has begu
Cooler Temp Read (°C): 4.6 Cooler Temp	Corrected (°	'c): 4.	8	Ві	ological Tissue Frozen? Yes No
Temp should be above freezing to 6°C		and a second	Dat	e and Initials of	Person Examining Contents: 11/30/12 85
	······································				Comments:
Chain of Custody Present?	Yes	□No	□N/A	1.	
Chain of Custody Filled Out?	Yes	No	□N/A	2.	
Chain of Custody Relinquished?	Yes	□No	□N/A	3.	
Sampler Name and/or Signature on COC?	Yes	□No	□N/A	4.	
Samples Arrived within Hold Time?	Yes	□No	□N/A	5.	
Short Hold Time Analysis (<72 hr)?	Yes	No	□N/A	6.	
Rush Turn Around Time Requested?	Yes °	No	□N/A	7.	
Sufficient Volume?	Yes	No	□N/A	8.	
Correct Containers Used?	Ves	□No	□n/a	9.	
-Pace Containers Used?	<b>Y</b> Yes	□No	□n/a		
Containers Intact?	Yes	□No	□N/A	10.	
Filtered Volume Received for Dissolved Tests?	✓	□No	₩/A	11.	
Sample Labels Match COC?	Ves	□No	□n/a	12.	
-Includes Date/Time/ID/Analysis Matrix:	TT'		,		
All containers needing acid/base preservation have	Yes	□No	ZN/A	13.	☐HNO₃ ☐H₂SO₄ ☐NaOH ☐HCI
been checked? Noncompliances are noted in 13.  All containers needing preservation are found to be in	· ·	Comp	<i></i>	Sample #	
compliance with EPA recommendation?	Yes	□No	N/A	ourrene ii	
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>12) Exceptions: VOA, Coliform, TOC, Oil and Grease,		<i>)</i>			Lot # of added
WI-DRO (water)	☐Yes	/ No		Initial when co	
Headspace in VOA Vials ( >6mm)?	∐Yes	□No	N/A	14.	
Trip Blank Present?	□Yes	□No	N/A	15.	
Trip Blank Custody Seals Present?	Yes	□No ⟨	ZN/A	ummin and the state of the stat	
Pace Trip Blank Lot # (if purchased):					
CLIENT NOTIFICATION/RESOLUTION					Field Data Required? Yes No
Person Contacted:				Date/Time:	
Comments/Resolution:				***************************************	
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Project Manager Review:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out hold, incorrect preservative, out of temp, incorrect containers)





March 18, 2013

Tad Cline Farallon Consulting LLC 975 5th Avenue NW Issaquah, WA 98027

RE: Project: 683-045 Skykomish REV

Pace Project No.: 10216650

#### Dear Tad Cline:

Enclosed are the analytical results for sample(s) received by the laboratory on December 28, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised at the client's request to a different format on 3/18/13 to show detection limits.

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

Sincerely,

Carol Davy

Carl Day

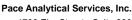
carol.davy@pacelabs.com Project Manager

Enclosures

cc: Desiree Clement, Farallon
Kristin Darnell, BNSF\_Farallon - WA
Emerald Erickson-Mulanax, Farallon
Jerry Portele, Farallon
Javan Ruark, Farallon Consulting LLC



#### **REPORT OF LABORATORY ANALYSIS**





1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

#### **CERTIFICATIONS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

**Minnesota Certification IDs** 

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #

Connecticut Certification #: PH-0256 EPA Region 8 Certification #: Pace Florida/NELAP Certification #: E87605

Georgia Certification #: 959
Hawaii Certification #Pace
Idaho Certification #: MN00064
Illinois Certification #: 200011
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEO Certification #: 9909

Michigan DEQ Certification #: 9909 Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT CERT0092 Nevada Certification #: MN\_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530 North Dakota Certification #: R-036 North Dakota Certification #: R-036A Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563

Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia/DCLS Certification #: 002521
Virginia/VELAP Certification #: 460163
Washington Certification #: C754
West Virginia Certification #: 382
Wisconsin Certification #: 999407970



#### **SAMPLE SUMMARY**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10216650001	1C-W-8-122712	Water	12/27/12 09:50	12/28/12 00:00
10216650002	1C-W-1-122712	Water	12/27/12 10:30	12/28/12 00:00
10216650003	5-W-19-122712	Water	12/27/12 11:15	12/28/12 00:00
10216650004	1C-W-7-122712	Water	12/27/12 11:15	12/28/12 00:00
10216650005	1C-WO-7-122712	Water	12/27/12 11:20	12/28/12 00:00
10216650006	5W-16-122712	Water	12/27/12 11:18	12/28/12 00:00
10216650007	5W-16D-122712	Water	12/27/12 11:18	12/28/12 00:00
10216650008	5W-15-122712	Water	12/27/12 12:05	12/28/12 00:00
10216650009	5-W-17-122712	Water	12/27/12 12:10	12/28/12 00:00
10216650010	GW-4-122712	Water	12/27/12 12:15	12/28/12 00:00
10216650011	2A-W-42-122712	Water	12/27/12 13:10	12/28/12 00:00
10216650012	5-W-18-122712	Water	12/27/12 13:30	12/28/12 00:00
10216650013	5-W-14-122712	Water	12/27/12 13:40	12/28/12 00:00
10216650014	GW-3-122712	Water	12/27/12 13:50	12/28/12 00:00
10216650015	2A-W-9-122712	Water	12/27/12 13:55	12/28/12 00:00
10216650016	GW-2-122712	Water	12/27/12 14:30	12/28/12 00:00
10216650017	GW-1-122712	Water	12/27/12 14:35	12/28/12 00:00
10216650018	1B-W-23-122712	Water	12/27/12 14:45	12/28/12 00:00
10216650019	2A-W-41-122712	Water	12/27/12 15:30	12/28/12 00:00
10216650020	2A-W-10-122712	Water	12/27/12 15:50	12/28/12 00:00
10216650021	2A-W-100-122712	Water	12/27/12 17:05	12/28/12 00:00
10216650022	2B-W-4-122712	Water	12/27/12 16:42	12/28/12 00:00
10216650023	MW-3-122712	Water	12/27/12 16:55	12/28/12 00:00
10216650024	MW-4-122712	Water	12/27/12 16:55	12/28/12 00:00





#### **SAMPLE ANALYTE COUNT**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10216650001	1C-W-8-122712	NWTPH-Dx	JLR	3	PASI-M
10216650002	1C-W-1-122712	NWTPH-Dx	JLR	3	PASI-M
10216650003	5-W-19-122712	NWTPH-Dx	JLR	3	PASI-M
10216650004	1C-W-7-122712	NWTPH-Dx	JLR	3	PASI-M
10216650005	1C-WO-7-122712	NWTPH-Dx	JLR	3	PASI-M
10216650006	5W-16-122712	NWTPH-Dx	JLR	3	PASI-M
10216650007	5W-16D-122712	NWTPH-Dx	JLR	3	PASI-M
10216650008	5W-15-122712	NWTPH-Dx	JLR	3	PASI-M
10216650009	5-W-17-122712	NWTPH-Dx	JLR	3	PASI-M
10216650010	GW-4-122712	NWTPH-Dx	JLR	3	PASI-M
10216650011	2A-W-42-122712	NWTPH-Dx	JLR	3	PASI-M
10216650012	5-W-18-122712	NWTPH-Dx	JLR	3	PASI-M
10216650013	5-W-14-122712	NWTPH-Dx	JLR	3	PASI-M
10216650014	GW-3-122712	NWTPH-Dx	JLR	3	PASI-M
10216650015	2A-W-9-122712	NWTPH-Dx	JLR	3	PASI-M
10216650016	GW-2-122712	NWTPH-Dx	JLR	3	PASI-M
10216650017	GW-1-122712	NWTPH-Dx	JLR	3	PASI-M
10216650018	1B-W-23-122712	NWTPH-Dx	JLR	3	PASI-M
10216650019	2A-W-41-122712	NWTPH-Dx	JLR	3	PASI-M
10216650020	2A-W-10-122712	NWTPH-Dx	JLR	3	PASI-M
10216650021	2A-W-100-122712	NWTPH-Dx	JLR	3	PASI-M
10216650022	2B-W-4-122712	NWTPH-Dx	JLR	3	PASI-M
10216650023	MW-3-122712	NWTPH-Dx	JLR	3	PASI-M
10216650024	MW-4-122712	NWTPH-Dx	JLR	3	PASI-M





#### **PROJECT NARRATIVE**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Method:NWTPH-DxDescription:NWTPH-Dx GCSClient:Farallon - WA BNSFDate:March 18, 2013

#### **General Information:**

24 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



#### **ANALYTICAL RESULTS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Sample: 1C-W-8-122712	Lab ID: 10216650001	Collected: 12	/27/12 09:50	Received: 12/	/28/12 00:00	Matrix: Water	
Parameters	Results Units	Report Limit MD	L DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	n Method: E	PA 3510			
Diesel Fuel Range	<b>0.16</b> mg/L	0.10 0.	021 1	01/03/13 07:09	01/07/13 21:4	13	
Motor Oil Range <i>Surrogates</i>	<b>0.20</b> mg/L	0.10 0	030 1	01/03/13 07:09	01/07/13 21:4	13	
n-Pentacosane (S)	87 %	50-150	1	01/03/13 07:09	01/07/13 21:4	13 629-99-2	
Sample: 1C-W-1-122712	Lab ID: 10216650002	Collected: 12	/27/12 10:30	Received: 12/	/28/12 00:00	Matrix: Water	
Parameters	Results Units	Report Limit MD	L DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	n Method: E	PA 3510		•	
Diesel Fuel Range	ND mg/L	0.10 0.	021 1	01/03/13 07:09	01/07/13 22:0	)5	
Motor Oil Range <b>Surrogates</b>	ND mg/L	0.10 0.	030 1	01/03/13 07:09	01/07/13 22:0	05	
n-Pentacosane (S)	82 %	50-150	1	01/03/13 07:09	01/07/13 22:0	05 629-99-2	
Sample: 5-W-19-122712	Lab ID: 10216650003	Collected: 12	/27/12 11:15	Received: 12/	/28/12 00:00	Matrix: Water	
Parameters	Results Units	Report Limit MD	L DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	n Method: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.10 0.	021 1	01/03/13 07:09	01/07/13 22:2	27	
Motor Oil Range <i>Surrogates</i>	ND mg/L	0.10 0	030 1	01/03/13 07:09	01/07/13 22:2	27	
n-Pentacosane (S)	84 %	50-150	1	01/03/13 07:09	01/07/13 22:2	27 629-99-2	
Sample: 1C-W-7-122712	Lab ID: 10216650004	Collected: 12	/27/12 11:15	Received: 12/	/28/12 00:00	Matrix: Water	
Parameters	Results Units	Report Limit MD	L DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	n Method: E	PA 3510			,
Diesel Fuel Range	ND mg/L	0.10 0.	021 1	01/03/13 07:09	01/07/13 23:1	1	
Motor Oil Range  Surrogates	0.12 mg/L		030 1	01/03/13 07:09			
n-Pentacosane (S)	82 %	50-150	1	01/03/13 07:09	01/07/13 23:1	1 629-99-2	
· ,							

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#### **REPORT OF LABORATORY ANALYSIS**

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#### **ANALYTICAL RESULTS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Sample: 1C-WO-7-122712	Lab ID: 10	216650005	Collected:	12/27/12	11:20	Received: 12/	28/12 00:00 N	latrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Prepa	ration Met	hod: Ef	PA 3510			
Diesel Fuel Range	ND mg/L	_	0.10	0.021	1	01/04/13 07:08	01/07/13 23:55	5	
Motor Oil Range	<b>0.13</b> mg/L	-	0.10	0.030	1	01/04/13 07:08	01/07/13 23:55	5	
Surrogates n-Pentacosane (S)	91 %		50-150		1	01/04/13 07:08	01/07/13 23:55	5 629-99-2	
Sample: 5W-16-122712	Lab ID: 10	216650006	Collected:	12/27/12	11:18	Received: 12/	28/12 00:00 M	latrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me								
	·		0.10	0.022	1	01/04/13 07:08	01/08/13 00:17	7	
Diesel Fuel Range Motor Oil Range	ND mg/L ND mg/L		0.10	0.022	1	01/04/13 07:08	01/08/13 00:17		
Surrogates	g/_	-	00	0.00	•		0 1/00/ 10 00111		
n-Pentacosane (S)	94 %		50-150		1	01/04/13 07:08	01/08/13 00:17	629-99-2	
Sample: 5W-16D-122712	Lab ID: 10	216650007	Collected:	12/27/12	11:18	Received: 12/	28/12 00:00 N	latrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Prepa	ration Met	hod: EF	PA 3510		•	
Diesel Fuel Range	ND mg/L	_	0.11	0.023	1	01/04/13 07:08	01/08/13 00:39	)	
Motor Oil Range	ND mg/L	-	0.11	0.033	1	01/04/13 07:08	01/08/13 00:39	)	
Surrogates n-Pentacosane (S)	97 %		50-150		1	01/04/13 07:08	01/08/13 00:39	9 629-99-2	
Sample: 5W-15-122712	Lab ID: 10	216650008	Collected:	12/27/12	12:05	Received: 12/	28/12 00:00 M	latrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Me	thod: NWTP	H-Dx Prepa	ration Met	hod: El	PA 3510			
Diesel Fuel Range	<b>0.21</b> mg/L	-	0.10	0.021	1	01/04/13 07:08	01/08/13 08:11		
Motor Oil Range	<b>0.29</b> mg/L		0.10	0.030	1	01/04/13 07:08	01/08/13 08:11		
Surrogates									

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#### **REPORT OF LABORATORY ANALYSIS**

