

2022 ANNUAL LONG-TERM MONITORING REPORT

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

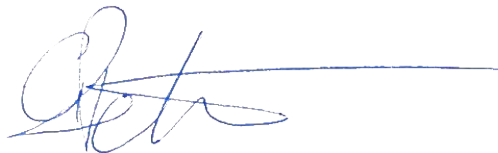
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ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Environment
BNSF	BNSF Railway Company
CPOC	conditional point of compliance
CUL	the site-specific NWTPH-Dx groundwater cleanup level of 208 micrograms per liter and absence of sheen
DO	dissolved oxygen
DRO	total petroleum hydrocarbons as diesel-range organics
Ecology	Washington State Department of Ecology
Farallon	Farallon Consulting, L.L.C.
HCC	hydraulic control and containment
HWF	hot water flushing
LNAPL	light nonaqueous-phase liquid
LTM program	long-term monitoring program
MDL	method detection limit
mg/l	milligrams per liter
NWTPH-Dx	the sum of diesel- and oil-range organics analyzed using Ecology Method NWTPH-Dx
ORP	oxidation-reduction potential
µg/l	micrograms per liter
ORO	total petroleum hydrocarbons as oil-range organics
RL	the site-specific NWTPH-Dx groundwater remediation level of 477 µg/l and absence of sheen
UCL	Upper Confidence Limit



EXECUTIVE SUMMARY

The *2022 Annual Long-Term Monitoring Report* summarizes the long-term groundwater monitoring activities conducted in 2022 at the BNSF Railway Company (BNSF) Former Maintenance and Fueling Facility in Skykomish, Washington (herein referred to as the Site). Site-wide groundwater monitoring was conducted in June and October 2022 in general accordance with the *Final Long-Term Monitoring Plan* (Farallon 2020; Washington State Department of Ecology [Ecology] 2020). Historically (2010 to 2020), quarterly and semiannual groundwater monitoring and sampling were performed at the Site in accordance with the *2010 Compliance Monitoring Plan*, with a full network of 104 wells. The Site transitioned to semiannual groundwater monitoring in 2020, with a reduced well network of 38 wells. As part of implementation of the *Final Long-Term Monitoring Plan*, 25 wells were decommissioned in 2021. Groundwater samples collected during the monitoring events were analyzed for total petroleum hydrocarbons as diesel-range and oil-range organics (herein referred to collectively as NWTPH-Dx) using Ecology Method NWTPH-Dx.

Groundwater flow direction in 2022 generally was consistent with prior years. South of the hydraulic control and containment (HCC) system barrier wall (i.e., up-gradient), the groundwater flow direction is predominantly toward the west-northwest. North of the HCC system barrier wall (i.e., down-gradient), groundwater flow direction is toward the northwest.

Light nonaqueous-phase liquid (LNAPL) was observed in recovery wells up-gradient of and adjacent to the HCC system barrier wall, between the West Gate and Center Gate, which is consistent with prior years; measured LNAPL observations ranged from a light trace (i.e., less than 0.01 foot thick and thin coating of LNAPL and/or a sheen observed on the oil-water interface probe) to 2.12 feet thick. Over the life cycle of the data record, measured LNAPL thicknesses have exhibited an overall decreasing or stable trend, with some minor variability.

The site-specific NWTPH-Dx groundwater cleanup level (CUL) of 208 micrograms per liter ($\mu\text{g/l}$) and absence of sheen is applicable at the groundwater conditional point of compliance, defined as the point where groundwater enters the Skykomish River. Compliance with the CUL is assessed using monitoring wells in the Levee Zone adjacent to the Skykomish River. Compliance with the CUL was met at the conditional point of compliance in 2022.

The site-specific NWTPH-Dx groundwater remediation level of 477 $\mu\text{g/l}$ and absence of sheen (RL) is applicable from the BNSF railyard boundary to the groundwater conditional point of compliance, with the exception of the Skykomish School, where the RL is not required to be met (Ecology 2007). Reported NWTPH-Dx concentrations in the groundwater samples collected from monitoring wells north of the BNSF railyard and outside the Levee Zone were less than the RL, except for the sample collected from HCC system monitoring well 2A-W-41 in October 2022. NWTPH-Dx was detected at concentration of 780 $\mu\text{g/l}$ which exceeds the RL in the in the non-silica gel-prepared groundwater sample collected from monitoring well 2A-W-41 in October 2022.



NWTPH-Dx was detected at a concentration of 136 µg/l which is less than the RL in the non-silica gel-prepared groundwater sample collected in June 2022. NWTPH-Dx was not detected in June 2022 but was detected at a concentration of 460 µg/l in the non-silica gel-prepared groundwater samples collected from gate well GW-3 in October 2022. The groundwater samples collected from monitoring well 2A-W-41 and gate well GW-3 in June and October 2022 were analyzed by Ecology Method NWTPH-Dx, both with and without a silica gel cleanup preparation process. NWTPH-Dx concentrations in all the silica gel-prepared samples were less than the RL. Biofouling observations have been noted proximate to gate well GW-3 and up-gradient of monitoring well 2A-W-41 for approximately 8 years, and results of the analyses performed with and without silica gel cleanup demonstrate that the non-silica gel-prepared samples are biased high due to biogenic or petroleum metabolite interferences and that breakthrough of groundwater containing NWTPH-Dx greater than the RL is not occurring. Groundwater samples collected from gate well GW-3 and monitoring well 2A-W-41 will continue to be analyzed both with and without silica gel cleanup to gain additional perspective on biogenic or petroleum metabolite interference.

As required under the *Final Long-Term Monitoring Plan*, a statistical analysis of the groundwater analytical data was performed to evaluate whether cleanup actions are meeting the objectives established in the Consent Decree and whether modifications to the long-term monitoring program are warranted. The statistical evaluation consisted of calculating the NWTPH-Dx concentration 95 percent Upper Confidence Limit and the Mann-Kendall Trend Test for Plume Stability from Ecology's *Natural Attenuation Analysis Tool Package for Petroleum-Contaminated Ground Water* (Ecology 2005). The statistical evaluation was conducted in accordance with Section 720(9) of Chapter 173-340 of the Washington Administrative Code. Statistical analysis of the analytical results indicates that the cleanup objectives for the Site are being met. Additionally, based on the statistical analysis, groundwater sampling at monitoring wells 1C-W-7 and MW-4 are eligible to be discontinued in accordance with the applicable Decision Rules presented in the *Final Long-Term Monitoring Plan*. It is recommended for long-term monitoring program optimization that groundwater sampling at monitoring wells 1C-W-7 and MW-4 be discontinued beginning in 2023.



1.0 INTRODUCTION

The *2022 Annual Long-Term Monitoring Report* summarizes the long-term groundwater monitoring activities conducted in 2022 at the BNSF Railway Company (BNSF) Former Maintenance and Fueling Facility in Skykomish, Washington (herein referred to as the Site) (Figure 1). Site-wide groundwater monitoring was conducted in June and October 2022 in accordance with the *Final Long-Term Monitoring Plan* (Farallon 2020; *Final Long-Term Monitoring Plan*).

Quality control and quality assurance issues (i.e., method blank detections of target analytes, out-of-criteria laboratory control sample and surrogate recoveries) were identified in the analytical report provided by the analytical laboratory for the March 2022 samples. Due to the laboratory quality control and quality assurance issues, the data was deemed unsuitable for use and rejected. None of the March groundwater monitoring sampling data was relied upon. The site-wide groundwater monitoring and sampling event was performed again in June 2022 and replaces the data collected in March 2022.

Wildfire activity in the immediate area of the Site resulted in restricted access to the Site and potentially hazardous Site conditions during September 2022 and part of October 2022. The semiannual groundwater monitoring event typically conducted in September 2022 was postponed until October 2022.

1.1 SITE DESCRIPTION

The Site includes BNSF property and public and private properties in the Town of Skykomish in King County, Washington, and encompasses an area of approximately 40 acres (Figure 1). The Site is bounded by the Skykomish River to the north, the Town of Skykomish city limits to the east, Old Cascade Highway to the south, and Former Maloney Creek to the west. Railroad Avenue separates the BNSF railyard from the main commercial district of the Town of Skykomish (Figure 1). Additional Site history and background information are presented in the *Consent Decree Supplemental Remedial Investigation, Volume 1* (The RETEC Group, Inc. 2002); *2007 Cleanup Action Plan* (Washington Department of Ecology [Ecology] 2007); and *2017 Hot Water Flushing Remediation Performance Report* (Farallon 2018).

1.2 SUMMARY OF CLEANUP ACTIONS

In 1991, BNSF initiated a Remedial Investigation/Feasibility Study of the Skykomish railyard in accordance with the Washington State Model Toxics Control Act Cleanup Regulation (MTCA). In 1993, Ecology and BNSF signed Agreed Order No. DE 91TC-N213, which included a Remedial Investigation/Feasibility Study Work Plan and a requirement to evaluate potential interim actions for recovering petroleum hydrocarbons. In July 2001, Ecology and BNSF signed Agreed Order No. DE 01TCPNR-2800 for an interim action to reduce petroleum seeps into the Skykomish River. In May 2006, Ecology and BNSF signed Agreed Order No. DE 3279 for an interim action to remediate soil, groundwater, and sediment in the Levee Zone (west of the 5th Street Bridge and



north of West River Road), in the adjacent Skykomish River, and on adjacent upland properties south of West River Road and north of the Skykomish School.

In October 2007, BNSF and Ecology signed a Consent Decree, which finalized the *2007 Cleanup Action Plan*. In 2008, BNSF initiated cleanup actions pursuant to the Consent Decree. Cleanup actions consisted of the following activities:

- Excavation of contaminated soil from most of the Town of Skykomish north of the BNSF railyard and areas south and west of the railyard (including moving structures to excavate soil beneath them);
- Excavation of a minimum of 7,500 cubic yards of contaminated soil from the BNSF railyard;
- Operation of an air sparging system north of the northeastern portion of the BNSF railyard;
- Operation of a hydraulic control and containment (HCC) system that included installation of a sheet pile barrier wall with treatment gates separating the BNSF railyard from the Town of Skykomish to the north;
- Operation of recovery wells in the BNSF railyard and around the Skykomish School property to remove light nonaqueous-phase liquid (LNAPL); and
- Operation of a hot water flushing (HWF) system at the Skykomish School property.

Detailed information about cleanup actions completed under the Consent Decree is presented in multiple as-built completion reports, HCC operations reports, HCC optimization reports, HWF operations reports, and groundwater monitoring reports submitted to Ecology from 2006 through 2020.

1.3 CLEANUP LEVELS AND REMEDIATION LEVELS

The Site-specific groundwater cleanup level (CUL) established in the *2007 Cleanup Action Plan* for total petroleum hydrocarbon concentrations, defined as the sum of total petroleum hydrocarbons as diesel-range organics (DRO) and oil-range organics (ORO) analyzed using Ecology Method NWTPH-Dx (herein referred to collectively as NWTPH-Dx), is 208 micrograms per liter ($\mu\text{g/l}$) and the absence of sheen. The CUL is applicable at the groundwater conditional point of compliance (CPOC), defined as the surface water boundary where groundwater enters the Skykomish River and Former Maloney Creek. The basis for the CUL is protection of sediments from being adversely impacted by groundwater. Compliance with the CUL currently is assessed using monitoring wells in the Levee Zone adjacent to the Skykomish River (Figure 1). Based on historical groundwater elevation and hydraulic gradient data, groundwater does not flow toward or discharge to Former Maloney Creek (Farallon 2020).

The Site-specific groundwater remediation level (RL) for NWTPH-Dx is 477 $\mu\text{g/l}$ and absence of sheen. The RL is applicable from the BNSF railyard boundary to the groundwater CPOC, except



for the Skykomish School property, and is used to assess groundwater quality in areas of the Site north of the BNSF railyard boundary and outside the Levee Zone (Figure 1).

Per Consent Decree No. 07-2-33672-9 SEA dated October 2007 (Consent Decree), there may be isolated areas outside of the BNSF railyard boundary where the RL cannot be achieved. “Ecology will not require the remediation level be met beneath and down-gradient of such isolated areas” (e.g., the Skykomish School property), but the CUL must still be met at the CPOC in the Levee Zone (Figure 1). Contingency treatment methods will be employed at the groundwater CPOC if a sheen, or NWTPH-Dx concentrations exceeding 208 µg/l, are reported in groundwater samples at the CPOC.

1.4 HCC SYSTEM OPERATION AND MAINTENANCE MONITORING

The HCC system and monitoring locations that are used to assess the operation and performance of the HCC system are described in the *2011 Operation and Maintenance Manual for the Hydraulic Control and Containment System* (AECOM Environment 2011, *2011 Operation and Maintenance Manual*) and the *2014 Addendum to the Operation and Maintenance Manual for the Hydraulic Control and Containment System* (Farallon 2014, *2014 Addendum*). HCC system monitoring locations include 11 HCC system monitoring wells (gate wells GW-1 through GW-4; end wells EW-1 and EW-2A; and monitoring wells 5-W-43, 2A-W-40, 2A-W-41, 1B-W-23, and 2A-W-42), 20 sentry wells, 14 piezometers, and several HCC system gate vaults. HCC system monitoring locations were monitored in accordance with the *2011 Operation and Maintenance Manual* and the *2014 Addendum*. HCC system monitoring wells were sampled quarterly in March, June, October, and December 2022, and the sentry wells were sampled semiannually in June and October 2022. Results of HCC system groundwater monitoring are presented under separate cover in the *2022 Annual HCC System Operations Report*.

1.5 GROUNDWATER MONITORING OBJECTIVES

The objective of groundwater monitoring and sampling under the *Final Long-Term Monitoring Plan* is to confirm the long-term effectiveness of the cleanup actions by demonstrating compliance with the site-specific NWTPH-Dx groundwater CUL at the CPOC monitoring wells located within the Levee Zone, and that the site-specific RL is being met at monitoring wells between the BNSF railyard boundary and the CPOC wells, with the exception of monitoring wells located at the Skykomish School property (Ecology 2007).

To meet this objective, the long-term monitoring program (LTM program) consists of the following activities:

- Collection of groundwater samples for analysis of NWTPH-Dx and to assess the presence of sheen to confirm that Site groundwater quality complies with the CUL and the RL at the respective points of compliance (Levee Zone and areas north of the BNSF railyard boundary, respectively);



- Collection of LNAPL data (presence and thickness) to characterize the extent of LNAPL at the Site;
- Measurement of groundwater elevations to characterize hydraulic gradients and groundwater flow directions at the Site;
- Statistical analysis of groundwater analytical data to evaluate compliance that the CUL is being met at the CPOC; and
- Evaluation of natural source zone depletion to estimate the rate of natural source zone depletion occurring in the BNSF railyard.

1.6 REPORT ORGANIZATION

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

- **Section 2: Groundwater Monitoring Well Network** describes the monitoring well network;
- **Section 3: Sampling, Analysis, and Reporting** describes the groundwater sampling methods, laboratory analysis and reporting procedures, and data management and validation protocols used;
- **Section 4: Results and Discussion** describes the results from the groundwater monitoring, including groundwater levels and flow directions, field parameters, and groundwater analytical results;
- **Section 5: Statistical Evaluation** describes the statistical evaluation approach that will be used to assess compliance that the Site-specific CUL is being met at the CPOC;
- **Section 6: Long-Term Monitoring Program Optimization, Modification, and Termination** describes how the statistical evaluation results are used and provides recommendations for LTM program optimization;
- **Section 7: Conclusions** provides conclusions based on the groundwater monitoring results; and
- **Section 8: References** provides a list of the documents used in preparing this report.



2.0 GROUNDWATER MONITORING WELL NETWORK

The network of wells used for the LTM program was established in the *Final Long-Term Monitoring Plan*, as described below.

A total of 19 monitoring well locations were selected for long-term monitoring of NWTPH-Dx, based on the following objectives:

- To verify compliance with the CUL at the CPOC (i.e., Levee Zone wells);
- To demonstrate the RL is being met north of the BNSF railyard boundary and outside the Levee Zone, except in isolated areas such as the Skykomish School, as noted in the *2007 Cleanup Action Plan*;
- To provide spatial coverage of the Site; and
- To assess the effectiveness of cleanup actions (i.e., HCC system and HWF remediation system).

An additional three monitoring well locations were selected for monitoring of NWTPH-Dx, based on the following objectives:

- The RL was statistically met during the HCC passive operations pilot study (monitoring well 1C-W-7); and
- The conditions under Decision Rule 1 are met under Section. 7.1 of the *Final Long-Term Monitoring Plan* (Farallon 2020, Ecology 2020) (monitoring wells 2A-W-9 and MW-4).

An additional six monitoring wells, 10 recovery wells, and one surface water location were selected for liquid-level gauging only, based on the following objectives:

- To characterize the extent of LNAPL at the Site; and
- To characterize hydraulic gradients and groundwater flow directions at the Site.

LTM program monitoring will be conducted semiannually for a period of 2 years following transition to passive operation of the HCC system and will transition to annual monitoring thereafter.

The LTM program well network is shown on Figure 1.



3.0 SAMPLING, ANALYSIS, AND REPORTING

This section summarizes the sampling methods, laboratory analysis and reporting procedures, and data management and validation protocols for the groundwater monitoring program. Groundwater samples collected in 2022 were analyzed by Eurofins FGS, Seattle of Tacoma, Washington. The groundwater analytical results were independently validated by Sayler Data Solutions, Inc. of Kirkland, Washington.

3.1 SAMPLING METHODS

Liquid-level gauging and groundwater sampling was conducted in accordance with the *Final Long-Term Monitoring Plan*. Groundwater samples were collected using low-flow sampling techniques and peristaltic pumps. The samples were collected in laboratory-supplied containers after groundwater field parameters stabilized during well purging. The filled sample containers were placed on ice in a cooler and delivered to the analytical laboratories under standard chain-of-custody protocols.

3.2 LABORATORY ANALYSIS AND REPORTING PROCEDURES

Groundwater samples were analyzed by Ecology Method NWTPH-Dx. The NWTPH-Dx analytical results are reported as DRO and ORO fractions, which are summed to give the total NWTPH-Dx concentration. If both DRO and ORO fractions were detected, the total NWTPH-Dx concentration was calculated as the sum of the reported DRO and ORO concentrations. If the DRO and/or ORO fraction was not detected, half the method detection limit (MDL) was used for the non-detected fraction in the NWTPH-Dx calculation.

Groundwater samples collected from gate well GW-3 and monitoring well 2A-W-41 also were analyzed by Ecology Method NWTPH-Dx with a silica gel cleanup preparation process to assess biogenic and/or petroleum metabolite interference due to observed biofouling proximate to gate well GW-3 and up-gradient of monitoring well 2A-W-41.

3.3 DATA MANAGEMENT AND VALIDATION PROTOCOLS

The laboratory electronic data deliverables were directly imported into an electronic database that contains existing Site data. A quality control check was performed on the imported data to ensure that they were uploaded accurately. Laboratory analytical reports are provided in Appendix A.

Sayler Data Solutions, Inc. independently validated the groundwater analytical data to assess whether the data met the quality control/validation standards described in the *Final Long-Term Monitoring Plan*. The data validation procedures were based on *U.S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. Environmental Protection Agency 2008); data evaluation metrics included precision, accuracy, method compliance, and completeness of the data set. The data



validation results indicate that the groundwater analytical data are suitable for the intended use of assessing groundwater quality. Data validation reports are provided in Appendix B.



4.0 RESULTS AND DISCUSSION

The results from the 2022 LTM are summarized in this section. Groundwater elevation and LNAPL thickness and groundwater-quality parameters measured during the groundwater monitoring events are summarized in Tables 1 and 2, respectively. Table 3 provides groundwater analytical results for the DRO and ORO fractions and calculated total NWTPH-Dx concentrations. Groundwater elevation contour maps for the groundwater monitoring events are presented on Figures 2 and 3. Figures 4 and 5 show the NWTPH-Dx results for each groundwater monitoring event and the estimated areal extent of LNAPL.

4.1 GROUNDWATER LEVELS AND GRADIENT DIRECTIONS

As shown on Figures 2 and 3, the calculated groundwater elevations at the HCC system barrier wall gate vaults and select wells and piezometers were not used for interpreting groundwater gradient and direction because they were not designed to provide representative water-level measurements. Groundwater elevations at some wells were inconsistent with groundwater elevation data from nearby locations (due to local geological heterogeneities) and therefore were not considered representative. In other cases, it was not possible to graphically depict finer details of groundwater elevation contours because the spatial scale of the groundwater elevation contour maps is too small.

Seasonal groundwater-level fluctuations of 0.55 to 5.64 feet occurred in wells on the southern (i.e., up-gradient) side of the HCC system barrier wall. Seasonal groundwater-level fluctuations in wells and piezometers on the northern (i.e., down-gradient) side of the HCC system barrier wall were similar in magnitude, ranging from 0.53 to 3.96 feet. The HCC system barrier wall restricts groundwater flow, generally causing groundwater mounding on the southern side of the barrier wall and accentuating a westerly component to groundwater flow near the wall.

Interpreted hydraulic gradients in 2022 were generally consistent with prior years. South of the HCC system barrier wall, the gradient direction was predominantly toward the northwest. North of the HCC system barrier wall, the gradient direction was predominantly toward the west-northwest, subparallel to the Skykomish River flow direction. Gradient magnitudes on the southern side of the HCC system barrier wall were on the order of 0.01 to 0.02 foot per foot. Gradient magnitudes on the northern side of the HCC system barrier wall were on the order of 0.01 foot per foot.

4.2 FIELD PARAMETERS

Field parameters measured during well purging included temperature, pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), turbidity, and specific conductivity. Table 2 presents the stabilized field parameter values recorded at the wells sampled in 2022.

Groundwater temperatures varied seasonally, ranging from 8.0 degrees Celsius in monitoring well 5-W-14 in October 2022 to 14.6 degrees Celsius in monitoring well 1B-W-23 in October 2022.



Groundwater pH values were generally consistent with prior years, ranging from 5.38 to 6.86 during the June and October 2022 events. Measured DO concentrations also were generally consistent with prior years, ranging from 0.27 milligram per liter (mg/l) to 9.94 mg/l. In general, monitoring wells with no reported detections of petroleum hydrocarbons exhibited higher DO values than monitoring wells with reported detections, indicating that the petroleum hydrocarbons in groundwater are biodegrading aerobically.

ORP values were generally consistent with prior years, ranging from -134.2 millivolts to 343.1 millivolts. Of the 46 ORP values measured in 2022, 39 were positive. The predominantly positive ORP values and DO concentrations exceeding 1.0 mg/l indicate that conditions are favorable for aerobic biodegradation of petroleum hydrocarbons.

4.3 GROUNDWATER ANALYTICAL RESULTS

The groundwater analytical results are summarized below. Table 3 presents groundwater analytical results for the DRO and ORO fractions and calculated total NWTPH-Dx concentrations. Figures 4 and 5 illustrate the NWTPH-Dx results for each groundwater monitoring event and the estimated areal extent of LNAPL. NWTPH-Dx trend plots are provided in Appendix C.

4.3.1 Compliance Monitoring—Levee Zone Monitoring Wells

Levee zone monitoring wells (5-W-14 and 5-W-16 through 5-W-19) were gauged, sampled for NWTPH-Dx, and assessed for the absence of sheen to verify compliance with the CUL at the CPOC. NWTPH-Dx was detected at concentrations of 167 and 171 µg/l, which are less than the CUL of 208 µg/l in the groundwater samples collected from monitoring well 5-W-18 during the June and October 2022 monitoring events.

NWTPH-Dx was not detected at concentrations exceeding the MDL in the groundwater samples collected from the Levee Zone monitoring wells 5-W-14, 5-W-16, 5W-17, and 5-W-19. LNAPL or sheen was not observed in any of the Levee Zone monitoring wells.

4.3.2 Remediation Performance Monitoring—Locations North of Railyard and Outside of Levee Zone

The following monitoring wells were gauged, sampled for NWTPH-Dx, and assessed for the absence of sheen to demonstrate that the RL is being met north of the BNSF railyard boundary and outside the Levee Zone, and to assess the effectiveness the HCC system.

GW-1	GW-4	2A-W-42	1C-W-7
GW-2	2A-W-40	5-W-43	1C-W-8
GW-3	2A-W-41	1C-W-4	1B-W-23

NWTPH-Dx was detected at a concentration of 780 µg/l, which exceeds the RL of 466 µg/l in the groundwater sample collected from monitoring well 2A-W-41 during the October 2022 monitoring



event. The sample also was analyzed following a silica gel cleanup preparation process, with a reported concentration of 143 µg/l. NWTPH-Dx was detected at a concentration of 460 µg/l, which is less than but close to the RL of 466 µg/l, in the groundwater sample collected from gate well GW-3 during the October 2022 monitoring event. The sample also was analyzed following a silica gel cleanup preparation process, with a reported concentration of 193 µg/l. This sample was collected directly following recharge after the well ran dry during the purging activities. This may have contributed to the elevated concentration of NWTPH-Dx detected in the sample, since NWTPH-Dx was not detected in the sample collected at gate well GW-3 during the June 2022 monitoring event when the well did not run dry during purging.

NWTPH-Dx was detected at concentrations either less than the RL of 477 µg/l or was not detected in groundwater samples collected from the remaining monitoring wells during the June and October 2022 monitoring events (Table 3; Figures 4 and 5).

Monitoring well 2A-W-41 is down-gradient of gate well GW-3, which is immediately north and down-gradient of the Center Gate, where substantial biofouling by iron bacteria has been observed. NWTPH-Dx in groundwater at this location has been variable since biofouling was first observed in 2014 (C). Groundwater samples from gate well GW-3 and monitoring well 2A-W-41 were analyzed with and without silica gel cleanup to further assess sample interference. NWTPH-Dx concentrations in all the silica gel-prepared samples were less than the RL, and notably less than the NWTPH-Dx concentrations in the non-silica gel-prepared samples (Appendix C). The lower NWTPH-Dx concentrations reported in the silica gel-prepared samples from gate well GW-3 and monitoring well 2A-W-41 indicate that reported concentrations in the non-silica gel-prepared samples are biased high due to biogenic interference and that the NWTPH-Dx concentrations reported at gate well GW-3 and monitoring well 2A-W-41 do not indicate that breakthrough of groundwater containing NWTPH-Dx greater than the RL is occurring.

Skykomish School monitoring wells 5-W-51, 5-W-55, and 5-W-56 were gauged, sampled for NWTPH-Dx, and assessed for the absence of sheen to assess the effectiveness of the HWF remediation system. NWTPH-Dx was detected at concentrations of 297 and 800 µg/l during the June and October 2022 monitoring events in the groundwater samples collected from monitoring well 5-W-51. NWTPH-Dx was detected at concentrations of 68 and 91 µg/l during the June and October 2022 monitoring events in the groundwater samples collected from monitoring well 5-W-55. NWTPH-Dx was detected at concentrations of 477 and 5,400 µg/l during the June and October 2022 monitoring events in the groundwater samples collected from monitoring well 5-W-56.

The NWTPH-Dx concentrations detected in 5-W-51 and 5-W-55 are consistent with NWTPH-Dx concentrations reported in those wells following completion of HWF activities in 2018. The NWTPH-Dx concentrations detected in 5-W-56 have increased compared to NWTPH-Dx concentrations reported for the well following completion of HWF activities in 2018. As noted in Section 1.3, the Skykomish School monitoring wells are not required to meet the RL per the Consent Decree.



LNAPL or sheen was not observed in recovery well RW-10 or any of the Levee Zone monitoring wells situated down-gradient of recovery well RW-10 during any of the monitoring events. LNAPL or sheen was not observed in any of the other remediation performance monitoring locations north of the BNSF railyard.

4.3.3 Remediation Performance Monitoring – Locations Within the Railyard

Monitoring wells MW-4 and 2A-W-9 were gauged, sampled for NWTPH-Dx, and assessed for sheen to evaluate up-gradient groundwater conditions. NWTPH-Dx concentrations were less than the RL in the groundwater samples collected from these monitoring wells (Table 3; Figures 4 and 5). LNAPL or sheen was not observed in monitoring wells MW-4 and 2A-W-9.

Measurable LNAPL was observed in recovery wells RW-07 and RW-08 (Table 1):

- **Recovery well RW-07:** A heavy trace of LNAPL was observed in October 2022, and measurable LNAPL was recorded in June (1.51 feet). LNAPL thicknesses at recovery well RW-07 in 2022 are generally consistent with observations from 2021.
- **Recovery well RW-08:** A light trace of LNAPL was observed in June 2022, and measurable LNAPL was recorded in October (2.12 feet). The LNAPL observation at recovery well RW-08 in October 2022 is greater than historical observations and is suspected to be due to LNAPL coating the probe, resulting in a measurement that is biased high.

LNAPL thickness trend plots for recovery wells that historically have contained measurable LNAPL are included in Appendix D.



5.0 STATISTICAL ANALYSIS

The groundwater monitoring data were evaluated against the decision rules provided in Section 7 of the *Final Long-Term Monitoring Plan* to determine whether the cleanup actions are meeting the objectives established in the Consent Decree, and whether any modifications to the LTM program are warranted. The decision rules specify the criteria for continuing, modifying, or terminating the LTM program.

The dataset used for the statistical evaluation included the last 3 years of sampling data for each monitoring location, or the most recent 10 data points for locations with fewer than 10 data points within the last 3 years. To verify compliance with the appropriate target, the data were evaluated to determine whether they met the required three-part statistical test in accordance with Section 720[9] of Chapter 173-340 of the Washington Administrative Code (WAC 173-340-720[9]):

- The 95th percentile Upper Confidence Limit (95 percent UCL) on the true mean of the NWTPH-Dx test results from the monitoring point must be less than the groundwater CUL or RL (whichever is applicable at the specific monitoring location);
- Fewer than 10 percent of the samples exceed the applicable groundwater CUL or RL; and
- No single sample is greater than two times the applicable groundwater CUL or RL.

U.S. Environmental Protection Agency ProUCL statistical software was used to calculate the NWTPH-Dx concentration 95 percent UCL using the appropriate statistical method (based on the data distribution) for comparison with the monitoring location target (CUL or RL). Mann-Kendall Trend Test for Plume Stability from Ecology's Natural Attenuation Analysis Tool Package for Petroleum-Contaminated Ground Water (Ecology 2005) was used to determine the trend for NWTPH-Dx plumes at select wells. The statistical analysis results are summarized on Table E-1 in Appendix E. The supporting ProUCL and Mann-Kendall analyses data are included in Appendix E.

The statistical evaluation confirms that the cleanup objectives for the Levee Zone wells (CUL of 208 µg/l) and monitoring wells north of the BNSF railyard and outside of the Levee Zone (RL of 477 µg/l) are being met, with the exception of monitoring well 2A-W-41 and gate well GW-3, where the results are biased high due to biofouling (discussed above in Section 4.3.3). NWTPH-Dx concentrations in all the silica gel-prepared samples were less than the RL.

Schoolyard monitoring wells 5-W-51 and 5-W-56, which are not required to meet the RL (see Section 1.3), have concentrations of NWTPH-Dx that exceed the RL and the concentrations are now exhibiting a stable trend at those locations (Appendix E).