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#### **ANALYTICAL RESULTS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Sample: 5-W-17-122712	Lab ID: 10216650009	Collected: 12/27/	12 12:10	Received: 12	/28/12 00:00 M	latrix: Water	
Parameters	Results Units	Report Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation M	lethod: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.10 0.022	. 1	01/04/13 07:08	01/08/13 03:04		
Motor Oil Range <i>Surrogates</i>	ND mg/L	0.10 0.031	1	01/04/13 07:08	01/08/13 03:04	ŀ	
n-Pentacosane (S)	96 %	50-150	1	01/04/13 07:08	01/08/13 03:04	629-99-2	
Sample: GW-4-122712	Lab ID: 10216650010	Collected: 12/27/	12 12:15	Received: 12	/28/12 00:00 M	latrix: Water	
Parameters	Results Units	Report Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
- Tarameters			- —	- Trepared	- Analyzed		
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation M	lethod: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.10 0.021		01/04/13 07:08			
Motor Oil Range <i>Surrogates</i>	ND mg/L	0.10 0.030	1	01/04/13 07:08	01/08/13 03:26	5	
n-Pentacosane (S)	95 %	50-150	1	01/04/13 07:08	01/08/13 03:26	629-99-2	
Sample: 2A-W-42-122712	Lab ID: 10216650011	Collected: 12/27/	12 13:10	Received: 12	/28/12 00:00 M	latrix: Water	
Parameters	Results Units	Report Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation M	lethod: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.10 0.022	! 1	01/04/13 07:08	01/08/13 06:21		
Motor Oil Range Surrogates	<b>0.21</b> mg/L	0.10 0.031	1	01/04/13 07:08	01/08/13 06:21		
n-Pentacosane (S)	91 %	50-150	1	01/04/13 07:08	01/08/13 06:21	629-99-2	
Sample: 5-W-18-122712	Lab ID: 10216650012	Collected: 12/27/	12 13:30	Received: 12	/28/12 00:00 M	latrix: Water	
Parameters	Results Units	Report Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation M	ethod: E	 PA 3510	_	_	
Diesel Fuel Range	ND mg/L	0.10 0.022		01/04/13 07:08	01/08/13 04:32	•	
Motor Oil Range Surrogates	0.16 mg/L	0.10 0.022		01/04/13 07:08			
n-Pentacosane (S)	92 %	50-150	1	01/04/13 07:08	01/08/13 04:32	2 629-99-2	

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#### **ANALYTICAL RESULTS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Sample: 5-W-14-122712	Lab ID: 10216650013	Collected: 12/2	7/12 13:40	Received: 12	/28/12 00:00 N	/latrix: Water	
Parameters	Results Units	Report Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	Method: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.10 0.02	1 1	01/04/13 07:08	01/08/13 07:49	9	
Motor Oil Range Surrogates	ND mg/L	0.10 0.00	0 1	01/04/13 07:08	01/08/13 07:49	9	
n-Pentacosane (S)	99 %	50-150	1	01/04/13 07:08	01/08/13 07:49	9 629-99-2	
Sample: GW-3-122712	Lab ID: 10216650014	Collected: 12/2	7/12 13:50	Received: 12	/28/12 00:00 N	Matrix: Water	
Parameters	Results Units	Report Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
				- Trepared	- Analyzeu		- Quai
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	Method: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.11 0.02	2 1	01/04/13 07:08	01/08/13 04:53	3	
Motor Oil Range Surrogates	ND mg/L	0.11 0.03	2 1	01/04/13 07:08	01/08/13 04:5	3	
n-Pentacosane (S)	101 %	50-150	1	01/04/13 07:08	01/08/13 04:53	3 629-99-2	
Sample: 2A-W-9-122712	Lab ID: 10216650015	Collected: 12/2	7/12 13:55	Received: 12	/28/12 00:00 N	Matrix: Water	
Parameters	Results Units	Report Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	Method: E	PA 3510			
Diesel Fuel Range	<b>2.7</b> mg/L	0.10 0.02	2 1	01/04/13 07:08	01/08/13 07:2	7	
Motor Oil Range Surrogates	<b>1.6</b> mg/L	0.10 0.03	1 1	01/04/13 07:08	01/08/13 07:2	7	
n-Pentacosane (S)	92 %	50-150	1	01/04/13 07:08	01/08/13 07:2	7 629-99-2	
Sample: GW-2-122712	Lab ID: 10216650016	Collected: 12/2	7/12 14:30	Received: 12	/28/12 00:00 N	Matrix: Water	
		Report					
Parameters	Results Units	Limit MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Preparation	Method: E	PA 3510			
Diesel Fuel Range	ND mg/L	0.10 0.02	1 1	01/04/13 07:08	01/08/13 05:1	5	
Motor Oil Range Surrogates	ND mg/L	0.10 0.03		01/04/13 07:08			
				04/04/40 0= 00			
n-Pentacosane (S)	92 %	50-150	1	01/04/13 07:08	01/08/13 05:1	5 629-99-2	

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#### **REPORT OF LABORATORY ANALYSIS**

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#### **ANALYTICAL RESULTS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Sample: GW-1-122712	Lab ID: 10216650017	Collected: 1	12/27/12 14:35	Received: 12/	28/12 00:00 Ma	atrix: Water	
Parameters	Results Units	Report Limit M	IDL DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWTI	PH-Dx Prepara	tion Method: EF	PA 3510			
Diesel Fuel Range Motor Oil Range <b>Surrogates</b> n-Pentacosane (S)	ND mg/L ND mg/L 94 %	0.10 0.10 50-150	0.021 1 0.030 1	01/04/13 07:08	01/08/13 08:33 01/08/13 08:33 01/08/13 08:33	620-00-2	
THE CHILACOSAITE (O)	34 /0	30-130		01/04/13 07:00	01/00/13 00:33	029-99-2	
Sample: 1B-W-23-122712	Lab ID: 10216650018	Collected: 1 Report	12/27/12 14:45	Received: 12/	28/12 00:00 Ma	atrix: Water	
Parameters	Results Units	•	IDL DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWTI	PH-Dx Prepara	tion Method: EF	PA 3510			
Diesel Fuel Range Motor Oil Range <b>Surrogates</b>	ND mg/L ND mg/L	0.11 0.11	0.022 1 0.032 1		01/08/13 05:37 01/08/13 05:37		
n-Pentacosane (S)	97 %	50-150	1	01/04/13 07:08	01/08/13 05:37	629-99-2	
Sample: 2A-W-41-122712	Lab ID: 10216650019	Collected: 1	12/27/12 15:30	Received: 12/	28/12 00:00 Ma	atrix: Water	
Parameters	Results Units	Report Limit M	IDL DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWTI	PH-Dx Prepara	tion Method: EF	PA 3510			
Diesel Fuel Range Motor Oil Range Surrogates	ND mg/L ND mg/L		0.021 1 0.030 1		01/08/13 03:48 01/08/13 03:48		
n-Pentacosane (S)	92 %	50-150	1	01/04/13 07:08	01/08/13 03:48	629-99-2	
Sample: 2A-W-10-122712	Lab ID: 10216650020	Collected: 1	12/27/12 15:50	Received: 12/	28/12 00:00 Ma	atrix: Water	
Parameters	Results Units	Report Limit M	IDL DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWTI	PH-Dx Prepara	tion Method: EF	PA 3510			
Diesel Fuel Range Motor Oil Range Surrogates	<b>0.13</b> mg/L <b>0.25</b> mg/L		0.021 1 0.030 1	01/04/13 07:08 01/04/13 07:08	01/08/13 08:54 01/08/13 08:54		
n-Pentacosane (S)	94 %	50-150	1	01/04/13 07:08	01/08/13 08:54	629-99-2	

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#### **REPORT OF LABORATORY ANALYSIS**

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#### **ANALYTICAL RESULTS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

		Donort						
Parameters	Results Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Prepa	ration Met	hod: El	PA 3510			
Diesel Fuel Range	<b>0.14</b> mg/L	0.10	0.022	1	01/04/13 07:08	01/08/13 07:0	)5	
Motor Oil Range Surrogates	<b>0.27</b> mg/L	0.10	0.031	1	01/04/13 07:08	01/08/13 07:0	)5	
n-Pentacosane (S)	90 %	50-150		1	01/04/13 07:08	01/08/13 07:0	)5 629-99-2	
Sample: 2B-W-4-122712	Lab ID: 10216650022	2 Collected:	12/27/12	16:42	Received: 12/	28/12 00:00	Matrix: Water	
Parameters	Results Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Prepa	ration Met	hod: El	PA 3510			
Diesel Fuel Range	ND mg/L	0.10	0.021	1	01/04/13 07:08	01/08/13 06:4	13	
Motor Oil Range Surrogates	ND mg/L	0.10	0.030	1	01/04/13 07:08	01/08/13 06:4	13	
n-Pentacosane (S)	95 %	50-150		1	01/04/13 07:08	01/08/13 06:4	13 629-99-2	
Sample: MW-3-122712	Lab ID: 10216650023	3 Collected:	12/27/12	16:55	Received: 12/	28/12 00:00	Matrix: Water	
Parameters	Results Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Prepa	aration Met	hod: Ef	PA 3510			
Diesel Fuel Range	ND mg/L	0.10	0.022	1	01/04/13 07:08	01/08/13 04:1	10	
Motor Oil Range Surrogates	ND mg/L	0.10	0.031	1	01/04/13 07:08	01/08/13 04:1	10	
n-Pentacosane (S)	95 %	50-150		1	01/04/13 07:08	01/08/13 04:1	10 629-99-2	
Sample: MW-4-122712	Lab ID: 10216650024	l Collected:	: 12/27/12	16:55	Received: 12/	28/12 00:00	Matrix: Water	
Parameters	Results Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS	Analytical Method: NWT	PH-Dx Prepa	ration Met	hod: El	PA 3510			
Diesel Fuel Range	ND mg/L	0.10	0.021	1	01/04/13 07:08	01/08/13 05:5	59	
Motor Oil Range Surrogates	ND mg/L	0.10	0.031	1	01/04/13 07:08			
n-Pentacosane (S)	95 %	50-150		1	01/04/13 07:08	01/08/13 05:5	59 629-99-2	

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#### **QUALITY CONTROL DATA**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

QC Batch: OEXT/20620 Analysis Method: NWTPH-Dx QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 10216650001, 10216650002, 10216650003, 10216650004

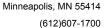
Matrix: Water METHOD BLANK: 1359174

Associated Lab Samples: 10216650001, 10216650002, 10216650003, 10216650004

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed Diesel Fuel Range mg/L ND 0.10 01/07/13 17:43 mg/L 0.10 Motor Oil Range ND 01/07/13 17:43 n-Pentacosane (S) % 50-150 01/07/13 17:43

LABORATORY CONTROL SAMPLE & LCSD: 1359175 1359176 LCSD Spike LCS **LCSD** LCS % Rec Max Result **RPD** Qualifiers Parameter Units Conc. Result % Rec % Rec Limits **RPD** 2 Diesel Fuel Range mg/L 1.7 1.8 85 90 50-150 6 20 n-Pentacosane (S) % 93 98 50-150

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#### **QUALITY CONTROL DATA**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Date: 03/18/2013 04:18 PM

QC Batch: OEXT/20629 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 10216650005, 10216650006, 10216650007, 10216650008, 10216650009, 10216650011,

10216650012, 10216650013, 10216650014, 10216650015, 10216650016, 10216650017, 10216650018,

10216650019, 10216650020, 10216650021, 10216650022, 10216650023, 10216650024

METHOD BLANK: 1359647 Matrix: Water

Associated Lab Samples: 10216650005, 10216650006, 10216650007, 10216650008, 10216650009, 10216650010, 10216650011,

10216650012, 10216650013, 10216650014, 10216650015, 10216650016, 10216650017, 10216650018,

10216650019, 10216650020, 10216650021, 10216650022, 10216650023, 10216650024

Blank Reporting Parameter Units Result Limit Qualifiers Analyzed Diesel Fuel Range mg/L ND 0.10 01/08/13 01:48 Motor Oil Range ND 0.10 01/08/13 01:48 mg/L n-Pentacosane (S) % 94 50-150 01/08/13 01:48

LABORATORY CONTROL SAI	MPLE & LCSD: 1359648		13	359649						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
Diesel Fuel Range			2 1.8	1.8	90	88	50-150	3	20	
n-Pentacosane (S)	%				97	98	50-150			



#### **QUALIFIERS**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

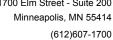
#### **LABORATORIES**

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PASI-M Pace Analytical Services - Minneapolis

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#### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 683-045 Skykomish REV

Pace Project No.: 10216650

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10216650001	1C-W-8-122712	EPA 3510	OEXT/20620	NWTPH-Dx	GCSV/10680
10216650002	1C-W-1-122712	EPA 3510	OEXT/20620	NWTPH-Dx	GCSV/10680
10216650003	5-W-19-122712	EPA 3510	OEXT/20620	NWTPH-Dx	GCSV/10680
10216650004	1C-W-7-122712	EPA 3510	OEXT/20620	NWTPH-Dx	GCSV/10680
10216650005	1C-WO-7-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650006	5W-16-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650007	5W-16D-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650008	5W-15-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650009	5-W-17-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650010	GW-4-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650011	2A-W-42-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650012	5-W-18-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650013	5-W-14-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650014	GW-3-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650015	2A-W-9-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650016	GW-2-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650017	GW-1-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650018	1B-W-23-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650019	2A-W-41-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650020	2A-W-10-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650021	2A-W-100-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650022	2B-W-4-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650023	MW-3-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681
10216650024	MW-4-122712	EPA 3510	OEXT/20629	NWTPH-Dx	GCSV/10681

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

					Additional Comments:	14221-81-822	1 2 A - W - 42 + 62 27	5 F & -4 - 1 2 2 7 1 2	16 2 2 1 1 - 4 1 - 12 °	SE-15-172712	5W-160-1227;	6 5 2 1 - 2 1 - 2 2 1 2	277-4-02-7-17-2	2 C-W-7-12271	3 × S - 1 - 1 - 1 - 2 × S	3	10-W-8-1227	Section D Required Client Information SAMPLE ID One Character per box. (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	8 3	425 295 0600 425 295 0850	35	ISSACUAH WA 98027	N. W. W.	THE CONSTITUTE	
			\$ J T		RELINQUISHE	2	2		2		2				7 2	2	2	비약용 등 PP 기 등 도 및 RP 기 등 도 및 RP 기 기 기 기 기 기 기 기 기 기 기 기 기 기 기 기 기 기	CHI New Comes	1 14	Project Name:	Duringes Order No.	COPY TO COLLY PORTELE	Report To: MB CLINE	Section B Required Project Information:
SAMPLER NAME AND SIGNATURE PRINT NAME OF SAMPLER SIGNATURE OF SAMPLER				- FARMUN (12/28/01)	RELINQUISHED BY / AFFILIATION DATE	9								2		The state of the s	C 12/27/12 4	SAMPLE TYPE  SAMPLE TO COLLECTED  COLLECTED  COMPOSITE STAFT  COMPOSITE ST				Address;	Company Name:	R	Section C invoice information:
A CA WA				1230 115100C	TIME ACCEPTED BY / AFFILIATION	1330 4 4	S O	12:5	200	5	3	ČE	8	2	Tis S	535	750	SAMPLE TEMP AT COLLECTION  # OF CONTAINERS  Unpreserved  H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub>			AND THE PARTY OF T	AMERICAN PROPERTY OF THE PROPE		SHEPPARO	
DATE Signed (MM/DD/YY)			12:24.12	いると	NATION DATE TIME												*	Na;S;O <sub>2</sub> Methanol Other Analysis:	Hitered (YIN)	Mallycon		{" UST } RCRA	NPDES	RE	
Temp in °C  Received on Ice  Custody Sealed Cooler  Samples Intact	Y/N	Y/V Y/V			SAMPLE CONDITIONS	0/2	9	       	3		8	R	7.00	8			3	Restricted Chothe Project No.		OH SCI WI W OINER	GA I I N	OTHER	ROUND WATER TO DRINKING WATER	REGULATORY AGENCY	Page: 1 of 2