6.0 LONG-TERM MONITORING PROGRAM OPTIMIZATION, MODIFICATION, AND TERMINATION

The LTM program is intended to be adaptive to changing conditions at the Site. Data are evaluated against the decision rules provided in Section 7.1 of the *Final Long-Term Monitoring Plan* to determine whether the cleanup actions are meeting the objectives established in the Consent Decree, and whether any modifications to the LTM program are warranted. The decision rules specify the criteria for continuing, modifying, or terminating the LTM program. The decision rules also identify Site conditions that may warrant contingency measures.

Statistical analysis data are used to optimize the LTM program while ensuring that sufficient data are collected to verify that NWTPH-Dx concentrations in groundwater are not endangering potential receptors (e.g., the Skykomish River). LTM program optimization recommendations which are based on the statistical evaluation of data presented in Section 5.0 above are presented below:

- Per Section 3.1.2 and Decision Rule 2 in Section 7.1 of the *Final Long-Term Monitoring Plan*, Former Air Sparge Area monitoring well 1C-W-7 remains eligible for removal from the LTM program, as the statistical analysis of NTWPH-Dx results indicates that the 95 percent UCL for NWTPH-Dx is less than the RL, spatial coverage of the area around 1C-W-7 is achieved by monitoring well 1C-W-8, and further monitoring of 1C-W-7 would provide redundant information. Therefore, groundwater monitoring at the sparge area well 1C-W-7 should be discontinued and the well decommissioned. Up-gradient gate well GW-4 is sufficient to provide data for continued monitoring of groundwater exiting the east gate.
- Per Section 3.1.2 and Decision Rule 1 in Section 7.1 of the *Final Long-Term Monitoring Plan*, monitoring well MW-4 remains eligible for removal from the LTM program, as the statistical analysis of NWTPH-Dx results indicates that the 95 percent UCL for NWTPH-Dx is less than the RL, and monitoring well MW-4 is not under the influence of an engineering control. Furthermore, the groundwater flow direction at MW-4 is consistently to the northwest toward the BNSF railyard. Therefore, groundwater monitoring at monitoring well MW-4 does not provide data useful for the evaluation of whether cleanup actions are meeting the objectives, and NWTPH-Dx sampling at monitoring well MW-4 should be discontinued.



7.0 CONCLUSIONS

The groundwater monitoring data indicate that LNAPL thicknesses in groundwater remained stable or increased slightly in 2022. NWTPH-Dx concentrations in groundwater remained stable or decreased in 2022. NWTPH-Dx was not detected in the groundwater samples collected from any of the Levee Zone monitoring wells near the Skykomish River during the June and October 2022 monitoring events.

LNAPL was observed in monitoring wells and piezometers up-gradient of and adjacent to the HCC system barrier wall, between the West Gate and Center Gate, which is consistent with prior years. LNAPL observations ranged from a light trace to 2.12 feet thick. LNAPL thicknesses have exhibited an overall decreasing or stable trend, with minor variability since LNAPL gauging began in 2012 (Appendix D).

NWTPH-Dx was not detected in the groundwater sample collected in June 2022 but was reported at concentrations of 460 µg/l in October 2022 in the non-silica gel-prepared groundwater samples collected from gate well GW-3. NWTPH-Dx was reported at concentrations of 136 µg/l in June 2022 and 780 µg/l October 2022 in the non-silica gel-prepared groundwater samples collected from monitoring well 2A-W-41. Due to the observed biofouling at the locations since 2014, groundwater samples from gate well GW-3 and monitoring well 2A-W-41 were analyzed both with and without silica gel cleanup. NWTPH-Dx concentrations in all the silica gel-prepared samples were less than the RL (Appendix C). The biofouling observations noted proximate to gate well GW-3 and up-gradient of monitoring well 2A-W-41, and results of the analyses performed with and without silica gel cleanup, demonstrate that the results from the non-silica gel-prepared samples are biased high due to biogenic or petroleum metabolite interferences. Groundwater samples collected from gate well GW-3 and monitoring well 2A-W-41 will continue to be analyzed both with and without silica gel cleanup to assess biogenic and/or petroleum metabolite interference.

Statistical analysis of the analytical results indicates that the cleanup objectives for the Site are being met. Additionally, based on the statistical analysis, groundwater sampling at monitoring wells 1C-W-7 and MW-4 may be discontinued in accordance with the applicable Decision Rules presented in the *Final Long-Term Monitoring Plan*. It is recommended for LTM program optimization that groundwater sampling at monitoring wells 1C-W-7 and MW-4 be discontinued in future groundwater monitoring events. Monitoring well 1C-W-7 should be decommissioned, as there is sufficient up-gradient coverage from gate well GW-4.



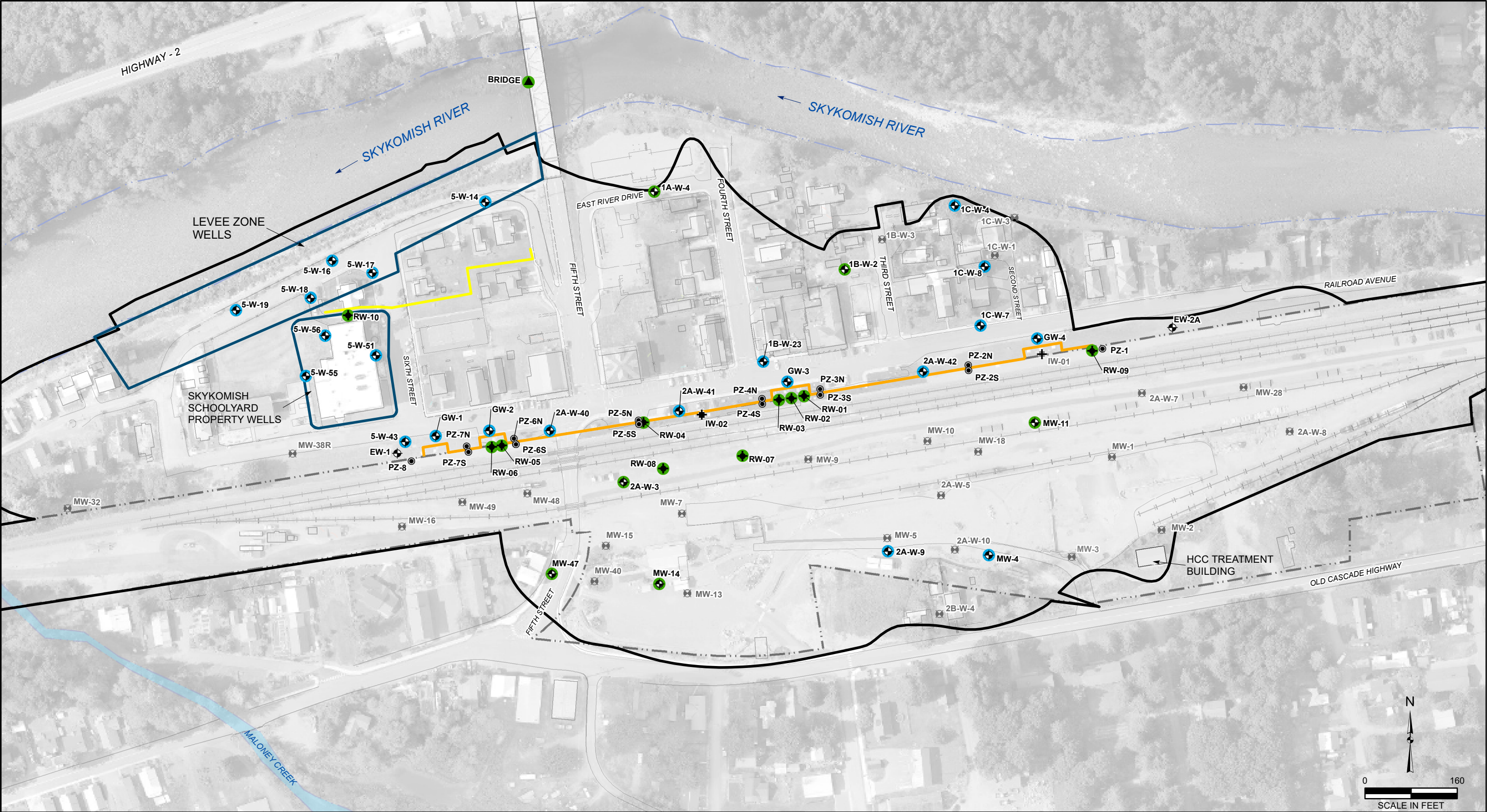
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FIGURES

2022 ANNUAL LONG-TERM MONITORING REPORT BNSF Former Maintenance and Fueling Facility Skykomish, Washington Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071



LEGEND

1B-W-3	DECOMMISSIONED MONITORING WELL		RECOVERY WELL LOCATION GAUGED
2A-W-41	MONITORING WELL		MONITORING WELL LOCATION GAUGED
RW-4	RECOVERY WELL		MONITORING WELL LOCATION SAMPLED FOR NWTPh-Dx
PZ-5S	PIEZOMETER		HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
IW-01	DECOMMISSIONED INJECTION WELL		BNSF RAILYARD BOUNDARY
IW-02	INJECTION WELL		MECHANICALLY STABILIZED EARTH WALL
BRIDGE	BRIDGE MEASURING POINT LOCATION GAUGED		

MONITORING WELL ZONES
 SITE BOUNDARY
NOTES
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SENTRY WELLS AND BARRIER WALL GATE VAULT LOCATIONS NOT SHOWN. SEE FIGURE 2 FOR BARRIER WALL GATE DETAILS.
MONITORING WELL MW-3 DAMAGED.
WELLS NOT INCLUDED IN A ZONE ARE CONSIDERED SITE-WIDE MONITORING WELLS.
IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015



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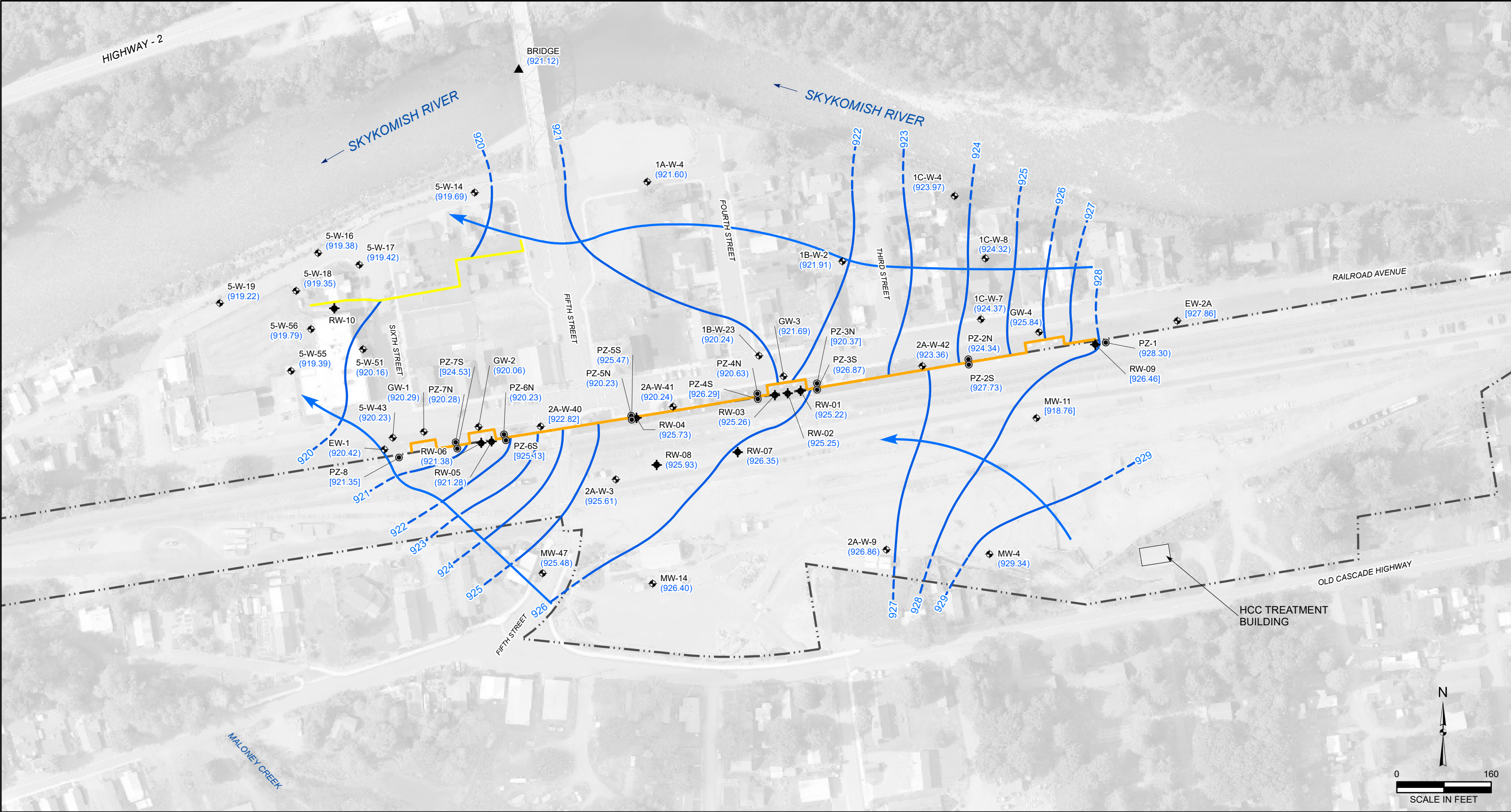
Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

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FIGURE 1
SITE PLAN SHOWING 2022
LONG-TERM PROGRAM MONITORING NETWORK
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071



LEGEND

- 2A-W-41 MONITORING WELL
RW-04 RECOVERY WELL
PZ-5S PIEZOMETER
IW-02 INJECTION WELL
FWG-WV BARRIER WALL GATE VAULT
BRIDGE BRIDGE MEASURING POINT

- (929.34) GROUNDWATER OR SURFACE WATER (SKYKOMISH RIVER)
ELEVATION IN FEET NAVD88 (JUNE, 2020)
[927.86] GROUNDWATER ELEVATION NOT USED
FOR CONTOURING
929 - - - - - INTERPRETED GROUNDWATER ELEVATION CONTOUR
IN FEET NAVD88 (INFERRED WHERE DASHED)
 APPROXIMATE GROUNDWATER FLOW DIRECTION

- - - - - BNSF RAILYARD BOUNDARY
 HYDRAULIC CONTROL AND CONTAINMENT
SYSTEM SHEET PILE BARRIER WALL AND GATES

- MECHANICALLY STABILIZED
EARTH WALL

NOTES:
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SENTRY WELLS NOT SHOWN.
ONLY BARRIER WALL GATE VAULT LOCATIONS WHERE GROUNDWATER
ELEVATIONS WERE MEASURED ARE SHOWN.
LOCATIONS SHOWN IN GRAY NOT GAUGED IN JUNE 2020.
NAVD88 = NORTH AMERICAN VERTICAL DATUM OF 1988
IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

ALL LOCATIONS ARE APPROXIMATE. FIGURES WERE PRODUCED IN COLOR.
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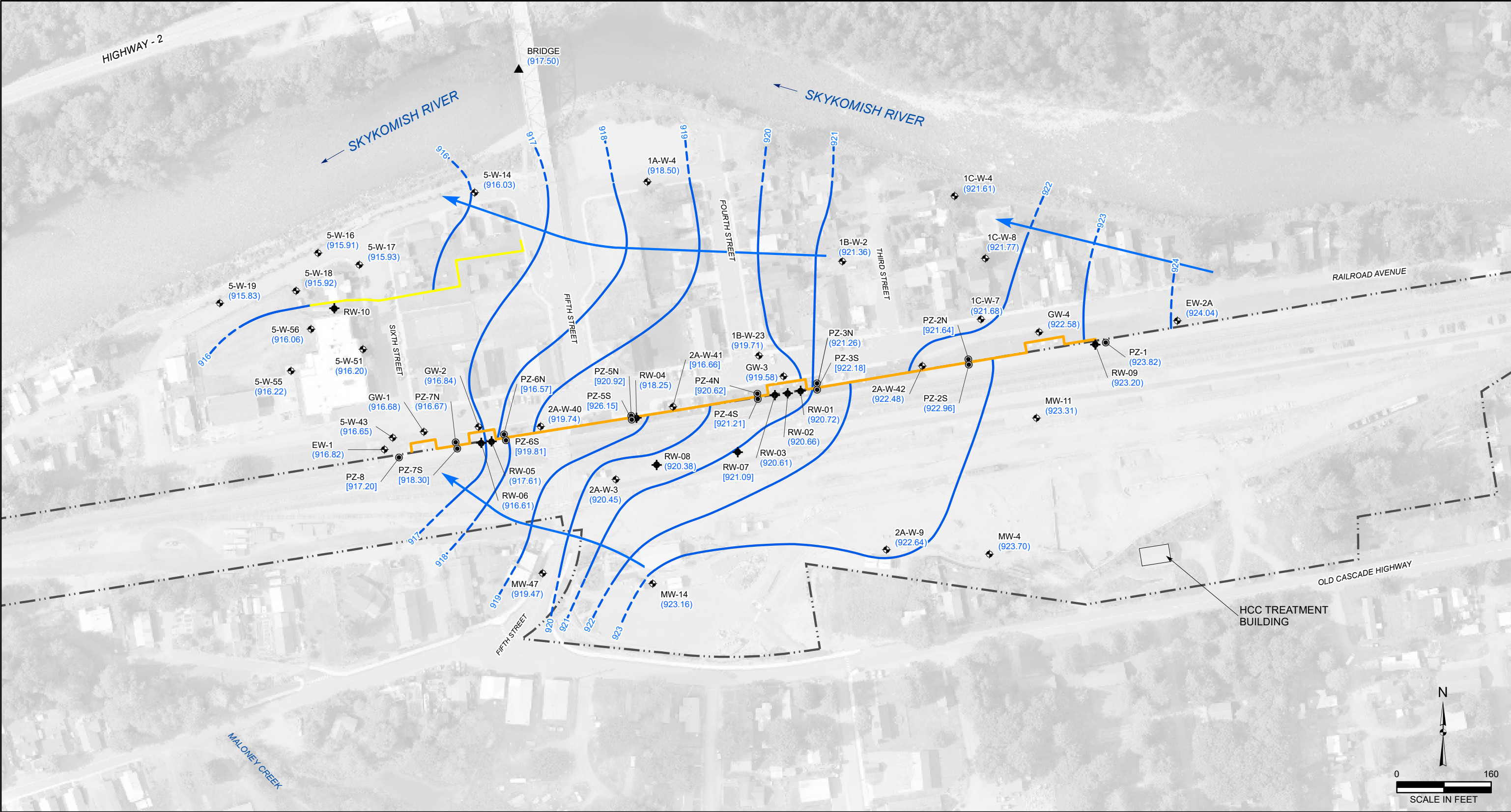
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FIGURE 2
JUNE 2022
GROUNDWATER ELEVATION CONTOUR MAP
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON
FARALLON PN: 683-071



LEGEND

- 2A-W-41 MONITORING WELL
- RW-04 RECOVERY WELL
- PZ-5S PIEZOMETER
- IW-02 INJECTION WELL
- FWG-WV BARRIER WALL GATE VAULT
- BRIDGE BRIDGE MEASURING POINT

- (924.04)
- [926.15]
- 923
- APPROXIMATE GROUNDWATER FLOW DIRECTION

- BNSF RAILYARD BOUNDARY
- HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
- MECHANICALLY STABILIZED EARTH WALL
- NOTES:
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SENTRY WELLS NOT SHOWN.
ONLY BARRIER WALL GATE VAULT LOCATIONS WHERE GROUNDWATER ELEVATIONS WERE MEASURED ARE SHOWN.
LOCATIONS SHOWN IN GRAY NOT GAUGED IN JUNE 2020.
NAVD88 = NORTH AMERICAN VERTICAL DATUM OF 1988
IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

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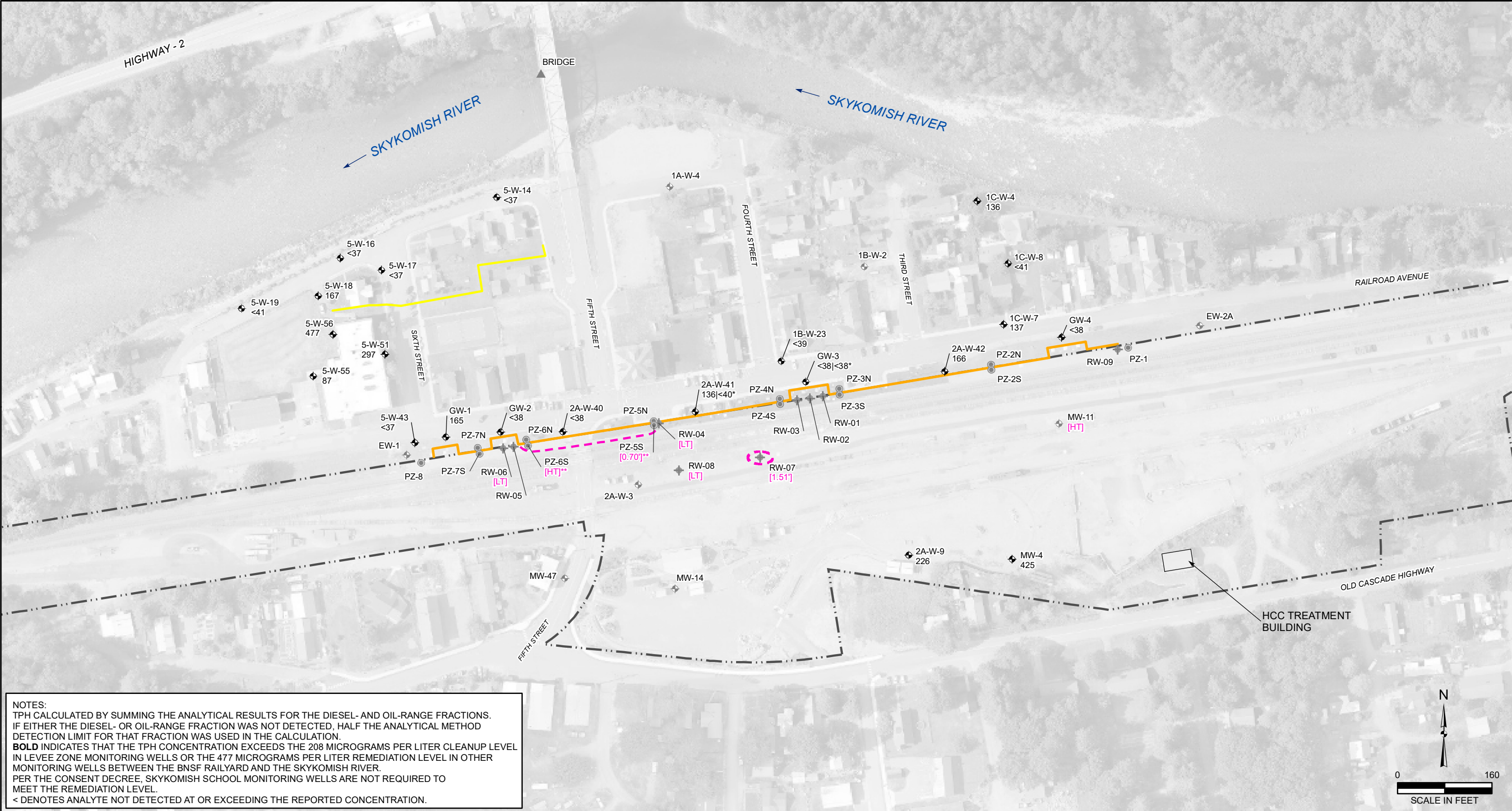
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ALL LOCATIONS ARE APPROXIMATE. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

FIGURE 3
OCTOBER 2022
GROUNDWATER ELEVATION CONTOUR MAP
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071



NOTES:
TPH CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE FRACTIONS.
IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD
DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.
BOLD INDICATES THAT THE TPH CONCENTRATION EXCEEDS THE 208 MICROGRAMS PER LITER CLEANUP LEVEL
IN LEVEE ZONE MONITORING WELLS OR THE 477 MICROGRAMS PER LITER REMEDIATION LEVEL IN OTHER
MONITORING WELLS BETWEEN THE BNSF RAILYARD AND THE SKYKOMISH RIVER.
PER THE CONSENT DECREE, SKYKOMISH SCHOOL MONITORING WELLS ARE NOT REQUIRED TO
MEET THE REMEDIATION LEVEL.
< DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTED CONCENTRATION.

- 2A-W-41 ◆ MONITORING WELL
RW-04 ◆ RECOVERY WELL
PZ-5S ● PIEZOMETER
IW-02 ★ INJECTION WELL
BRIDGE ▲ BRIDGE MEASURING POINT
● LOCATIONS SHOWN IN GRAY NOT
SAMPLED IN JUNE 2022.

- LEGEND**
— HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
SHEET PILE BARRIER WALL AND GATES
- - - BNSF RAILYARD BOUNDARY
— MECHANICALLY STABILIZED EARTH WALL

IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

- 610
<41
40*
ESTIMATED EXTENT OF LNAPL AS INDICATED BY MEASURABLE LNAPL
THICKNESS ON GROUNDWATER SURFACE
[HT]
[LT]
[1.51]
**
LNAPL
TOTAL PETROLEUM HYDROCARBONS (TPH) IN MICROGRAMS PER LITER
TPH NOT DETECTED AT OR EXCEEDING THE GIVEN REPORTING LIMIT
TPH IN MICROGRAMS PER LITER AFTER SILICA GEL CLEANUP
HEAVY TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF;
NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
LIGHT TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF;
NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
MEASURABLE LNAPL THICKNESS IN FEET
DATA INCLUDED FOR COMPLETENESS. SEE TABLE 8 OF THE 2021
ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM REPORT
LIGHT NONAQUEOUS-PHASE LIQUID

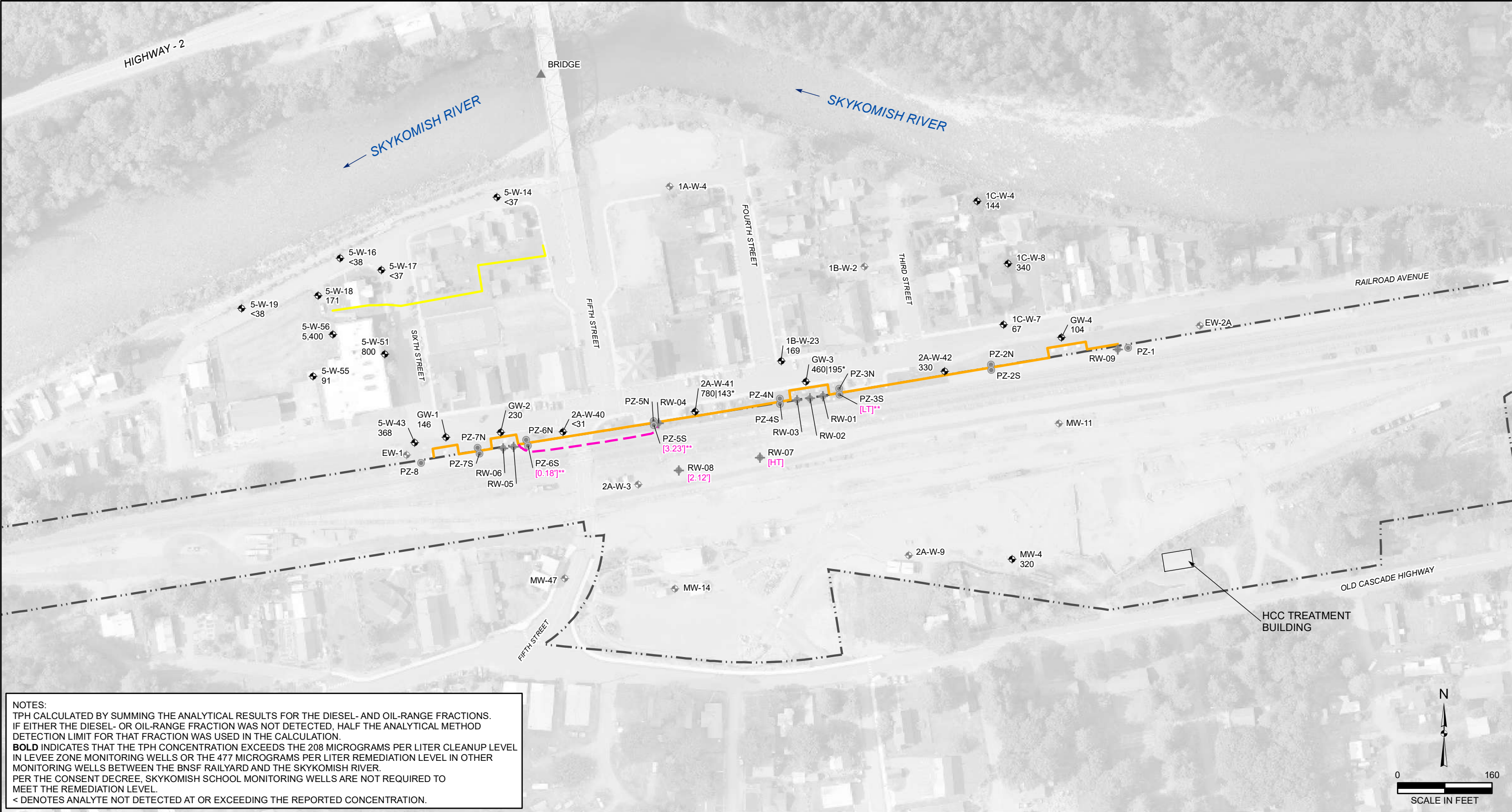
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FIGURE 4
JUNE 2022
TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON
FARALLON PN: 683-071



NOTES:
TPH CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE FRACTIONS.
IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD
DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.
BOLD INDICATES THAT THE TPH CONCENTRATION EXCEEDS THE 208 MICROGRAMS PER LITER CLEANUP LEVEL
IN LEVEE ZONE MONITORING WELLS OR THE 477 MICROGRAMS PER LITER REMEDIATION LEVEL IN OTHER
MONITORING WELLS BETWEEN THE BNSF RAILYARD AND THE SKYKOMISH RIVER.
PER THE CONSENT DECREE, SKYKOMISH SCHOOL MONITORING WELLS ARE NOT REQUIRED TO
MEET THE REMEDIATION LEVEL.
< DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTED CONCENTRATION.

LEGEND	
2A-W-41	MONITORING WELL
RW-04	RECOVERY WELL
PZ-5S	PIEZOMETER
IW-02	INJECTION WELL
BRIDGE	BRIDGE MEASURING POINT
	LOCATIONS SHOWN IN GRAY NOT SAMPLED IN OCTOBER 2022.
	HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
	BNSF RAILYARD BOUNDARY
	MECHANICALLY STABILIZED EARTH WALL

5,400	TOTAL PETROLEUM HYDROCARBONS (TPH) IN MICROGRAMS PER LITER
<38	TPH NOT DETECTED AT OR EXCEEDING THE GIVEN REPORTING LIMIT
195*	TPH IN MICROGRAMS PER LITER AFTER SILICA GEL CLEANUP
	ESTIMATED EXTENT OF LNAPL AS INDICATED BY MEASURABLE LNAPL THICKNESS ON GROUNDWATER SURFACE
[HT]	HEAVY TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[LT]	LIGHT TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[3.23]	MEASURABLE LNAPL THICKNESS IN FEET
**	DATA INCLUDED FOR COMPLETENESS. SEE TABLE 8 OF THE 2021 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM REPORT
LNAPL	LIGHT NONAQUEOUS-PHASE LIQUID



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FIGURE 5

OCTOBER 2022

TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

TABLES

2022 ANNUAL LONG-TERM MONITORING REPORT BNSF Former Maintenance and Fueling Facility Skykomish, Washington Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

Table 1
2022 Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation ¹ (feet NAVD88)	Date	Depth to Water ² (feet)	Water Elevation ¹ (feet NAVD88)	LNAPL Thickness (feet)
Compliance Monitoring - Levee Zone Monitoring Wells					
5-W-14	926.59	6/6/2022	6.90	919.69	—
		10/25/2022	10.56	916.03	—
5-W-16	925.20	6/6/2022	5.82	919.38	—
		10/25/2022	9.29	915.91	—
5-W-17	924.60	6/6/2022	5.18	919.42	—
		10/25/2022	8.67	915.93	—
5-W-18	924.64	6/6/2022	5.29	919.35	—
		10/25/2022	8.72	915.92	—
5-W-19	924.35	6/6/2022	5.13	919.22	—
		10/25/2022	8.52	915.83	—
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone					
GW-1	928.24	6/6/2022	7.95	920.29	—
		10/25/2022	11.56	916.68	—
GW-2	930.29	6/6/2022	10.23	920.06	—
		10/25/2022	13.45	916.84	—
GW-3	935.82	6/6/2022	14.13	921.69	—
		10/25/2022	16.24	919.58	—

Table 1
2022 Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation ¹ (feet NAVD88)	Date	Depth to Water ² (feet)	Water Elevation ¹ (feet NAVD88)	LNAPL Thickness (feet)
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone (continued)					
GW-4	934.68	6/6/2022	8.84	925.84	—
		10/25/2022	12.10	922.58	—
2A-W-40	933.34	6/6/2022	10.52	922.82	—
		10/25/2022	13.60	919.74	—
2A-W-41	935.22	6/6/2022	14.98	920.24	—
		10/25/2022	18.56	916.66	—
2A-W-42	935.37	6/6/2022	12.01	923.36	—
		10/25/2022	12.89	922.48	—
5-W-43	926.18	6/6/2022	5.95	920.23	—
		10/25/2022	9.53	916.65	—
1C-W-4	932.74	6/6/2022	8.77	923.97	—
		10/25/2022	11.13	921.61	—
1C-W-7	935.04	6/6/2022	10.67	924.37	—
		10/25/2022	13.36	921.68	—
1C-W-8	935.70	6/6/2022	11.38	924.32	—
		10/25/2022	13.93	921.77	—

Table 1
2022 Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation ¹ (feet NAVD88)	Date	Depth to Water ² (feet)	Water Elevation ¹ (feet NAVD88)	LNAPL Thickness (feet)
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone (continued)					
1B-W-23	936.25	6/6/2022	16.01	920.24	—
		10/25/2022	16.54	919.71	—
5-W-51	925.08	6/6/2022	4.92	920.16	—
		10/25/2022	8.88	916.20	—
5-W-55	923.92	6/6/2022	4.53	919.39	—
		10/25/2022	7.70	916.22	—
5-W-56	924.76	6/6/2022	4.97	919.79	—
		10/25/2022	8.70	916.06	—
Remediation Performance Monitoring - Wells Within Railyard					
MW-4	936.95	6/6/2022	7.61	929.34	—
		10/25/2022	13.25	923.70	—
2A-W-9	936.58	6/6/2022	9.72	926.86	—
		10/25/2022	13.94	922.64	—
Gauging Locations					
1A-W-4	929.07	6/6/2022	7.47	921.60	—
		10/25/2022	10.57	918.50	—
1B-W-2	935.81	6/6/2022	13.90	921.91	—
		10/25/2022	14.45	921.36	—
2A-W-3	934.43	6/6/2022	8.82	925.61	—
		10/25/2022	13.98	920.45	—

Table 1
2022 Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation ¹ (feet NAVD88)	Date	Depth to Water ² (feet)	Water Elevation ¹ (feet NAVD88)	LNAPL Thickness (feet)
Gauging Locations (continued)					
MW-11	939.20	6/6/2022	20.44	918.76	Heavy Trace
		10/25/2022	15.89	923.31	—
MW-14	936.80	6/6/2022	10.40	926.40	—
		10/25/2022	13.64	923.16	—
MW-47	932.61	6/6/2022	7.13	925.48	—
		10/25/2022	13.14	919.47	—
RW-01	932.84	6/6/2022	7.62	925.22	—
		10/25/2022	12.12	920.72	—
RW-02	933.84	6/6/2022	8.59	925.25	—
		10/25/2022	13.18	920.66	—
RW-03	933.80	6/6/2022	8.54	925.26	—
		10/25/2022	13.19	920.61	—
RW-04	931.86	6/6/2022	6.13	925.73	Light Trace
		10/25/2022	13.61	918.25	—
RW-05	928.53	6/6/2022	7.25	921.28	—
		10/25/2022	10.92	917.61	—

Table 1
2022 Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation ¹ (feet NAVD88)	Date	Depth to Water ² (feet)	Water Elevation ¹ (feet NAVD88)	LNAPL Thickness (feet)
Gauging Locations (continued)					
RW-06	928.53	6/6/2022	7.15	921.38	Light Trace
		10/25/2022	11.92	916.61	—
RW-07	933.06	6/6/2022	6.71 C	926.35 C	1.51
		10/25/2022	11.97	921.09	Heavy Trace
RW-08	931.85	6/6/2022	5.92	925.93	Light Trace
		10/25/2022	11.47 C	920.38 C	2.12 ³
RW-09	933.96	6/6/2022	7.50	926.46	—
		10/25/2022	10.76	923.20	—
RW-10	925.11	6/6/2022	4.93	920.18	—
		10/25/2022	NM	NM	—

Table 1
2022 Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation ¹ (feet NAVD88)	Date	Depth to Water ² (feet)	Water Elevation ¹ (feet NAVD88)	LNAPL Thickness (feet)
Gauging Locations (continued)					
Skykomish River Bridge		6/6/2022	21.97	921.12	—
		10/25/2022	25.59	917.50	—

NOTES:

— denotes LNAPL was not observed.

C = corrected depths to water and water elevations based on LNAPL thickness

LNAPL = light nonaqueous-phase liquid

NA = not applicable

NM = not measured

Light Trace = LNAPL less than 0.01 foot thick and thin coating of LNAPL and/or a sheen observed on the oil-water interface probe

Heavy Trace = LNAPL less than 0.01 foot thick and thick coating of LNAPL observed on the oil-water interface probe

¹Elevations referenced to North American Vertical Datum of 1988 (NAVD88).

²Depths referenced to measuring point (e.g., top of well casing, top of vault).

* Depth to water could not be measured as location was blocked.

³ Inaccurate LNAPL thickness measurement due to instrumentation fouling.

Table 2
2022 Stabilized Groundwater Field Parameter Values
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Temperature (degrees Celsius)	pH (Standard Units)	Dissolved Oxygen (milligrams per liter)	Oxidation-Reduction Potential (millivolts)	Specific Conductivity (mS/cm)	Turbidity (NTU)
Compliance Monitoring - Levee Zone Monitoring Wells							
5-W-14	6/7/2022	11.3	6.57	6.02	321.1	0.093	0.25
	10/26/2022	8.0	6.45	6.98	316.7	0.072	2.60
5-W-16	6/7/2022	9.4	6.80	9.94	285.6	0.058	3.93
	10/26/2022	8.7	6.72	8.04	305.4	0.070	4.02
5-W-17	6/7/2022	10.5	6.45	5.93	308.7	0.093	1.71
	10/26/2022	8.1	6.43	6.53	323.6	0.074	5.25
5-W-18	6/6/2022	10.7	6.51	7.00	300.8	0.087	3.04
	10/26/2022	8.3	6.33	5.62	294.3	0.088	4.21
5-W-19	6/8/2022	12.1	6.44	6.51	335.9	0.092	0.69
	10/26/2022	8.3	6.62	6.50	303.1	0.076	2.92
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone							
GW-1	6/7/2022	13.0	5.93	1.61	266.9	0.160	2.51
	10/26/2022	11.1	6.01	1.62	160.6	0.107	4.2
GW-2	6/7/2022	13.9	6.20	2.82	218.9	0.100	0.55
	10/26/2022	9.3	6.51	4.74	133.9	0.092	3.63
GW-3	6/7/2022	9.9	5.96	4.64	129.0	0.0725	10.70
	10/26/2022	Well went dry during purging - sample was collected after well recharged.					
GW-4	6/7/2022	9.0	6.86	2.67	85.0	0.1306	0.26
	10/26/2022	9.4	6.23	3.73	343.1	0.081	3.14
2A-W-40	6/7/2022	10.3	6.54	8.39	322.2	0.062	1.20
	10/26/2022	8.7	6.56	7.05	197.2	0.061	7.4
2A-W-41	6/7/2022	12.3	6.53	7.54	-134.2	0.142	5.39
	10/27/2022	10.4	6.33	1.96	78.8	0.195	7.00
2A-W-42	6/7/2022	9.4	6.10	3.87	139.7	0.1169	2.71
	10/26/2022	10.6	5.90	4.76	288.9	0.145	2.01
5-W-43	6/7/2022	11.4	6.19	2.99	320.7	0.089	0.10
	10/26/2022	9.4	6.21	5.07	223.8	0.073	2.85

Table 2
2022 Stabilized Groundwater Field Parameter Values
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Temperature (degrees Celsius)	pH (Standard Units)	Dissolved Oxygen (milligrams per liter)	Oxidation-Reduction Potential (millivolts)	Specific Conductivity (mS/cm)	Turbidity (NTU)
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone (continued)							
1C-W-4	6/7/2022	8.2	5.87	8.21	134.3	0.0634	0.63
	10/27/2022	9.4	5.98	8.45	317.1	0.072	38.02
1C-W-7	6/7/2022	9.4	6.12	6.31	-90.7	0.070	0.37
	10/27/2022	11.2	5.38	2.63	299.7	0.096	4.4
1C-W-8	6/7/2022	9.9	6.14	8.27	-67.0	0.062	2.46
	10/27/2022	9.7	5.55	5.95	226.0	0.081	6.5
1B-W-23	6/7/2022	14.2	6.12	9.84	132.8	0.0609	3.15
	10/27/2022	14.6	5.96	7.09	275.9	0.106	4.4
5-W-51	6/6/2022	10.8	6.61	5.67	259.5	0.199	0.92
	10/26/2022	10.4	6.13	3.96	264.2	0.090	3.95
5-W-55	6/6/2022	11.0	6.39	0.27	195.4	0.126	9.42
	10/26/2022	13.0	6.29	5.14	274.3	0.115	6.57
5-W-56	6/6/2022	13.7	6.65	1.99	114.7	0.290	5.78
	10/26/2022	13.9	6.40	1.51	67.3	0.898	50.6
Remediation Performance Monitoring - Wells Within Railyard							
MW-4	6/7/2022	10.6	5.91	4.54	140.9	86.1	0.63
	10/27/2022	9.3	5.66	1.09	155.0	0.085	4.23
2A-W-9	6/7/2022	10.5	6.16	0.90	54.6	0.045	3.37
	10/27/2022	Well went dry during purging and did not recover. No sample collected.					

NOTES:

mS/cm = milliSiemens per centimeter

NTU = nephelometric turbidity units

Table 3
2022 Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l) ¹			ORO (µg/l) ¹			Calculated NWTPH-Dx ² (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Compliance Monitoring - Levee Zone Monitoring Wells									
NWTPH-Dx results compared to the CUL = 208 µg/l									
5-W-14	6/7/2022	5-W-14-060722	< 51	30	51	< 88	44	88	< 37
	10/26/2022	5-W-14-102622	< 51	30	51	< 88	44	88	< 37
5-W-16	6/7/2022	5-W-16-060722	< 51	30	51	< 88	44	88	< 37
	10/26/2022	5-W-16-102622	< 52	31	52	< 89	45	89	< 38
5-W-17	6/7/2022	5-W-17-060722	< 51	30	51	< 87	44	87	< 37
	10/26/2022	5-W-17-102622	< 51	30	51	< 88	44	88	< 37
5-W-18	6/6/2022	5-W-18-060622	< 55 U	33	55	150 J	48	110	167 J
	10/26/2022	5-W-18-102622	61	30	51	110	44	88	171
5-W-19	6/8/2022	5-W-19-060822	< 55	33	55	< 95	48	95	< 41
	10/26/2022	5-W-19-102622	< 51	30	51	< 89	45	89	< 38
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone									
NWTPH-Dx results compared to the RL = 477 µg/l									
GW-1	6/7/2022	GW-1-060722	< 51 U	30	51	150	44	88	165
	10/26/2022	GW-1-102622	59	25	42	87	37	73	146
GW-2	6/7/2022	GW-2-060722	< 52	31	52	< 90	45	90	< 38
	10/26/2022	GW-2-102622	80	31	52	150	46	91	230
GW-3	6/7/2022	GW-3-060722	< 51 < 51 ³	30 30 ³	51 51 ³	< 89 < 89 ³	45 45 ³	89 89 ³	< 38 < 38 ³
	10/27/2022	GW-3-102722	160 < 52 ³	30 30 ³	52 52 ³	300 180 ³	45 45 ³	89 89 ³	460 195 ³

Table 3
2022 Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l) ¹			ORO (µg/l) ¹			Calculated NWTPH-Dx ² (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone (continued)									
NWTPH-Dx results compared to the RL = 477 µg/l (continued)									
GW-4	6/7/2022	GW-4-060722	< 52	31	52	< 90	45	90	< 38
	10/26/2022	GW-4-102622	< 51	30	51	89	45	88	104
5-W-43	6/7/2022	5-W-43-060722	< 51	30	51	< 88	44	88	< 37
	10/26/2022	5-W-43-102622	88	31	52	280	45	90	368
2A-W-40	6/7/2022	2A-W-40-060722	< 52	31	52	< 89	45	89	< 38
	10/26/2022	2A-W-40-102622	< 42	25	42	< 73	37	73	< 31
2A-W-41	6/7/2022	2A-W-41-060722	< 54 U < 54 ³	32 32 ³	54 54 ³	120 < 93 ³	47 47 ³	93 93 ³	136 < 40 ³
	10/27/2022	2A-W-41-102722	500 120 ³	30 30 ³	51 51 ³	280 < 89 ³	45 45 ³	89 89 ³	780 143 ³
2A-W-42	6/7/2022	2A-W-42-060722	< 52 U	31	52	150	45	90	166
	10/26/2022	2A-W-42-102622	180	32	54	150	47	94	330
1C-W-4	6/7/2022	1C-W-4-060722	< 52 U	31	52	120	45	90	136
	10/27/2022	1C-W-4-102722	62	26	43	82	38	75	144
1C-W-7	6/7/2022	1C-W-7-060722	< 58 U	34	58	120	50	100	137
	10/27/2022	1C-W-7-102722	48	26	44	< 75	38	75	67

Table 3
2022 Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l) ¹			ORO (µg/l) ¹			Calculated NWTPH-Dx ² (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Remediation Performance Monitoring - Wells North of Railyard and Outside of Levee Zone (continued)									
NWTPH-Dx results compared to the RL = 477 µg/l (continued)									
1C-W-8	6/7/2022	1C-W-8-060722	< 56 U	33	56	< 96	48	96	< 41
	10/27/2022	1C-W-8-102722	130	25	42	210	37	73	340
1B-W-23	6/7/2022	1B-W-23-060722	< 52	31	52	< 91	46	91	< 39
	10/27/2022	1B-W-23-102722	69	26	44	100	38	76	169
No target NWTPH-Dx concentration									
5-W-51	6/6/2022	5-W-51-060622	< 55 U	33	55	280 J	48	110	297 J
	10/26/2022	5-W-51-102622	390	31	52	410	45	90	800
5-W-55	6/6/2022	5-W-55-060622	< 38 UJ	38	38	49 J	48	110	68 J
	10/26/2022	5-W-55-1026-22	68	31	52	< 90	46	90	91
5-W-56	6/6/2022	5-W-56-060622	< 56 U	33	56	460 J	48	110	477 J
	10/26/2022	5-W-56-102622	3,000	25	43	2,400	37	74	5,400
Remediation Performance Monitoring - Wells Within Railyard									
No target NWTPH-Dx concentration									
MW-4	6/7/2022	MW-4-060722	< 51 U	30	51	410	45	89	425
	10/27/2022	MW-4-102722	160	30	51	160	45	88	320
2A-W-9	6/7/2022	2A-W-9-060722	< 53 U	31	53	210	46	92	226
	10/27/2022	Not Sampled	Not Sampled						

NOTES:

Results in **bold** denote concentrations exceeding the 208 µg/l NWTPH-Dx cleanup level (Levee Zone wells) or the 477 µg/l NWTPH-Dx remediation level (wells outside the Levee Zone and between the BNSF railyard and the Skykomish River).

< denotes analyte not detected at or exceeding the reported concentration.

¹Analyzed by Washington State Department of Ecology (Ecology) Method NWTPH-Dx without silica gel cleanup unless otherwise noted.

²Sum of DRO and ORO, using half the MDL for non-detect results.

³Sample analyzed by Ecology Method NWTPH-Dx with silica gel cleanup.

CUL = Cleanup Level

DRO = total petroleum hydrocarbons as diesel-range organics

J = reported concentration is an estimated value

MDL = method detection limit

MRL = method reporting limit

µg/l = micrograms per liter

ORO = total petroleum hydrocarbons as oil-range organics

RL = Remediation Level

U = analyte was not detected based on data validation evaluation

UJ = analyte was not detected and reporting limit is an estimate

APPENDIX A
LABORATORY REPORTS

2022 ANNUAL LONG-TERM MONITORING REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-114630-1

Client Project/Site: BNSF Skykomish Ground Water
Revision: 2

For:

Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston



Authorized for release by:

8/10/2022 11:44:35 AM

Pauline Matlock, Project Manager
(253)922-2310

Pauline.Matlock@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Job ID: 580-114630-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative 580-114630-1

Comments

No additional comments.

Revision

The report being provided is a revision of the original report sent on 6/23/2022. The report (revision 2) is being revised due to: Samples 1-5 and 25-39 require the RL for Motor Oil to be elevated to the correct value based on the lowest ICAL point achieved for that batch, since re-analysis was not possible. Results for this batch have been reported down to the MDL (detection limit) with J-flags on results between the RL and MDL.

Receipt

The samples were received on 6/9/2022 8:51 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 1.1° C, 1.3° C, 2.1° C and 2.9° C.

Receipt Exceptions

The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): S-W-SO-060622 (580-114630-5), S-W-6-060722 (580-114630-11) and GW-3-060722 (580-114630-20).

Sample -5: The container labels list 5-W-56-060622, while the COC lists 5-W-50-060622. Client confirmed that the container label was correct.

Sample -11: The container labels list 5-W-16-060722, while the COC lists 5-W-6-060722. Client confirmed that the container label was correct.

Sample -20: The container labels of two containers list GW-30-060722, while the COC and remaining two containers list GW-3-060722. Client confirmed that GW-30-060722 should be its own separate sample. This was logged in as sample # 48.

GC Semi VOA

Method NWTPH-Dx: One of the method blanks for preparation batches 580-394134 and 580-394136 and analytical batch 580-394185 contained Motor Oil (>C24-C36) above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL). The only impacted client samples are the SG Cleaned samples 2A-W-41-060722 (580-114630-6) and GW-3-060722 (580-114630-20), which were both ND for Motor Oil above the reporting limit.

Method NWTPH-Dx: The continuing calibration verification (CCV) associated with batch 580-394387 recovered above the upper control limit for o-Terphenyl, #2 Diesel (C10-C24) and Motor Oil (>C24-C36). The samples associated with this CCV were non-detects for the affected analytes above the reporting limit; therefore, the data have been reported. The associated samples are: S1-BU-060822 (580-114630-40), S1-AD-060822 (580-114630-41), S1-AU-060822 (580-114630-42), S3-BD-060822 (580-114630-43), S3-BU-060822 (580-114630-44), MW-555-060822 (580-114630-45), 5-W-19-060822 (580-114630-47), GW-30-060722 (580-114630-48), (CCV 580-394387/67) and (CCV 580-394387/81).

Method NWTPH-Dx: The closing calibration verifiers failed to meet lower method acceptance criteria for Motor Oil for the following samples. The initial calibration verifier did meet acceptance criteria for Motor Oil, which indicates that these samples may have caused the closing CCVs to fail, as these samples were the only ones in this batch. The only CCV that passed criteria in this batch is the opener. The 2nd CCV had -17.9% drift, the 3rd CCV had -18.0% drift, and the final CCV had -19.8% drift.

5-W-18-060622 (580-114630-1), 5-W-180-060622 (580-114630-2), 5-W-51-060622 (580-114630-3), 5-W-55-060622 (580-114630-4), 5-W-56-060622 (580-114630-5), S4-AD-060822 (580-114630-25), S4-AU-060822 (580-114630-26), S3-CU-060822 (580-114630-27), S3-CD-060822 (580-114630-28), S2-AU-060822 (580-114630-29), S2-AD-060822 (580-114630-30), S2-BD-060822 (580-114630-31), S2-BU-060822 (580-114630-32), S4-CD-060822 (580-114630-33), S4-CU-060822 (580-114630-34), S4-BU-060822 (580-114630-35), S4-BD-060822 (580-114630-36), S3-AD-060822 (580-114630-37), S3-AU-060822 (580-114630-38), S1-BD-060822 (580-114630-39), (CCV 580-394464/14), (CCV 580-394464/25) and (CCV 580-394464/29)

Method NWTPH-Dx: The reporting limit (RL) for Motor Oil was found to be below the lowest ICAL point for the following samples, which will require a reanalysis in order to correct. The RL was revised to reflect the lower ICAL point on 8/10/2022.

Case Narrative

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Job ID: 580-114630-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

5-W-18-060622 (580-114630-1), 5-W-180-060622 (580-114630-2), 5-W-51-060622 (580-114630-3), 5-W-55-060622 (580-114630-4), 5-W-56-060622 (580-114630-5), S4-AD-060822 (580-114630-25), S4-AU-060822 (580-114630-26), S3-CU-060822 (580-114630-27), S3-CD-060822 (580-114630-28), S2-AU-060822 (580-114630-29), S2-AD-060822 (580-114630-30), S2-BD-060822 (580-114630-31), S2-BU-060822 (580-114630-32), S4-CD-060822 (580-114630-33), S4-CU-060822 (580-114630-34), S4-BU-060822 (580-114630-35), S4-BD-060822 (580-114630-36), S3-AD-060822 (580-114630-37), S3-AU-060822 (580-114630-38) and S1-BD-060822 (580-114630-39)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-18-060622

Lab Sample ID: 580-114630-1

Date Collected: 06/06/22 16:27

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.084		0.055	0.033	mg/L		06/20/22 16:28	06/21/22 21:36	1
Motor Oil (>C24-C36)	0.15		0.11	0.048	mg/L		06/20/22 16:28	06/21/22 21:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	92		50 - 150				06/20/22 16:28	06/21/22 21:36	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-180-060622

Lab Sample ID: 580-114630-2

Date Collected: 06/06/22 16:40

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.054	J	0.056	0.033	mg/L		06/20/22 16:28	06/21/22 21:56	1
Motor Oil (>C24-C36)	0.11		0.11	0.049	mg/L		06/20/22 16:28	06/21/22 21:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	94		50 - 150				06/20/22 16:28	06/21/22 21:56	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-51-060622

Lab Sample ID: 580-114630-3

Date Collected: 06/06/22 17:18

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.12		0.055	0.033	mg/L		06/20/22 16:28	06/21/22 22:35	1
Motor Oil (>C24-C36)	0.28		0.11	0.048	mg/L		06/20/22 16:28	06/21/22 22:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	90		50 - 150				06/20/22 16:28	06/21/22 22:35	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-55-060622

Lab Sample ID: 580-114630-4

Date Collected: 06/06/22 15:30

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.038	J	0.055	0.033	mg/L		06/20/22 16:28	06/21/22 22:54	1
Motor Oil (>C24-C36)	0.049	J	0.11	0.048	mg/L		06/20/22 16:28	06/21/22 22:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		50 - 150				06/20/22 16:28	06/21/22 22:54	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-56-060622

Lab Sample ID: 580-114630-5

Date Collected: 06/06/22 14:51

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.15		0.056	0.033	mg/L		06/20/22 16:28	06/21/22 23:14	1
Motor Oil (>C24-C36)	0.46		0.11	0.048	mg/L		06/20/22 16:28	06/21/22 23:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	85		50 - 150				06/20/22 16:28	06/21/22 23:14	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 2A-W-41-060722

Lab Sample ID: 580-114630-6

Date Collected: 06/07/22 14:50

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.11		0.054		mg/L		06/17/22 08:36	06/17/22 16:16	1
Motor Oil (>C24-C36)	0.12		0.093		mg/L		06/17/22 08:36	06/17/22 16:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	82		50 - 150				06/17/22 08:36	06/17/22 16:16	1

Method: NWTPH-Dx - Semi-Volatile Petroleum Products by NWTPH with Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.054		mg/L		06/17/22 08:36	06/18/22 00:40	1
Motor Oil (>C24-C36)	ND		0.093		mg/L		06/17/22 08:36	06/18/22 00:40	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	89		50 - 150				06/17/22 08:36	06/18/22 00:40	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 2A-W-410-060722

Lab Sample ID: 580-114630-7

Date Collected: 06/07/22 14:50

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.10		0.054		mg/L		06/17/22 08:36	06/17/22 16:57	1
Motor Oil (>C24-C36)	0.15		0.093		mg/L		06/17/22 08:36	06/17/22 16:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	91		50 - 150				06/17/22 08:36	06/17/22 16:57	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 1C-W-8-060722

Lab Sample ID: 580-114630-8

Date Collected: 06/07/22 12:03

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.059		0.056		mg/L		06/17/22 08:36	06/17/22 17:17	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		06/17/22 08:36	06/17/22 17:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150				06/17/22 08:36	06/17/22 17:17	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 1C-W-7-060722

Lab Sample ID: 580-114630-9

Date Collected: 06/07/22 11:55

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.087		0.058		mg/L		06/17/22 08:36	06/17/22 17:37	1
Motor Oil (>C24-C36)	0.12		0.10		mg/L		06/17/22 08:36	06/17/22 17:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	85		50 - 150				06/17/22 08:36	06/17/22 17:37	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: EW-2A--060722

Lab Sample ID: 580-114630-10

Date Collected: 06/07/22 09:45

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.056		mg/L		06/17/22 08:36	06/17/22 17:57	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		06/17/22 08:36	06/17/22 17:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	84		50 - 150				06/17/22 08:36	06/17/22 17:57	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-16-060722

Lab Sample ID: 580-114630-11

Date Collected: 06/07/22 09:58

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/17/22 08:36	06/17/22 18:17	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		06/17/22 08:36	06/17/22 18:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	74		50 - 150				06/17/22 08:36	06/17/22 18:17	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-14-060722

Lab Sample ID: 580-114630-12

Date Collected: 06/07/22 11:00

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/17/22 08:36	06/17/22 18:57	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		06/17/22 08:36	06/17/22 18:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	85		50 - 150				06/17/22 08:36	06/17/22 18:57	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-17-060722

Lab Sample ID: 580-114630-13

Date Collected: 06/07/22 10:30

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/17/22 08:36	06/17/22 19:17	1
Motor Oil (>C24-C36)	ND		0.087		mg/L		06/17/22 08:36	06/17/22 19:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	84		50 - 150				06/17/22 08:36	06/17/22 19:17	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: EW-1-060722

Lab Sample ID: 580-114630-14

Date Collected: 06/07/22 11:42

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/17/22 08:36	06/17/22 19:38	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		06/17/22 08:36	06/17/22 19:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	79		50 - 150				06/17/22 08:36	06/17/22 19:38	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: MW-4-060722

Lab Sample ID: 580-114630-15

Date Collected: 06/07/22 15:45

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.15		0.051		mg/L		06/17/22 08:37	06/17/22 19:58	1
Motor Oil (>C24-C36)	0.41		0.089		mg/L		06/17/22 08:37	06/17/22 19:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	82		50 - 150				06/17/22 08:37	06/17/22 19:58	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 2A-W-40-060722

Lab Sample ID: 580-114630-16

Date Collected: 06/07/22 15:46

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/17/22 08:36	06/17/22 20:18	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		06/17/22 08:36	06/17/22 20:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	80		50 - 150				06/17/22 08:36	06/17/22 20:18	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: GW-2-060722

Lab Sample ID: 580-114630-17

Date Collected: 06/07/22 15:07

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/17/22 08:36	06/17/22 20:38	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		06/17/22 08:36	06/17/22 20:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	86		50 - 150				06/17/22 08:36	06/17/22 20:38	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: GW-1-060722

Lab Sample ID: 580-114630-18

Date Collected: 06/07/22 14:17

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.058		0.051		mg/L		06/17/22 08:36	06/17/22 20:58	1
Motor Oil (>C24-C36)	0.15		0.088		mg/L		06/17/22 08:36	06/17/22 20:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	73		50 - 150				06/17/22 08:36	06/17/22 20:58	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-43-060722

Lab Sample ID: 580-114630-19

Date Collected: 06/07/22 12:09

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/17/22 08:36	06/17/22 21:18	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		06/17/22 08:36	06/17/22 21:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	83		50 - 150				06/17/22 08:36	06/17/22 21:18	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: GW-3-060722

Lab Sample ID: 580-114630-20

Date Collected: 06/07/22 14:50

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/17/22 08:36	06/17/22 16:37	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		06/17/22 08:36	06/17/22 16:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	83		50 - 150				06/17/22 08:36	06/17/22 16:37	1

Method: NWTPH-Dx - Semi-Volatile Petroleum Products by NWTPH with Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/17/22 08:36	06/18/22 01:00	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		06/17/22 08:36	06/18/22 01:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	87		50 - 150				06/17/22 08:36	06/18/22 01:00	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 1B-W-23-060722

Lab Sample ID: 580-114630-21

Date Collected: 06/07/22 14:20

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/17/22 08:36	06/17/22 21:38	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/17/22 08:36	06/17/22 21:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	77		50 - 150				06/17/22 08:36	06/17/22 21:38	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 2A-W-42-060722

Lab Sample ID: 580-114630-22

Date Collected: 06/07/22 12:00

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.10		0.052		mg/L		06/17/22 08:36	06/17/22 21:59	1
Motor Oil (>C24-C36)	0.15		0.090		mg/L		06/17/22 08:36	06/17/22 21:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	88		50 - 150				06/17/22 08:36	06/17/22 21:59	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 1C-W-4-060722

Lab Sample ID: 580-114630-23

Date Collected: 06/07/22 11:15

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.10		0.052		mg/L		06/17/22 08:36	06/17/22 22:39	1
Motor Oil (>C24-C36)	0.12		0.090		mg/L		06/17/22 08:36	06/17/22 22:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	89		50 - 150				06/17/22 08:36	06/17/22 22:39	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: GW-4-060722