# CHAIN-OF-CUSTODY / Analytical Request Document | 02/650 The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

							Additional Comments:	7	30-31-32 ピザ	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	219-14-1001-122317	8 2F-W-10-12271P		10 4W-23-1122712	2 (4 1 - 1 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4	2 CW-2-122772	2次トローターナナナー	。 (中央 - 2 - 1 - 2 -	3- W- 14- 12-29-12		Sample IDs MUST BE UNIQUE AR	One Character per box.	SAMPLED	Section D Required Client Information MATRIX	~~		BREW COMMITTEE		Copy io	(J) N-		Section A Section B	RE IN THE PERSONNEL PROPERTY.
				•	B		RELINQUISHED BY / AFFILIATION	4											\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		MAT	RIX (	CODE TYPE =COM		63-045	<u></u>	Purchase Order No. TOLOG - MOG		NO POR	Kepon lo. 1 MB CLINE			
0,6	SKONATURE OF SAMPLERY	PRINT Name OF SAMPLER. DINCER			<del></del>	CASO 1081/100 1030	DATE TIME	1683	2.534		2752	12.50	15%	5.	1435	2430		13,72	0,12; 21,143,12;	DATE TIME DATE TIME	COMPOSITE STARY COMPCSITE ENDIGHAL A C	LE TI	EMP A	COLLECTED	Pace Profile #:	Pace Project Manager:	Pace Quote Reterence:	Address:	Company Marie. 8255	WILLIAM BONCE SHEPPARO	Invoice Information:	Section C	
	DATE Signed (MM/DD/YY)	CANIMA TOLL			-	(1) OSS 12	ACCEPTED BY / AFFILIATION	4											N	Unp H <sub>2</sub> S HN0 HCI Ne( Na <sub>2</sub> Met	O <sub>4</sub> O <sub>3</sub> OH S <sub>2</sub> O <sub>2</sub> hanol	ved	AINE	Preservatives	Fitte								
	Te	mp in "C ceived on Ice	Y/N		<u> </u>	2-79-17-0:25 EST \$	P																Analysis: K		Filtered (YIN)	N C OH C SC WI		[ RCRA   O	NPDES GROUND WATER I	REGULATORY AGE		Page:	mine-windows (refer with
	Sea	Custody led Cooler amples Intact	+	Y/N	Y/N	-	CONDITIONS	7.50		R	8	00	0/2	000	27	300	212	0	0					oucarnet.		OTHER WAY			UKINKING WAIEK			Cof 2	Angelland Difference and a second

Samples Reid 12/28/12 Tass. Pace Analytical® SIGNATURE CUSTODY SEAL DATE\_ All SIGNATURE Vace Analytical ° CUSTODY SEAL Pace Analytical CUSTODY SEAL Pace Analytical® SIGNATURE CUSTODY SEAL DATE SIGNATURE Pace Analytical\* CUSTO

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# Pace Analytical\*

### Document Name: Sample Condition Upon Receipt Form

Document No.: F-MN-L-213-rev.05 Document Revised: 13Nov2012 Page 1 of 1

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition Upon Receipt  Client Name:	Proj	ect #: MO	#: 102166E	50
Courier:		1021	6050	
-	7919		Optional: Proj. Due Date	: Proj. Name:
Custody Seal on Cooler/Box Present? Yes				9000000
Packing Material: Bubble Wrap Bubble Bag	s None Oth	er:	Temp Blank?	Yes No
Thermometer Used:	Type of Ice: Wet	Blue No	one Samples on ice, coo	ling process has begun
Cooler Temp Read (°C): (7.7.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	orrected (°C): Obt 1.3	3,1-7,1-0,1-8 B Date and Initials o	iological Tissue Frozen? If Person Examining Contents: Comments:	Yes
Chain of Custody Present?	□Yes □No □	N/A 1. N 3	Coc- proinced co	ic on later
Chain of Custody Filled Out?	☐Yes ☐No ☐	N/A 2. def	<b>C</b> -	
Chain of Custody Relinquished?	Yes No	N/A 3.		
Sampler Name and/or Signature on COC?	Yes No	N/A 4.		
Samples Arrived within Hold Time?		N/A 5.		
Short Hold Time Analysis (<72 hr)?	Yes No 🗆	N/A 6.		
Rush Turn Around Time Requested?	□Yes ☑No □	N/A 7.		
Sufficient Volume?	ØYes □No □	N/A 8.		
Correct Containers Used?	Øygs □No □	N/A 9.		
-Pace Containers Used?		N/A		
Containers Intact?	✓Yes □No □	N/A 10.		
Filtered Volume Received for Dissolved Tests?	□Yes □No □	N/A 11.		
Sample Labels Match COC?	Yes No	N/A 12.		
-Includes Date/Time/ID/Analysis Matrix:			•	
All containers needing acid/base preservation have been checked? Noncompliances are noted in 13.  All containers needing preservation are found to be in compliance with EPA recommendation?  (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>12)  Exceptions: VOA, Coliform, TOC, Oil and Grease,  WI-DRO (water)		N/A 13. Sample # N/A Initial when co	☐HNO₃ ☐H₂SO₄  Lot # of a  completed: preserva	*
Headspace in VOA Vials ( >6mm)?	□Yes □No □	N/A 14.		,
Trip Blank Present?		N/A 15.		000-4000-0
Trip Blank Custody Seals Present?	□Yes □No □	KN/A	ì	
Pace Trip Blank Lot # (if purchased):	/			
CLIENT NOTIFICATION/RESOLUTION  Person Contacted:  Comments/Resolution:  Saufills	received in	Date/Time:	Field Data Required?  GOC 21 LIGHT	□Yes □No 1-3:13 26 Losme Islo
ODC' N	rema loser	47 VV 11	nsil "	
		dw)		
Project Manager Review		MM Date:	1,3-13	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# APPENDIX C DATA VALIDATION REPORTS

2011/2012 SITE-WIDE GROUNDWATER MONITORING REPORT BNSF Former Maintenance and Fueling Facility Skykomish, Washington Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-043



Submitted by: AECOM Pittsburgh PA 60191113-0545 December 2011

December 1, 2011

Organic Limited Data Validation Report

Environment

BNSF Skykomish
Groundwater Samples
Pace Analytical Services, Inc. Data
October 2010 – September 2011

Prepared By Gregory A. Malzone Project Chemist

#### Overview

The samples analyzed for the BNSF Skykomish groundwater sampling effort from October 2010 through September 2011 are listed in the Table of Samples Analyzed (pages 2-7). Limited data validation was performed on a total of one hundred ninety-five groundwater samples.

Samples were analyzed by Pace Analytical Services, Inc. of Seattle, WA (Pace-Seattle). The reviewed analysis was Diesel Range and Motor Oil Range Organics by WDOE method NWTPH-Dx (with and/or without Silica Gel Cleanup).

The Analytical Limited Data Validation Checklist is presented as pages 8-16. Data were evaluated based on validation criteria set forth in the *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*; document number USEPA-540-R-08-01, June 2008, as they applied to the reported methodology. Washington State Department of Ecology (WDOE) methods were also reviewed as per *WDOE Analytical Methods for Petroleum Hydrocarbons*, ECY 97-602 of June 1997. Field duplicate RPD review and applicable control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, December 1996.

The following data components were reviewed during the limited data validation procedure:

#### Submitted Deliverables

Case Narratives (including laboratory flags)

Chain-of-Custody form(s) and sample integrity

Sample results, reporting detection limits, dilution factors

Holding times

Method blank results

Organic surrogate recoveries

LCS, LCSD (blank spike, blank spike duplicate) recoveries

Laboratory duplicate RPDs

Field duplicate data (calculated RPDs)

Electronic data deliverable (EDD) query

#### **Data Validation Qualifiers Assigned During this Review**

J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ: The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

Assigned qualifiers are detailed in the Analytical Limited Data Validation Checklist and are summarized in the Table of Qualified Analytical Results (page 17).

#### **Overall Data Assessment**

Precision, accuracy, and method compliance have been determined to be acceptable, based on the data submitted. No data were missing, and no data points were rejected. All reported data are suitable for their intended use with the qualifications and clarifications noted.

# Table of Samples Analyzed BNSF Skykomish

Matrix	Sample ID		Sample Da Time		Lab SDG	Lab Sample ID
Groundwater	1C-W-1-1010		10/26/2010	10:55	255465	255465001
Groundwater	1C-W-8-1010		10/26/2010	11:40	252906	255465002
Groundwater	1C-W-80-1010	1C-W-8-1010 Dup	10/26/2010	12:20	252906	255465003
Groundwater	1C-W-7-1010		10/26/2010	12:45	252906	255465004
Groundwater	1C-W-1-1110		11/30/2010	11:55	255839	255839001
Groundwater	1C-W-8-1110		11/30/2010	12:40	255839	255839002
Groundwater	1C-W-80-1110	1C-W-8-1110 Dup	11/30/2010	13:00	255839	255839003
Groundwater	1C-W-7-1110		11/30/2010	14:15	255839	255839004
Groundwater	1C-W-7-1210		12/14/2010	14:20	256063	256063001
Groundwater	1C-W-1-1210		12/14/2010	14:15	256063	256063002
Groundwater	1C-W-8-1210		12/14/2010	14:45	256063	256063003
Groundwater	2B-W-4-1210		12/14/2010	15:25	256063	256063004
Groundwater	2A-W-40-1210		12/14/2010	16:20	256063	256063005
Groundwater	5-W-43-1210		12/14/2010	16:30	256063	256063006
Groundwater	2A-W-9-1210		12/15/2010	8:50	256063	256063007
Groundwater	2A-W-10-1210		12/15/2010	9:35	256063	256063008
Groundwater	MW-4-1210		12/15/2010	10:15	256063	256063009
Groundwater	MW-3-1210		12/15/2010	11:00	256063	256063010
Groundwater	MW-30-1210	MW-3-1210 Dup	12/15/2010	11:15	256063	256063011
Groundwater	GW-1-1210		12/15/2010	12:50	256063	256063012
Groundwater	2A-W-42-1210		12/15/2010	14:00	256063	256063013
Groundwater	5-W-20-1210		12/15/2010	14:35	256063	256063014
Groundwater	5-W-42-1210		12/15/2010	15:30	256063	256063015
Groundwater	5-W-18-1210		12/15/2010	16:10	256063	256063016
Groundwater	EW-1-1210		12/15/2010	9:35	256063	256063017
Groundwater	GW-2-1210		12/15/2010	11:15	256063	256063018
Groundwater	GW-20-1210	GW-2-1210 Dup	12/15/2010	10:15	256063	256063019
Groundwater	2A-W-41-1210		12/15/2010	13:00	256063	256063020
Groundwater	GW-3-1210		12/15/2010	13:55	256063	256063021
Groundwater	1B-W-23-1210		12/15/2010	15:20	256063	256063022
Groundwater	GW-4-1210		12/15/2010	16:15	256063	256063023
Groundwater	5-W-19-1210		12/16/2010	8:50	256063	256063024
Groundwater			12/16/2010	9:30	256063	256063025
Groundwater	5-W-14-1210		12/16/2010	9:45	256063	256063026
Groundwater Groundwater	5-W-17-1210		12/16/2010 12/16/2010	8:40	256063	256063027 256063028
	5-W-15-1210	E W 15 1010 Dup		10:35	256063	
Groundwater	5-W-150-1210	5-W-15-1210 Dup	12/16/2010	9:35	256063	256063029
Groundwater	1C-W-7-0111	40 M 7 0444 Dun	1/26/2011	9:05	256372	256372001
Groundwater	1C-W-70-0111	1C-W-7-0111 Dup	1/26/2011	9:20	256372	256372002
Groundwater	1C-W-1-0111		1/26/2011	10:00	256372	256372003
Groundwater	1C-W-8-0111		1/26/2011	10:50	256372	256372004
Groundwater	1C-W-1-0211		2/21/2011	11:40	256702	256702001
Groundwater	1C-W-7-0211		2/21/2011	9:50	256702	256702002
Groundwater	1C-W-8-0211	40 W 4 0044 D	2/21/2011	10:50	256702	256702003
Groundwater	1C-W-100-0211	1C-W-1-0211 Dup	2/21/2011	10:40	256702	256702004