Lab Sample ID: 580-114630-24

Date Collected: 06/07/22 10:30

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/17/22 08:36	06/17/22 22:59	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		06/17/22 08:36	06/17/22 22:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	80		50 - 150				06/17/22 08:36	06/17/22 22:59	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S4-AD-060822

Lab Sample ID: 580-114630-25

Date Collected: 06/08/22 11:45

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.031	J	0.052	0.031	mg/L		06/20/22 09:32	06/21/22 16:22	1
Motor Oil (>C24-C36)	ND		0.10	0.045	mg/L		06/20/22 09:32	06/21/22 16:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83		50 - 150				06/20/22 09:32	06/21/22 16:22	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S4-AU-060822

Lab Sample ID: 580-114630-26

Date Collected: 06/08/22 12:10

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.066		0.053	0.031	mg/L		06/20/22 09:32	06/21/22 16:42	1
Motor Oil (>C24-C36)	0.080	J	0.11	0.046	mg/L		06/20/22 09:32	06/21/22 16:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	75		50 - 150				06/20/22 09:32	06/21/22 16:42	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-CU-060822

Lab Sample ID: 580-114630-27

Date Collected: 06/08/22 11:45

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.11		0.052	0.031	mg/L		06/20/22 09:32	06/21/22 17:01	1
Motor Oil (>C24-C36)	0.18		0.10	0.045	mg/L		06/20/22 09:32	06/21/22 17:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150				06/20/22 09:32	06/21/22 17:01	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-CD-060822

Lab Sample ID: 580-114630-28

Date Collected: 06/08/22 11:25

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.036	J	0.052	0.031	mg/L		06/20/22 09:32	06/21/22 17:21	1
Motor Oil (>C24-C36)	ND		0.10	0.046	mg/L		06/20/22 09:32	06/21/22 17:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	81		50 - 150				06/20/22 09:32	06/21/22 17:21	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S2-AU-060822

Lab Sample ID: 580-114630-29

Date Collected: 06/08/22 10:10

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.032	J	0.053	0.031	mg/L		06/20/22 09:32	06/21/22 17:40	1
Motor Oil (>C24-C36)	ND		0.11	0.046	mg/L		06/20/22 09:32	06/21/22 17:40	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	80		50 - 150				06/20/22 09:32	06/21/22 17:40	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S2-AD-060822

Lab Sample ID: 580-114630-30

Date Collected: 06/08/22 09:45

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.041	J	0.053	0.031	mg/L		06/20/22 09:32	06/21/22 18:00	1
Motor Oil (>C24-C36)	ND		0.11	0.046	mg/L		06/20/22 09:32	06/21/22 18:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	75		50 - 150				06/20/22 09:32	06/21/22 18:00	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S2-BD-060822

Lab Sample ID: 580-114630-31

Date Collected: 06/08/22 10:25

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.034	J	0.052	0.030	mg/L		06/20/22 09:32	06/21/22 18:20	1
Motor Oil (>C24-C36)	ND		0.10	0.045	mg/L		06/20/22 09:32	06/21/22 18:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	72		50 - 150				06/20/22 09:32	06/21/22 18:20	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S2-BU-060822

Lab Sample ID: 580-114630-32

Date Collected: 06/08/22 10:48

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.076		0.052	0.031	mg/L		06/20/22 09:32	06/21/22 18:59	1
Motor Oil (>C24-C36)	0.063	J	0.10	0.045	mg/L		06/20/22 09:32	06/21/22 18:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	86		50 - 150				06/20/22 09:32	06/21/22 18:59	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S4-CD-060822

Lab Sample ID: 580-114630-33

Date Collected: 06/08/22 12:15

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052	0.031	mg/L		06/20/22 09:32	06/21/22 19:19	1
Motor Oil (>C24-C36)	ND		0.10	0.046	mg/L		06/20/22 09:32	06/21/22 19:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	57		50 - 150				06/20/22 09:32	06/21/22 19:19	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S4-CU-060822

Lab Sample ID: 580-114630-34

Date Collected: 06/08/22 12:35

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.11		0.052	0.031	mg/L		06/20/22 09:32	06/21/22 19:38	1
Motor Oil (>C24-C36)	0.12		0.10	0.045	mg/L		06/20/22 09:32	06/21/22 19:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	78		50 - 150				06/20/22 09:32	06/21/22 19:38	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S4-BU-060822

Lab Sample ID: 580-114630-35

Date Collected: 06/08/22 12:20

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.033	J	0.057	0.033	mg/L		06/20/22 09:32	06/21/22 19:58	1
Motor Oil (>C24-C36)	ND		0.11	0.049	mg/L		06/20/22 09:32	06/21/22 19:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	81		50 - 150				06/20/22 09:32	06/21/22 19:58	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S4-BD-060822

Lab Sample ID: 580-114630-36

Date Collected: 06/08/22 11:51

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.043	J	0.054	0.032	mg/L		06/20/22 09:32	06/21/22 20:17	1
Motor Oil (>C24-C36)	ND		0.11	0.047	mg/L		06/20/22 09:32	06/21/22 20:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	87		50 - 150				06/20/22 09:32	06/21/22 20:17	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-AD-060822

Lab Sample ID: 580-114630-37

Date Collected: 06/08/22 11:12

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055	0.032	mg/L		06/20/22 09:32	06/21/22 20:37	1
Motor Oil (>C24-C36)	ND		0.11	0.048	mg/L		06/20/22 09:32	06/21/22 20:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	80		50 - 150				06/20/22 09:32	06/21/22 20:37	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-AU-060822

Lab Sample ID: 580-114630-38

Date Collected: 06/08/22 10:50

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.25		0.053	0.031	mg/L		06/20/22 09:32	06/21/22 20:57	1
Motor Oil (>C24-C36)	0.23		0.11	0.046	mg/L		06/20/22 09:32	06/21/22 20:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	78		50 - 150				06/20/22 09:32	06/21/22 20:57	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S1-BD-060822

Lab Sample ID: 580-114630-39

Date Collected: 06/08/22 10:05

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.041	J	0.057	0.034	mg/L		06/20/22 09:32	06/21/22 21:16	1
Motor Oil (>C24-C36)	ND		0.11	0.050	mg/L		06/20/22 09:32	06/21/22 21:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	73		50 - 150				06/20/22 09:32	06/21/22 21:16	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S1-BU-060822

Lab Sample ID: 580-114630-40

Date Collected: 06/08/22 09:45

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.053		mg/L		06/21/22 09:25	06/21/22 17:33	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/21/22 09:25	06/21/22 17:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	81		50 - 150				06/21/22 09:25	06/21/22 17:33	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S1-AD-060822

Lab Sample ID: 580-114630-41

Date Collected: 06/08/22 09:37

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/21/22 09:25	06/21/22 17:53	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		06/21/22 09:25	06/21/22 17:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	69		50 - 150				06/21/22 09:25	06/21/22 17:53	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S1-AU-060822

Lab Sample ID: 580-114630-42

Date Collected: 06/08/22 10:00

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/21/22 09:25	06/21/22 18:14	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		06/21/22 09:25	06/21/22 18:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	81		50 - 150				06/21/22 09:25	06/21/22 18:14	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-BD-060822

Lab Sample ID: 580-114630-43

Date Collected: 06/08/22 10:40

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/21/22 09:25	06/21/22 18:34	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		06/21/22 09:25	06/21/22 18:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	72		50 - 150				06/21/22 09:25	06/21/22 18:34	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-BU-060822

Lab Sample ID: 580-114630-44

Date Collected: 06/08/22 11:00

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		06/21/22 09:25	06/21/22 18:54	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		06/21/22 09:25	06/21/22 18:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	68		50 - 150				06/21/22 09:25	06/21/22 18:54	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: MW-555-060822

Lab Sample ID: 580-114630-45

Date Collected: 06/08/22 12:55

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.063		0.052		mg/L		06/21/22 09:25	06/21/22 19:14	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		06/21/22 09:25	06/21/22 19:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	74		50 - 150				06/21/22 09:25	06/21/22 19:14	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 2A-W-9-060722

Lab Sample ID: 580-114630-46

Date Collected: 06/07/22 16:28

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.13		0.053		mg/L		06/17/22 08:36	06/17/22 23:19	1
Motor Oil (>C24-C36)	0.21		0.092		mg/L		06/17/22 08:36	06/17/22 23:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	60		50 - 150				06/17/22 08:36	06/17/22 23:19	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-19-060822

Lab Sample ID: 580-114630-47

Date Collected: 06/08/22 13:48

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		06/21/22 09:25	06/21/22 19:55	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		06/21/22 09:25	06/21/22 19:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	80		50 - 150				06/21/22 09:25	06/21/22 19:55	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: GW-30-060722

Lab Sample ID: 580-114630-48

Date Collected: 06/07/22 14:50

Matrix: Water

Date Received: 06/09/22 08:51

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		06/21/22 09:25	06/21/22 17:13	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		06/21/22 09:25	06/21/22 17:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	78		50 - 150				06/21/22 09:25	06/21/22 17:13	1

QC Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-394134/1-A

Matrix: Water

Analysis Batch: 394185

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394134

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		06/17/22 08:36	06/17/22 15:16	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		06/17/22 08:36	06/17/22 15:16	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	85		50 - 150				06/17/22 08:36	06/17/22 15:16	1

Lab Sample ID: LCS 580-394134/2-A

Matrix: Water

Analysis Batch: 394185

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394134

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
#2 Diesel (C10-C24)	4.00	3.11		mg/L		78	50 - 120	
Motor Oil (>C24-C36)	4.00	3.59		mg/L		90	64 - 120	
Surrogate	LCS %Recovery	LCS Qualifier	Limits					
o-Terphenyl	97		50 - 150					

Lab Sample ID: LCSD 580-394134/3-A

Matrix: Water

Analysis Batch: 394185

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 394134

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	2.85		mg/L		71	50 - 120	9	26
Motor Oil (>C24-C36)	4.00	3.34		mg/L		83	64 - 120	7	24
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl	88		50 - 150						

Lab Sample ID: MB 580-394279/1-A

Matrix: Water

Analysis Batch: 394637

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394279

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		06/20/22 09:32	06/22/22 19:03	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		06/20/22 09:32	06/22/22 19:03	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	85		50 - 150				06/20/22 09:32	06/22/22 19:03	1

Lab Sample ID: LCS 580-394279/2-A

Matrix: Water

Analysis Batch: 394464

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394279

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
#2 Diesel (C10-C24)	4.00	2.70		mg/L		67	50 - 120	
Motor Oil (>C24-C36)	4.00	2.73		mg/L		68	64 - 120	

Eurofins Seattle

QC Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 580-394279/2-A
Matrix: Water
Analysis Batch: 394464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 394279

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	83		50 - 150

Lab Sample ID: LCSD 580-394279/3-A
Matrix: Water
Analysis Batch: 394464

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 394279

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	2.95		mg/L		74	50 - 120	9	26
Motor Oil (>C24-C36)	4.00	2.97		mg/L		74	64 - 120	8	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	94		50 - 150

Lab Sample ID: MB 580-394395/1-A
Matrix: Water
Analysis Batch: 394387

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 394395

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		06/21/22 09:25	06/21/22 16:12	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		06/21/22 09:25	06/21/22 16:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	83		50 - 150	06/21/22 09:25	06/21/22 16:12	1

Lab Sample ID: LCS 580-394395/2-A
Matrix: Water
Analysis Batch: 394387

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 394395

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
#2 Diesel (C10-C24)	4.00	3.00		mg/L		75	50 - 120
Motor Oil (>C24-C36)	4.00	3.37		mg/L		84	64 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	89		50 - 150

Lab Sample ID: LCSD 580-394395/3-A
Matrix: Water
Analysis Batch: 394387

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 394395

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	2.95		mg/L		74	50 - 120	2	26
Motor Oil (>C24-C36)	4.00	3.31		mg/L		83	64 - 120	2	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	88		50 - 150

Eurofins Seattle

QC Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Method: NWTPH-Dx - Semi-Volatile Petroleum Products by NWTPH with Silica Gel Cleanup

Lab Sample ID: MB 580-394134/1-B

Matrix: Water

Analysis Batch: 394185

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394134

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		06/17/22 08:36	06/17/22 23:40	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		06/17/22 08:36	06/17/22 23:40	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	90		50 - 150				06/17/22 08:36	06/17/22 23:40	1

Lab Sample ID: LCS 580-394134/2-B

Matrix: Water

Analysis Batch: 394185

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394134

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
#2 Diesel (C10-C24)	4.00	3.26		mg/L		82	50 - 120		
Motor Oil (>C24-C36)	4.00	3.77		mg/L		94	64 - 120		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
o-Terphenyl	107		50 - 150						

Lab Sample ID: LCSD 580-394134/3-B

Matrix: Water

Analysis Batch: 394185

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 394134

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	2.94		mg/L		73	50 - 120	10	26
Motor Oil (>C24-C36)	4.00	3.51		mg/L		88	64 - 120	7	24
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl	99		50 - 150						

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-18-060622

Lab Sample ID: 580-114630-1

Date Collected: 06/06/22 16:27

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 16:28
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 21:36

Client Sample ID: 5-W-180-060622

Lab Sample ID: 580-114630-2

Date Collected: 06/06/22 16:40

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 16:28
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 21:56

Client Sample ID: 5-W-51-060622

Lab Sample ID: 580-114630-3

Date Collected: 06/06/22 17:18

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 16:28
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 22:35

Client Sample ID: 5-W-55-060622

Lab Sample ID: 580-114630-4

Date Collected: 06/06/22 15:30

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 16:28
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 22:54

Client Sample ID: 5-W-56-060622

Lab Sample ID: 580-114630-5

Date Collected: 06/06/22 14:51

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 16:28
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 23:14

Client Sample ID: 2A-W-41-060722

Lab Sample ID: 580-114630-6

Date Collected: 06/07/22 14:50

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 16:16
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Cleanup	3630C			394136	JJY	EETNW SE.	06/17/22 09:00
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/18/22 00:40

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 2A-W-410-060722

Lab Sample ID: 580-114630-7

Date Collected: 06/07/22 14:50

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 16:57

Client Sample ID: 1C-W-8-060722

Lab Sample ID: 580-114630-8

Date Collected: 06/07/22 12:03

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 17:17

Client Sample ID: 1C-W-7-060722

Lab Sample ID: 580-114630-9

Date Collected: 06/07/22 11:55

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 17:37

Client Sample ID: EW-2A--060722

Lab Sample ID: 580-114630-10

Date Collected: 06/07/22 09:45

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 17:57

Client Sample ID: 5-W-16-060722

Lab Sample ID: 580-114630-11

Date Collected: 06/07/22 09:58

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 18:17

Client Sample ID: 5-W-14-060722

Lab Sample ID: 580-114630-12

Date Collected: 06/07/22 11:00

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 18:57

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-17-060722

Lab Sample ID: 580-114630-13

Date Collected: 06/07/22 10:30

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 19:17

Client Sample ID: EW-1-060722

Lab Sample ID: 580-114630-14

Date Collected: 06/07/22 11:42

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 19:38

Client Sample ID: MW-4-060722

Lab Sample ID: 580-114630-15

Date Collected: 06/07/22 15:45

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:37
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 19:58

Client Sample ID: 2A-W-40-060722

Lab Sample ID: 580-114630-16

Date Collected: 06/07/22 15:46

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 20:18

Client Sample ID: GW-2-060722

Lab Sample ID: 580-114630-17

Date Collected: 06/07/22 15:07

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 20:38

Client Sample ID: GW-1-060722

Lab Sample ID: 580-114630-18

Date Collected: 06/07/22 14:17

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 20:58

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: 5-W-43-060722

Lab Sample ID: 580-114630-19

Date Collected: 06/07/22 12:09

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 21:18

Client Sample ID: GW-3-060722

Lab Sample ID: 580-114630-20

Date Collected: 06/07/22 14:50

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 16:37
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Cleanup	3630C			394136	JJY	EETNW SE.	06/17/22 09:00
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/18/22 01:00

Client Sample ID: 1B-W-23-060722

Lab Sample ID: 580-114630-21

Date Collected: 06/07/22 14:20

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 21:38

Client Sample ID: 2A-W-42-060722

Lab Sample ID: 580-114630-22

Date Collected: 06/07/22 12:00

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 21:59

Client Sample ID: 1C-W-4-060722

Lab Sample ID: 580-114630-23

Date Collected: 06/07/22 11:15

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 22:39

Client Sample ID: GW-4-060722

Lab Sample ID: 580-114630-24

Date Collected: 06/07/22 10:30

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 22:59

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S4-AD-060822

Lab Sample ID: 580-114630-25

Date Collected: 06/08/22 11:45

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 16:22

Client Sample ID: S4-AU-060822

Lab Sample ID: 580-114630-26

Date Collected: 06/08/22 12:10

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 16:42

Client Sample ID: S3-CU-060822

Lab Sample ID: 580-114630-27

Date Collected: 06/08/22 11:45

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 17:01

Client Sample ID: S3-CD-060822

Lab Sample ID: 580-114630-28

Date Collected: 06/08/22 11:25

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 17:21

Client Sample ID: S2-AU-060822

Lab Sample ID: 580-114630-29

Date Collected: 06/08/22 10:10

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 17:40

Client Sample ID: S2-AD-060822

Lab Sample ID: 580-114630-30

Date Collected: 06/08/22 09:45

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 18:00

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S2-BD-060822

Lab Sample ID: 580-114630-31

Date Collected: 06/08/22 10:25

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 18:20

Client Sample ID: S2-BU-060822

Lab Sample ID: 580-114630-32

Date Collected: 06/08/22 10:48

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 18:59

Client Sample ID: S4-CD-060822

Lab Sample ID: 580-114630-33

Date Collected: 06/08/22 12:15

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 19:19

Client Sample ID: S4-CU-060822

Lab Sample ID: 580-114630-34

Date Collected: 06/08/22 12:35

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 19:38

Client Sample ID: S4-BU-060822

Lab Sample ID: 580-114630-35

Date Collected: 06/08/22 12:20

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 19:58

Client Sample ID: S4-BD-060822

Lab Sample ID: 580-114630-36

Date Collected: 06/08/22 11:51

Matrix: Water

Date Received: 06/09/22 08:51

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 20:17

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-AD-060822

Date Collected: 06/08/22 11:12

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-37

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 20:37

Client Sample ID: S3-AU-060822

Date Collected: 06/08/22 10:50

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-38

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 20:57

Client Sample ID: S1-BD-060822

Date Collected: 06/08/22 10:05

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-39

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394279	JJY	EETNW SE.	06/20/22 09:32
Total/NA	Analysis	NWTPH-Dx		1	394464	Y1F	EETNW SE.	06/21/22 21:16

Client Sample ID: S1-BU-060822

Date Collected: 06/08/22 09:45

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-40

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 17:33

Client Sample ID: S1-AD-060822

Date Collected: 06/08/22 09:37

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-41

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 17:53

Client Sample ID: S1-AU-060822

Date Collected: 06/08/22 10:00

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-42

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 18:14

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Client Sample ID: S3-BD-060822

Date Collected: 06/08/22 10:40

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-43

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 18:34

Client Sample ID: S3-BU-060822

Date Collected: 06/08/22 11:00

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-44

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 18:54

Client Sample ID: MW-555-060822

Date Collected: 06/08/22 12:55

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-45

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 19:14

Client Sample ID: 2A-W-9-060722

Date Collected: 06/07/22 16:28

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-46

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394134	JJY	EETNW SE.	06/17/22 08:36
Total/NA	Analysis	NWTPH-Dx		1	394185	DH	EETNW SE.	06/17/22 23:19

Client Sample ID: 5-W-19-060822

Date Collected: 06/08/22 13:48

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-47

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 19:55

Client Sample ID: GW-30-060722

Date Collected: 06/07/22 14:50

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-48

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 17:13

Laboratory References:

EETNW SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Eurofins Seattle

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-22

1
2
3
4
5
6
7
8
9
10
11

Sample Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-114630-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-114630-1	5-W-18-060622	Water	06/06/22 16:27	06/09/22 08:51
580-114630-2	5-W-180-060622	Water	06/06/22 16:40	06/09/22 08:51
580-114630-3	5-W-51-060622	Water	06/06/22 17:18	06/09/22 08:51
580-114630-4	5-W-55-060622	Water	06/06/22 15:30	06/09/22 08:51
580-114630-5	5-W-56-060622	Water	06/06/22 14:51	06/09/22 08:51
580-114630-6	2A-W-41-060722	Water	06/07/22 14:50	06/09/22 08:51
580-114630-7	2A-W-410-060722	Water	06/07/22 14:50	06/09/22 08:51
580-114630-8	1C-W-8-060722	Water	06/07/22 12:03	06/09/22 08:51
580-114630-9	1C-W-7-060722	Water	06/07/22 11:55	06/09/22 08:51
580-114630-10	EW-2A--060722	Water	06/07/22 09:45	06/09/22 08:51
580-114630-11	5-W-16-060722	Water	06/07/22 09:58	06/09/22 08:51
580-114630-12	5-W-14-060722	Water	06/07/22 11:00	06/09/22 08:51
580-114630-13	5-W-17-060722	Water	06/07/22 10:30	06/09/22 08:51
580-114630-14	EW-1-060722	Water	06/07/22 11:42	06/09/22 08:51
580-114630-15	MW-4-060722	Water	06/07/22 15:45	06/09/22 08:51
580-114630-16	2A-W-40-060722	Water	06/07/22 15:46	06/09/22 08:51
580-114630-17	GW-2-060722	Water	06/07/22 15:07	06/09/22 08:51
580-114630-18	GW-1-060722	Water	06/07/22 14:17	06/09/22 08:51
580-114630-19	5-W-43-060722	Water	06/07/22 12:09	06/09/22 08:51
580-114630-20	GW-3-060722	Water	06/07/22 14:50	06/09/22 08:51
580-114630-21	1B-W-23-060722	Water	06/07/22 14:20	06/09/22 08:51
580-114630-22	2A-W-42-060722	Water	06/07/22 12:00	06/09/22 08:51
580-114630-23	1C-W-4-060722	Water	06/07/22 11:15	06/09/22 08:51
580-114630-24	GW-4-060722	Water	06/07/22 10:30	06/09/22 08:51
580-114630-25	S4-AD-060822	Water	06/08/22 11:45	06/09/22 08:51
580-114630-26	S4-AU-060822	Water	06/08/22 12:10	06/09/22 08:51
580-114630-27	S3-CU-060822	Water	06/08/22 11:45	06/09/22 08:51
580-114630-28	S3-CD-060822	Water	06/08/22 11:25	06/09/22 08:51
580-114630-29	S2-AU-060822	Water	06/08/22 10:10	06/09/22 08:51
580-114630-30	S2-AD-060822	Water	06/08/22 09:45	06/09/22 08:51
580-114630-31	S2-BD-060822	Water	06/08/22 10:25	06/09/22 08:51
580-114630-32	S2-BU-060822	Water	06/08/22 10:48	06/09/22 08:51
580-114630-33	S4-CD-060822	Water	06/08/22 12:15	06/09/22 08:51
580-114630-34	S4-CU-060822	Water	06/08/22 12:35	06/09/22 08:51
580-114630-35	S4-BU-060822	Water	06/08/22 12:20	06/09/22 08:51
580-114630-36	S4-BD-060822	Water	06/08/22 11:51	06/09/22 08:51
580-114630-37	S3-AD-060822	Water	06/08/22 11:12	06/09/22 08:51
580-114630-38	S3-AU-060822	Water	06/08/22 10:50	06/09/22 08:51
580-114630-39	S1-BD-060822	Water	06/08/22 10:05	06/09/22 08:51
580-114630-40	S1-BU-060822	Water	06/08/22 09:45	06/09/22 08:51
580-114630-41	S1-AD-060822	Water	06/08/22 09:37	06/09/22 08:51
580-114630-42	S1-AU-060822	Water	06/08/22 10:00	06/09/22 08:51
580-114630-43	S3-BD-060822	Water	06/08/22 10:40	06/09/22 08:51
580-114630-44	S3-BU-060822	Water	06/08/22 11:00	06/09/22 08:51
580-114630-45	MW-555-060822	Water	06/08/22 12:55	06/09/22 08:51
580-114630-46	2A-W-9-060722	Water	06/07/22 16:28	06/09/22 08:51
580-114630-47	5-W-19-060822	Water	06/08/22 13:48	06/09/22 08:51
580-114630-48	GW-30-060722	Water	06/07/22 14:50	06/09/22 08:51



530-114630 Chain of Custody

LABORATORY INFORMATION										LAB WORK ORDER:				
Laboratory:					Project Manager:					SHIPMENT INFORMATION				
Address:					Phone:									
City/State/ZIP:					Fax:									
Project State of Origin:					CONSULTANT INFORMATION					Project Number:				
BNSF Project Number:					Company:					Project Manager:				
BNSF Project Name:					Address:					Email:				
BNSF Contact:					City/State/ZIP:					Phone:				
BNSF Project Number: 683-071					Company: Furallon					Project Number: 683-071				
BNSF Project Name: BNSF Skykomish					Address: 975 5th Ave. NW					Project Manager: Amanda McLaughlin				
BNSF Contact: Shane Duggross					City/State/ZIP: Issaquah WA. 98027					Email: A.McLaughlin@Furallon.com				
BNSF Work Order No.:					Phone: 425 245 0800					Fax:				
TURNAROUND TIME			DELIVERABLES			METHODS FOR ANALYSIS			COMMENTS		LAB USE			
<input type="checkbox"/> 1-day Rush <input type="checkbox"/> 2-day Rush <input type="checkbox"/> 3-day Rush			<input type="checkbox"/> 5- to 8-day Rush <input checked="" type="checkbox"/> Standard 10-Day <input type="checkbox"/> Other _____			<input type="checkbox"/> BNSF Standard (Level II) <input type="checkbox"/> Level III <input type="checkbox"/> Level IV							<input type="checkbox"/> Other Deliverables? <input type="checkbox"/> EDD Req. Format?	
SAMPLE INFORMATION														
Sample Identification	Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix	METHODS FOR ANALYSIS					COMMENTS	LAB USE
		Date	Time	Sampler				NW TPH-DX	NW TPH-DX + SGC					
1 5-W-18-060622	2	6/6/22	16:27	GP	N	G	W	X						
2 5-W-180-060622	✓	6/6/22	16:40	GP	N	G	W							
3 5-W-S1-060622			17:18	GP	N	G	W							
4 5-W-SS-060622			15:30	GP										
5 5-W-SO-060622			14:51	GP										
6 2A-W-41-060722		6/7/22	14:50	MM				X						
7 2A-W-410-060722			14:50	MM										
8 1C-W-8-060722			12:03	MM										
9 1C-W-7-060722			11:55	MM										
10 EW-2A-060722			09:45	MM										
11 5-W-6-060722			09:58	GP										
12 5-W-14-060722			11:00	GP										
13 5-W-17-060722			10:30	GP										
14 EW-1-060722			11:42	GP										
15 MW-4-060722			15:45	ES										
Relinquished By: Max Henry Nelson		Date/Time: 6/8/22 13:59		Received By: Emi Smith		Date/Time: 6/8/22 13:59		Comments and Special Analytical Requirements:						
Relinquished By: Emi Smith		Date/Time: 6/9/22 0846		Received By: Sydney Lachoff		Date/Time: 6/9/22 851								
Relinquished By:		Date/Time:		Received By:		Date/Time:								
Received by Laboratory:		Date/Time:		Lab Remarks:		Lab: Custody Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.		BNSF COC No.				

ORIGINAL - RETURN TO LABORATORY WITH SAMPLES

DUPLICATE - CONSULTANT

TAL-1001 (0912)

 CHAIN OF CUSTODY		LABORATORY INFORMATION						LAB WORK ORDER:				
		Laboratory:			Project Manager:			SHIPMENT INFORMATION				
		Address:			Phone:							
		City/State/ZIP:			Fax:							
BNSF PROJECT INFORMATION				CONSULTANT INFORMATION				Project Number: 683-071				
BNSF Project Number: 683-071				Project City: Skykomish				Company: Farallon		Project Manager: Amanda Meugniot		
BNSF Project Name: BNSF Skykomish				Address: 975 5th Ave. NW				Email: Ameugniot@farallonconsulting.com		Phone: 425 245 0800		
BNSF Contact: Shane DeGross				BNSF Work Order No.:				City/State/ZIP: Issaquah		Fax:		
TURNAROUND TIME			DELIVERABLES			<input type="checkbox"/> Other Deliverables?			METHODS FOR ANALYSIS			
<input type="checkbox"/> 1-day Rush <input type="checkbox"/> 2-day Rush <input type="checkbox"/> 3-day Rush			<input type="checkbox"/> 5-to 8-day Rush <input checked="" type="checkbox"/> Standard 10-Day <input type="checkbox"/> Other			<input type="checkbox"/> BNSF Standard (Level II) <input type="checkbox"/> Level III <input type="checkbox"/> Level IV			<input type="checkbox"/> EDD Req. Format?			
SAMPLE INFORMATION												
Sample Identification		Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix	COMMENTS LAB USE			
			Date	Time	Sampler							
16 1 2A-W-40-060722		Z	6/7/22	15:46	GP	N	G	W	X			
2 6W-2-060722				15:07	GP							
3 6W-1-060722				14:17	GP							
4 S-W-43-060722				12:04	GP							
20 5 6W-3-060722				14:50	ES				X			
6 1B-W-23-060722				14:20	ES							
7 2A-W-42-060722				12:00	ES							
8 1C-W-4060722				11:15	ES							
9 6W-4-060722				10:30	ES							
25 10 S4-AD-060822			6/8/22	11:45	GP							
11 S4-AU-060822				12:10	GP							
12 S3-CU-060822				11:45	ES							
13 S3-CD-060822				11:25	ES							
14 S2-AU-060822				10:10	ES							
30 15 S2-AD-060822				09:45	ES							
Relinquished By: Max-Henry Nelson		Date/Time: 6/8/22 1359		Received By: Emi Smith		Date/Time: 6/8/22 1359		Comments and Special Analytical Requirements: Email to Ameugniot@farallonconsulting.com				
Relinquished By: Emi Smith		Date/Time: 6/9/22 0846		Received By: Sydney Lackoff		Date/Time: 6/9/22 8:51						
Relinquished By:		Date/Time:		Received By:		Date/Time:						
Received by Laboratory:		Date/Time:		Lab Remarks:		Lab: Custody Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No						
								Custody Seal No.		BNSF COC No		

ORIGINAL - RETURN TO LABORATORY WITH SAMPLES

DUPLICATE - CONSULTANT

TAL-1001 (0912)

 CHAIN OF CUSTODY		LABORATORY INFORMATION						LAB WORK ORDER:	
		Laboratory:			Project Manager:			SHIPMENT INFORMATION	
		Address:			Phone:				
		City/State/ZIP:			Fax:				
BNSF PROJECT INFORMATION		Project State of Origin:		CONSULTANT INFORMATION				Project Number: 683-071	
BNSF Project Number: 683-071		Project City: Skykomish		Company: Farallon				Project Manager: Amanda Magnante	
BNSF Project Name: BNSF Skykomish				Address: 475 5th Ave. NW				Email: Amagnante@farallonmonitoring.com	
BNSF Contact: Shane DeGross		BNSF Work Order No.:		City/State/ZIP: Issaquah				Phone: 425 245 0800 Fax:	
TURNAROUND TIME		DELIVERABLES				METHODS FOR ANALYSIS			
<input type="checkbox"/> 1-day Rush <input type="checkbox"/> 2-day Rush <input type="checkbox"/> 3-day Rush		<input type="checkbox"/> 5- to 8-day Rush <input checked="" type="checkbox"/> Standard 10-Day <input type="checkbox"/> Other _____				<input type="checkbox"/> Other Deliverables? <input type="checkbox"/> BNSF Standard (Level II) <input type="checkbox"/> Level III <input type="checkbox"/> Level IV <input type="checkbox"/> EDD Req. Format?			
SAMPLE INFORMATION									
Sample Identification		Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix	COMMENTS
			Date	Time	Sampler				LAB USE
31	S2-BD-060822	2	060822	10:25	ES	N	G	W	
32	S2-BU-060822			10:48	ES				
33	S4-CD-060822			12:15	ES				
34	S4-CU-060822			12:35	ES				
35	S4-BU-060822			12:20	MW				
36	S4-BD-060822			11:51	MW				
37	S3-AD-060822			11:12	MW				
38	S3-AU-060822			10:50	MW				
39	S1-BD-060822			10:05	MW				
40	S1-BU-060822			9:45	MW				
41	S1-AD-060822			9:37	GP				
42	S1-AU-060822			10:00	GP				
43	S3-BD-060822			10:40	GP				
44	S3-BU-060822			11:00	GP				
45	MW-SSS-060822			12:55	ES				
Relinquished By: Max-Henry Nelson		Date/Time: 6/8/22 13:59	Received By: Emi Smith				Date/Time: 6/8/22 13:59		Comments and Special Analytical Requirements:
Relinquished By: Emi Smith		Date/Time: 6/9/22 08:46	Received By: Sydney Baroff				Date/Time: 6/9/22 8:51		
Relinquished By:		Date/Time:	Received By:				Date/Time:		
Received by Laboratory:		Date/Time:	Lab Remarks:				Lab. Custody Intact? <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.
									BNSF COC No

ORIGINAL - RETURN TO LABORATORY WITH SAMPLES

DUPLICATE - CONSULTANT

TAL-1001 (0912)

46
47

Therm. ID: 1R8 Cor: BB ° Unc: 3.1 °
Cooler Dsc: BB FedEx: _____
Packing: Bub UPS: _____
Cust. Seal: Yes No ☒ Lab Cour: _____
Blue Ice ☒ Dry, None Other: Client
Dropoff

Therm. ID: 1R8 Cor: 2.1 ° Unc: 2.3 °
Cooler Dsc: BB FedEx: _____
Packing: Bub UPS: _____
Cust. Seal: Yes No ☒ Lab Cour: _____
Blue Ice ☒ Dry, None Other: Client
Dropoff

Therm. ID: 1R8 Cor: 1.1 ° Unc: 1.4 °
Cooler Dsc: BB FedEx: _____
Packing: Bub UPS: _____
Cust. Seal: Yes No ☒ Lab Cour: _____
Blue Ice ☒ Dry, None Other: Client
Dropoff

Therm. ID: 1R8 Cor: 1.3 ° Unc: 1.5 °
Cooler Dsc: BB FedEx: _____
Packing: Bub UPS: _____
Cust. Seal: Yes No ☒ Lab Cour: _____
Blue Ice ☒ Dry, None Other: Client
Dropoff

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-114630-1

Login Number: 114630

List Number: 1

Creator: Greene, Ashton R

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

PREPARED FOR

Attn: Amanda Meuginot
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah Washington 98027

Generated 11/21/2022 8:36:04 PM

JOB DESCRIPTION

BNSF Skykomish Rush NPDES

JOB NUMBER

580-119455-1



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Case Narrative

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Job ID: 580-119455-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative 580-119455-1

Comments

No additional comments.

Receipt

The samples were received on 10/31/2022 1:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were -0.1° C, 0.2° C and 0.6° C.

Receipt Exceptions

The following samples appear twice on the COC therefore one instance of each set was removed from the login: 5-W-51-102622 (580-119455-8), 5-W-43-102622 (580-119455-9), 5-W-51-102622 (580-119455-15) and 5-W-43-102622 (580-119455-16)

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method 3510C: The following sample formed emulsions during the extraction procedure: GW-3-102722 (580-119455-3). The emulsions were broken up using additional methylene chloride rinses and sodium sulfate filtration as needed.

Method 3510C: A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: Due to consistently low returns from the surrogate in the recent past, the water during concentration 1 was kept between 65°C and 70°C under the suspicion that the methylene chloride was volatilizing excessively at the higher temperature called for in the SOP.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S4-BU-102722

Lab Sample ID: 580-119455-1

Date Collected: 10/27/22 16:32

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.053		0.052		mg/L		11/10/22 11:52	11/12/22 01:18	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		11/10/22 11:52	11/12/22 01:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	62		50 - 150				11/10/22 11:52	11/12/22 01:18	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S3-CD-102722

Lab Sample ID: 580-119455-2

Date Collected: 10/27/22 15:37

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.11		0.052		mg/L		11/10/22 11:52	11/12/22 01:36	1
Motor Oil (>C24-C36)	0.10		0.091		mg/L		11/10/22 11:52	11/12/22 01:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	62		50 - 150				11/10/22 11:52	11/12/22 01:36	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: GW-3-102722

Lab Sample ID: 580-119455-3

Date Collected: 10/27/22 16:00

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.16		0.052		mg/L		11/10/22 10:04	11/11/22 23:54	1
Motor Oil (>C24-C36)	0.30		0.089		mg/L		11/10/22 10:04	11/11/22 23:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	75		50 - 150				11/10/22 10:04	11/11/22 23:54	1

Method: NWTPH-Dx - Semi-Volatile Petroleum Products by NWTPH with Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		11/10/22 10:04	11/12/22 03:56	1
Motor Oil (>C24-C36)	0.18		0.089		mg/L		11/10/22 10:04	11/12/22 03:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	79		50 - 150				11/10/22 10:04	11/12/22 03:56	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S3-AU-102722

Lab Sample ID: 580-119455-4

Date Collected: 10/27/22 15:11

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		11/10/22 11:52	11/12/22 01:55	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		11/10/22 11:52	11/12/22 01:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	58		50 - 150				11/10/22 11:52	11/12/22 01:55	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S1-AD-102722

Lab Sample ID: 580-119455-5

Date Collected: 10/27/22 13:50

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.058		0.044		mg/L		11/10/22 11:52	11/12/22 02:13	1
Motor Oil (>C24-C36)	ND		0.076		mg/L		11/10/22 11:52	11/12/22 02:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	67		50 - 150				11/10/22 11:52	11/12/22 02:13	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S1-AU-102722

Lab Sample ID: 580-119455-6

Date Collected: 10/27/22 14:05

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/10/22 11:52	11/12/22 02:32	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		11/10/22 11:52	11/12/22 02:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	57		50 - 150				11/10/22 11:52	11/12/22 02:32	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S2-AD-102722

Lab Sample ID: 580-119455-7

Date Collected: 10/27/22 14:30

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.053		mg/L		11/10/22 11:52	11/12/22 02:51	1
Motor Oil (>C24-C36)	ND		0.092		mg/L		11/10/22 11:52	11/12/22 02:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	59		50 - 150				11/10/22 11:52	11/12/22 02:51	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-51-102622

Lab Sample ID: 580-119455-8

Date Collected: 10/26/22 13:45

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.39		0.052		mg/L		11/09/22 09:28	11/10/22 21:03	1
Motor Oil (>C24-C36)	0.41		0.090		mg/L		11/09/22 09:28	11/10/22 21:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	71		50 - 150				11/09/22 09:28	11/10/22 21:03	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-43-102622

Lab Sample ID: 580-119455-9

Date Collected: 10/26/22 11:14

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.088		0.052		mg/L		11/09/22 09:28	11/10/22 21:24	1
Motor Oil (>C24-C36)	0.28		0.090		mg/L		11/09/22 09:28	11/10/22 21:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	80		50 - 150				11/09/22 09:28	11/10/22 21:24	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: GW-2-102622

Lab Sample ID: 580-119455-10

Date Collected: 10/26/22 09:57

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.080		0.052		mg/L		11/09/22 09:28	11/10/22 21:44	1
Motor Oil (>C24-C36)	0.15		0.091		mg/L		11/09/22 09:28	11/10/22 21:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	73		50 - 150				11/09/22 09:28	11/10/22 21:44	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 2A-W-42-102622

Lab Sample ID: 580-119455-11

Date Collected: 10/26/22 15:55

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.18		0.054		mg/L		11/09/22 09:28	11/10/22 22:04	1
Motor Oil (>C24-C36)	0.15		0.094		mg/L		11/09/22 09:28	11/10/22 22:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	71		50 - 150				11/09/22 09:28	11/10/22 22:04	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-55-1026-22

Lab Sample ID: 580-119455-12

Date Collected: 10/26/22 12:15

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.068		0.052		mg/L		11/09/22 09:28	11/10/22 22:24	1
Motor Oil (>C24-C36)	ND		0.090		mg/L		11/09/22 09:28	11/10/22 22:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	80		50 - 150				11/09/22 09:28	11/10/22 22:24	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 1C-W-4-102722

Lab Sample ID: 580-119455-13

Date Collected: 10/27/22 10:45

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.062		0.043		mg/L		11/10/22 11:52	11/12/22 03:09	1
Motor Oil (>C24-C36)	0.082		0.075		mg/L		11/10/22 11:52	11/12/22 03:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	53		50 - 150				11/10/22 11:52	11/12/22 03:09	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 1C-W-7-102722

Lab Sample ID: 580-119455-14

Date Collected: 10/27/22 11:36

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.048		0.044		mg/L		11/10/22 11:52	11/12/22 03:46	1
Motor Oil (>C24-C36)	ND		0.075		mg/L		11/10/22 11:52	11/12/22 03:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	63		50 - 150				11/10/22 11:52	11/12/22 03:46	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S1-BU-102722

Lab Sample ID: 580-119455-17

Date Collected: 10/27/22 13:40

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/10/22 11:52	11/12/22 04:05	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		11/10/22 11:52	11/12/22 04:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	56		50 - 150				11/10/22 11:52	11/12/22 04:05	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S1-BD-102722

Lab Sample ID: 580-119455-18

Date Collected: 10/27/22 13:35

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/10/22 11:52	11/12/22 04:23	1
Motor Oil (>C24-C36)	ND		0.087		mg/L		11/10/22 11:52	11/12/22 04:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	60		50 - 150				11/10/22 11:52	11/12/22 04:23	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S3-BU-102722

Lab Sample ID: 580-119455-19

Date Collected: 10/27/22 16:00

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.053		mg/L		11/10/22 11:52	11/12/22 04:42	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		11/10/22 11:52	11/12/22 04:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	58		50 - 150				11/10/22 11:52	11/12/22 04:42	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 1C-W-70-102722

Lab Sample ID: 580-119455-20

Date Collected: 10/27/22 11:45

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.063		0.043		mg/L		11/10/22 11:52	11/12/22 05:00	1
Motor Oil (>C24-C36)	0.17		0.075		mg/L		11/10/22 11:52	11/12/22 05:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	63		50 - 150				11/10/22 11:52	11/12/22 05:00	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S3-AD-102722

Lab Sample ID: 580-119455-21

Date Collected: 10/27/22 15:10

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/10/22 11:52	11/12/22 05:18	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		11/10/22 11:52	11/12/22 05:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	65		50 - 150				11/10/22 11:52	11/12/22 05:18	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: GW-1-102622

Lab Sample ID: 580-119455-22

Date Collected: 10/26/22 10:42

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.059		0.042		mg/L		11/09/22 09:28	11/10/22 22:44	1
Motor Oil (>C24-C36)	0.087		0.073		mg/L		11/09/22 09:28	11/10/22 22:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	78		50 - 150				11/09/22 09:28	11/10/22 22:44	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: EW-1-102622

Lab Sample ID: 580-119455-23

Date Collected: 10/26/22 11:13

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.050		0.043		mg/L		11/09/22 09:28	11/10/22 23:04	1
Motor Oil (>C24-C36)	ND		0.074		mg/L		11/09/22 09:28	11/10/22 23:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	67		50 - 150				11/09/22 09:28	11/10/22 23:04	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-56-102622

Lab Sample ID: 580-119455-24

Date Collected: 10/26/22 12:21

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	3.0		0.043		mg/L		11/09/22 09:28	11/10/22 23:45	1
Motor Oil (>C24-C36)	2.4		0.074		mg/L		11/09/22 09:28	11/10/22 23:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	61		50 - 150				11/09/22 09:28	11/10/22 23:45	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 2A-W-40-102622

Lab Sample ID: 580-119455-25

Date Collected: 10/26/22 13:23

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.042		mg/L		11/09/22 09:28	11/11/22 00:05	1
Motor Oil (>C24-C36)	ND		0.073		mg/L		11/09/22 09:28	11/11/22 00:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	60		50 - 150				11/09/22 09:28	11/11/22 00:05	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 1B-W-23-102722

Lab Sample ID: 580-119455-26

Date Collected: 10/27/22 09:35

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.069		0.044		mg/L		11/10/22 11:52	11/12/22 05:37	1
Motor Oil (>C24-C36)	0.10		0.076		mg/L		11/10/22 11:52	11/12/22 05:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	54		50 - 150				11/10/22 11:52	11/12/22 05:37	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 1C-W-8-102722

Lab Sample ID: 580-119455-27

Date Collected: 10/27/22 10:47

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.13		0.042		mg/L		11/10/22 11:52	11/12/22 05:56	1
Motor Oil (>C24-C36)	0.21		0.073		mg/L		11/10/22 11:52	11/12/22 05:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	54		50 - 150				11/10/22 11:52	11/12/22 05:56	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S3-BD-102722

Lab Sample ID: 580-119455-28

Date Collected: 10/27/22 15:53

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.042		mg/L		11/10/22 11:52	11/12/22 06:14	1
Motor Oil (>C24-C36)	ND		0.073		mg/L		11/10/22 11:52	11/12/22 06:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	63		50 - 150				11/10/22 11:52	11/12/22 06:14	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S3-CU-102722

Lab Sample ID: 580-119455-29

Date Collected: 10/27/22 15:13

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.042		mg/L		11/10/22 11:52	11/16/22 02:27	1
Motor Oil (>C24-C36)	ND		0.072		mg/L		11/10/22 11:52	11/16/22 02:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	62		50 - 150				11/10/22 11:52	11/16/22 02:27	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S4-AD-102722

Lab Sample ID: 580-119455-30

Date Collected: 10/27/22 16:57

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.042		mg/L		11/10/22 11:52	11/12/22 07:09	1
Motor Oil (>C24-C36)	ND		0.073		mg/L		11/10/22 11:52	11/12/22 07:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	52		50 - 150				11/10/22 11:52	11/12/22 07:09	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S4-BD-102722

Lab Sample ID: 580-119455-31

Date Collected: 10/27/22 16:30

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.043		mg/L		11/10/22 11:52	11/12/22 07:28	1
Motor Oil (>C24-C36)	ND		0.074		mg/L		11/10/22 11:52	11/12/22 07:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	63		50 - 150				11/10/22 11:52	11/12/22 07:28	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S4-AU-102722

Lab Sample ID: 580-119455-32

Date Collected: 10/27/22 17:10

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.043		mg/L		11/10/22 11:52	11/12/22 07:46	1
Motor Oil (>C24-C36)	ND		0.074		mg/L		11/10/22 11:52	11/12/22 07:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	59		50 - 150				11/10/22 11:52	11/12/22 07:46	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S2-AU-102722

Lab Sample ID: 580-119455-33

Date Collected: 10/27/22 14:08

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/10/22 10:04	11/12/22 00:34	1
Motor Oil (>C24-C36)	ND		0.087		mg/L		11/10/22 10:04	11/12/22 00:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	66		50 - 150				11/10/22 10:04	11/12/22 00:34	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S4-CD-102722

Lab Sample ID: 580-119455-34

Date Collected: 10/27/22 16:40

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.054		mg/L		11/10/22 10:04	11/12/22 00:55	1
Motor Oil (>C24-C36)	ND		0.093		mg/L		11/10/22 10:04	11/12/22 00:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	72		50 - 150				11/10/22 10:04	11/12/22 00:55	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S4-CU-102722

Lab Sample ID: 580-119455-35

Date Collected: 10/27/22 17:00

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/10/22 10:04	11/12/22 01:15	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		11/10/22 10:04	11/12/22 01:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	70		50 - 150				11/10/22 10:04	11/12/22 01:15	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: GW-4-102622

Lab Sample ID: 580-119455-36

Date Collected: 10/26/22 15:30

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/09/22 09:28	11/11/22 00:25	1
Motor Oil (>C24-C36)	0.089		0.088		mg/L		11/09/22 09:28	11/11/22 00:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	70		50 - 150				11/09/22 09:28	11/11/22 00:25	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: EW-2A-102622

Lab Sample ID: 580-119455-37

Date Collected: 10/26/22 14:38

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.057		0.051		mg/L		11/09/22 09:28	11/11/22 00:45	1
Motor Oil (>C24-C36)	0.18		0.088		mg/L		11/09/22 09:28	11/11/22 00:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	75		50 - 150				11/09/22 09:28	11/11/22 00:45	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-14-102622

Lab Sample ID: 580-119455-38

Date Collected: 10/26/22 13:50

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/09/22 09:28	11/11/22 01:05	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		11/09/22 09:28	11/11/22 01:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	71		50 - 150				11/09/22 09:28	11/11/22 01:05	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-17-102622

Lab Sample ID: 580-119455-39

Date Collected: 10/26/22 13:15

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/09/22 09:28	11/11/22 01:25	1
Motor Oil (>C24-C36)	ND		0.088		mg/L		11/09/22 09:28	11/11/22 01:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	72		50 - 150				11/09/22 09:28	11/11/22 01:25	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-16-102622

Lab Sample ID: 580-119455-40

Date Collected: 10/26/22 11:50

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.052		mg/L		11/09/22 09:28	11/11/22 01:45	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		11/09/22 09:28	11/11/22 01:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	75		50 - 150				11/09/22 09:28	11/11/22 01:45	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-19-102622

Lab Sample ID: 580-119455-41

Date Collected: 10/26/22 11:10

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.051		mg/L		11/09/22 09:28	11/11/22 02:06	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		11/09/22 09:28	11/11/22 02:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	78		50 - 150				11/09/22 09:28	11/11/22 02:06	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-18-102622

Lab Sample ID: 580-119455-42

Date Collected: 10/26/22 10:35

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.061		0.051		mg/L		11/09/22 09:28	11/11/22 02:26	1
Motor Oil (>C24-C36)	0.11		0.088		mg/L		11/09/22 09:28	11/11/22 02:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150				11/09/22 09:28	11/11/22 02:26	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-180-102622

Lab Sample ID: 580-119455-43

Date Collected: 10/26/22 10:40

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.068		0.051		mg/L		11/09/22 09:28	11/11/22 02:46	1
Motor Oil (>C24-C36)	0.13		0.087		mg/L		11/09/22 09:28	11/11/22 02:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	64		50 - 150				11/09/22 09:28	11/11/22 02:46	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: MW-4-102722

Lab Sample ID: 580-119455-44

Date Collected: 10/27/22 11:00

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.16		0.051		mg/L		11/10/22 10:04	11/12/22 01:35	1
Motor Oil (>C24-C36)	0.16		0.088		mg/L		11/10/22 10:04	11/12/22 01:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	64		50 - 150				11/10/22 10:04	11/12/22 01:35	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 2A-W-41-102722

Lab Sample ID: 580-119455-45

Date Collected: 10/27/22 12:15

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.50		0.051		mg/L		11/10/22 10:04	11/12/22 00:14	1
Motor Oil (>C24-C36)	0.28		0.089		mg/L		11/10/22 10:04	11/12/22 00:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	77		50 - 150				11/10/22 10:04	11/12/22 00:14	1

Method: NWTPH-Dx - Semi-Volatile Petroleum Products by NWTPH with Silica Gel Cleanup

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.12		0.051		mg/L		11/10/22 10:04	11/12/22 04:16	1
Motor Oil (>C24-C36)	ND		0.089		mg/L		11/10/22 10:04	11/12/22 04:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	82		50 - 150				11/10/22 10:04	11/12/22 04:16	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: MW-555-102722

Lab Sample ID: 580-119455-47

Date Collected: 10/27/22 18:58

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.043		mg/L		11/10/22 10:04	11/12/22 01:55	1
Motor Oil (>C24-C36)	ND		0.074		mg/L		11/10/22 10:04	11/12/22 01:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	83		50 - 150				11/10/22 10:04	11/12/22 01:55	1

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 2A-W-410-102722

Lab Sample ID: 580-119455-48

Date Collected: 10/27/22 12:20

Matrix: Water

Date Received: 10/31/22 13:30

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.59		0.051		mg/L		11/10/22 10:04	11/12/22 02:35	1
Motor Oil (>C24-C36)	0.37		0.088		mg/L		11/10/22 10:04	11/12/22 02:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	66		50 - 150				11/10/22 10:04	11/12/22 02:35	1

QC Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-409344/1-A

Matrix: Water

Analysis Batch: 409620

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 409344

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		11/09/22 09:28	11/10/22 20:03	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		11/09/22 09:28	11/10/22 20:03	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150				11/09/22 09:28	11/10/22 20:03	1

Lab Sample ID: LCS 580-409344/2-A

Matrix: Water

Analysis Batch: 409620

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 409344

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
#2 Diesel (C10-C24)	4.00	3.70		mg/L		92	50 - 120	
Motor Oil (>C24-C36)	4.00	4.34		mg/L		109	64 - 120	
Surrogate	LCS %Recovery	LCS Qualifier	Limits					
o-Terphenyl	95		50 - 150					

Lab Sample ID: LCSD 580-409344/3-A

Matrix: Water

Analysis Batch: 409620

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 409344

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	3.16		mg/L		79	50 - 120	16	26
Motor Oil (>C24-C36)	4.00	3.73		mg/L		93	64 - 120	15	24
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl	81		50 - 150						

Lab Sample ID: MB 580-409509/1-A

Matrix: Water

Analysis Batch: 409784

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 409509

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		11/10/22 10:04	11/11/22 22:54	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		11/10/22 10:04	11/11/22 22:54	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83		50 - 150				11/10/22 10:04	11/11/22 22:54	1

Lab Sample ID: LCS 580-409509/2-A

Matrix: Water

Analysis Batch: 409784

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 409509

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
#2 Diesel (C10-C24)	4.00	3.39		mg/L		85	50 - 120	
Motor Oil (>C24-C36)	4.00	3.91		mg/L		98	64 - 120	

Eurofins Seattle

QC Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 580-409509/2-A
Matrix: Water
Analysis Batch: 409784

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409509

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
o-Terphenyl	98		50 - 150

Lab Sample ID: LCSD 580-409509/3-A
Matrix: Water
Analysis Batch: 409784

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 409509

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	3.50		mg/L		87	50 - 120	3	26
Motor Oil (>C24-C36)	4.00	4.04		mg/L		101	64 - 120	3	24

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
o-Terphenyl	96		50 - 150

Lab Sample ID: MB 580-409543/1-A
Matrix: Water
Analysis Batch: 409787

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409543

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		11/10/22 11:52	11/12/22 00:22	1
Motor Oil (>C24-C36)	ND		0.095		mg/L		11/10/22 11:52	11/12/22 00:22	1

	MB	MB		Prepared	Analyzed	Dil Fac
Surrogate	%Recovery	Qualifier	Limits			
o-Terphenyl	62		50 - 150	11/10/22 11:52	11/12/22 00:22	1

Lab Sample ID: LCS 580-409543/2-A
Matrix: Water
Analysis Batch: 409787

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409543

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
#2 Diesel (C10-C24)	4.00	3.41		mg/L		85	50 - 120
Motor Oil (>C24-C36)	4.00	3.57		mg/L		89	64 - 120

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
o-Terphenyl	90		50 - 150

Lab Sample ID: LCSD 580-409543/3-A
Matrix: Water
Analysis Batch: 409787

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 409543

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	3.03		mg/L		76	50 - 120	12	26
Motor Oil (>C24-C36)	4.00	3.19		mg/L		80	64 - 120	11	24

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
o-Terphenyl	78		50 - 150

Eurofins Seattle

QC Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Method: NWTPH-Dx - Semi-Volatile Petroleum Products by NWTPH with Silica Gel Cleanup

Lab Sample ID: MB 580-409509/1-B

Matrix: Water

Analysis Batch: 409784

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 409509

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.055		mg/L		11/10/22 10:04	11/12/22 02:56	1
Motor Oil (>C24-C36)	ND		0.18		mg/L		11/10/22 10:04	11/12/22 02:56	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83		50 - 150				11/10/22 10:04	11/12/22 02:56	1

Lab Sample ID: LCS 580-409509/2-B

Matrix: Water

Analysis Batch: 409784

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 409509

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
#2 Diesel (C10-C24)	4.00	3.55		mg/L		89	50 - 120		
Motor Oil (>C24-C36)	4.00	4.25		mg/L		106	64 - 120		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
o-Terphenyl	101		50 - 150						

Lab Sample ID: LCSD 580-409509/3-B

Matrix: Water

Analysis Batch: 409784

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 409509

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.00	3.59		mg/L		90	50 - 120	1	26
Motor Oil (>C24-C36)	4.00	4.26		mg/L		106	64 - 120	0	24
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl	100		50 - 150						

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S4-BU-102722

Lab Sample ID: 580-119455-1

Date Collected: 10/27/22 16:32

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 01:18

Client Sample ID: S3-CD-102722

Lab Sample ID: 580-119455-2

Date Collected: 10/27/22 15:37

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 01:36

Client Sample ID: GW-3-102722

Lab Sample ID: 580-119455-3

Date Collected: 10/27/22 16:00

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/11/22 23:54
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Cleanup	3630C			409510	CSS	EET SEA	11/10/22 10:10
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 03:56

Client Sample ID: S3-AU-102722

Lab Sample ID: 580-119455-4

Date Collected: 10/27/22 15:11

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 01:55

Client Sample ID: S1-AD-102722

Lab Sample ID: 580-119455-5

Date Collected: 10/27/22 13:50

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 02:13

Client Sample ID: S1-AU-102722

Lab Sample ID: 580-119455-6

Date Collected: 10/27/22 14:05

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 02:32

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S2-AD-102722

Lab Sample ID: 580-119455-7

Date Collected: 10/27/22 14:30

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 02:51

Client Sample ID: 5-W-51-102622

Lab Sample ID: 580-119455-8

Date Collected: 10/26/22 13:45

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 21:03

Client Sample ID: 5-W-43-102622

Lab Sample ID: 580-119455-9

Date Collected: 10/26/22 11:14

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 21:24

Client Sample ID: GW-2-102622

Lab Sample ID: 580-119455-10

Date Collected: 10/26/22 09:57

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 21:44

Client Sample ID: 2A-W-42-102622

Lab Sample ID: 580-119455-11

Date Collected: 10/26/22 15:55

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 22:04

Client Sample ID: 5-W-55-1026-22

Lab Sample ID: 580-119455-12

Date Collected: 10/26/22 12:15

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 22:24

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 1C-W-4-102722

Lab Sample ID: 580-119455-13

Date Collected: 10/27/22 10:45

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 03:09

Client Sample ID: 1C-W-7-102722

Lab Sample ID: 580-119455-14

Date Collected: 10/27/22 11:36

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 03:46

Client Sample ID: S1-BU-102722

Lab Sample ID: 580-119455-17

Date Collected: 10/27/22 13:40

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 04:05

Client Sample ID: S1-BD-102722

Lab Sample ID: 580-119455-18

Date Collected: 10/27/22 13:35

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 04:23

Client Sample ID: S3-BU-102722

Lab Sample ID: 580-119455-19

Date Collected: 10/27/22 16:00

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 04:42

Client Sample ID: 1C-W-70-102722

Lab Sample ID: 580-119455-20

Date Collected: 10/27/22 11:45

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 05:00

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S3-AD-102722

Lab Sample ID: 580-119455-21

Date Collected: 10/27/22 15:10

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 05:18

Client Sample ID: GW-1-102622

Lab Sample ID: 580-119455-22

Date Collected: 10/26/22 10:42

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 22:44

Client Sample ID: EW-1-102622

Lab Sample ID: 580-119455-23

Date Collected: 10/26/22 11:13

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 23:04

Client Sample ID: 5-W-56-102622

Lab Sample ID: 580-119455-24

Date Collected: 10/26/22 12:21

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/10/22 23:45

Client Sample ID: 2A-W-40-102622

Lab Sample ID: 580-119455-25

Date Collected: 10/26/22 13:23

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 00:05

Client Sample ID: 1B-W-23-102722

Lab Sample ID: 580-119455-26

Date Collected: 10/27/22 09:35

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 05:37

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 1C-W-8-102722

Lab Sample ID: 580-119455-27

Date Collected: 10/27/22 10:47

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 05:56

Client Sample ID: S3-BD-102722

Lab Sample ID: 580-119455-28

Date Collected: 10/27/22 15:53

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 06:14

Client Sample ID: S3-CU-102722

Lab Sample ID: 580-119455-29

Date Collected: 10/27/22 15:13

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	410114	DH	EET SEA	11/16/22 02:27

Client Sample ID: S4-AD-102722

Lab Sample ID: 580-119455-30

Date Collected: 10/27/22 16:57

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 07:09

Client Sample ID: S4-BD-102722

Lab Sample ID: 580-119455-31

Date Collected: 10/27/22 16:30

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 07:28

Client Sample ID: S4-AU-102722

Lab Sample ID: 580-119455-32

Date Collected: 10/27/22 17:10

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409543	CSS	EET SEA	11/10/22 11:52
Total/NA	Analysis	NWTPH-Dx		1	409787	JSM	EET SEA	11/12/22 07:46

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: S2-AU-102722

Lab Sample ID: 580-119455-33

Date Collected: 10/27/22 14:08

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 00:34

Client Sample ID: S4-CD-102722

Lab Sample ID: 580-119455-34

Date Collected: 10/27/22 16:40

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 00:55

Client Sample ID: S4-CU-102722

Lab Sample ID: 580-119455-35

Date Collected: 10/27/22 17:00

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 01:15

Client Sample ID: GW-4-102622

Lab Sample ID: 580-119455-36

Date Collected: 10/26/22 15:30

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 00:25

Client Sample ID: EW-2A-102622

Lab Sample ID: 580-119455-37

Date Collected: 10/26/22 14:38

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 00:45

Client Sample ID: 5-W-14-102622

Lab Sample ID: 580-119455-38

Date Collected: 10/26/22 13:50

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 01:05

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 5-W-17-102622

Lab Sample ID: 580-119455-39

Date Collected: 10/26/22 13:15

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 01:25

Client Sample ID: 5-W-16-102622

Lab Sample ID: 580-119455-40

Date Collected: 10/26/22 11:50

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 01:45

Client Sample ID: 5-W-19-102622

Lab Sample ID: 580-119455-41

Date Collected: 10/26/22 11:10

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 02:06

Client Sample ID: 5-W-18-102622

Lab Sample ID: 580-119455-42

Date Collected: 10/26/22 10:35

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 02:26

Client Sample ID: 5-W-180-102622

Lab Sample ID: 580-119455-43

Date Collected: 10/26/22 10:40

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409344	CSS	EET SEA	11/09/22 09:28
Total/NA	Analysis	NWTPH-Dx		1	409620	JSM	EET SEA	11/11/22 02:46