# Table of Samples Analyzed BNSF Skykomish

Matrix	Sample ID		Sample Da Time		Lab SDG	Lab Sample ID
Groundwater	S1-AU-030111		3/1/2011	11:40	256796	256796001
Groundwater	S1-AD-030111		3/1/2011	11:50	256796	256796002
Groundwater	S1-BU-030111		3/1/2011	12:15	256796	256796003
Groundwater	S10-BU-030111	S1-BU-030111 Dup	3/1/2011	12:30	256796	256796004
Groundwater	S1-BD-030111	·	3/1/2011	12:20	256796	256796005
Groundwater	S2-AU-030111		3/1/2011	12:50	256796	256796006
Groundwater	S2-AD-030111		3/1/2011	12:55	256796	256796007
Groundwater	S2-BU-030111		3/1/2011	13:25	256796	256796008
Groundwater	S2-BD-030111		3/1/2011	13:30	256796	256796009
Groundwater	S3-AU-030111	S3-AU-030111 Dup	3/1/2011	14:25	256796	256796010
Groundwater	S30-AU-030111	·	3/1/2011	14:30	256796	256796011
Groundwater	S3-AD-030111		3/1/2011	14:35	256796	256796012
Groundwater	S3-BU-030111		3/1/2011	16:40	256796	256796013
Groundwater	S3-BD-030111		3/1/2011	16:50	256796	256796014
Groundwater	S3-CU-030111		3/1/2011	17:15	256796	256796015
Groundwater	S3-CD-030111		3/1/2011	17:10	256796	256796016
Groundwater	S4-AU-030111		3/1/2011	17:45	256796	256796017
Groundwater	S4-AD-030111		3/1/2011	17:50	256796	256796018
Groundwater	S4-BU-030111		3/1/2011	18:10	256796	256796019
Groundwater	S4-BD-030111		3/1/2011	18:15	256796	256796020
Groundwater	S4-CU-030111		3/1/2011	18:40	256796	256796021
Groundwater	S4-CD-030111		3/1/2011	18:45	256796	256796022
Groundwater	2B-W-4-0311		3/21/2011	9:30	257035	257035001
Groundwater	5-W-43-0311		3/21/2011	14:00	257035	257035002
Groundwater	GW-1-0311		3/21/2011	14:40	257035	257035003
Groundwater	GW-2-0311		3/21/2011	15:55	257035	257035004
Groundwater	MW-35R-0311		3/21/2011	15:15	257035	257035005
Groundwater	GW-3-0311		3/21/2011	16:40	257035	257035006
Groundwater	GW-30-0311	GW-3-0311 Dup	3/21/2011	16:55	257035	257035007
Groundwater	5-W-18-0311		3/21/2011	9:10	257035	257035008
Groundwater	5-W-19-0311		3/22/2011	9:50	257035	257035009
Groundwater	5-W-20-0311		3/22/2011	10:55	257035	257035010
Groundwater			3/22/2011	11:35	257035	257035011
Groundwater	5-W-14-0311		3/22/2011	9:15	257035	257035012
Groundwater	5-W-15-0311		3/22/2011	11:20	257035	257035013
Groundwater	5-W-16-0311		3/22/2011	10:15	257035	257035014
Groundwater	1C-W-3-0311		3/22/2011	11:25	257035	257035015
Groundwater	1C-W-1-0311		3/22/2011	10:20	257035	257035016
Groundwater	1C-W-8-0311		3/22/2011	9:40	257035	257035017
Groundwater	1C-W-17-0311		3/22/2011	13:05	257035	257035018
Groundwater	1C-W-170-0311	1C-W-17-0311 Dup	3/22/2011	12:05	257035	257035019
Groundwater	5-W-50-0311	2 55.1 200	3/22/2011	13:15	257035	257035020
Groundwater	5-W-54-0311		3/22/2011	14:35	257035	257035021
Groundwater	EW-1-0311		3/22/2011	14:10	257035	257035022
Groundwater	5-W-540-0311	5-W-54-0311 Dup	3/22/2011	14:00	257035	257035023

# Table of Samples Analyzed BNSF Skykomish

Matrix	Sample ID		Sample Da Time		Lab SDG	Lab Sample ID
Groundwater	1C-W-4-0311		3/22/2011	13:30	257035	257035024
Groundwater	1C-W-7-0311		3/22/2011	14:35	257035	257035025
Groundwater	1B-W-3-0311		3/22/2011	15:35	257035	257035026
Groundwater	GW-16-0311		3/22/2011	16:15	257056	257056001
Groundwater	GW-160-0311	GW-16-0311 Dup	3/22/2011	16:30	257056	257056002
Groundwater	5-W-51-0311		3/22/2011	16:55	257056	257056003
Groundwater	1B-W-2-0311		3/22/2011	17:20	257056	257056004
Groundwater	2A-W-42-0311		3/22/2011	16:35	257056	257056005
Groundwater	5-W-55-0311		3/23/2011	10:05	257056	257056006
Groundwater	5-W-56-0311		3/23/2011	9:10	257056	257056007
Groundwater	2A-W-41-0311		3/23/2011	11:00	257056	257056008
Groundwater	GW-4-0311		3/23/2011	8:50	257056	257056009
Groundwater	MW-3-0311		3/23/2011	9:50	257056	257056010
Groundwater	MW-4-0311		3/23/2011	10:35	257056	257056011
Groundwater	2A-W-10-0311		3/23/2011	11:00	257056	257056012
Groundwater	2A-W-9-0311		3/23/2011	12:05	257056	257056013
Groundwater	1B-W-23-0311		3/23/2011	12:35	257056	257056014
Groundwater	1A-W-4-0311		3/23/2011	13:20	257056	257056015
Groundwater	2A-W-40-0311		3/23/2011	14:00	257056	257056016
Groundwater	2A-W-400-0311	2A-W-40-0311 Dup	3/23/2011	13:00	257056	257056017
Groundwater	1C-W-7-0411		4/27/2011	11:37	257465	257465001
Groundwater	1C-W-8-0411		4/27/2011	14:00	257465	257465002
Groundwater	1C-W-1-0411		4/27/2011	13:20	257465	257465003
Groundwater	1C-W-70-0411	1C-W-7-0411 Dup	4/27/2011	10:35	257465	257465004
Groundwater	1C-W-1-0511	·	5/19/2011	10:50	257749	257749001
Groundwater	1C-W-8-0511		5/19/2011	11:25	257749	257749002
Groundwater	1C-W-7-0511		5/19/2011	12:35	257749	257749003
Groundwater	1C-W-70-0511	1C-W-7-0511 Dup	5/19/2011	12:45	257749	257749004
Groundwater	S1-AU-0511		5/27/2011	9:50	257895	257895001
Groundwater	S1-AD-0511		5/27/2011	9:55	257895	257895002
Groundwater	S1-BU-0511		5/27/2011	10:15	257895	257895003
Groundwater	S1-BD-0511		5/27/2011	10:20	257895	257895004
Groundwater	S2-AU-0511		5/27/2011	11:00	257895	257895005
Groundwater	S2-AD-0511		5/27/2011	11:10	257895	257895006
Groundwater	S2-BU-0511		5/27/2011	11:20	257895	257895007
Groundwater	S20-BU-0511	S2-BU-0511 Dup	5/27/2011	11:25	257895	257895008
Groundwater	S2-BD-0511		5/27/2011	11:30	257895	257895009
Groundwater	S3-AU-0511		5/27/2011	11:55	257895	257895010
Groundwater	S3-AD-0511		5/27/2011	12:05	257895	257895011
Groundwater	S3-BU-0511		5/27/2011	12:15	257895	257895012
Groundwater	S3-BD-0511		5/27/2011	12:25	257895	257895013
Groundwater	S3-CU-0511		5/27/2011	12:40	257895	257895014
Groundwater	S30-CU-0511	S3-CU-0511 Dup	5/27/2011	12:45	257895	257895015
Groundwater	S3-CD-0511	- r	5/27/2011	12:55	257895	257895016
Groundwater	S4-AU-0511		5/27/2011	13:20	257895	257895017

# Table of Samples Analyzed BNSF Skykomish

Matrix	Sample ID		Sample Da Time		Lab SDG	Lab Sample ID
Groundwater	S4-AD-0511		5/27/2011	13:10	257895	257895018
Groundwater	S4-BU-0511		5/27/2011	13:30	257895	257895019
Groundwater	S4-BD-0511		5/27/2011	13:35	257895	257895020
Groundwater	S4-CU-0511		5/27/2011	13:45	257895	257895021
Groundwater	S4-CD-0511		5/27/2011	13:50	257895	257895022
Groundwater	2B-W-4-0611		6/21/2011	12:25	258246	258246001
Groundwater	GW-1-0611		6/21/2011	13:20	258246	258246002
Groundwater	5-W-43-0611		6/21/2011	14:05	258246	258246003
Groundwater	GW-2-0611		6/21/2011	14:45	258246	258246004
Groundwater	GW-3-0611		6/21/2011	15:45	258246	258246005
Groundwater	2A-W-41-0611		6/21/2011	16:30	258246	258246006
Groundwater	2A-W-42-0611		6/21/2011	15:35	258246	258246007
Groundwater	GW-4-0611		6/21/2011	16:20	258246	258246008
Groundwater	EW-2A-0611		6/21/2011	17:10	258246	258246009
Groundwater	1C-W-1-0611		6/22/2011	9:15	258246	258246010
Groundwater	1C-W-7-0611		6/22/2011	10:50	258246	258246011
Groundwater	1C-W-8-0611		6/22/2011	9:55	258246	258246012
Groundwater	5-W-14-0611		6/22/2011	8:20	258246	258246013
Groundwater	5-W-17-0611		6/22/2011	10:00	258246	258246014
Groundwater	5-W-15-0611		6/22/2011	10:35	258246	258246015
Groundwater	5-W-150-0611	5-W-15-0611 Dup	6/22/2011	10:50	258246	258246016
Groundwater	5-W-19-0611		6/22/2011	12:35	258246	258246017
Groundwater	5-W-18-0611		6/22/2011	13:15	258246	258246018
Groundwater	5-W-16-0611		6/22/2011	13:50	258246	258246019
Groundwater	2A-W-9-0611		6/22/2011	15:05	258246	258246020
Groundwater	2A-W-10-0611		6/22/2011	15:25	258246	258246021
Groundwater	2A-W-100-0611	2A-W-10-0611 Dup	6/22/2011	15:40	258246	258246022
Groundwater	1B-W-23-0611		6/22/2011	12:00	258246	258246023
Groundwater	2A-W-40-0611	04.144.40.0044.5	6/22/2011	14:00	258246	258246024
Groundwater	2A-W-400-0611	2A-W-40-0611 Dup	6/22/2011	14:30	258246	258246025
Groundwater	EW-1-0611		6/22/2011	15:05	258246	258246026
Groundwater	MW-3-0611		6/22/2011	16:00	258246	258246027
Groundwater	MW-4-0611		6/22/2011	16:00	258246	258246028
Groundwater	1C-W-1-0711		7/28/2011	13:40	258667	258667001
Groundwater	1C-W-7-0711		7/28/2011	11:35	258667	258667002
Groundwater	1C-W-8-0711		7/28/2011	12:40	258667	258667003
Groundwater	1C-W-80-0711	1C-W-8-0711 Dup	7/28/2011	13:00	258667	258667004
Groundwater	1C-W-1-0811		8/30/2011	12:45	259039	259039001
Groundwater	1C-W-7-0811		8/30/2011	14:25	259039	259039002
Groundwater	1C-W-80-0811	1C-W-8-0811 Dup	8/30/2011	14:00	259039	259039003
Groundwater	1C-W-8-0811		8/30/2011	13:25	259039	259039004
Groundwater	MW-4-0911		9/19/2011	10:05	259304	259304001
Groundwater	MW-40-0911	MW-4-0911 Dup	9/19/2011	8:45	259304	259304002
Groundwater	ZA-W-10-0911		9/19/2011	10:45	259304	259304003
Groundwater	ZA-W-09-0911		9/19/2011	11:15	259304	259304004

# Table of Samples Analyzed BNSF Skykomish

#### **Groundwater Samples**

## Pace Analytical (Pace-Seattle) Laboratory Reports (as listed) October 2010 - September 2011

Matrix	Sample ID		Sample Da Time		Lab SDG	Lab Sample ID
Groundwater	ZA-W-4-0911		9/19/2011	13:10	259304	259304005
Groundwater	MW-3-0911		9/19/2011	13:55	259304	259304006
Groundwater	5-W-43-0911		9/19/2011	14:50	259304	259304007
Groundwater	GW-1-0911		9/19/2011	15:45	259304	259304008
Groundwater	1C-W-1-0911		9/20/2011	10:20	259304	259304009
Groundwater	1C-W-8-0911		9/20/2011	11:10	259304	259304010
Groundwater	1C-W-3-0911		9/20/2011	12:00	259304	259304011
Groundwater	1C-W-4-0911		9/20/2011	14:40	259304	259304012
Groundwater	1C-W-7-0911		9/20/2011	15:35	259304	259304013
Groundwater	1B-W-2-0911		9/20/2011	16:35	259304	259304014
Groundwater	1B-W-3-0911		9/20/2011	17:50	259304	259304015
Groundwater	MW-36R-0911		9/20/2011	10:20	259304	259304016
Groundwater	EW-1-0911		9/20/2011	11:10	259304	259304017
Groundwater	ZA-W-41-0911		9/20/2011	12:10	259304	259304018
Groundwater	ZA-W-40-0911		9/20/2011	14:30	259304	259304019
Groundwater	ZA-W-400-0911	ZA-W-40-0911 Dup	9/20/2011	13:30	259304	259304020
Groundwater	GW-3-0911		9/20/2011	15:40	259304	259304021
Groundwater	GW-30-0911	GW-3-0911 Dup	9/20/2011	14:40	259304	259304022
Groundwater	ZA-W-42-0911		9/20/2011	16:40	259304	259304023
Groundwater	GW-4-0911		9/20/2011	17:30	259304	259304024
Groundwater	S1-AU-0911		9/20/2011	15:20	259311	259311001
Groundwater	S1-AD-0911		9/20/2011	15:25	259311	259311002
Groundwater	S1-BU-0911		9/20/2011	15:30	259311	259311003
Groundwater	S1-BD-0911		9/20/2011	15:35	259311	259311004
Groundwater	S2-AU-0911		9/20/2011	16:00	259311	259311005
Groundwater	S2-AD-0911		9/20/2011	16:05	259311	259311006
Groundwater	S2-BU-0911		9/20/2011	16:20	259311	259311007
Groundwater	S2-BD-0911		9/20/2011	16:25	259311	259311008
Groundwater	S3-AU-0911		9/20/2011	16:40	259311	259311009
Groundwater	S30-AU-0911	S3-AU-0911 Dup	9/20/2011	16:45	259311	259311010
Groundwater	S3-AD-0911		9/20/2011	17:10	259311	259311011
Groundwater	S3-BU-0911		9/20/2011	17:15	259311	259311012
Groundwater	S3-CU-0911		9/20/2011	17:35	259311	259311013
Groundwater	S3-CD-0911		9/20/2011	17:40	259311	259311014
Groundwater	S4-AU-0911		9/20/2011	18:10	259311	259311015
Groundwater	S40-AU-0911	S4-AU-0911 Dup	9/20/2011	18:15	259311	259311016
Groundwater	S4-AD-0911		9/20/2011	18:20	259311	259311017
Groundwater	S4-BD-0911		9/20/2011	18:25	259311	259311018
Groundwater	S4-BU-0911		9/20/2011	18:30	259311	259311019
Groundwater	S4-CD-0911		9/20/2011	18:40	259311	259311020
Groundwater	S4-CU-0911		9/20/2011	18:45	259311	259311021
Groundwater	S3-BD-0911		9/20/2011	17:15	259311	259311022
Groundwater	5-W-14-0911		9/21/2011	9:10	259314	259314001
Groundwater	5-W-50-0911		9/21/2011	10:00	259314	259314002
Groundwater	5-W-15-0911		9/21/2011	10:30	259314	259314003