Client Sample ID: MW-4-102722

Lab Sample ID: 580-119455-44

Date Collected: 10/27/22 11:00

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 01:35

Eurofins Seattle

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Client Sample ID: 2A-W-41-102722

Lab Sample ID: 580-119455-45

Date Collected: 10/27/22 12:15

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 00:14
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Cleanup	3630C			409510	CSS	EET SEA	11/10/22 10:10
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 04:16

Client Sample ID: MW-555-102722

Lab Sample ID: 580-119455-47

Date Collected: 10/27/22 18:58

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 01:55

Client Sample ID: 2A-W-410-102722

Lab Sample ID: 580-119455-48

Date Collected: 10/27/22 12:20

Matrix: Water

Date Received: 10/31/22 13:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			409509	CSS	EET SEA	11/10/22 10:04
Total/NA	Analysis	NWTPH-Dx		1	409784	JSM	EET SEA	11/12/22 02:35

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-23

1
2
3
4
5
6
7
8
9
10
11
12

Sample Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-119455-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-119455-1	S4-BU-102722	Water	10/27/22 16:32	10/31/22 13:30
580-119455-2	S3-CD-102722	Water	10/27/22 15:37	10/31/22 13:30
580-119455-3	GW-3-102722	Water	10/27/22 16:00	10/31/22 13:30
580-119455-4	S3-AU-102722	Water	10/27/22 15:11	10/31/22 13:30
580-119455-5	S1-AD-102722	Water	10/27/22 13:50	10/31/22 13:30
580-119455-6	S1-AU-102722	Water	10/27/22 14:05	10/31/22 13:30
580-119455-7	S2-AD-102722	Water	10/27/22 14:30	10/31/22 13:30
580-119455-8	5-W-51-102622	Water	10/26/22 13:45	10/31/22 13:30
580-119455-9	5-W-43-102622	Water	10/26/22 11:14	10/31/22 13:30
580-119455-10	GW-2-102622	Water	10/26/22 09:57	10/31/22 13:30
580-119455-11	2A-W-42-102622	Water	10/26/22 15:55	10/31/22 13:30
580-119455-12	5-W-55-1026-22	Water	10/26/22 12:15	10/31/22 13:30
580-119455-13	1C-W-4-102722	Water	10/27/22 10:45	10/31/22 13:30
580-119455-14	1C-W-7-102722	Water	10/27/22 11:36	10/31/22 13:30
580-119455-17	S1-BU-102722	Water	10/27/22 13:40	10/31/22 13:30
580-119455-18	S1-BD-102722	Water	10/27/22 13:35	10/31/22 13:30
580-119455-19	S3-BU-102722	Water	10/27/22 16:00	10/31/22 13:30
580-119455-20	1C-W-70-102722	Water	10/27/22 11:45	10/31/22 13:30
580-119455-21	S3-AD-102722	Water	10/27/22 15:10	10/31/22 13:30
580-119455-22	GW-1-102622	Water	10/26/22 10:42	10/31/22 13:30
580-119455-23	EW-1-102622	Water	10/26/22 11:13	10/31/22 13:30
580-119455-24	5-W-56-102622	Water	10/26/22 12:21	10/31/22 13:30
580-119455-25	2A-W-40-102622	Water	10/26/22 13:23	10/31/22 13:30
580-119455-26	1B-W-23-102722	Water	10/27/22 09:35	10/31/22 13:30
580-119455-27	1C-W-8-102722	Water	10/27/22 10:47	10/31/22 13:30
580-119455-28	S3-BD-102722	Water	10/27/22 15:53	10/31/22 13:30
580-119455-29	S3-CU-102722	Water	10/27/22 15:13	10/31/22 13:30
580-119455-30	S4-AD-102722	Water	10/27/22 16:57	10/31/22 13:30
580-119455-31	S4-BD-102722	Water	10/27/22 16:30	10/31/22 13:30
580-119455-32	S4-AU-102722	Water	10/27/22 17:10	10/31/22 13:30
580-119455-33	S2-AU-102722	Water	10/27/22 14:08	10/31/22 13:30
580-119455-34	S4-CD-102722	Water	10/27/22 16:40	10/31/22 13:30
580-119455-35	S4-CU-102722	Water	10/27/22 17:00	10/31/22 13:30
580-119455-36	GW-4-102622	Water	10/26/22 15:30	10/31/22 13:30
580-119455-37	EW-2A-102622	Water	10/26/22 14:38	10/31/22 13:30
580-119455-38	5-W-14-102622	Water	10/26/22 13:50	10/31/22 13:30
580-119455-39	5-W-17-102622	Water	10/26/22 13:15	10/31/22 13:30
580-119455-40	5-W-16-102622	Water	10/26/22 11:50	10/31/22 13:30
580-119455-41	5-W-19-102622	Water	10/26/22 11:10	10/31/22 13:30
580-119455-42	5-W-18-102622	Water	10/26/22 10:35	10/31/22 13:30
580-119455-43	5-W-180-102622	Water	10/26/22 10:40	10/31/22 13:30
580-119455-44	MW-4-102722	Water	10/27/22 11:00	10/31/22 13:30
580-119455-45	2A-W-41-102722	Water	10/27/22 12:15	10/31/22 13:30
580-119455-47	MW-555-102722	Water	10/27/22 18:58	10/31/22 13:30
580-119455-48	2A-W-410-102722	Water	10/27/22 12:20	10/31/22 13:30

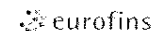
Eurofins Seattle

5755 8th Street East

Tacoma, WA 98424

Phone: 253-922-2310

Chain of Custody Record

Environment Testing
America

Client Information		Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:									
Client Contact:		Phone:		E-Mail:		State of Origin:		Page:									
Matthew Bowser <i>Amanda Meunier</i>				Pauline.Matlock@et.eurofinsus.com		WA		Page 1 of 5									
Company:		PWSID:		Analysis Requested													
Farallon Consulting LLC																	
Address:		Due Date Requested:		<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Field Filtered Sample (Yes or No)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Perform MS/MSD (Yes or No)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">NTPH Dx - NTPH-DX</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Silica Gel Clean up</div> </div>													
975 5th Avenue NW Suite 100																	
City:		TAT Requested (days):															
Issaquah		Standard															
State, Zip:		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No															
WA, 98027																	
Phone:		PO #:		<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Total Number of Containers</div> </div>													
		683-071															
Email:		WO #:															
a.meunier@farallonconsulting.com																	
Project Name:		Tax Code 8800 BF10007215															
BNSF Skykomish Rush NPDES		Project #:															
Site:		SSOW#:															
Washington																	
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=tissue, A=air)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		NTPH Dx - NTPH-DX		Special Instructions/Note:	
S4-BU-102722		10-27-22		1632				Water		X							
S3-CO-102722		10-27-22		1537				Water		X							
GW-3-102722		10-27-22		1600				Water		X		X					
S3-AU-102722		10-27-22		1511				Water		X							
S1-AD-102722		10-27-22		1350				Water		X							
S1-AU-102722		10-27-22		1405				Water		X							
S2-AD-102722		10-27-22		1430				Water		X							
S4-BU-102722		10-27-22		1632				Water		X							
S-W-S1-102622		10-26-22		1345				Water		X							
S-W-43-102622		10-26-22		1114				Water		X							
GW-2-102622		10-26-22		1957				Water		X							
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)															
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months															
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:															
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:											
Relinquished by: <i>Guin Smith</i>		Date/Time: 10/27/22 2048		Company: Farallon		Received by: <i>Sydney Lamb</i>		Date/Time: 10/31/22 1330		Company: <i>ETA</i>							
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:							
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:							
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:													
<input type="checkbox"/> Yes <input type="checkbox"/> No																	



530-119455 Chain of Custody

Phone: 253-922-2310

Environment Testing Aspects

Client Information		Lab PM:		Carrier Tracking No(s):		COC No:					
Client Contact: Matthew Bowser Amanda Neugrist		Matlock, Pauline M				580-51107-14389.2					
Company: Farallon Consulting LLC		E-Mail: Pauline.Matlock@et.eurofinsus.com		State of Origin: WA		Page Page 2 of 5					
Address: 975 5th Avenue NW Suite 100		Due Date Requested:		Analysis Requested		Job #:					
City: Issaquah		TAT Requested (days): Standard				Preservation Codes:					
State, Zip: WA, 98027		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify)					
Phone:		PO #: 683-071				Other:					
Email: amneugrist@farallonconsulting.com		WO #:									
Project Name: BNSF Skykomish Rush NPDES		Tax Code 8800 BF10007215									
Site: Washington		Project #: 58005923									
		SSOW#:									
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=tissue, A=air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH_Dx - NWTPH-Dx	Total Number of containers	Special Instructions/Note:	
				Preservation Code:							
2A-W-42-102622		10-26-22	1555		Water	X			2		
5-W-55-102622		10-26-22	1215		Water	X					
1C-W-4-102722		10-27-22	1045		Water	X					
1C-W-7-102722		10-27-22	1136		Water	X					
5-W-51-102622		10-26-22	1345		Water	X					
5-W-43-102622		10-26-22	1114		Water	X					
S1-BU-102722		10-27-22	1340		Water	X					
S1-BD-102722		10-27-22	1335		Water	X					
S3-CU-102722		10-27-22	1600		Water	X					
1C-W-70-102722		10-27-22	1145		Water	X					
S3-AD-102722		10-27-22	1510		Water	X					
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:									
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:					
Relinquished by: <i>Quinn Smith</i>		Date/Time: 10/27/22 2048		Company: Farallon		Received by: <i>Sydney Lawton</i>		Date/Time: 10/31/22 1330		Company: <i>PLA</i>	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:							

Eurofins Seattle

5755 8th Street East

Tacoma, WA 98424

Phone: 253-922-2310

Chain of Custody Record

Environment Testing
America

Client Information		Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:																																							
Client Contact:		Phone:		E-Mail:		State of Origin:		Page:																																							
Matthew Bower <i>Amanda Meunquist</i>				Pauline.Matlock@et.eurofinsus.com		WA		Page 5 of 5																																							
Company:		PWSID:		Analysis Requested																																											
Farallon Consulting LLC																																															
Address:		Due Date Requested:		<table border="1"> <tr><td colspan="12">Preservation Codes:</td></tr> <tr><td>A - HCL</td><td>M - Hexane</td></tr> <tr><td>B - NaOH</td><td>N - None</td></tr> <tr><td>C - Zn Acetate</td><td>O - AsNaO2</td></tr> <tr><td>D - Nitric Acid</td><td>P - Na2O4S</td></tr> <tr><td>E - NaHSO4</td><td>Q - Na2SO3</td></tr> <tr><td>F - MeOH</td><td>R - Na2S2O3</td></tr> <tr><td>G - Amchlor</td><td>S - H2SO4</td></tr> <tr><td>H - Ascorbic Acid</td><td>T - TSP Dodecahydrate</td></tr> <tr><td>I - Ice</td><td>U - Acetone</td></tr> <tr><td>J - Di Water</td><td>V - MCAA</td></tr> <tr><td>K - EDTA</td><td>W - pH 4-5</td></tr> <tr><td>L - EDA</td><td>Y - Trizma</td></tr> <tr><td></td><td>Z - other (specify)</td></tr> </table>						Preservation Codes:												A - HCL	M - Hexane	B - NaOH	N - None	C - Zn Acetate	O - AsNaO2	D - Nitric Acid	P - Na2O4S	E - NaHSO4	Q - Na2SO3	F - MeOH	R - Na2S2O3	G - Amchlor	S - H2SO4	H - Ascorbic Acid	T - TSP Dodecahydrate	I - Ice	U - Acetone	J - Di Water	V - MCAA	K - EDTA	W - pH 4-5	L - EDA	Y - Trizma		Z - other (specify)
Preservation Codes:																																															
A - HCL	M - Hexane																																														
B - NaOH	N - None																																														
C - Zn Acetate	O - AsNaO2																																														
D - Nitric Acid	P - Na2O4S																																														
E - NaHSO4	Q - Na2SO3																																														
F - MeOH	R - Na2S2O3																																														
G - Amchlor	S - H2SO4																																														
H - Ascorbic Acid	T - TSP Dodecahydrate																																														
I - Ice	U - Acetone																																														
J - Di Water	V - MCAA																																														
K - EDTA	W - pH 4-5																																														
L - EDA	Y - Trizma																																														
	Z - other (specify)																																														
975 5th Avenue NW Suite 100		TAT Requested (days):																																													
City:		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No																																													
Issaquah		PO #:																																													
State, Zip:		WO #:																																													
WA 98027		Tax Code 8800 BF10007215																																													
Phone:		Project #:																																													
BNSF Skykomish Rush NPDES		SSOW#:																																													
Site:																																															
Washington																																															
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=tissue, A=air)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		NWTPH Dx - NWTPH-Dx		Total Number of Containers		Special Instructions/Note:																													
GW-1-102622		10-26-22		1042				Water		X						2																															
EW-1-102622		10-26-22		1113				Water		X						2																															
5-W-56-102622		10-26-22		1221				Water		X						2																															
2A-W-40-102622		10-26-22		1323				Water		X						2																															
1B-W-23-102722		10-27-22		0935				Water		X						2																															
1C-W-8-102722		10-27-22		1047				Water		X						2																															
53-BD-102722		10-27-22		1553				Water		X						2																															
53-CU-102722		10-27-22		1513				Water		X						2																															
54-AD-102722		10-27-22		1657				Water		X						2																															
54-BD-102722		10-27-22		1630				Water		X						2																															
54-AU-102722		10-27-22		1710				Water		X						2																															
Possible Hazard Identification										Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																																					
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological										<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																																					
Deliverable Requested: I, II, III, IV, Other (specify)										Special Instructions/QC Requirements:																																					
Empty Kit Relinquished by:				Date:				Time:				Method of Shipment:																																			
Relinquished by: <i>Quinn Smith</i>				Date/Time: 10/27/22 2048				Company: Farallon				Received by: <i>Sydney Carling</i>																																			
Relinquished by:				Date/Time:				Company:				Received by:																																			
Relinquished by:				Date/Time:				Company:				Received by:																																			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No				Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks:																																							

Therm. ID: 1610 Cor: 1.6 ° Unc: 1.8 °
Cooler Dsc: BB FedEx: _____
Packing: BB UPS: _____
Cust. Seal: Yes No Lab Cour: L
Blue Ice Wet Dry, None Other: _____

HCC Syst

Therm. ID: 1610 Cor: 0.2 ° Unc: 0.4 °
Cooler Dsc: BB FedEx: _____
Packing: BB UPS: _____
Cust. Seal: Yes No Lab Cour: L
Blue Ice Wet Dry, None Other: _____

Therm. ID: 1610 Cor: 0.6 ° Unc: 0.8 °
Cooler Dsc: BB FedEx: _____
Packing: BB UPS: _____
Cust. Seal: Yes No Lab Cour: L
Blue Ice Wet Dry, None Other: _____

Therm. ID: 1610 Cor: 0.1 ° Unc: 0.3 °
Cooler Dsc: BB FedEx: _____
Packing: BB UPS: _____
Cust. Seal: Yes No Lab Cour: L
Blue Ice Wet Dry, None Other: _____

4

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-119455-1

Login Number: 119455

List Source: Eurofins Seattle

List Number: 1

Creator: Presley, Kim A

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins Seattle

Job Notes

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The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



Authorized for release by
Pauline Matlock, Project Manager
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(253)922-2310

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APPENDIX B
DATA VALIDATION REPORTS

2022 ANNUAL LONG-TERM MONITORING REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071



DATA VALIDATION REPORT

Skykomish Groundwater Monitoring, June 2022 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

December 17, 2022

1.0 Introduction

Data set: Data were received for validation under one laboratory sample delivery group (SDG). Data were submitted by Eurofins Seattle in Tacoma, Washington. Submissions included both a laboratory report and an electronic data deliverable (EDD) as follows:

SDG	EDD File Name*	Report File Name	Report Date
5801146301	580-114630-1_EquFarallon_EFW2LabRES.csv	J114630-1 UDS Level 2 Report Rev(2) Final Report.pdf	08/10/22

* Supplied EDD includes 4 files for each SDG utilizing LabRES, LabTST, LabBCH, and FSample suffixes.

Analytical methods: The following methods were utilized:

Analysis	Analysis method	Preparation method
Diesel range organics (TPH-Dx)	NWTPH-Dx	SW3510C
Diesel range organics with silica gel cleanup (TPH-SG)	NWTPH-Dx	SW3510C/SW3630C

Analytical Schedule: The following samples and analyses were included in this review:

SDG	Sample ID	Sample Date/Time	Lab ID	Analyses
5801146301	5-W-18-060622	06/06/2022 16:27	580-114630-1	TPH-Dx
5801146301	5-W-180-060622	06/06/2022 16:40	580-114630-2	TPH-Dx
5801146301	5-W-51-060622	06/06/2022 17:18	580-114630-3	TPH-Dx
5801146301	5-W-55-060622	06/06/2022 15:30	580-114630-4	TPH-Dx
5801146301	5-W-56-060622	06/06/2022 14:51	580-114630-5	TPH-Dx
5801146301	2A-W-41-060722	06/07/2022 14:50	580-114630-6	TPH-Dx, TPHSG
5801146301	2A-W-410-060722	06/07/2022 14:50	580-114630-7	TPH-Dx
5801146301	1C-W-8-060722	06/07/2022 12:03	580-114630-8	TPH-Dx
5801146301	1C-W-7-060722	06/07/2022 11:55	580-114630-9	TPH-Dx
5801146301	EW-2A-060722	06/07/2022 09:45	580-114630-10	TPH-Dx
5801146301	5-W-16-060722	06/07/2022 09:58	580-114630-11	TPH-Dx
5801146301	5-W-14-060722	06/07/2022 11:00	580-114630-12	TPH-Dx
5801146301	5-W-17-060722	06/07/2022 10:30	580-114630-13	TPH-Dx
5801146301	EW-1-060722	06/07/2022 11:42	580-114630-14	TPH-Dx
5801146301	MW-4-060722	06/07/2022 15:45	580-114630-15	TPH-Dx
5801146301	2A-W-40-060722	06/07/2022 15:46	580-114630-16	TPH-Dx
5801146301	GW-2-060722	06/07/2022 15:07	580-114630-17	TPH-Dx

SDG	Sample ID	Sample Date/Time	Lab ID	Analyses
5801146301	GW-1-060722	06/07/2022 14:17	580-114630-18	TPH-Dx
5801146301	5-W-43-060722	06/07/2022 12:09	580-114630-19	TPH-Dx
5801146301	GW-3-060722	06/07/2022 14:50	580-114630-20	TPH-Dx, TPHSG
5801146301	1B-W-23-060722	06/07/2022 14:20	580-114630-21	TPH-Dx
5801146301	2A-W-42-060722	06/07/2022 12:00	580-114630-22	TPH-Dx
5801146301	1C-W-4-060722	06/07/2022 11:15	580-114630-23	TPH-Dx
5801146301	GW-4-060722	06/07/2022 10:30	580-114630-24	TPH-Dx
5801146301	S4-AD-060822	06/08/2022 11:45	580-114630-25	TPH-Dx
5801146301	S4-AU-060822	06/08/2022 12:10	580-114630-26	TPH-Dx
5801146301	S3-CU-060822	06/08/2022 11:45	580-114630-27	TPH-Dx
5801146301	S3-CD-060822	06/08/2022 11:25	580-114630-28	TPH-Dx
5801146301	S2-AU-060822	06/08/2022 10:10	580-114630-29	TPH-Dx
5801146301	S2-AD-060822	06/08/2022 09:45	580-114630-30	TPH-Dx
5801146301	S2-BD-060822	06/08/2022 10:25	580-114630-31	TPH-Dx
5801146301	S2-BU-060822	06/08/2022 10:48	580-114630-32	TPH-Dx
5801146301	S4-CD-060822	06/08/2022 12:15	580-114630-33	TPH-Dx
5801146301	S4-CU-060822	06/08/2022 12:35	580-114630-34	TPH-Dx
5801146301	S4-BU-060822	06/08/2022 12:20	580-114630-35	TPH-Dx
5801146301	S4-BD-060822	06/08/2022 11:51	580-114630-36	TPH-Dx
5801146301	S3-AD-060822	06/08/2022 11:12	580-114630-37	TPH-Dx
5801146301	S3-AU-060822	06/08/2022 10:50	580-114630-38	TPH-Dx
5801146301	S1-BD-060822	06/08/2022 10:05	580-114630-39	TPH-Dx
5801146301	S1-BU-060822	06/08/2022 09:45	580-114630-40	TPH-Dx
5801146301	S1-AD-060822	06/08/2022 09:37	580-114630-41	TPH-Dx
5801146301	S1-AU-060822	06/08/2022 10:00	580-114630-42	TPH-Dx
5801146301	S3-BD-060822	06/08/2022 10:40	580-114630-43	TPH-Dx
5801146301	S3-BU-060822	06/08/2022 11:00	580-114630-44	TPH-Dx
5801146301	MW-555-060822	06/08/2022 12:55	580-114630-45	TPH-Dx
5801146301	2A-W-9-060722	06/07/2022 16:28	580-114630-46	TPH-Dx
5801146301	5-W-19-060822	06/08/2022 13:48	580-114630-47	TPH-Dx
5801146301	GW-30-060722	06/07/2022 14:50	580-114630-48	TPH-Dx

2.0 Validation

Results were evaluated based on criteria from the analytical methods, project documents, and current EPA guidance documents. References for these documents are listed in section 7.0 of this report. The criteria gathered from the above documents are briefly summarized in the Appendix "Data Validation Criteria" at the end of this report.

A stage 2A summary validation was performed including both the laboratory report and electronic data deliverable (EDD), earning EPA OSWER validation label code S2AVEM. All 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, if assigned, are summarized in section 4.0 of this report and added to the validated EDD, in accordance with the EDD field definitions and agreed upon conventions.

3.0 Validation Findings

Data validation criteria specified in the appendix were met with the following exceptions:

- Contamination above ten times the lowest sample concentration was reported in the field blank. Associated concentrations within 5 times the blank level should be considered not

detected at the reported concentration, and are qualified "U". Associated concentrations both within 5 times the blank level and also below the reporting limit should be considered not detected and estimated at the reported concentration. Qualifiers are applied to results both with and without silica gel cleanup if applicable. The specific contamination level is shown below:

Analysis	Blank ID	Analyte	Concentration	RL	Units
TPH-Dx	MW-555-060822	#2 Diesel (C10-C24)	0.063	0.052	mg/l

➤ According to the laboratory narrative, low motor oil responses were observed in the three calibration standards. Both non-detect and detected motor oil results are qualified as estimated in the associated samples.

➤ Motor oil reporting limits were slightly elevated in six samples due to a laboratory extraction volume slightly below the target of 250 mL in combination with a calibration low standard equivalent to the requested reporting limit. Affected samples are shown below:

Analysis	Sample ID	Analyte	Reported RL	Target RL	Units
TPH-Dx	S1-BD-060822	Motor Oil (>C24-C36)	0.11	0.10	mg/l
TPH-Dx	S2-AD-060822	Motor Oil (>C24-C36)	0.11	0.10	mg/l
TPH-Dx	S2-AU-060822	Motor Oil (>C24-C36)	0.11	0.10	mg/l
TPH-Dx	S3-AD-060822	Motor Oil (>C24-C36)	0.11	0.10	mg/l
TPH-Dx	S4-BD-060822	Motor Oil (>C24-C36)	0.11	0.10	mg/l
TPH-Dx	S4-BU-060822	Motor Oil (>C24-C36)	0.11	0.10	mg/l

➤ According to the laboratory narrative, the client was contacted regarding discrepancies between the chain of custody sample IDs and sample container labels. Reported sample IDs matched the resolution described in the laboratory narrative, and no further action was required.

4.0 Validation Qualifiers

The following validation qualifiers were assigned on the basis of this review:

Client ID	Analyte(s)	Qualifier	Reason
1C-W-4-060722	#2 Diesel (C10-C24)	U	Field blank contamination
1C-W-7-060722	#2 Diesel (C10-C24)	U	Field blank contamination
1C-W-8-060722	#2 Diesel (C10-C24)	U	Field blank contamination
2A-W-410-060722	#2 Diesel (C10-C24)	U	Field blank contamination
2A-W-41-060722	#2 Diesel (C10-C24)	U	Field blank contamination
2A-W-42-060722	#2 Diesel (C10-C24)	U	Field blank contamination
2A-W-9-060722	#2 Diesel (C10-C24)	U	Field blank contamination
5-W-180-060622	Motor Oil (>C24-C36)	J	Low continuing calibration response
5-W-180-060622	#2 Diesel (C10-C24)	UJ	Field blank contamination
5-W-18-060622	Motor Oil (>C24-C36)	J	Low continuing calibration response
5-W-18-060622	#2 Diesel (C10-C24)	U	Field blank contamination
5-W-51-060622	Motor Oil (>C24-C36)	J	Low continuing calibration response
5-W-51-060622	#2 Diesel (C10-C24)	U	Field blank contamination
5-W-55-060622	Motor Oil (>C24-C36)	J	Low continuing calibration response
5-W-55-060622	#2 Diesel (C10-C24)	UJ	Field blank contamination
5-W-56-060622	Motor Oil (>C24-C36)	J	Low continuing calibration response
5-W-56-060622	#2 Diesel (C10-C24)	U	Field blank contamination
GW-1-060722	#2 Diesel (C10-C24)	U	Field blank contamination
MW-4-060722	#2 Diesel (C10-C24)	U	Field blank contamination
S1-BD-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination

Client ID	Analyte(s)	Qualifier	Reason
S1-BD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S2-AD-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination
S2-AD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S2-AU-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination
S2-AU-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S2-BD-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination
S2-BD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S2-BU-060822	Motor Oil (>C24-C36)	J	Low continuing calibration response
S2-BU-060822	#2 Diesel (C10-C24)	U	Field blank contamination
S3-AD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S3-AU-060822	Motor Oil (>C24-C36)	J	Low continuing calibration response
S3-AU-060822	#2 Diesel (C10-C24)	U	Field blank contamination
S3-CD-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination
S3-CD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S3-CU-060822	Motor Oil (>C24-C36)	J	Low continuing calibration response
S3-CU-060822	#2 Diesel (C10-C24)	U	Field blank contamination
S4-AD-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination
S4-AD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S4-AU-060822	Motor Oil (>C24-C36)	J	Low continuing calibration response
S4-AU-060822	#2 Diesel (C10-C24)	U	Field blank contamination
S4-BD-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination
S4-BD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S4-BU-060822	#2 Diesel (C10-C24)	UJ	Field blank contamination
S4-BU-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S4-CD-060822	Motor Oil (>C24-C36)	UJ	Low continuing calibration response
S4-CU-060822	Motor Oil (>C24-C36)	J	Low continuing calibration response
S4-CU-060822	#2 Diesel (C10-C24)	U	Field blank contamination

5.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Accuracy and precision measurements were within control limits for target analytes. Field blank contamination resulted in elevated diesel reporting limits and estimated concentrations. Analytical decisions resulted in six elevated motor oil reporting limits. Samples were collected from each required location. The preparation and analytical methods performed matched the requested methods. These methods are approved EPA methods and therefore meet comparability requirements. Samples were collected from both quarterly and semi-annual locations due to analytical issues with the first quarter sampling event. A data completeness of 100% was calculated based on 43 of 43 intended sample analyses completed, meeting the project goal of 90%.

6.0 Common Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value.
UY	The reporting limit was elevated due to chromatographic overlap with related compounds. The material was analyzed for, but was not detected above the level of the associated value.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

<u>DV Qualifier</u>	<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	This sample result has been rejected in favor of a more accurate, precise or conservative result. Result has been excluded from the validated EDD.
R2	This sample result has been rejected in favor of a more accurate, precise or conservative result from another analytical method. Result has been excluded from the validated EDD.

<u>QC Element</u>	<u>Definition</u>
ICAL	Initial calibration
ICV	Initial calibration verification
CCV	Continuing calibration verification
LCS	Laboratory control sample
LCSD	Laboratory control sample
MS	Matrix spike
MSD	Matrix spike duplicate
SRM	Standard reference material
RRM	Regional reference material
FD	Field duplicate
FB	Field blank
RB	Rinse blank
TB	Trip blank
IS	Internal standard
RT	Retention time
RRT	Relative retention time
RPD	Relative percent difference

<u>Abbreviation</u>	<u>Definition</u>
CRDL	Contract required detection limit
DV	Data validation
EDL	Estimated detection limit
EMPC	Estimated maximum possible concentration
KED	Kinetic energy discrimination in collision/reaction cell
MDL	Method detection limit
NA	Not applicable
QAPP	Quality Assurance Project Plan
RL	Reporting limit
RSD	Relative standard deviations
SDG	Sample delivery group
SIM	Selective ion monitoring
SRM	Selective reaction monitoring
UCT	Universal cell technology

7.0 References

USEPA National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. January 2017, EPA-540-R-2017-002.

USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, January 2017, EPA-540-R-2017-001.

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.

Method 6020B: *Inductively Coupled Plasma – Mass Spectrometry*, SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 2 July 2014.

Method NWTPH-Dx: *Semi-Volatile Petroleum Products Method for Soil and Water*, Analytical Methods for Petroleum Hydrocarbons, WA State Department of Ecology ECY 97-0-02, June 1997.

LTM Plan: *Final Long-Term Monitoring Plan, BNSF Former Maintenance and Fueling Facility, Skykomish Washington, Consent Decree No. 07-2-33672-9 SEA*. Submitted by Farallon Consulting L.L.C., November 9, 2020.

HCC Manual: *2011 Operation and Maintenance Manual for the Hydraulic Control Containment System, Former Maintenance and Fueling Facility – Skykomish, WA*. Prepared for The BNSF Railway Company, prepared by AECOM, April 8, 2001.

APPENDIX – DATA VALIDATION CRITERIA

Data Package Completeness and Sample Integrity

QC Element	Criteria
Completeness	Laboratory report includes the appropriate level of detail as described in the EPA Guidance documents (USEPA, January 2009)
Sample ID transcription	Chain of custodies and/or sample log-in documentation are present for all samples reported and match sample IDs used in the laboratory report and electronic data deliverable (EDD).
Sample receipt condition	Sample containers are intact upon receipt at the laboratory and preservation and storage requirements meet method specific guidelines.
Sample analysis frequencies	21 sampling locations listed in Table 3 of the LTM plan currently require semi-annual TPH-Dx analysis. Additionally, the HCC manual lists 20 sentry wells which currently require semi-annual TPH-Dx analysis. 9 of the 21 sampling locations in Table 3 of the LTM plan and an additional 2 end well locations currently require quarterly TPH-Dx analysis based on the HCC manual. This results in 43 required sample locations in quarters 1 and 3 and 11 required sample locations in quarters 2 and 4.
Reporting Limits	Reporting limits for non-detect results at or below 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons.
Laboratory Narrative	The laboratory narrative, data flags and any corrective action documentation are evaluated for impact on data usability.

Notes:

- Newer versions of published analytical methods are considered acceptable substitutions.
- Method substitutions utilizing different instrumentation are also considered acceptable, e.g. method 200.8 (ICP-MS) for method 200.7 (ICP-AES) if desired reporting limits are met.
- Data referencing older versions of published analytical methods may be assessed based on criteria present in newer versions.