# Table of Samples Analyzed BNSF Skykomish

Matrix	Sample ID		Sample Da Time		Lab SDG	Lab Sample ID
Groundwater	5-W-19-0911		9/21/2011	11:10	259314	259314004
Groundwater	5-W-18-0911		9/21/2011	11:45	259314	259314005
Groundwater	5-W-17-0911		9/21/2011	13:40	259314	259314006
Groundwater	5-W-170-0911	5-W-17-0911 Dup	9/21/2011	13:55	259314	259314007
Groundwater	5-W-16-0911		9/21/2011	14:40	259314	259314008
Groundwater	1A-W-4-0911		9/21/2011	15:35	259314	259314009
Groundwater	5-W-55-0911		9/21/2011	9:40	259314	259314010
Groundwater	5-W-56-0911		9/21/2011	10:30	259314	259314011
Groundwater	GW-2-0911		9/21/2011	11:45	259314	259314012
Groundwater	EW-2A-0911		9/21/2011	12:40	259314	259314013
Groundwater	5-W-51-0911		9/21/2011	14:15	259314	259314014
Groundwater	5-W-54-0911		9/21/2011	15:10	259314	259314015
Groundwater	MW-16-0911		9/21/2011	16:05	259314	259314016
Groundwater	1B-W-23-0911		9/21/2011	17:05	259314	259314017

#### **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

Project Name: BNSF Skykomish		_aboratory: Pa WA (Pace-Sea		nalytical Service	s, Inc. of	Seattle,				
Project Reference: Groundwater Samples	;	Sample Matrix:	Gro	undwater Sampl	es					
AECOM Project: 60191113-0545	,	Sample Start D	ate:	10/26/2010						
Validator/Date Validated: Greg Malzone 12/01/2011 (completed)	;	Sample End Da	ate: 0	9/21/2011						
Samples Analyzed: see Table of Samples Analyzed, September 2011 (pages 2-7).	BNSF	Skykomish, G	Groun	dwater Samples	, October	2010 -				
Parameters Reviewed:										
Diesel Range and Motor Oil Range Organics by WD0 cleanup).	OE me	ethod NWTPH-	·Dx (\	with and/or witho	ut Silica (	Gel				
Laboratory Project IDs (SDGs): 255465, 255839, 256 257149, 257895, 258246, 258667, 259039, 259304,			)2, 25	56796, 257035, 2	257056, 2	57465,				
PRECISION, ACCURACY, METHOD COM	PLIAN	ICE, AND CO	MPLE	TENESS ASSE	SSMENT	•				
Precision:	Х	Acceptable		Unacceptable	GAM	Initials				
using the Relative Percent Difference (RPD). The RI samples divided by the mean and expressed as a pe EPA published and/or laboratory control-charted QC duplicate RPDs (see item 17). Two data points required 21). Overall field and laboratory precision was accepand no data points were rejected. Precision measured	ercent. limits. red qu table l	RPD precision Four data politication base because a majore	n me ints re ed on ority o	asurements were equired qualificate field duplicate re of the data points	e compar tion base esults (se	ed to d on lab e item				
Accuracy:	Х	Acceptable		Unacceptable	GAM	Initials				
Comments: Accuracy, a measure of the analytical bias, was determined by reviewing method blank results for evidence of contamination stemming from the analytical process. In addition, laboratory accuracy was measured by evaluating laboratory control sample, laboratory control sample duplicate (LCS, LCSD) and organic system monitoring compound (surrogate) percent recoveries (%Rs). LCS, LCSD %Rs demonstrated overall analytical performance. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. The %Rs were compared to EPA published and/or laboratory control-charted QC limits. Some data required qualification based on method blank contamination (see item 11), surrogate recovery (see item 14), and LCS recovery (see item 15). Overall field and laboratory accuracy were acceptable because a majority of the data points were unqualified and no data were rejected. Accuracy measurements are reviewed in items 11, 12, 14, 15, 16, and 20.										
Method Compliance:	X	Acceptable		Unacceptable	GAM	Initials				
Comments: For this data set, method compliance wa and reporting limits against method specified require holding time was exceeded (see item 8). Overall me submitted. Method compliance measurements are re	ments thod o	. Four data po compliance was	ints r s acc	equired qualificate ptable based or	ntions bec n the data	ause the				

Acceptable

Unacceptable GAM Initials

#### **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

Completeness:

Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals were set at 90-100%. Determination of completeness during this limited data validation procedure included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results and QC summary reports. All of the data received were useable, with some qualification. No data points were missing or rejected. Completeness of the data set was 100%.						
VALIDATION CRITERIA CHECK						
The following data qualifiers were used in this review:  J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.						
UJ: The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.						
The following comments requiring qualification are in bold type. The other comments are of interest, but qualification of the samples was not necessary.						
Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).						
Did the laboratory identify any non- conformances related to the analytical results?		Yes	Х	No	GAM	Initials
Comments: Spike recoveries outside of QC limits were noted. Any assigned laboratory flags were reviewed during the limited validation procedure.						
Data qualification, if any, related to the comments and/or assigned laboratory data flags are discussed in the following sections.						
Were sample Chain-of-Custody forms complete?	Х	Yes		No	GAM	Initials
Comments: The COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, and laboratory dates and times of sample receipt.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	Х	Yes		No	GAM	Initials
Comments: All requested analyses as documented on the original COCs were completed.						
4. Were samples received in good condition and at the appropriate temperature?	X	Yes		No	GAM	Initials
Comments: All samples were received intact and in good condition with cooler temperatures of 0.2° C to 7.4° C as noted on the Sample Condition Upon Receipt Forms provided. Samples received at less than 2°C were determined to be in acceptable condition since sample containers were intact and samples themselves were not frozen. Samples received at greater than 6° C were determined to be in acceptable condition since samples were hand-delivered from the field, ice was noted as present in the coolers and cooling process had begun, no other preservation issues were noted, and samples were kept in cold storage =4° C upon receipt at the laboratory. No action is required other than to note these observations.</td						

## **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

5. Were the reported analytical methods in compliance with WP/QAPP, permit, or COC?	X	Yes		No	GAM	Initials		
Comments: The reported method and clean up (as a the parameters requested and the sample matrix.	ipplicable) r	net the C	OC request	s and is i	n compliar	ice with		
6. Were detection limits in accordance with WP/QAPP, permit, or method?		Yes	X	No	GAM	Initials		
Comments: The reporting limits (RLs) are achievable by the quoted method. Note that the laboratory did not report any analyte concentrations ≥ method detection limit (MDL) but < practical quantitation limit/reporting limit (PQL/RL) for any data sets except the July 2011 samples (SDG 258667). The July 2011 samples were nadvertently submitted for the routine instead of the low level organic extraction method as required. In order to compensate, the data for samples 1C-W-1-0711, 1C-W-7-0711, 1C-W-8-0711, and 1C-W-80-0711 were reported to the MDLs to achieve the lowest detection limits possible. The PQLs are elevated for samples 1C-W-1-0711, 1C-W-7-0711, 1C-W-8-0711, and 1C-W-80-0711.								
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	X	Yes		No	GAM	Initials		
Comments: Only analytes applicable to the requested method were reported.								
8. Were all sample holding times met?		Yes	X	No	GAM	Initials		
Comments: The required holding time periods for <u>chemically preserved groundwater samples</u> was: 14 days from sample collection to extraction, and 40 days from extraction to analysis for NWTPH-Dx. The method-required sample extraction and analytical holding times were met for all samples with the following exceptions.  SDG 259314: NWTPH-Dx analysis was assigned to samples 5-W-56-0911 and GW-2-0911 per project manager request on 10/14/11. The NWTPH-Dx analyses were performed 12 days beyond the 14-day holding time for chemically preserved aqueous samples. The positive and non-detect diesel range organics and motor oil range organics results for samples 5-W-56-0911 and GW-2-0911 were qualified "J" and "UJ," as estimates, because of low bias due to the holding time being exceeded.								
Refer to the table of Qualified Analytical Results concentrations qualified (page 17).	for a listing	g of the s	amples, ar	nalytes, a	ınd			
9. Were correct concentration units reported?	X	Yes		No	GAM	Initials		
Comments: All results were reported as mg/L (ppm)								
10. Were the reporting requirements for flagged data met?	X	Yes		No	GAM	Initials		
Comments: All assigned laboratory flags were reviewed and evaluated during the limited validation process.  Data validation qualifiers supersede any assigned laboratory data flags.								
11. Were laboratory blank samples free of target analyte contamination?		Yes	X	No	GAM	Initials		
Comments: The method blank samples were free of	target analy	yte contar	mination wit	th the follo	owing exce	eptions.		
SDG 259304: Diesel range organics were detected in The positive diesel range organics result for assoreporting limit, but less than five times the method.	ociated sar	nple EW-	-1-0911 wa	s greater	than the			

because of laboratory contamination. Non-detect results were not qualified on this basis.

## **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

Continued from Item 11 above.								
<b>SDG 259314:</b> Diesel range organics were detected in method blank 88090 at a concentration of 0.024 mg/L. The positive diesel range organics result for associated sample 5-W-50-0911 was greater than five times the method blank level and did not require qualification.								
Refer to the table of Qualified Analytical Results to concentrations qualified (page 17).	for a listing	g of the s	amples, a	nalytes, a	ınd			
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	NA	Yes	NA	No	GAM	Initials		
Comments: No field, equipment, or trip blank sample	s were sub	mitted/red	quired for th	nis data se	et.			
13. Were instrument calibrations within method or data validation control limits?	NA	Yes	NA	No	GAM	Initials		
Comments: Not applicable for this level of limited dat in analytical laboratory reports and were therefore no				ation data	were not	supplied		
14. Were surrogate recoveries within control limits?		Yes	X	No	GAM	Initials		
Comments: Reported surrogate %Rs for organic analyses were within laboratory control-charted QC limits for all project samples and associated QC samples, or met the following requirement, except as noted. Non-volatile surrogate recoveries affected by required sample dilution did not require qualification, because extraction/analytical efficiency was demonstrated in associated blank and LCS, LCSD, and surrogate %Rs.								
						Rs.		
	associated for sample sel range o	blank and e 1C-W-1 organics	LCS, LCS -1110 was and motor	D, and su low (50% oil range	rrogate %  and les  organics	s than		
extraction/analytical efficiency was demonstrated in a SDG 255839: The o-terphenyl surrogate recovery the lower laboratory quality conrol limit. The dies for sample 1C-W-1-1110 were qualified "J" and "U"	for sample sel range o JJ," as est	blank and e 1C-W-1 organics imates, p	LCS, LCS -1110 was and motor possibly bi	D, and su low (50% oil range ased low	irrogate % in and lese organics in due to	s than		
extraction/analytical efficiency was demonstrated in a SDG 255839: The o-terphenyl surrogate recovery the lower laboratory quality conrol limit. The dies for sample 1C-W-1-1110 were qualified "J" and "Ususpected matrix interference.  Refer to the table of Qualified Analytical Results in the surrogate recovery.	for sample sel range o JJ," as est	blank and e 1C-W-1 organics imates, p	LCS, LCS -1110 was and motor possibly bi	D, and su low (50% oil range ased low	irrogate % in and lese organics in due to	s than		
extraction/analytical efficiency was demonstrated in a SDG 255839: The o-terphenyl surrogate recovery the lower laboratory quality conrol limit. The dies for sample 1C-W-1-1110 were qualified "J" and "Ususpected matrix interference.  Refer to the table of Qualified Analytical Results to concentrations qualified (page 17).  15. Were laboratory control sample recoveries	for sample sel range of JJ," as est for a listing	e 1C-W-1 organics imates, p g of the s Yes	TLCS, LCS -1110 was and motor possibly bi camples, a	No	arrogate % b) and les c organics due to and GAM GOTO organic	Initials		
extraction/analytical efficiency was demonstrated in a SDG 255839: The o-terphenyl surrogate recovery the lower laboratory quality conrol limit. The dies for sample 1C-W-1-1110 were qualified "J" and "Ususpected matrix interference.  Refer to the table of Qualified Analytical Results to concentrations qualified (page 17).  15. Were laboratory control sample recoveries within control limits?  Comments: Reported LCS, LCSD recoveries were witarget analytes, and/or were within laboratory control.	for sample sel range of JJ," as est for a listing ithin data v-charted Quarange orgalel range re	e 1C-W-1 organics imates, p g of the s Yes alidation of the imits as nics was esult for a	TLCS, LCS -1110 was and motor cossibly bi camples, a  X  QC limits (7 s allowed for associated	No To-130% for organic	GAM  for organic methods  than the	Initials  s) for all with the		
extraction/analytical efficiency was demonstrated in a SDG 255839: The o-terphenyl surrogate recovery the lower laboratory quality conrol limit. The dies for sample 1C-W-1-1110 were qualified "J" and "Ususpected matrix interference.  Refer to the table of Qualified Analytical Results to concentrations qualified (page 17).  15. Were laboratory control sample recoveries within control limits?  Comments: Reported LCS, LCSD recoveries were with target analytes, and/or were within laboratory control following exception.  SDG 255839: The LCS 51446 recovery for diesel relaboratory quality control limit. The positive dieseling the surrogate and surrogated to the surrogate and surrogated to the s	for sample sel range of JJ," as est for a listing ithin data v-charted Quarange orgalel range reause of low	e 1C-W-1 organics imates, p g of the s Yes  Alidation of the service was esult for a wethood	TLCS, LCS -1110 was and motor possibly bi camples, and X  QC limits (7 s allowed for low (40%) associated d bias.	No To-130% for organic and less	GAM  for organic methods  than the	Initials  s) for all with the		
extraction/analytical efficiency was demonstrated in a SDG 255839: The o-terphenyl surrogate recovery the lower laboratory quality conrol limit. The dies for sample 1C-W-1-1110 were qualified "J" and "Ususpected matrix interference.  Refer to the table of Qualified Analytical Results to concentrations qualified (page 17).  15. Were laboratory control sample recoveries within control limits?  Comments: Reported LCS, LCSD recoveries were w target analytes, and/or were within laboratory control following exception.  SDG 255839: The LCS 51446 recovery for diesel relaboratory quality control limit. The positive diese qualified "J," as an estimated concentration, because the table of Qualified Analytical Results to the table of Qualified Analytical Results to the same temperature of the same t	for sample sel range of JJ," as est for a listing ithin data v-charted Quarange orgalel range reause of low	e 1C-W-1 organics imates, p g of the s Yes  Alidation of the service was esult for a wethood	TLCS, LCS -1110 was and motor possibly bi camples, and X  QC limits (7 s allowed for low (40%) associated d bias.	No To-130% for organic and less	GAM  for organic methods  than the	Initials  s) for all with the		

X

Yes

GAM

No

Initials

## **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

17. Were all duplicate RPDs within control limits?

Comments: Laboratory RPDs for target analytes in LCS/LCSD and project-specific laboratory replicate samples were within laboratory QC limits of 50% with the following exceptions.							
SDG 256796: The RPD between the original and replicate analysis for sample S4-AD-030111 was greater than the maximum quality control limit (76%) for diesel range organics. The positive diesel range result for sample S4-AD-030111 was qualified "J," as an estimated concentration, because of method imprecision and/or sample heterogeneity.							
SDG 257895: The RPD between the original and replicate analysis for sample S4-CU-0511 was greater than the maximum quality control limit (101%) for diesel range organics. The positive diesel range result for sample S4-CU-0511 was qualified "J," as an estimated concentration, because of method imprecision and/or sample heterogeneity.							
SDG 257895: The diesel range result for sample S3-AD-0511 was non-detect at the reporting limit. The laboratory duplicate was positive and greater than the reporting limit. The RPD could not be calculated. The non-detect diesel range result for sample S3-AD-0511 was qualified "UJ," as an estimate, because of method imprecision and/or sample heterogeneity.							
<b>SDG 259314:</b> The RPD between the original and repthe maximum quality control limit (52%) for diesel rar sample 5-W-51-0911 was qualified "J," as an estimand/or sample heterogeneity.	nge organic	s. The p	ositive die	sel range	e result for	r	
Refer to the table of Qualified Analytical Results concentrations qualified (page 17).	for a listing	of the s	amples, ar	nalytes, a	and		
18. Were organic system performance criteria met?	NA	Yes	NA	No	GAM	Initials	
Comments: Not applicable for this level of limited data validation – Organic system performance data were not supplied in analytical laboratory reports and were therefore not included in this data review.							
19. Were internal standards within method criteria for GC/MS sample analyses?	NA	Yes	NA	No	GAM	Initials	
Comments: Not applicable for this level of limited data validation or for the analytical method reported.							
20. Were inorganic system performance criteria NA Yes NA No GAM Initials met?							
Comments: Not applicable for this level of limited data	ta validation	or for the	e analytical	method i	reported.		

### **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

21. Were blind field du discuss the precision (F	plicates collected? If so, RPD) of the results.	X		Yes		No	GAM	Initials
Duplicate Sample No.	IC-W-80-1010	Р	rim	ary Sam	ple No.	IC-W-8-10	10	
Duplicate Sample No.	IC-W-80-1110	Р	Primary Sample No.		IC-W-8-1110			
Duplicate Sample No.	MW-30-1210	Р	Primary Sample No.		MW-3-121	0		
Duplicate Sample No.	GW-20-1210	Р	rim	ary Sam	ple No.	GW-2-121	0	
Duplicate Sample No.	5-W-150-1210	Р	rim	ary Sam	ple No.	5-W-15-12	210	
Duplicate Sample No.	1C-W-70-0111	P	rim	ary Sam	ple No.	1C-W-7-0	111	
Duplicate Sample No.	1C-W-100-0211	P	rim	ary Sam	ple No.	1C-W-1-0	211	
Duplicate Sample No.	S10-BU-030111	Р	rim	ary Sam	ple No.	S1-BU-03	0111	
Duplicate Sample No.	S30-AU-030111	Р	rim	ary Sam	ple No.	S3-AU-03	0111	
Duplicate Sample No.	GW-30-0311	Р	Primary Sample No.		GW-3-031	GW-3-0311		
Duplicate Sample No.	1C-W-170-0311	P	Primary Sample No.		1C-W-17-0311			
Duplicate Sample No.	5-W-540-0311	Primary Sample No.		5-W-54-0311				
Duplicate Sample No.	GW-160-0311	Primary Sample No.		ple No.	GW-16-0311			
Duplicate Sample No.	2A-W-400-0311	Р	Primary Sample No.		2A-W-40-0311			
Duplicate Sample No.	1C-W-70-0411	Р	Primary Sample No.		1C-W-7-0411			
Duplicate Sample No.	1C-W-70-0511	Р	rima	ary Sam	ple No.	1C-W-7-0511		
Duplicate Sample No.	S20-BU-0511	Р	rim	ary Sam	ple No.	S2-BU-0511		
Duplicate Sample No.	S30-CU-0511	Р	rim	ary Sam	ple No.	S3-CU-05	11	
Duplicate Sample No.	5-W-150-0611	Р	rim	ary Sam	ple No.	5-W-15-06	611	
Duplicate Sample No.	2A-W-100-0611	Р	rim	ary Sam	ple No.	2A-W-10-0	0611	
Duplicate Sample No.	2A-W-400-0611	Р	rim	ary Sam	ple No.	2A-W-40-0	0611	
Duplicate Sample No.	1C-W-80-0711	Р	rim	ary Sam	ple No.	1C-W-8-0	711	
Duplicate Sample No.	1C-W-80-0811	P	rim	ary Sam	ple No.	1C-W-8-0	811	
Duplicate Sample No.	MW-40-0911	Р	rim	ary Sam	ple No.	MW-4-091	1	
Duplicate Sample No.	ZA-W-400-0911	P	rim	ary Sam	ple No.	ZA-W-40-	0911	
Duplicate Sample No.	GW-30-0911	Р	rim	ary Sam	ple No.	GW-3-091	1	
Duplicate Sample No.	S40-AU-0911	Р	rim	ary Sam	ple No.	S4-AU-09	11	
Duplicate Sample No.	5-W-170-0911	Р	Primary Sample No.			5-W-17-09	911	

Comments: Field duplicate RPDs were within data validation QC limits of 0-30% for water matrices, or RPDs were not applicable due to results that were <u>+</u> the reporting limit or were non-detect in both samples with one exception. Qualifications (i.e., "J/UJ") were required for the diesel range organics results for samples S3-AU-030111 and S30-AU-030111 because of laboratory/field sampling imprecision and/or sample heterogeneity.

## **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

The following RPDs were calculated:

owning ixi	Ds were car	culateu.					
SDG	Method	Units	Analyte	1C-W-8-1010	1C-W-80-1010	RPD	Qualifiers
255465	NWTPH-Dx	mg/L	Diesel Range	2.2	2.1	5	
255465	NWTPH-Dx	mg/L	Motor Oil Range	0.84	0.83	1	
SDG	Method	Units	Analyte	1C-W-8-1110	1C-W-80-1110	RPD	Qualifiers
255839	NWTPH-Dx	mg/L	Diesel Range	0.28	0.26	7	
255839	NWTPH-Dx	mg/L	Motor Oil Range	0.13	0.14	7	
SDG	Method	Units	Analyte	MW-3-1210	MW-30-1210	RPD	Qualifiers
256063	NWTPH-Dx	mg/L	Diesel Range	0.049	0.057	15	
SDG	Method	Units	Analyte	GW-2-1210	GW-20-1210	RPD	Qualifiers
256063	NWTPH-Dx	mg/L	Diesel Range	0.045	0.049	9	
SDG	Method	Units	Analyte	5-W-15-1210	5-W-150-1210	RPD	Qualifiers
256063	NWTPH-Dx	mg/L	Diesel Range	0.49	0.47	4	
256063	NWTPH-Dx	mg/L	Diesel Range SG	0.065	0.059	10	
256063	NWTPH-Dx	mg/L	Motor Oil Range	0.34	0.35	3	
SDG	Method	Units	Analyte	1C-W-7-0111	1C-W-70-0111	RPD	Qualifiers
256372	NWTPH-Dx	mg/L	Diesel Range	0.082	0.067	20	
SDG	Method	Units	Analyte	1C-W-1-0211	1C-W-100-0211	RPD	Qualifiers
256702	NWTPH-Dx	mg/L	Diesel Range	0.069	0.076	10	
SDG	Method	Units	Analyte	S1-BU-030111	S10-BU-030111	RPD	Qualifiers
256796	All results were non-detect.						
SDG	Method	Units	Analyte	S3-AU-030111	S30-AU-030111	RPD	Qualifiers
256796	NWTPH-Dx	mg/L	Diesel Range	0.027	0.019 U	NC	J/UJ
SDG	Method	Units	Analyte	GW-3-0311	GW-30-0311	RPD	Qualifiers
257035	NWTPH-Dx	mg/L	Diesel Range	0.030	0.027	11	
SDG	Method	Units	Analyte	5-W-17-0311	5-W-170-0311	RPD	Qualifiers
257035			All results w	ere non-detect.			
SDG	Method	Units	Analyte	5-W-54-0311	5-W-540-0311	RPD	Qualifiers
257035	NWTPH-Dx	mg/L	Diesel Range	0.023	0.024	4	
SDG	Method	Units	Analyte	MW-16-0311	MW-160-0311	RPD	Qualifiers
257056			All results w	ere non-detect.			
SDG	Method	Units	Analyte	2A-W-40-0311	2A-W-400-0311	RPD	Qualifiers
257056			All results w	ere non-detect.			
SDG	Method	Units	Analyte	1C-W-7-0411	1C-W-70-0411	RPD	Qualifiers
257465	NWTPH-Dx	mg/L	Diesel Range	0.060	0.070	15	
SDG	Method	Units	Analyte	1C-W-7-0511	1C-W-70-0511	RPD	Qualifiers
257749	NWTPH-Dx	mg/L	Diesel Range	0.086	0.072	18	
SDG	Method	Units	Analyte	S2-BU-0511	S20-BU-0511	RPD	Qualifiers
257895	NWTPH-Dx	mg/L	Diesel Range	0.039	0.030	26	
SDG	Method	Units	Analyte	S3-CU-0511	S30-CU-0511	RPD	Qualifiers
257895			All results w	ere non-detect.			

Continued on next page

#### **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

The following RPDs were calculated:

			•				
SDG	Method	Units	Analyte	5-W-15-0611	5-W-150-0611	RPD	Qualifiers
258246	NWTPH-Dx	mg/L	Diesel Range	0.28	0.27	4	
258246	NWTPH-Dx mg/L		Diesel Range SG	0.053	0.061	14	
258246	NWTPH-Dx	mg/L	Motor Oil Range	0.19	0.19	0	
SDG	Method	Units	Analyte	2A-W-10-0611	2A-W-100-0611	RPD	Qualifiers
258246	NWTPH-Dx	mg/L	Diesel Range	0.14	0.15	7	
258246	NWTPH-Dx	mg/L	Motor Oil Range	0.32	0.36	12	
SDG	Method	Units	Analyte	2A-W-40-0611	2A-W-400-0611	RPD	Qualifiers
258246	258246 All results were non-detect.						
SDG	Method	Method Units Analyte		1C-W-8-0711	1C-W-80-0711	RPD	Qualifiers
258667	NWTPH-Dx mg/L		Diesel Range	0.14	0.16	13	
SDG	Method	d Units Analyte 1C-W-8-0811		1C-W-8-0811	1C-W-80-0811	RPD	Qualifiers
259039	NWTPH-Dx	mg/L	Diesel Range	0.14	0.12	15	
SDG	Method	Units	Analyte	MW-4-0911	MW-40-0911	RPD	Qualifiers
259304	NWTPH-Dx	mg/L	Diesel Range	0.025	0.025	0	
SDG	Method	Units	Analyte	ZA-W-40-0911	ZA-W-400-0911	RPD	Qualifiers
259304			All results we	re non-detect.			
SDG	Method	Units	Analyte	GW-3-0911	GW-30-0911	RPD	Qualifiers
259304			All results we	re non-detect.			
SDG	Method	Units	Analyte	S4-AU-0911	S40-AU-0911	RPD	Qualifiers
259311			All results we	re non-detect.			
SDG	Method         Units         Analyte         5-W-17-0911         5-W-170-0911         RPD						
259314							

# Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).

22. Were qualitative criteria for organic target analyte identification met?	NA	Yes	NA	No	GAM	Initials
Comments: Not applicable for this level of limited data validation – Chromatograms, library searches, and quantitation reports were not supplied in analytical laboratory reports and were therefore not included in this dat review. No identification or quantitation outliers were noted by the laboratory.						
23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	х	Yes		No	GAM	Initials

Comments: 100% EDD QA/QC of positive concentrations and RLs was done as part of this limited data validation procedure. The following changes were made to the EDD file during data validation:

The data validator corrected any significant figure discrepancies between hardcopy report and EDD entries. According to validation protocol, the hardcopy data report was accepted as the correct reference.

The AECOM Environment database manager was informed of all changes made to the EDD file via this Checklist. The EDD file, with corrections made and data validation qualifiers and reason codes added was returned to the database manager in Seattle, WA on 12/08/11.

#### **ANALYTICAL LIMITED DATA VALIDATION CHECKLIST**

24. General Comments: Data were evaluated based on validation criteria set forth in the *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*; document number USEPA-540-R-08-01, June 2008, as they applied to the reported methodology. Washington State Department of Ecology (WDOE) methods were also reviewed as per *WDOE Analytical Methods for Petroleum Hydrocarbons*, ECY 97-602 of June 1997. Field duplicate RPD review and applicable control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, December 1996.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).

# Table of Qualified Analytical Results BNSF Skykomish

#### **Groundwater Samples**

# Pace Analytical (Pace-Seattle) Laboratory Reports (as listed) October 2010 - September 2011

Sample ID	Lab ID	Method	Dilution	Analyte	Concentration		Qualifier	Reason Code	
Qualified Reportab	ed Reportable Data:								
1C-W-1-0110	255839001	NWTPH-Dx	1	Diesel Range		0.044	mg/L	J	LCS, SUR
1C-W-1-0110	255839001	NWTPH-Dx	1	Motor Oil Range	<	0.094	mg/L	UJ	SUR
S3-AU-030111	256796010	NWTPH-Dx	1	Diesel Range		0.027	mg/L	J	FD
S30-AU-030111	256796011	NWTPH-Dx	1	Diesel Range	<	0.019	mg/L	UJ	FD
S4-AD-030111	256796018	NWTPH-Dx	1	Diesel Range		0.062	mg/L	J	RPD
S3-AD-0511	257895011	NWTPH-Dx	1	Diesel Range	<	0.019	mg/L	UJ	RPD
S4-CU-0511	257895021	NWTPH-Dx	1	Diesel Range		0.021	mg/L	J	RPD
EW-1-0911	259304017	NWTPH-Dx	1	Diesel Range		0.024	mg/L	U	MB
5-W-56-0911	259314011	NWTPH-Dx	1	Diesel Range		0.95	mg/L	J	HT
5-W-56-0911	259314011	NWTPH-Dx	1	Motor Oil Range		0.57	mg/L	J	HT
GW-2-0911	259314012	NWTPH-Dx	1	Diesel Range		0.043	mg/L	J	HT
GW-2-0911	259314012	NWTPH-Dx	1	Motor Oil Range	<	0.094	mg/L	UJ	HT
5-W-51-0911	259314014	NWTPH-Dx	1	Diesel Range		2.1	mg/L	J	RPD

#### (1): Data Validation Qualifiers:

- J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
- UJ: The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

#### (2): Reason Codes:

FD: Field duplicate RPD (or difference) exceeded the advisory limits.