Selection of Reportable Results

Where multiple results are available for the same sample and analyte, the following guidelines are used to select the best result to report:

- (1) Data rejected as unusable based on other validation criteria are excluded from consideration.
- (2) If all results are non-detects, the lowest reporting limit is selected.
- (3) If both non-detect and detected results are available, the detection is selected.
- (4) If both results are detections, the following additional criteria are applied:
 - (a) If one result is off-scale and one is on-scale, the on-scale result is selected.
 - (b) If associated QC results indicated high bias, the lower concentration result is selected.
 - (c) If associated QC results indicated no, low, or mixed biases, the higher concentration result is selected.

This approach is conservative, and is considered most protective of the environment. The results not selected as the best result to report are qualified R1 if from the same analytical method, and R2 if from a different analytical method.

Field Quality Assurance/Quality Control Samples, Stage 2A Validation

QC Element	Frequency	Criteria
Field duplicates	One per 10 field samples	RPDs below 50% where concentrations are above five times the reporting limit, Concentrations within +/- two times the reporting limit where concentrations are below five times the reporting limit.
Equipment blanks (EB)	One per round of groundwater sampling.	< 10% of concentration in field samples.

Diesel Range Organics–Method NWTPH-Dx, Stage 2A Validation

QC Element	Frequency	Criteria
Holding times	Each sample	Water samples must analyzed within 14 days if preserved with hydrogen chloride and within 7 days if unpreserved. Transportation and storage temperatures should be below 6°C.
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentration in field samples.
Laboratory control sample (LCS)	Not specified.	Recoveries within 50-150% or meeting performance-based control limits
Duplicates	Matrix duplicate per batch of ≤10 samples. LCS and duplicate if no matrix duplicate.	RPDs within 30% or meeting performance-based control limits. Matrix duplicate not required if insufficient sample volume provided.
Surrogates	Each sample and QC sample	Recoveries within 50-150% or meet performance-based control limits.

Note: the above criteria applies to NWTPH-Dx both with and without silica gel cleanup



DATA VALIDATION REPORT

Skykomish Groundwater Monitoring, October 2022 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

December 12, 2022

1.0 Introduction

Data set: Data were received for validation under one laboratory sample delivery group (SDG). Data were submitted by Eurofins Seattle in Tacoma, Washington. Submissions included both a laboratory report and an electronic data deliverable (EDD) as follows:

SDG	EDD File Name*	Report File Name	Report Date
5801194551	580-119455-1_EquFarallon_EFW2LabRES.csv	J119455-1 UDS Level 2 Report Final Report.pdf	11/21/22

* Supplied EDD includes 4 files for each SDG utilizing LabRES, LabTST, LabBCH, and FSample suffixes.

Analytical methods: The following methods were utilized:

Analysis	Analysis method	Preparation method
Diesel range organics (TPH-Dx)	NWTPH-Dx	SW3510C
Diesel range organics with silica gel cleanup (TPH-DxSG)	NWTPH-Dx	SW3510C/SW3630C

Analytical Schedule: The following samples and analyses were included in this review:

SDG	Sample ID	Sample Date/Time	Lab ID	Analyses
5801194551	S4-BU-102722	10/27/2022 16:32	580-119455-1	TPH-Dx
5801194551	S3-CD-102722	10/27/2022 15:37	580-119455-2	TPH-Dx
5801194551	GW-3-102722	10/27/2022 16:00	580-119455-3	TPH-Dx, TPHSG
5801194551	S3-AU-102722	10/27/2022 15:11	580-119455-4	TPH-Dx
5801194551	S1-AD-102722	10/27/2022 13:50	580-119455-5	TPH-Dx
5801194551	S1-AU-102722	10/27/2022 14:05	580-119455-6	TPH-Dx
5801194551	S2-AD-102722	10/27/2022 14:30	580-119455-7	TPH-Dx
5801194551	5-W-51-102622	10/26/2022 13:45	580-119455-8	TPH-Dx
5801194551	5-W-43-102622	10/26/2022 11:14	580-119455-9	TPH-Dx
5801194551	GW-2-102622	10/26/2022 09:57	580-119455-10	TPH-Dx
5801194551	2A-W-42-102622	10/26/2022 15:55	580-119455-11	TPH-Dx
5801194551	5-W-55-1026-22	10/26/2022 12:15	580-119455-12	TPH-Dx
5801194551	1C-W-4-102722	10/27/2022 10:45	580-119455-13	TPH-Dx
5801194551	1C-W-7-102722	10/27/2022 11:36	580-119455-14	TPH-Dx
5801194551	S1-BU-102722	10/27/2022 13:40	580-119455-17	TPH-Dx

SDG	Sample ID	Sample Date/Time	Lab ID	Analyses
5801194551	S1-BD-102722	10/27/2022 13:35	580-119455-18	TPH-Dx
5801194551	S3-BU-102722	10/27/2022 16:00	580-119455-19	TPH-Dx
5801194551	1C-W-70-102722	10/27/2022 11:45	580-119455-20	TPH-Dx
5801194551	S3-AD-102722	10/27/2022 15:10	580-119455-21	TPH-Dx
5801194551	GW-1-102622	10/26/2022 10:42	580-119455-22	TPH-Dx
5801194551	EW-1-102622	10/26/2022 11:13	580-119455-23	TPH-Dx
5801194551	5-W-56-102622	10/26/2022 12:21	580-119455-24	TPH-Dx
5801194551	2A-W-40-102622	10/26/2022 13:23	580-119455-25	TPH-Dx
5801194551	1B-W-23-102722	10/27/2022 09:35	580-119455-26	TPH-Dx
5801194551	1C-W-8-102722	10/27/2022 10:47	580-119455-27	TPH-Dx
5801194551	S3-BD-102722	10/27/2022 15:53	580-119455-28	TPH-Dx
5801194551	S3-CU-102722	10/27/2022 15:13	580-119455-29	TPH-Dx
5801194551	S4-AD-102722	10/27/2022 16:57	580-119455-30	TPH-Dx
5801194551	S4-BD-102722	10/27/2022 16:30	580-119455-31	TPH-Dx
5801194551	S4-AU-102722	10/27/2022 17:10	580-119455-32	TPH-Dx
5801194551	S2-AU-102722	10/27/2022 14:08	580-119455-33	TPH-Dx
5801194551	S4-CD-102722	10/27/2022 16:40	580-119455-34	TPH-Dx
5801194551	S4-CU-102722	10/27/2022 17:00	580-119455-35	TPH-Dx
5801194551	GW-4-102622	10/26/2022 15:30	580-119455-36	TPH-Dx
5801194551	EW-2A-102622	10/26/2022 14:38	580-119455-37	TPH-Dx
5801194551	5-W-14-102622	10/26/2022 13:50	580-119455-38	TPH-Dx
5801194551	5-W-17-102622	10/26/2022 13:15	580-119455-39	TPH-Dx
5801194551	5-W-16-102622	10/26/2022 11:50	580-119455-40	TPH-Dx
5801194551	5-W-19-102622	10/26/2022 11:10	580-119455-41	TPH-Dx
5801194551	5-W-18-102622	10/26/2022 10:35	580-119455-42	TPH-Dx
5801194551	5-W-180-102622	10/26/2022 10:40	580-119455-43	TPH-Dx
5801194551	MW-4-102722	10/27/2022 11:00	580-119455-44	TPH-Dx
5801194551	2A-W-41-102722	10/27/2022 12:15	580-119455-45	TPH-Dx, TPHSG
5801194551	MW-555-102722	10/27/2022 18:58	580-119455-47	TPH-Dx
5801194551	2A-W-410-102722	10/27/2022 12:20	580-119455-48	TPH-Dx

2.0 Validation

Results were evaluated based on criteria from the analytical methods, project documents, and current EPA guidance documents. References for these documents are listed in section 7.0 of this report. The criteria gathered from the above documents are briefly summarized in the Appendix "Data Validation Criteria" at the end of this report.

A stage 2A summary validation was performed including both the laboratory report and electronic data deliverable (EDD), earning EPA OSWER validation label code S2AVEM. All 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, if assigned, are summarized in section 4.0 of this report and added to the validated EDD, in accordance with the EDD field definitions and agreed upon conventions.

3.0 Validation Findings

Data validation criteria specified in the appendix were met with the following exception:

The laboratory data package did not include chain of custodies for laboratory sample IDs 580-119455-33 through 580-119455-48. Chain of custody documentation was provided separately and included in this review.

The laboratory narrative noted that two samples, 5-W-51-102622 and 5-W-43-102622, were listed on the chain of custody twice. Appropriately, the second set of laboratory sample IDs assigned to these samples were not scheduled for analysis (580-119455-15 and 580-119455-16). An additional sample, GW-2-102622 was listed on the chain of custody twice, and the second laboratory sample ID assigned to this sample was also not scheduled for analysis (580-119455-46).

4.0 Validation Qualifiers

No qualifiers were assigned on the basis of this review

5.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Accuracy and precision measurements were within control limits for target analytes. With 2 exceptions, samples were collected from each required location. Locations S2-BD and S2-BU were not sampled until December due to a required reinstallation and data for these locations was not available for inclusion in this data review. The preparation and analytical methods performed matched the requested methods. These methods are approved EPA methods and therefore meet comparability requirements. A preliminary data completeness of 95.3% was calculated based on 41 of 43 intended sample analyses completed, meeting the project goal of 90%.

6.0 Common Abbreviations and Definitions

<u>DV Qualifier</u>	<u>Definition</u>
U	The material was analyzed for, but was not detected above the level of the associated value.
UY	The reporting limit was elevated due to chromatographic overlap with related compounds. The material was analyzed for, but was not detected above the level of the associated value.
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 analyte cannot be verified and data are not usable.
R1	This sample result has been rejected in favor of a more accurate, precise or conservative result. Result has been excluded from the validated EDD.
R2	This sample result has been rejected in favor of a more accurate, precise or conservative result from another analytical method. Result has been excluded from the validated EDD.
<u>QC Element</u>	<u>Definition</u>
ICAL	Initial calibration
ICV	Initial calibration verification

<u>QC Element</u>	<u>Definition</u>
CCV	Continuing calibration verification
LCS	Laboratory control sample
LCSD	Laboratory control sample
MS	Matrix spike
MSD	Matrix spike duplicate
SRM	Standard reference material
RRM	Regional reference material
FD	Field duplicate
FB	Field blank
RB	Rinse blank
TB	Trip blank
IS	Internal standard
RT	Retention time
RRT	Relative retention time
RPD	Relative percent difference

<u>Abbreviation</u>	<u>Definition</u>
CRDL	Contract required detection limit
DV	Data validation
EDL	Estimated detection limit
EMPC	Estimated maximum possible concentration
KED	Kinetic energy discrimination in collision/reaction cell
MDL	Method detection limit
NA	Not applicable
QAPP	Quality Assurance Project Plan
RL	Reporting limit
RSD	Relative standard deviations
SDG	Sample delivery group
SIM	Selective ion monitoring
SRM	Selective reaction monitoring
UCT	Universal cell technology

7.0 References

USEPA National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. January 2017, EPA-540-R-2017-002.

USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, January 2017, EPA-540-R-2017-001.

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.

Method 6020B: *Inductively Coupled Plasma – Mass Spectrometry*, SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 2 July 2014.

Method NWTPH-Dx: *Semi-Volatile Petroleum Products Method for Soil and Water*, Analytical Methods for Petroleum Hydrocarbons, WA State Department of Ecology ECY 97-0-02, June 1997.

LTM Plan: *Final Long-Term Monitoring Plan, BNSF Former Maintenance and Fueling Facility, Skykomish Washington, Consent Decree No. 07-2-33672-9 SEA*. Submitted by Farallon Consulting L.L.C., November 9, 2020.

HCC Manual: *2011 Operation and Maintenance Manual for the Hydraulic Control Containment System, Former Maintenance and Fueling Facility – Skykomish, WA*. Prepared for The BNSF Railway Company, prepared by AECOM, April 8, 2001.

APPENDIX – DATA VALIDATION CRITERIA

Data Package Completeness and Sample Integrity

QC Element	Criteria
Completeness	Laboratory report includes the appropriate level of detail as described in the EPA Guidance documents (USEPA, January 2009)
Sample ID transcription	Chain of custodies and/or sample log-in documentation are present for all samples reported and match sample IDs used in the laboratory report and electronic data deliverable (EDD).
Sample receipt condition	Sample containers are intact upon receipt at the laboratory and preservation and storage requirements meet method specific guidelines.
Sample analysis frequencies	21 of the 21 sampling locations listed in Table 3 of the LTM plan currently require semi-annual TPH-Dx analysis. Additionally, the HCC manual lists 20 sentry wells which currently require semi-annual TPH-Dx analysis. 9 of the 21 sampling locations in Table 3 of the LTM plan and an additional 2 end well locations currently require quarterly TPH-Dx analysis based on the HCC manual. This results in 43 required sample locations in quarters 1 and 3 and 11 required sample locations in quarters 2 and 4.
Reporting Limits	Reporting limits for non-detect results at or below 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons.
Laboratory Narrative	The laboratory narrative, data flags and any corrective action documentation are evaluated for impact on data usability.

Notes:

- Newer versions of published analytical methods are considered acceptable substitutions.
- Method substitutions utilizing different instrumentation are also considered acceptable, e.g. method 200.8 (ICP-MS) for method 200.7 (ICP-AES) if desired reporting limits are met.
- Data referencing older versions of published analytical methods may be assessed based on criteria present in newer versions.

Selection of Reportable Results

Where multiple results are available for the same sample and analyte, the following guidelines are used to select the best result to report:

- (1) Data rejected as unusable based on other validation criteria are excluded from consideration.
- (2) If all results are non-detects, the lowest reporting limit is selected.
- (3) If both non-detect and detected results are available, the detection is selected.
- (4) If both results are detections, the following additional criteria are applied:
 - (a) If one result is off-scale and one is on-scale, the on-scale result is selected.
 - (b) If associated QC results indicated high bias, the lower concentration result is selected.
 - (c) If associated QC results indicated no, low, or mixed biases, the higher concentration result is selected.

This approach is conservative, and is considered most protective of the environment. The results not selected as the best result to report are qualified R1 if from the same analytical method, and R2 if from a different analytical method.

Field Quality Assurance/Quality Control Samples, Stage 2A Validation

QC Element	Frequency	Criteria
Field duplicates	One per 10 field samples	RPDs below 50% where concentrations are above five times the reporting limit, Concentrations within +/- two times the reporting limit where concentrations are below five times the reporting limit.
Equipment blanks (EB)	One per round of groundwater sampling.	< 10% of concentration in field samples.

Diesel Range Organics–Method NWTPH-Dx, Stage 2A Validation

QC Element	Frequency	Criteria
Holding times	Each sample	Water samples must analyzed within 14 days if preserved with hydrogen chloride and within 7 days if unpreserved. Transportation and storage temperatures should be below 6°C.
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentration in field samples.
Laboratory control sample (LCS)	Not specified.	Recoveries within 50-150% or meeting performance-based control limits
Duplicates	Matrix duplicate per batch of ≤10 samples. LCS and duplicate if no matrix duplicate.	RPDs within 30% or meeting performance-based control limits. Matrix duplicate not required if insufficient sample volume provided.
Surrogates	Each sample and QC sample	Recoveries within 50-150% or meet performance-based control limits.

Note: the above criteria applies to NWTPH-Dx both with and without silica gel cleanup



DATA VALIDATION REPORT

Skykomish Groundwater Monitoring, December 2022 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

January 10, 2022

1.0 Introduction

Data set: Data were received for validation under one laboratory sample delivery group (SDG). Data were submitted by Eurofins Seattle in Tacoma, Washington. Submissions included both a laboratory report and an electronic data deliverable (EDD) as follows:

SDG	EDD File Name*	Report File Name	Report Date
5801210761	580-121076-1_EquFarallon_EFW2LabRES.csv	J121076-1 UDS Level 2 Report Final Report.pdf	01/06/23

* Supplied EDD includes 4 files for each SDG utilizing LabRES, LabTST, LabBCH, and FSample suffixes.

Analytical methods: The following methods were utilized:

Analysis	Analysis method	Preparation method
Diesel range organics (TPH-Dx)	NWTPH-Dx	SW3510C
Diesel range organics with silica gel cleanup (TPH-DxSG)	NWTPH-Dx	SW3510C/SW3630C

Analytical Schedule: The following samples and analyses were included in this review:

SDG	Sample ID	Sample Date/Time	Lab ID	Analyses
5801210761	GW-1-120722	12/07/2022 11:45	580-121076-1	TPH-Dx
5801210761	GW-2-120722	12/07/2022 10:20	580-121076-2	TPH-Dx
5801210761	GW-3-120722	12/07/2022 15:00	580-121076-3	TPH-Dx, TPH-DxSG
5801210761	GW-4-120722	12/07/2022 15:22	580-121076-4	TPH-Dx
5801210761	2A-W-40-120722	12/07/2022 13:00	580-121076-5	TPH-Dx
5801210761	2A-W-41-120722	12/07/2022 13:06	580-121076-6	TPH-Dx, TPH-DxSG
5801210761	IB-W-23-120722	12/07/2022 16:45	580-121076-7	TPH-Dx
5801210761	2A-W-42-120722	12/07/2022 15:49	580-121076-8	TPH-Dx
5801210761	5-W-43-120722	12/07/2022 10:45	580-121076-9	TPH-Dx
5801210761	EW-1-120722	12/07/2022 09:57	580-121076-10	TPH-Dx
5801210761	EW-2A-120722	12/07/2022 14:45	580-121076-11	TPH-Dx
5801210761	GW-30-120722	12/07/2022 15:05	580-121076-12	TPH-Dx
5801210761	MW-555-120822	12/08/2022 17:16	580-121076-13	TPH-Dx

2.0 Validation

Results were evaluated based on criteria from the analytical methods, project documents, and current EPA guidance documents. References for these documents are listed in section 7.0 of this report. The criteria gathered from the above documents are briefly summarized in the Appendix "Data Validation Criteria" at the end of this report.

A stage 2A summary validation was performed including both the laboratory report and electronic data deliverable (EDD), earning EPA OSWER validation label code S2AVEM. All 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, if assigned, are summarized in section 4.0 of this report and added to the validated EDD, in accordance with the EDD field definitions and agreed upon conventions.

3.0 Validation Findings

Data validation criteria specified in the appendix were met with the following exceptions:

- The sample collected from location 1B-W-23 was listed on the chain of custody and reported by the laboratory as IB-W-23-120722. No action was taken based on this 1 vs 1 discrepancy.
- As documented in the laboratory narrative, the field blank MW-555-120822 was not listed on the chain of custody.
- Contamination was reported in the field blank and in the method blanks associated with the field blank. Because motor oil was detected in the method blanks associated with both analyses of the field blank, field blank results for this analyte are invalid, and motor oil results are not qualified. The concentration of diesel in the second analysis of the field blank which was associated with a non-detect method blank result, and was used to qualify the sample results.

Sample results below five times this blank concentration should be considered not detected. Sample results both below five times the blank concentration and below the reporting limit should be considered not detected and estimated at the reported value. Sample results between five and ten times the blank concentration are qualified as estimated. Specific contamination levels are shown below:

Analysis	Blank ID	Analyte	Concentration	RL	Units
TPH-Dx	MW-555-120822	#2 Diesel (C10-C24)	0.087B	0.052	mg/l
TPH-Dx	MW-555-120822 RE	#2 Diesel (C10-C24)	0.089H*1	0.055	mg/l
TPH-Dx	MW-555-120822	Motor Oil (>C24-C36)	0.055JB	0.09	mg/l
TPH-Dx	MW-555-120822 RE	Motor Oil (>C24-C36)	0.11HB*1	0.095	mg/l
TPH-Dx	MB 580-413527/1-A	#2 Diesel (C10-C24)	0.0757	0.055	mg/l
TPH-Dx	MB 580-413527/1-A	Motor Oil (>C24-C36)	0.106	0.095	mg/l
TPH-Dx	MB 580-414035/1-A (with RE)	Motor Oil (>C24-C36)	0.0757J	0.095	mg/l

- Various Laboratory control sample duplicate RPDs exceeded control limits. Detected results in the associated samples are qualified as estimated and non-detect results are considered unaffected. Specific exceedances are shown below:

Analysis	QC ID	Analyte	RPD	Lab Control Limit
TPH-Dx	LCSD 580-414035/3-A	#2 Diesel (C10-C24)	45	26
TPH-Dx	LCSD 580-414035/3-A	Motor Oil (>C24-C36)	44	24
TPH-Dx	LCSD 580-413272/3-A	#2 Diesel (C10-C24)	44	26
TPH-Dx	LCSD 580-413272/3-A	Motor Oil (>C24-C36)	41	24
TPHSG	LCSD 580-413272/3-B	Motor Oil (>C24-C36)	38	24
TPHSG	LCSD 580-413272/3-B	#2 Diesel (C10-C24)	42	26

4.0 Validation Qualifiers

Client ID	Analyte(s)	Qualifier	Reason
Diesel range organics			
2A-W-40-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
2A-W-40-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
2A-W-41-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
2A-W-41-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
2A-W-42-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
2A-W-42-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
5-W-43-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
5-W-43-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
EW-1-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
EW-1-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
EW-2A-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
EW-2A-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
GW-1-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
GW-1-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
GW-2-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
GW-2-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
GW-30-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
GW-30-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
GW-3-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
GW-3-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
GW-4-120722	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
GW-4-120722	Motor Oil (>C24-C36)	UJ	Field blank contamination, High LCS/LCSD RPD
Diesel range organics with silica gel cleanup			
2A-W-41-120722	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	J	High LCS/LCSD RPD
GW-3-120722	Motor Oil (>C24-C36)	J	High LCS/LCSD RPD

5.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Quality control % recoveries demonstrate acceptable levels of accuracy. High laboratory control sample duplicate variability resulted in some estimated values. Samples were collected from each required location. The preparation and analytical methods performed matched the requested methods. These methods are approved EPA methods and therefore meet comparability requirements. A data completeness of 100% was calculated based on 11 of 11 intended sample analyses completed, meeting the project goal of 90%.

6.0 Common Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value.
UY	The reporting limit was elevated due to chromatographic overlap with related compounds. The material was analyzed for, but was not detected above the level of the associated value.

<u>DV Qualifier</u>	<u>Definition</u>
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 analyte cannot be verified and data are not usable.
R1	This sample result has been rejected in favor of a more accurate, precise or conservative result. Result has been excluded from the validated EDD.
R2	This sample result has been rejected in favor of a more accurate, precise or conservative result from another analytical method. Result has been excluded from the validated EDD.

<u>QC Element</u>	<u>Definition</u>
ICAL	Initial calibration
ICV	Initial calibration verification
CCV	Continuing calibration verification
LCS	Laboratory control sample
LCSD	Laboratory control sample
MS	Matrix spike
MSD	Matrix spike duplicate
SRM	Standard reference material
RRM	Regional reference material
FD	Field duplicate
FB	Field blank
RB	Rinse blank
TB	Trip blank
IS	Internal standard
RT	Retention time
RRT	Relative retention time
RPD	Relative percent difference

<u>Abbreviation</u>	<u>Definition</u>
CRDL	Contract required detection limit
DV	Data validation
EDL	Estimated detection limit
EMPC	Estimated maximum possible concentration
KED	Kinetic energy discrimination in collision/reaction cell
MDL	Method detection limit
NA	Not applicable
QAPP	Quality Assurance Project Plan
RL	Reporting limit
RSD	Relative standard deviations
SDG	Sample delivery group
SIM	Selective ion monitoring
SRM	Selective reaction monitoring
UCT	Universal cell technology

7.0 References

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USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, January 2017, EPA-540-R-2017-001.

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.

Method 6020B: *Inductively Coupled Plasma – Mass Spectrometry*, SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 2 July 2014.

Method NWTPH-Dx: *Semi-Volatile Petroleum Products Method for Soil and Water*, Analytical Methods for Petroleum Hydrocarbons, WA State Department of Ecology ECY 97-0-02, June 1997.

LTM Plan: *Final Long-Term Monitoring Plan, BNSF Former Maintenance and Fueling Facility, Skykomish Washington, Consent Decree No. 07-2-33672-9 SEA*. Submitted by Farallon Consulting L.L.C., November 9, 2020.

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APPENDIX – DATA VALIDATION CRITERIA

Data Package Completeness and Sample Integrity

QC Element	Criteria
Completeness	Laboratory report includes the appropriate level of detail as described in the EPA Guidance documents (USEPA, January 2009)
Sample ID transcription	Chain of custodies and/or sample log-in documentation are present for all samples reported and match sample IDs used in the laboratory report and electronic data deliverable (EDD).
Sample receipt condition	Sample containers are intact upon receipt at the laboratory and preservation and storage requirements meet method specific guidelines.
Sample analysis frequencies	21 of the 21 sampling locations listed in Table 3 of the LTM plan currently require semi-annual TPH-Dx analysis. Additionally, the HCC manual lists 20 sentry wells which currently require semi-annual TPH-Dx analysis. 9 of the 21 sampling locations in Table 3 of the LTM plan and an additional 2 end well locations currently require quarterly TPH-Dx analysis based on the HCC manual. This results in 43 required sample locations in quarters 1 and 3 and 11 required sample locations in quarters 2 and 4.
Reporting Limits	Reporting limits for non-detect results at or below 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons.
Laboratory Narrative	The laboratory narrative, data flags and any corrective action documentation are evaluated for impact on data usability.

Notes:

- Newer versions of published analytical methods are considered acceptable substitutions.
- Method substitutions utilizing different instrumentation are also considered acceptable, e.g. method 200.8 (ICP-MS) for method 200.7 (ICP-AES) if desired reporting limits are met.
- Data referencing older versions of published analytical methods may be assessed based on criteria present in newer versions.

Selection of Reportable Results

Where multiple results are available for the same sample and analyte, the following guidelines are used to select the best result to report:

- (1) Data rejected as unusable based on other validation criteria are excluded from consideration.
- (2) If all results are non-detects, the lowest reporting limit is selected.
- (3) If both non-detect and detected results are available, the detection is selected.
- (4) If both results are detections, the following additional criteria are applied:
 - (a) If one result is off-scale and one is on-scale, the on-scale result is selected.
 - (b) If associated QC results indicated high bias, the lower concentration result is selected.
 - (c) If associated QC results indicated no, low, or mixed biases, the higher concentration result is selected.

This approach is conservative, and is considered most protective of the environment. The results not selected as the best result to report are qualified R1 if from the same analytical method, and R2 if from a different analytical method.

Field Quality Assurance/Quality Control Samples, Stage 2A Validation

QC Element	Frequency	Criteria
Field duplicates	One per 10 field samples	RPDs below 50% where concentrations are above five times the reporting limit, Concentrations within +/- two times the reporting limit where concentrations are below five times the reporting limit.
Equipment blanks (EB)	One per round of groundwater sampling.	< 10% of concentration in field samples.

Diesel Range Organics–Method NWTPH-Dx, Stage 2A Validation

QC Element	Frequency	Criteria
Holding times	Each sample	Water samples must analyzed within 14 days if preserved with hydrogen chloride and within 7 days if unpreserved. Transportation and storage temperatures should be below 6°C.
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentration in field samples.
Laboratory control sample (LCS)	Not specified.	Recoveries within 50-150% or meeting performance-based control limits
Duplicates	Matrix duplicate per batch of ≤10 samples. LCS and duplicate if no matrix duplicate.	RPDs within 30% or meeting performance-based control limits. Matrix duplicate not required if insufficient sample volume provided.
Surrogates	Each sample and QC sample	Recoveries within 50-150% or meet performance-based control limits.