HT: The method-specified holding time was exceeded.

MB: Contamination was detected in the method blank.

RPD: Lab duplicate RPD (or difference) exceeded the quality control limits.

SUR: Surrogate recovery was outside the quality control limits.

# Sayler Data Solutions, Inc.

## DATA VALIDATION REPORT

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Skykomish Groundwater Monitoring July – September 2012 Data

Prepared for: Farallon Consulting, LLC 975 5<sup>th</sup> Avenue NW Issaquah, Washington 98027

November 26, 2012

#### 1.0 Introduction

The following water samples were validated:

Sample ID	Sample Date/Time	LabID	Matrix	Analyses
072612-JR	07/26/12	L1213607-01	Air	TO-15, APH
082012-DK	08/20/12	L1215203-01	Air	TO-15, APH
092012-DK	09/20/12	L1217135-01	Air	TO-15, APH
1C-W-7-0712	7/26/12 10:45 AM	2513117001	Water	NWTPH-Dx
1C-W-70-0712	7/26/12 12:00 PM	2513117002	Water	NWTPH-Dx
1C-W-8-0712	7/26/12 11:36 AM	2513117003	Water	NWTPH-Dx
1C-W-1-0712	7/26/12 12:16 PM	2513117004	Water	NWTPH-Dx
IC-W-7-082012	8/20/12 12:20 PM	2513365001	Water	NWTPH-Dx
IC-W-70-082012	8/20/12 6:00 PM	2513365002	Water	NWTPH-Dx
IC-W-8-082012	8/20/12 1:13 PM	2513365003	Water	NWTPH-Dx
IC-W-1-082012	8/20/12 1:59 PM	2513365004	Water	NWTPH-Dx
5-W-14-091812	9/18/12 9:50 AM	2513615001	Water	NWTPH-Dx with silica gel
5-W-15-091812	9/18/12 10:25 AM	2513615002	Water	NWTPH-Dx,
				NWTPH-Dx with silica gel
5-W-16-091812	9/18/12 11:15 AM	2513615003	Water	NWTPH-Dx,
				NWTPH-Dx with silica gel
5-W-17-091812	9/18/12 12:15 PM	2513615004	Water	NWTPH-Dx,
				NWTPH-Dx with silica gel
5-W-18-091812	9/18/12 12:55 PM	2513615005	Water	NWTPH-Dx,
				NWTPH-Dx with silica gel
5-W-19-091812	9/18/12 1:30 PM	2513615006	Water	NWTPH-Dx,
				NWTPH-Dx with silica gel
5-W-54-091812	9/18/12 2:20 PM	2513615007	Water	NWTPH-Dx
5-W-55-091812	9/18/12 2:50 PM	2513615008	Water	NWTPH-Dx
5-W-550-091812	9/18/12 2:55 PM	2513615009	Water	NWTPH-Dx
5-W-56-091812	9/18/12 3:45 PM	2513615010	Water	NWTPH-Dx
S4-BD-091812	9/18/12 2:54 PM	2513615011	Water	NWTPH-Dx
S4-CD-091812	9/18/12 3:14 PM	2513615012	Water	NWTPH-Dx
S4-BU-091812	9/18/12 3:28 PM	2513615013	Water	NWTPH-Dx
S4-CU-091812	9/18/12 3:30 PM	2513615014	Water	NWTPH-Dx

Sample ID	Sample Date/Time	LabID	Matrix	Analyses
S4-AU-091812	9/18/12 3:52 PM	2513615015	Water	NWTPH-Dx
S4-AD-091812	9/18/12 3:56 PM	2513615016	Water	NWTPH-Dx
S3-BD-091812	9/18/12 4:50 PM	2513615017	Water	NWTPH-Dx
S3-CD-091812	9/18/12 4:50 PM	2513615018	Water	NWTPH-Dx
S3-CU-091812	9/18/12 5:10 PM	2513615019	Water	NWTPH-Dx
S3-AD-091812	9/18/12 5:36 PM	2513615020	Water	NWTPH-Dx
S30-AD-091812	9/18/12 4:00 PM	2513615021	Water	NWTPH-Dx
2A-W-9-091912	9/19/12 10:45 AM	2513621001	Water	NWTPH-Dx
2A-W-10-091912	9/19/12 11:30 AM	2513621002	Water	NWTPH-Dx
MW-4-091912	9/19/12 12:05 PM	2513621003	Water	NWTPH-Dx
MW-3-091912	9/19/12 12:40 PM	2513621004	Water	NWTPH-Dx
2B-W-4-091912	9/19/12 1:10 PM	2513621005	Water	NWTPH-Dx
MW-16-091912	9/19/12 1:45 PM	2513621006	Water	NWTPH-Dx
EW-43-091912	9/19/12 2:35 PM	2513621007	Water	NWTPH-Dx
EW-1-091912	9/19/12 2:55 PM	2513621008	Water	NWTPH-Dx
MW-38R-091912	9/19/12 3:25 PM	2513621009	Water	NWTPH-Dx
5-W-50-091912	9/19/12 4:00 PM	2513621010	Water	NWTPH-Dx
GW-4-091912	9/19/12 11:12 AM	2513621011	Water	NWTPH-Dx
EW-2A-091912	9/19/12 11:25 AM	2513621012	Water	NWTPH-Dx
2A-W-42-091912	9/19/12 12:12 PM	2513621013	Water	NWTPH-Dx
1B-W-3-091912	9/19/12 12:20 PM	2513621014	Water	NWTPH-Dx
GW-3-091912	9/19/12 12:55 PM	2513621015	Water	NWTPH-Dx
1B-W-2-091912	9/19/12 1:58 PM	2513621016	Water	NWTPH-Dx
1B-W-23-091912	9/19/12 1:45 PM	2513621017	Water	NWTPH-Dx
2A-W-41-091912	9/19/12 2:55 PM	2513621018	Water	NWTPH-Dx
1A-W-4-091912	9/19/12 3:20 PM	2513621019	Water	NWTPH-Dx
1A-W-40-091912	9/19/12 8:00 PM	2513621020	Water	NWTPH-Dx
2A-W-40-091912	9/19/12 3:40 PM	2513621021	Water	NWTPH-Dx
S3-BU-091912	9/19/12 4:22 PM	2513621022	Water	NWTPH-Dx
S30-BU-091912	9/19/12 11:59 PM	2513621023	Water	NWTPH-Dx
S3-AU-091912	9/19/12 4:25 PM	2513621024	Water	NWTPH-Dx
S2-AU-091912	9/19/12 4:56 PM	2513621025	Water	NWTPH-Dx
S2-BD-091912	9/19/12 4:55 PM	2513621026	Water	NWTPH-Dx
S2-AD-091912	9/19/12 5:10 PM	2513621027	Water	NWTPH-Dx
S2-BU-091912	9/19/12 5:15 PM	2513621028	Water	NWTPH-Dx
S20-BU-091912	9/19/12 5:00 PM	2513621029	Water	NWTPH-Dx
S1-BD-091912	9/19/12 5:41 PM	2513621030	Water	NWTPH-Dx
S1-AD-091912	9/19/12 5:42 PM	2513621031	Water	NWTPH-Dx
S1-AU-091912	9/19/12 5:55 PM	2513621032	Water	NWTPH-Dx
S1-BU-091912	9/19/12 5:55 PM	2513621033	Water	NWTPH-Dx
IC-W-8-092012	9/20/12 9:30 AM	2513629001	Water	NWTPH-Dx
IC-WO-8-092012	9/20/12 9:40 AM	2513629002	Water	NWTPH-Dx
IC-W-7-092012	9/20/12 10:30 AM	2513629003	Water	NWTPH-Dx
W-1-092012	9/20/12 11:15 AM	2513629004	Water	NWTPH-Dx
IC-W-3-092012	9/20/12 12:00 PM	2513629005	Water	NWTPH-Dx
IC-W-4-092012	9/20/12 1:00 PM	2513629006	Water	NWTPH-Dx
GW-2-092012	9/20/12 1:50 PM	2513629007	Water	NWTPH-Dx
GW-1-092012	9/20/12 2:40 PM	2513629008	Water	NWTPH-Dx

A stage 2A summary validation was performed on the analytical results including both the hardcopy (portable document format) and electronic data deliverable, earning EPA OSWER validation label code S2AVEM. Validation was performed by Cari Sayler.

Data qualifiers are assigned based only on the criteria reviewed and do not include calibration or instrument performance issues unless noted in the laboratory narrative. Data qualifiers are listed in section 6.0 below.

#### 2.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

<u>Sample analysis frequencies:</u> Monthly sampling currently includes samples from three water sample locations and one air sample location. Quarterly sampling includes 22 additional water sample locations, and semi-annual sampling includes 32 additional water samples. However, no sample was required at location 5-W-43 due to the presence of product.

All intended samples were collected except for samples 5-W-43, and 5-W-51. The required analysis was completed by the laboratory for each collected sample except for the TPH without silica gel analysis on sample 5-W-14-091812.

<u>Analysis methods</u>: Water samples were analyzed by method NWTPH-Dx and prepared by methods SW3510. Six water samples were also analyzed for NWTPH-Dx with silica gel cleanup. Air samples were analyzed by EPA method TO-15SIM and MA-DEP method APH. These methods are approved EPA methods and therefore meet comparability requirements.

<u>Precision, accuracy and completeness:</u> Except for replaced results, no data were rejected and no qualifiers were assigned. Precision and accuracy were considered acceptable based on the available quality control samples. Data completeness was tabulated as follows:

	# Intended		
Analysis	Samples	Samples	Completeness
NWTPH-Dx	62	59	95.2%
NWTPH-DX with silica gel	6	6	100%
T0-15SIM	3	3	100%
APH	3	3	100%
Total, all analyses	74	71	95.9%

The overall data completeness of 95.9% meets the project goal of 90%.

#### 3.0 Diesel Range Petroleum Hydrocarbon Analysis - Water

<u>Quality control analysis frequencies:</u> The method specifies that a method blank must be analyzed one per analytical batch or one per twenty samples, whichever is more frequent and a laboratory duplicate must be analyzed one per ten samples. In addition, surrogate compounds must be measured in each field and quality control sample.

Each batch included a method blank, LCS, and laboratory duplicate, as well as appropriate surrogates.

<u>Holding times:</u> Unpreserved water samples must be extracted within 7 days of collection. Preserved water samples must be extracted within 14 days of collection. Extracts must be analyzed within 40 days of extraction. All samples were extracted and analyzed within holding time.

<u>Laboratory blank results</u>: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target analytes were detected in the method blanks.

<u>Surrogate recoveries:</u> Laboratory control limits ranged were 50-150%. Surrogate recoveries were within limits.

<u>LCS recoveries:</u> Laboratory control limits ranged from 51-114 to 69-124%. LCS recoveries were within limits.

<u>Laboratory duplicate RPDs:</u> The laboratory control limit for RPDs ranged from 36 to 42%. Laboratory duplicate RPDs were within limits with one exception:

QC ID	Analyte	RPD	Lab Control Limit
1C-W-7-0712DUP LR	Diesel Range	46	36

The duplicate concentrations are below five times the reporting limit, and within +/-two times the reporting limit of the sample concentration, and variability is considered acceptable. No qualifiers are assigned.

<u>Field duplicate RPDs:</u> For concentrations below five times the reporting limits, concentrations were within +/- two times the reporting limit. For concentrations above five times the reporting limit, RPDs were below 50%.

Reporting limits: The reporting limit goals are 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons. These goals were met for diesel range hydrocarbons. Reporting limits for motor oil range hydrocarbons ranged from 0.95 to 0.28 with the reporting limit exceeding 0.1 mg/L in all but six of the samples. No qualifiers are assigned on the basis of elevated reporting limits.

<u>Laboratory narrative and flags:</u> No additional qualifiers were assigned based on a review of the laboratory narrative or data flags.

Diesel range petroleum hydrocarbon data are acceptable for use as reported.

#### 4.0 Petroleum Hydrocarbon Analysis - Air

<u>Quality control analysis frequencies:</u> The method specifies that a method blank, a laboratory control sample, and a laboratory duplicate must be analyzed once per 24 hour batch.

Each batch included a method blank, LCS, and laboratory duplicate.

<u>Holding times:</u> Air samples must be analyzed within 30 days of sampling. All analyses were analyzed within holding time.

<u>Laboratory blank results</u>: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. Naphthalene and C12 hydrocarbons can be < 2 times the PQL. No target analytes were detected in the method blanks.

<u>LCS recoveries</u>: LCS recoveries were within the method specified range of 50-150% for naphthalene and 70-130% limits for all other compounds.

<u>Laboratory duplicate RPDs:</u> Duplicate RPDs were the method specified limit of <30%.

<u>Multiple analysis results:</u> Three analytes, 1,3-Butadiene, Benzene, and Naphthalene, were re-analyzed by method TO-15 in order to achieve lower reporting limits. None of these three analytes were detected in either analysis of any sample. The higher reporting limit result has been qualified "R2", replaced by another result.

<u>Laboratory narrative and flags:</u> No additional qualifiers were assigned based on a review of the laboratory narrative or data flags.

Air petroleum hydrocarbon data are qualified for use as reported.

#### 5.0 Volatile Organic Analysis - Air

<u>Quality control analysis frequencies:</u> The method specifies that a method blank, a laboratory control sample, and a laboratory duplicate must be analyzed once per 24 hour batch.

Each batch included a method blank, LCS, and laboratory duplicate.

<u>Holding times:</u> Air samples must be analyzed within 30 days of sampling. All analyses were analyzed within holding time.

<u>Laboratory blank results</u>: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target analytes were detected in the method blanks.

<u>Laboratory blank results</u>: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. Naphthalene and C12 hydrocarbons can be < 2 times the PQL. No target analytes were detected in the method blanks.

<u>LCS recoveries</u>: LCS recoveries were within the method specified range of 50-150% for naphthalene and 70-130% limits for all other compounds.

<u>Laboratory duplicate RPDs:</u> Duplicate RPDs were the method specified limit of <30%.

<u>Laboratory narrative and flags:</u> No additional qualifiers were assigned based on a review of the laboratory narrative or data flags.

Air volatile organic data are acceptable for use as reported.

#### 6.0 Validation Qualifiers

Sample ID	Analyte(s)	Qualifier	Reason
Petroleum Hy	drocarbon Analysis - Air		
072612-JR	1,3-Butadiene, Benzene, Naphthalene	R2	Result available from another method
082012-DK	1,3-Butadiene, Benzene, Naphthalene	R2	Result available from another method
092012-DK	1,3-Butadiene, Benzene, Naphthalene	R2	Result available from another method

#### 7.0 Abbreviations and Definitions

<b>DV</b> Qualifier	Definition
U Quanner	The material was analyzed for, but was not detected above the
U	level of the associated value. The associated value is either the
	sample reporting limit or the amount of contaminant detected in the
	sample.
J	The analyte was positively identified. The associated numerical
	value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is
	presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The
	associated value is an estimate and may be inaccurate or
	imprecise.
R	The sample result is rejected. The presence or absence of the
1	analyte cannot be verified and data are not usable.
R1	·
ΚI	The sample result has been replaced by a more reliable or more
DO	conservative result.
R2	The sample result has been replaced by a result from a different
	analysis method.
<u>Abbreviation</u>	<u>Definition</u>
DV	Data Validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate
RL	Reporting limit
RPD	Relative percent difference
RSD	Relative standard deviation
NOD	Relative Standard deviation

#### 8.0 References

USEPA Contract Laboratory Program National Functional Guidelines For Superfund Organic Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, June 2008, USEPA-540-R-008-01.

USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.

# Sayler Data Solutions, Inc.

## DATA VALIDATION REPORT

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Skykomish Groundwater Monitoring October – December 2012 Data

Prepared for: Farallon Consulting, LLC 975 5<sup>th</sup> Avenue NW Issaquah, Washington 98027

March 21, 2012

#### 1.0 Introduction

The following samples were validated:

Sample ID	Sample Date/Time	Lab ID	Matrix	Analyses
101012-DK	10/10/12 3:48 PM	L1218555-01	Air	APH, TO-15
112112-DK	11/21/12 4:23 PM	L1221557-01	Air	APH, TO-15
122712-DK	12/27/12 4:52 PM	L1300286-01	Air	APH, TO-15
1C-W-7-101012	10/10/12 1:56 PM	2513834001	Water	NWTPH-Dx
1C-W-8-101012	10/10/12 2:46 PM	2513834002	Water	NWTPH-Dx
1C-W-1-101012	10/10/12 3:10 PM	2513834003	Water	NWTPH-Dx
1C-W-70-101012	10/10/12 5:00 PM	2513834004	Water	NWTPH-Dx
1C-W-7-112112	11/21/12 10:10 AM	10213827001	Water	NWTPH-Dx
1C-W-8-112112	11/21/12 11:15 AM	10213827003	Water	NWTPH-Dx
1C-W-1-112112	11/21/12 11:42 AM	10213827004	Water	NWTPH-Dx
1C-W-70-112112	11/21/12 5:00 PM	10213827002	Water	NWTPH-Dx
1C-W-8-122712	12/27/12 9:50 AM	10216650001	Water	NWTPH-Dx
1C-W-1-122712	12/27/12 10:30 AM	10216650002	Water	NWTPH-Dx
1C-W-7-122712	12/27/12 11:15 AM	10216650004	Water	NWTPH-Dx
5-W-19-122712	12/27/12 11:15 AM	10216650003	Water	NWTPH-Dx
5W-16-122712	12/27/12 11:18 AM	10216650006	Water	NWTPH-Dx
5W-16D-122712	12/27/12 11:18 AM	10216650007	Water	NWTPH-Dx
1C-WO-7-122712	12/27/12 11:20 AM	10216650005	Water	NWTPH-Dx
5W-15-122712	12/27/12 12:05 PM	10216650008	Water	NWTPH-Dx
5-W-17-122712	12/27/12 12:10 PM	10216650009	Water	NWTPH-Dx
GW-4-122712	12/27/12 12:15 PM	10216650010	Water	NWTPH-Dx
2A-W-42-122712	12/27/12 1:10 PM	10216650011	Water	NWTPH-Dx
5-W-18-122712	12/27/12 1:30 PM	10216650012	Water	NWTPH-Dx
5-W-14-122712	12/27/12 1:40 PM	10216650013	Water	NWTPH-Dx
GW-3-122712	12/27/12 1:50 PM	10216650014	Water	NWTPH-Dx
2A-W-9-122712	12/27/12 1:55 PM	10216650015	Water	NWTPH-Dx
GW-2-122712	12/27/12 2:30 PM	10216650016	Water	NWTPH-Dx
GW-1-122712	12/27/12 2:35 PM	10216650017	Water	NWTPH-Dx
1B-W-23-122712	12/27/12 2:45 PM	10216650018	Water	NWTPH-Dx

Sample ID	Sample Date/Time	Lab ID	Matrix	Analyses
2A-W-41-122712	12/27/12 3:30 PM	10216650019	Water	NWTPH-Dx
2A-W-10-122712	12/27/12 3:50 PM	10216650020	Water	NWTPH-Dx
2B-W-4-122712	12/27/12 4:42 PM	10216650022	Water	NWTPH-Dx
MW-3-122712	12/27/12 4:55 PM	10216650023	Water	NWTPH-Dx
MW-4-122712	12/27/12 4:55 PM	10216650024	Water	NWTPH-Dx
2A-W-100-122712	12/27/12 5:05 PM	10216650021	Water	NWTPH-Dx

A stage 2A summary validation was performed on the analytical results including both the hardcopy (portable document format) and electronic data deliverable, earning EPA OSWER validation label code S2AVEM. Validation was performed by Cari Sayler.

Data qualifiers are assigned based only on the criteria reviewed and do not include calibration or instrument performance issues unless noted in the laboratory narrative. Data qualifiers are listed in section 6.0 below.

#### 2.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

<u>Sample analysis frequencies:</u> Monthly sampling currently includes samples from three water sample locations and one air sample location. Quarterly sampling includes 22 additional water sample locations, and semi-annual sampling includes 32 additional water samples. This event did not include the semi-annual samples.

Intended samples were collected with 4 exceptions: Field notes indicate samples 2A-W-40, 5-W-43, EW-1 and EW-2A were unable to be collected due to snow. The required analyses were completed by the laboratory for each collected sample.

<u>Analysis methods</u>: Water samples were analyzed by method NWTPH-Dx and prepared by methods SW3510. Air samples were analyzed by EPA method TO-15SIM and MA-DEP method APH. These methods are approved EPA methods and therefore meet comparability requirements.

<u>Precision, accuracy and completeness:</u> Except for replaced results, no data were rejected and no qualifiers were assigned. Precision and accuracy were considered acceptable based on the available quality control samples. Data completeness was tabulated as follows:

	# Intended	# Completed	%
Analysis	Samples	Samples	Completeness
NWTPH-Dx	31	27	87.1%
T0-15SIM	3	3	100%
APH	3	3	100%
Total, all analyses	37	33	89.2%

The overall data completeness of 89.2% is slightly under the project goal of 90%.

#### 3.0 Diesel Range Petroleum Hydrocarbon Analysis - Water

Quality control analysis frequencies: The method specifies that a method blank must be analyzed one per analytical batch or one per twenty samples, whichever is more

frequent and a laboratory duplicate must be analyzed one per ten samples. In addition, surrogate compounds must be measured in each field and quality control sample.

Each batch included a method blank, LCS, as well as appropriate surrogates. One batch included a non-project laboratory duplicate and the remaining three batches included a LCSD. No qualifiers are added on the basis of the missing laboratory duplicates.

<u>Holding times:</u> Unpreserved water samples must be extracted within 7 days of collection. Preserved water samples must be extracted within 14 days of collection. Extracts must be analyzed within 40 days of extraction. All samples were extracted and analyzed within holding time.

<u>Laboratory blank results</u>: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target analytes were detected in the method blanks.

<u>Surrogate recoveries:</u> Laboratory control limits ranged were 50-150%. Surrogate recoveries were within limits.

<u>LCS recoveries:</u> Laboratory control limits ranged from 50-150 to 62-120%. LCS recoveries were within limits.

<u>LCS/LCSD RPDs:</u> The laboratory control limit for RPDs was 20%. RPDs were within limits with one exception:

QC ID	Analyte	RPD	Lab Control Limit
1344390-LCS/LCSD	Diesel Range	26	20

Diesel range hydrocarbons were not detected in the associated samples, and no qualifiers were required.

<u>Laboratory duplicate RPDs:</u> The non-project laboratory duplicate demonstrated acceptable laboratory precision.

<u>Field duplicate RPDs:</u> For concentrations below five times the reporting limits, concentrations were within +/- two times the reporting limit. For concentrations above five times the reporting limit, RPDs were below 50%.

Reporting limits: The reporting limit goals are 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons. These limits were exceeded in the following samples:

Sample ID	Analyte	Reporting Limit (mg/L)
1B-W-23-122712	Diesel Range Hydrocarbons	0.11
1B-W-23-122712	Oil Range Hydrocarbons	0.11
1C-W-1-101012	Diesel Range Hydrocarbons	0.15
1C-W-1-101012	Oil Range Hydrocarbons	0.75
1C-W-1-112112	Diesel Range Hydrocarbons	0.4
1C-W-1-112112	Oil Range Hydrocarbons	0.4

Sample ID	Analyte	Reporting Limit (mg/L)
1C-W-7-101012	Diesel Range Hydrocarbons	0.15
1C-W-7-101012	Oil Range Hydrocarbons	0.75
1C-W-7-112112	Diesel Range Hydrocarbons	0.4
1C-W-7-112112	Oil Range Hydrocarbons	0.4
1C-W-8-101012	Oil Range Hydrocarbons	0.75
1C-W-8-112112	Diesel Range Hydrocarbons	0.4
1C-W-8-112112	Oil Range Hydrocarbons	0.4
5W-16-122712	Oil Range Hydrocarbons	0.41
GW-3-122712	Diesel Range Hydrocarbons	0.11
GW-3-122712	Oil Range Hydrocarbons	0.11

No qualifiers are assigned on the basis of elevated reporting limits.

<u>Laboratory narrative and flags:</u> No additional qualifiers were assigned based on a review of the laboratory narrative or data flags.

Diesel range petroleum hydrocarbon data are acceptable for use as reported.

#### 4.0 Petroleum Hydrocarbon Analysis - Air

<u>Quality control analysis frequencies:</u> The method specifies that a method blank, a laboratory control sample, and a laboratory duplicate must be analyzed once per 24 hour batch.

Each batch included a method blank and LCS. Two of the three batches included a laboratory duplicate. No qualifiers are added based on the absence of the lab duplicate.

<u>Holding times:</u> Air samples must be analyzed within 30 days of sampling. All analyses were analyzed within holding time.

<u>Laboratory blank results</u>: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. Naphthalene and C12 hydrocarbons can be < 2 times the PQL. No target analytes were detected in the method blanks.

<u>LCS recoveries</u>: LCS recoveries were within the method specified range of 50-150% for naphthalene and 70-130% limits for all other compounds.

<u>Laboratory duplicate RPDs:</u> Duplicate RPDs were the method specified limit of <30%.

<u>Multiple analysis results:</u> Three analytes, 1,3-Butadiene, Benzene, and Naphthalene, were re-analyzed by method TO-15 in order to achieve lower reporting limits. Naphthalene was not detected in the either analysis of any sample. Benzene and 1,3-butadiene was detected in the TO-15 analysis at levels below the APH reporting limit. The higher reporting limit result has been qualified "R2", replaced by another result.

<u>Laboratory narrative and flags:</u> No additional qualifiers were assigned based on a review of the laboratory narrative or data flags.

Air petroleum hydrocarbon data are qualified for use as qualified.

#### 5.0 Volatile Organic Analysis - Air

<u>Quality control analysis frequencies:</u> The method specifies that a method blank, a laboratory control sample, and a laboratory duplicate must be analyzed once per 24 hour batch.

Each batch included a method blank and LCS. One of the three batches included a laboratory duplicate. No qualifiers are added based on the absence of the lab duplicate.

<u>Holding times:</u> Air samples must be analyzed within 30 days of sampling. All analyses were analyzed within holding time.

<u>Laboratory blank results</u>: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target analytes were detected in the method blanks.

<u>LCS recoveries</u>: LCS recoveries were within the method specified range of 50-150% for naphthalene and 70-130% limits for all other compounds.

<u>Laboratory duplicate RPDs:</u> Duplicate RPDs were the method specified limit of <30%.

<u>Laboratory narrative and flags:</u> No additional qualifiers were assigned based on a review of the laboratory narrative or data flags.

Air volatile organic data are acceptable for use as reported.

#### 6.0 Validation Qualifiers

Sample ID	Analyte(s)	Qualifier	Reason
Petroleum Hy	drocarbon Analysis - Air		
101012-DK	1,3-Butadiene, Benzene, Naphthalene	R2	Result available from another method
112112-DK	1,3-Butadiene, Benzene, Naphthalene	R2	Result available from another method
122712-DK	1,3-Butadiene, Benzene, Naphthalene	R2	Result available from another method

#### 7.0 Abbreviations and Definitions

DV Qualifier	<u>Definition</u>
U	The material was analyzed for, but was not detected above the
	level of the associated value. The associated value is either the
	sample reporting limit or the amount of contaminant detected in the
	sample.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
	value is the approximate concentration of the analyte in the sample.

DV Qualifier	<u>Definition</u>
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.
R1	The sample result has been replaced by a more reliable or more conservative result.
R2	The sample result has been replaced by a result from a different analysis method.
Abbreviation	Definition
DV	Data Validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate
RL	Reporting limit

#### 8.0 References

RPD

RSD

USEPA Contract Laboratory Program National Functional Guidelines For Superfund Organic Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, June 2008, USEPA-540-R-008-01.

Relative percent difference Relative standard deviation

USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.