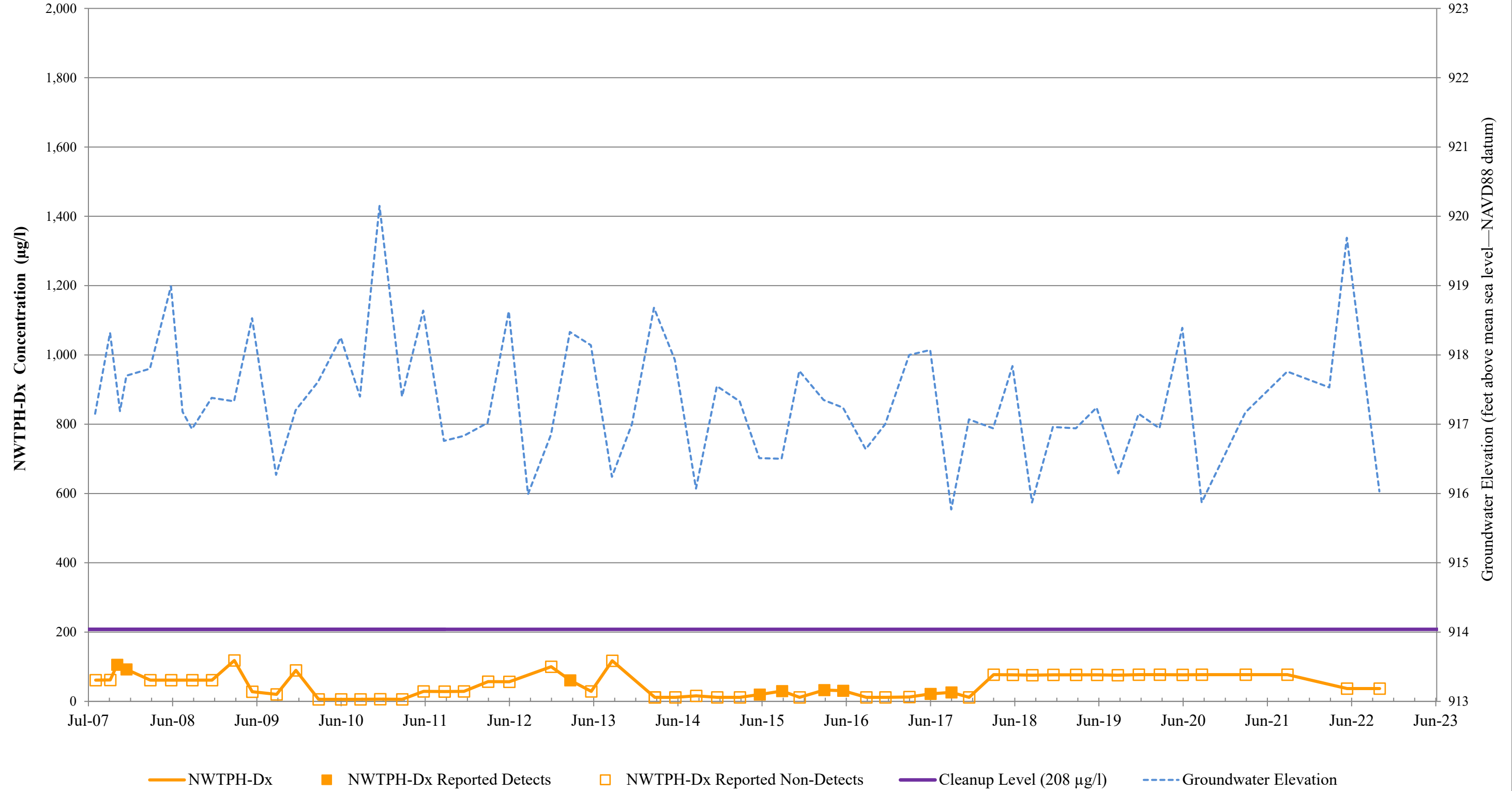
Note: the above criteria applies to NWTPH-Dx both with and without silica gel cleanup

APPENDIX C
NWTPH-Dx TREND PLOTS

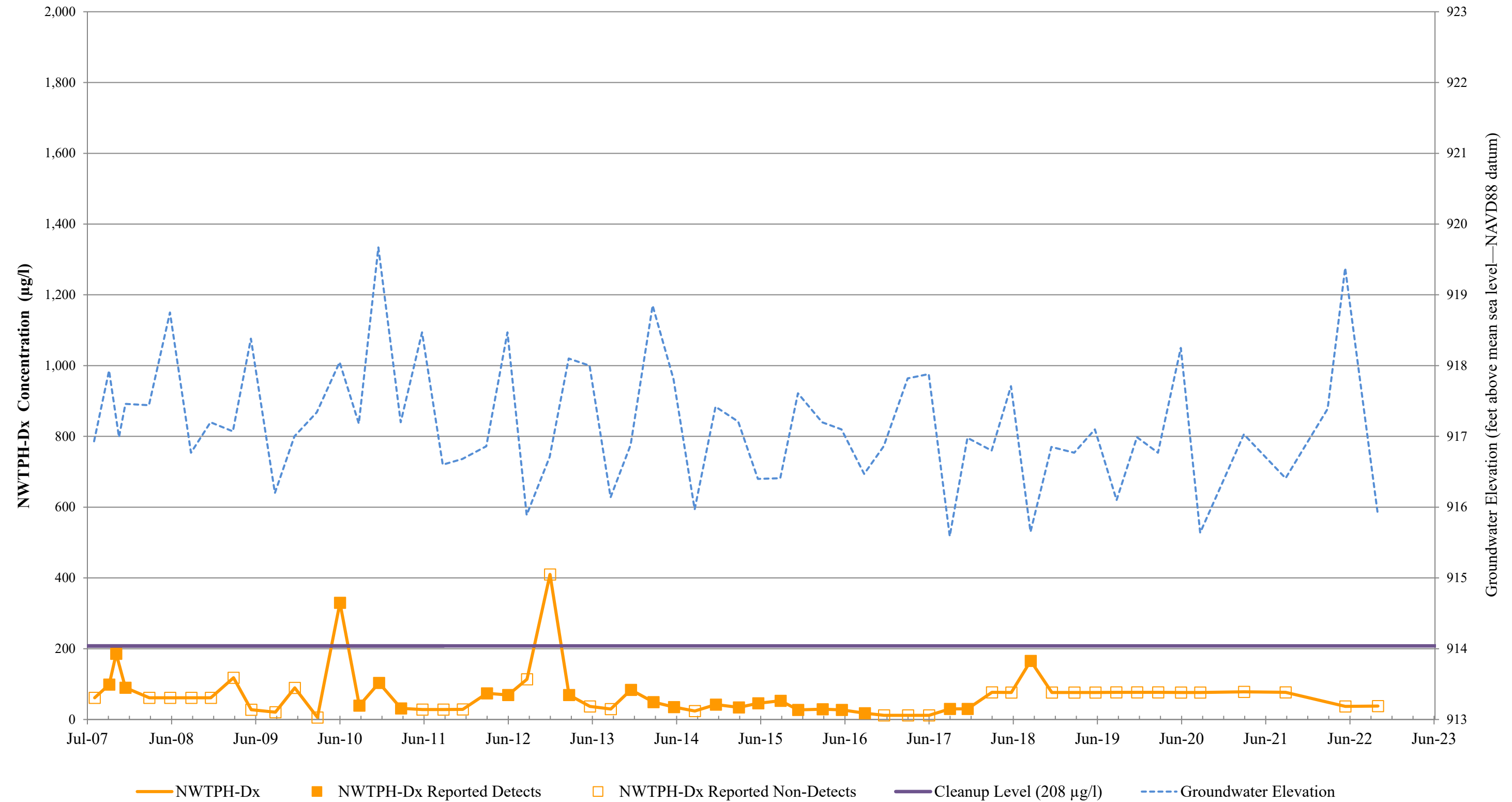
2022 ANNUAL LONG-TERM MONITORING REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

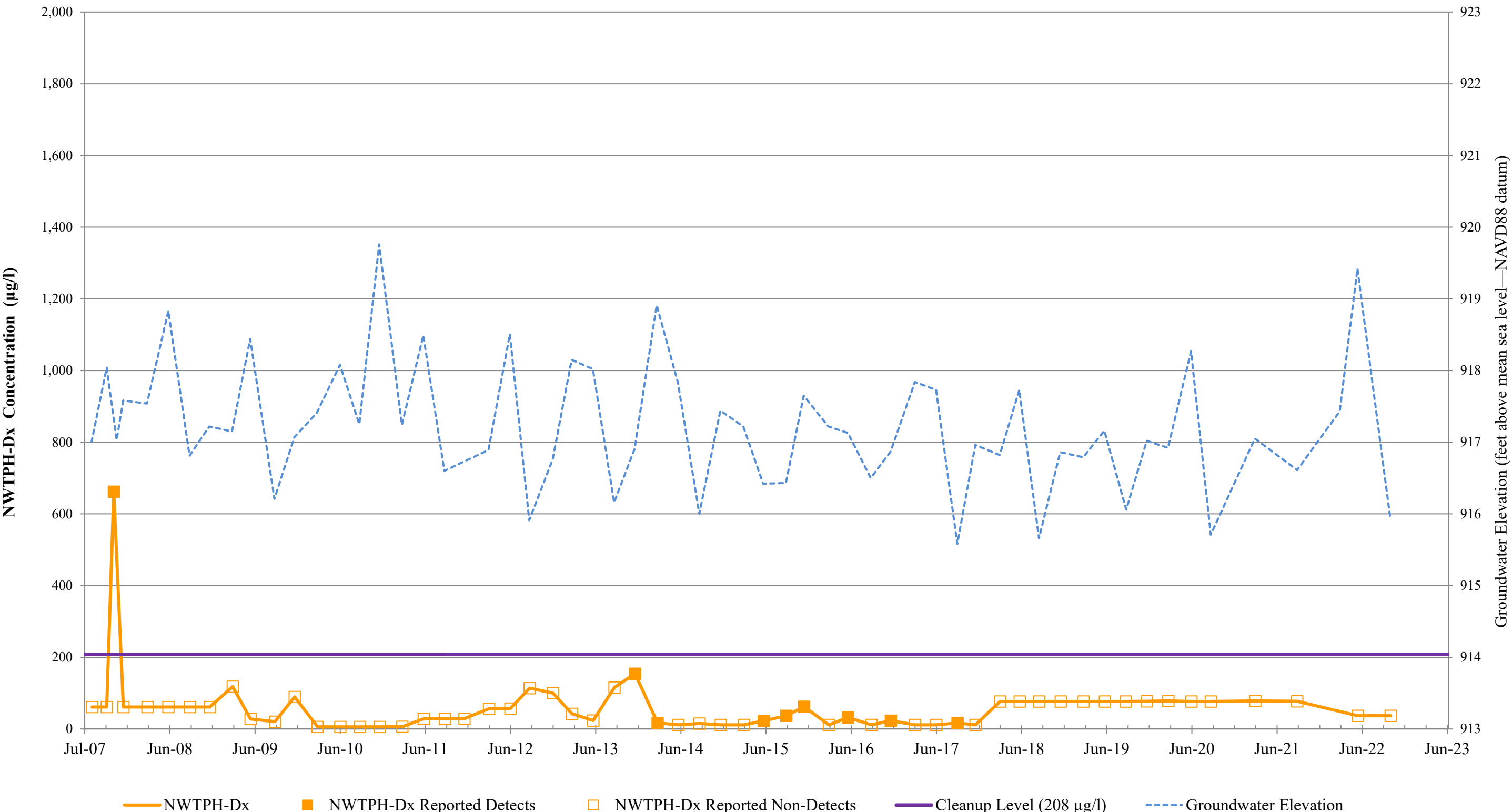
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-14



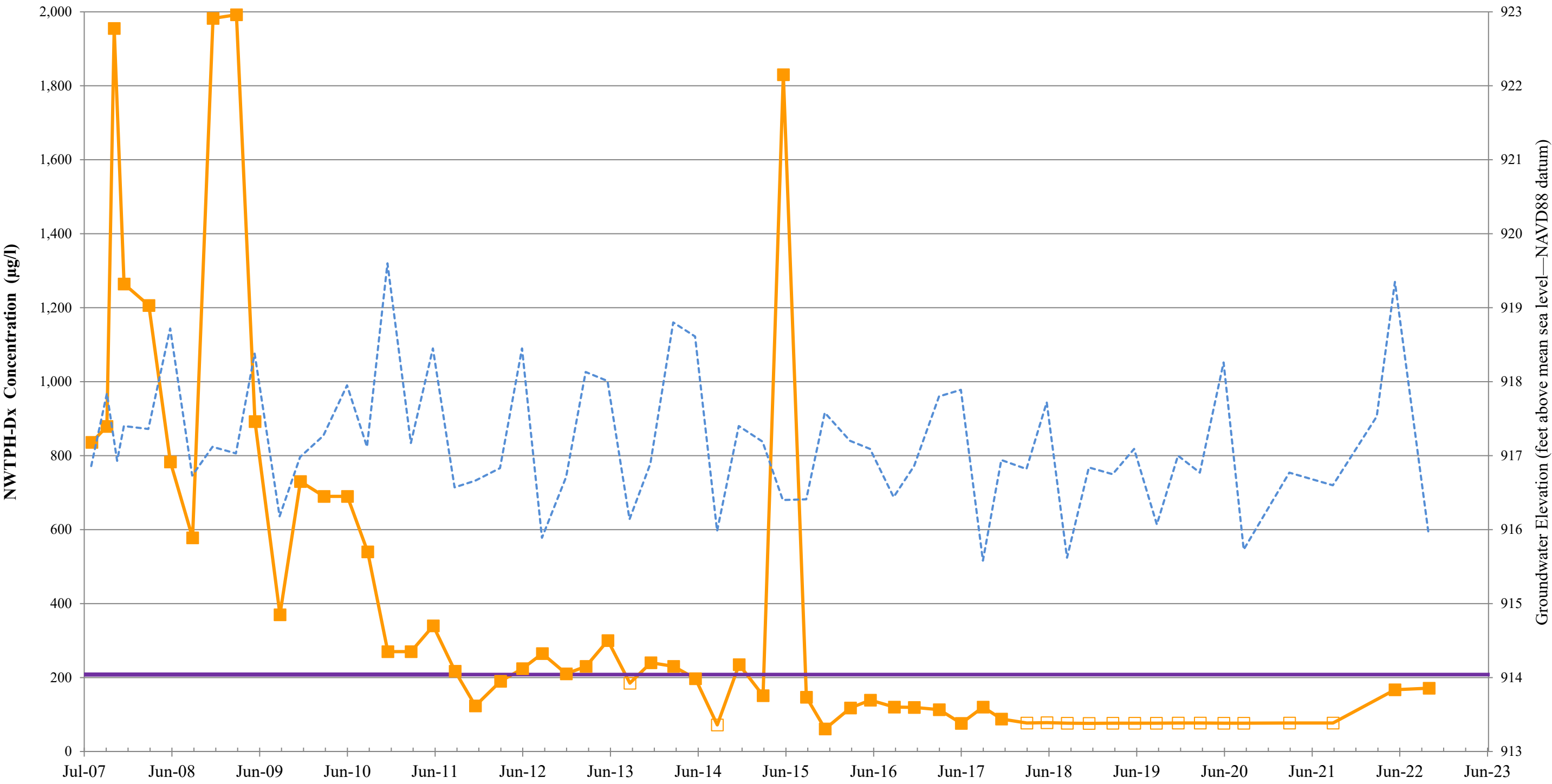
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-16



NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-17

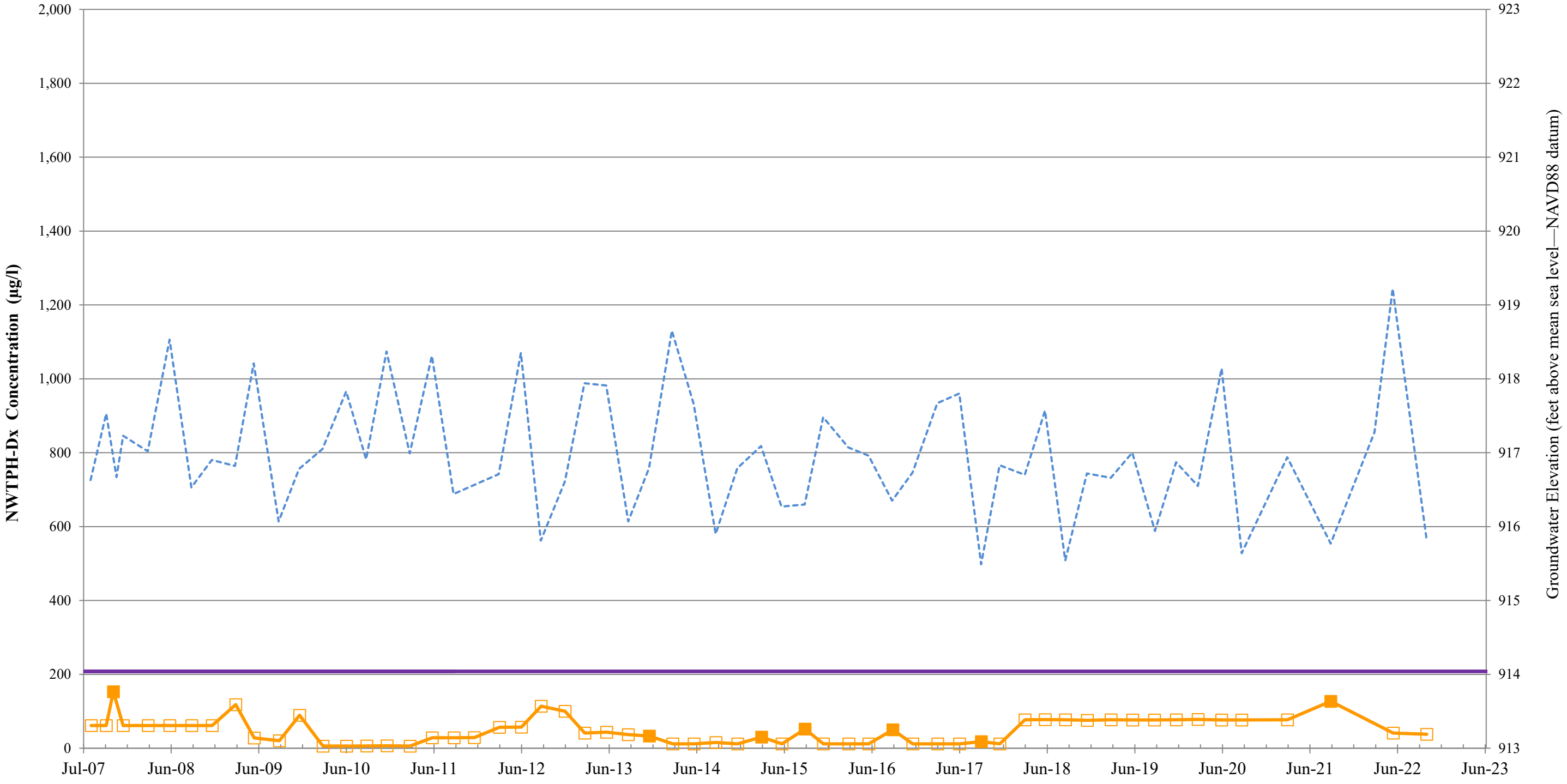


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-18



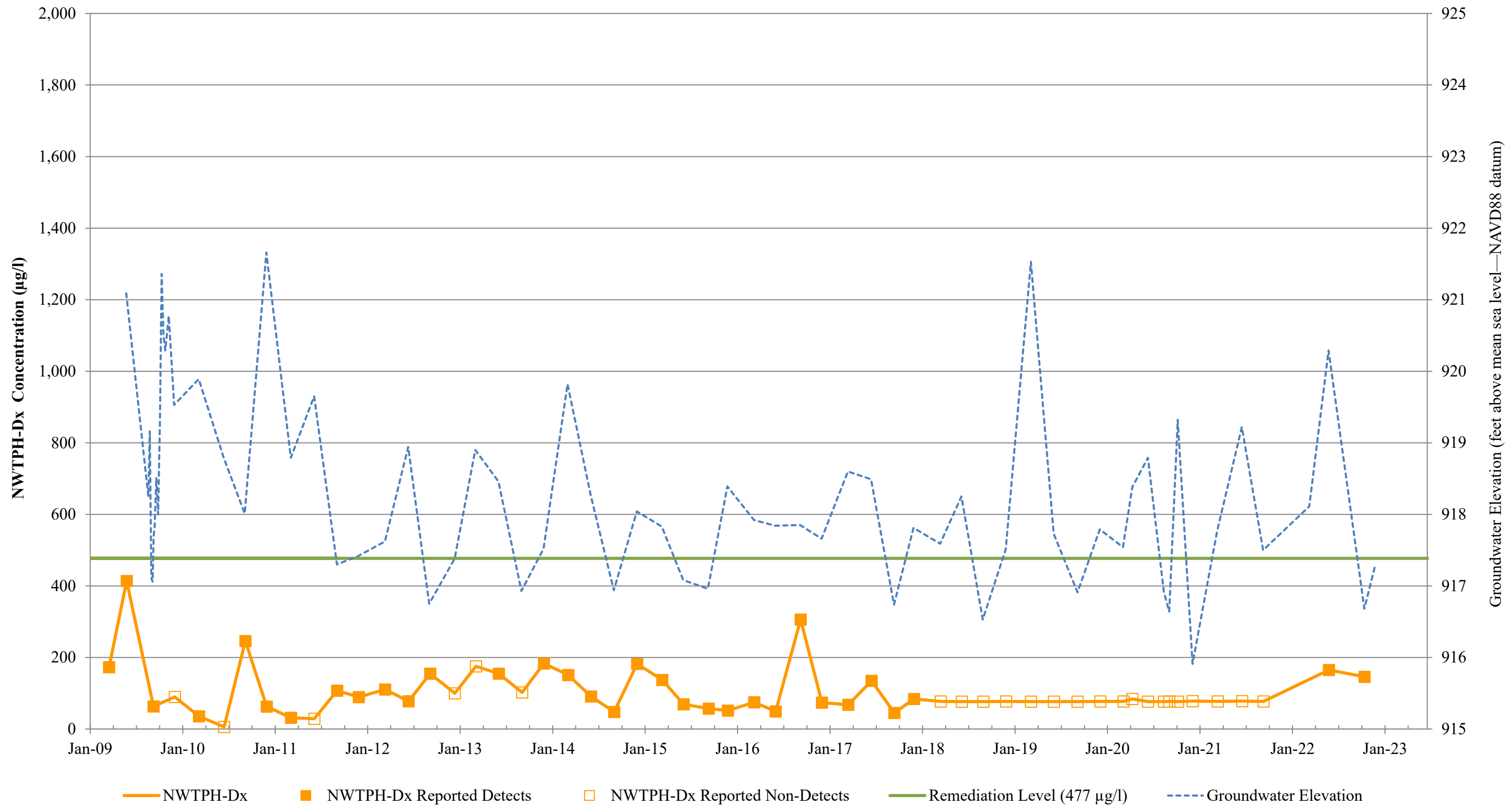
NWTPH-Dx NWTPH-Dx Reported Detects NWTPH-Dx Reported Non-Detects Cleanup Level (208 µg/l) Groundwater Elevation

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-070
Well 5-W-19

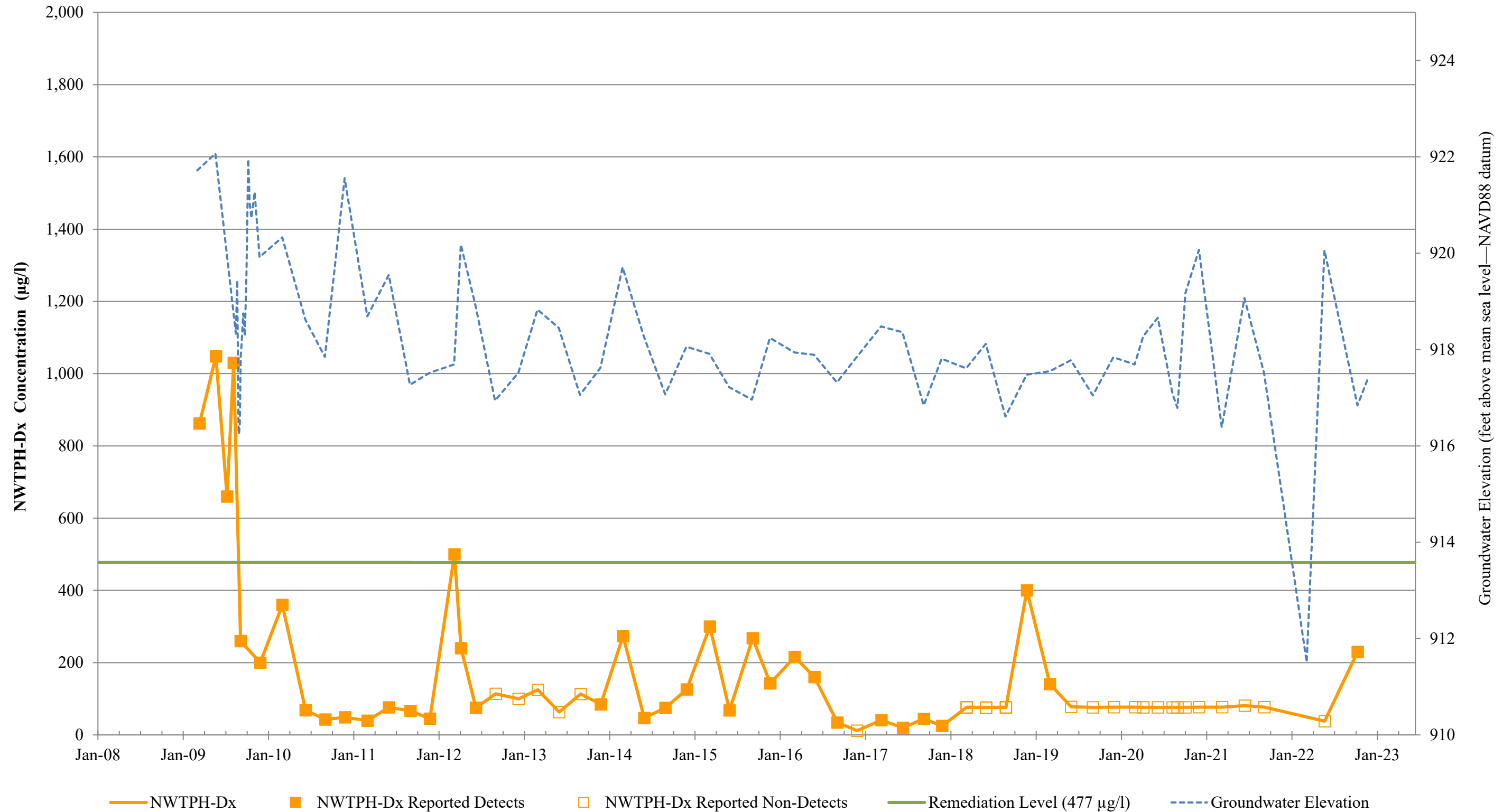


— NWTPH-Dx ■ NWTPH-Dx Reported Detects □ NWTPH-Dx Reported Non-Detects — Cleanup Level (208 µg/l) - - - Groundwater Elevation

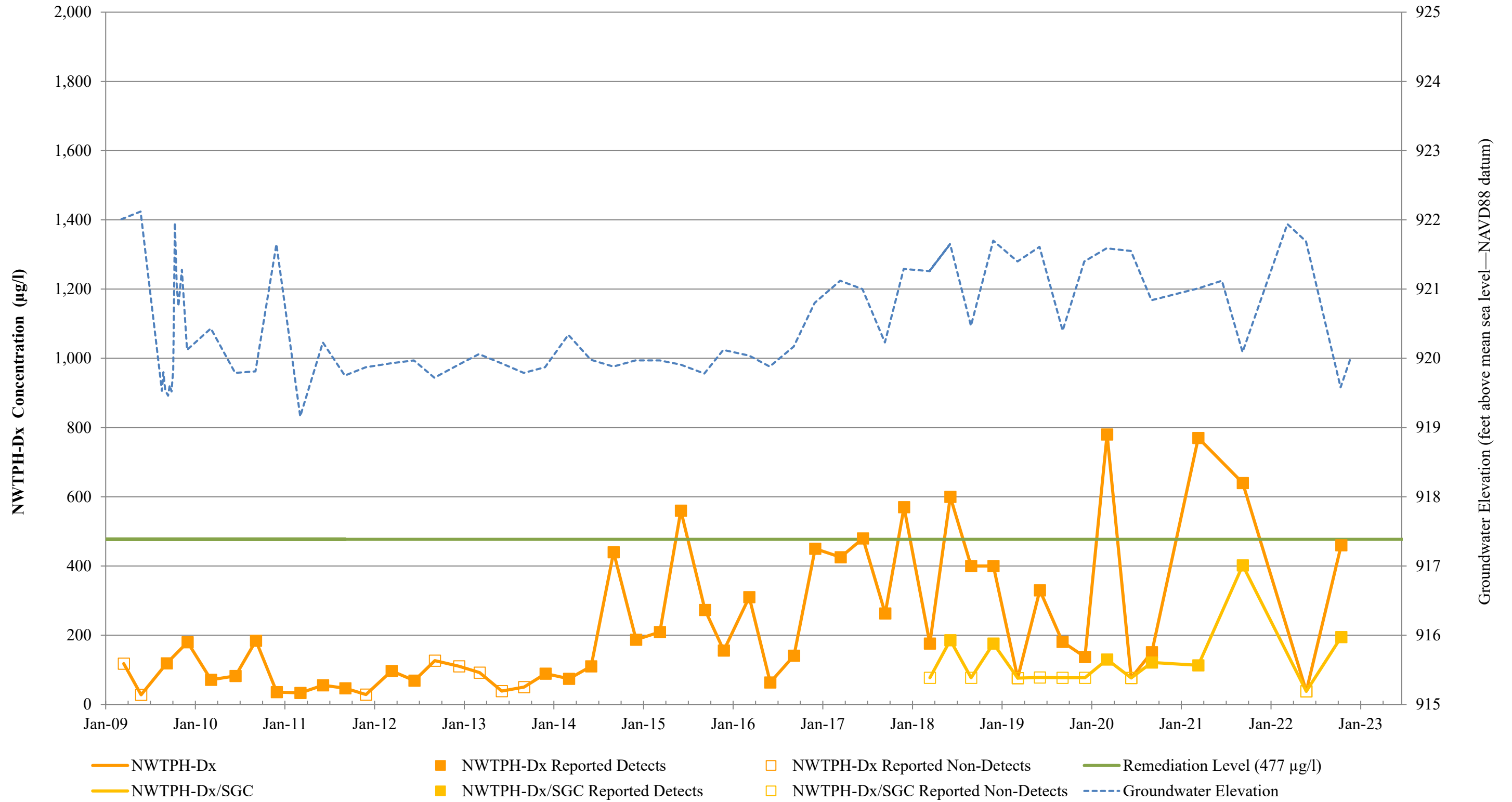
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-1



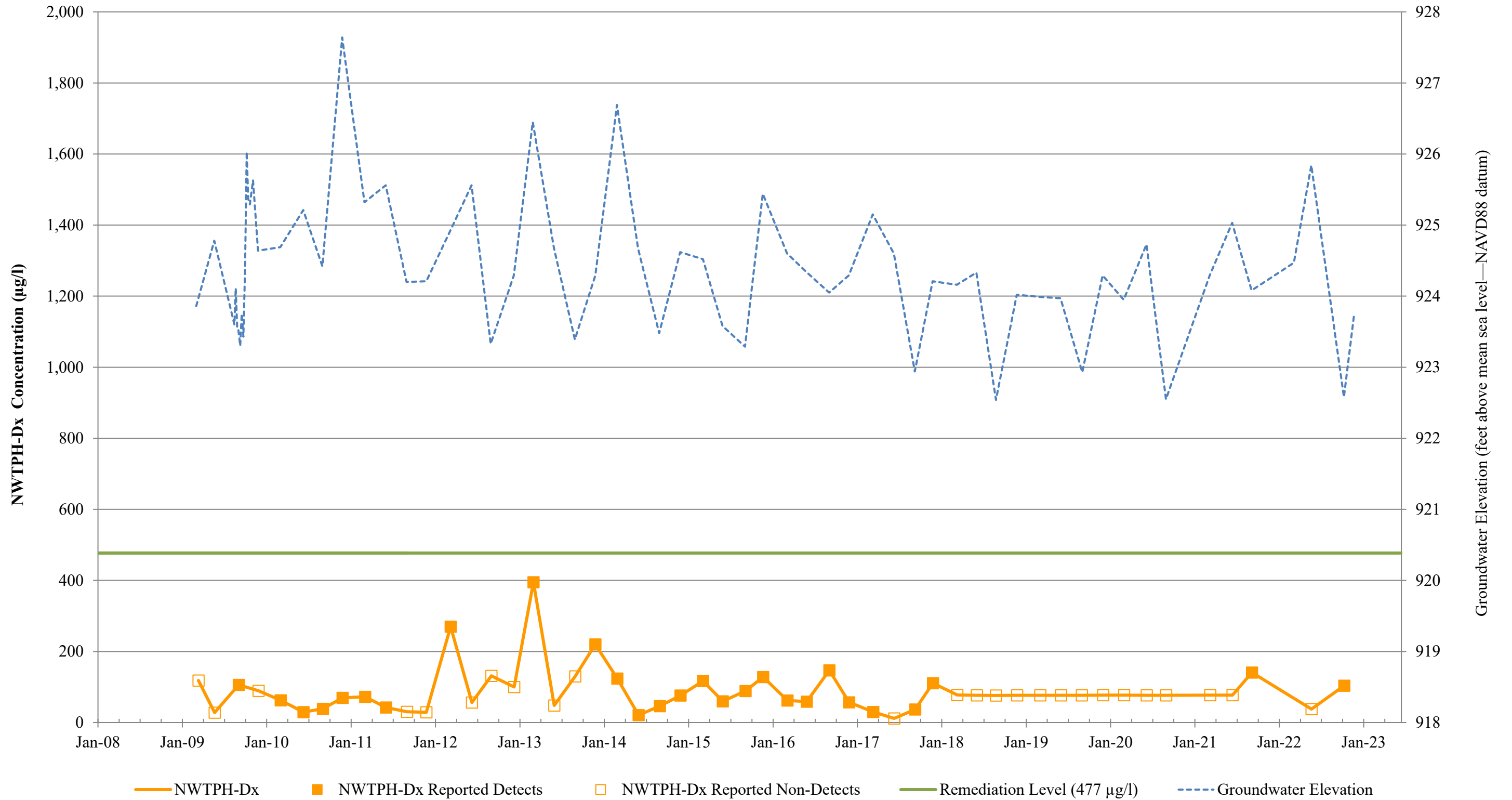
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-2



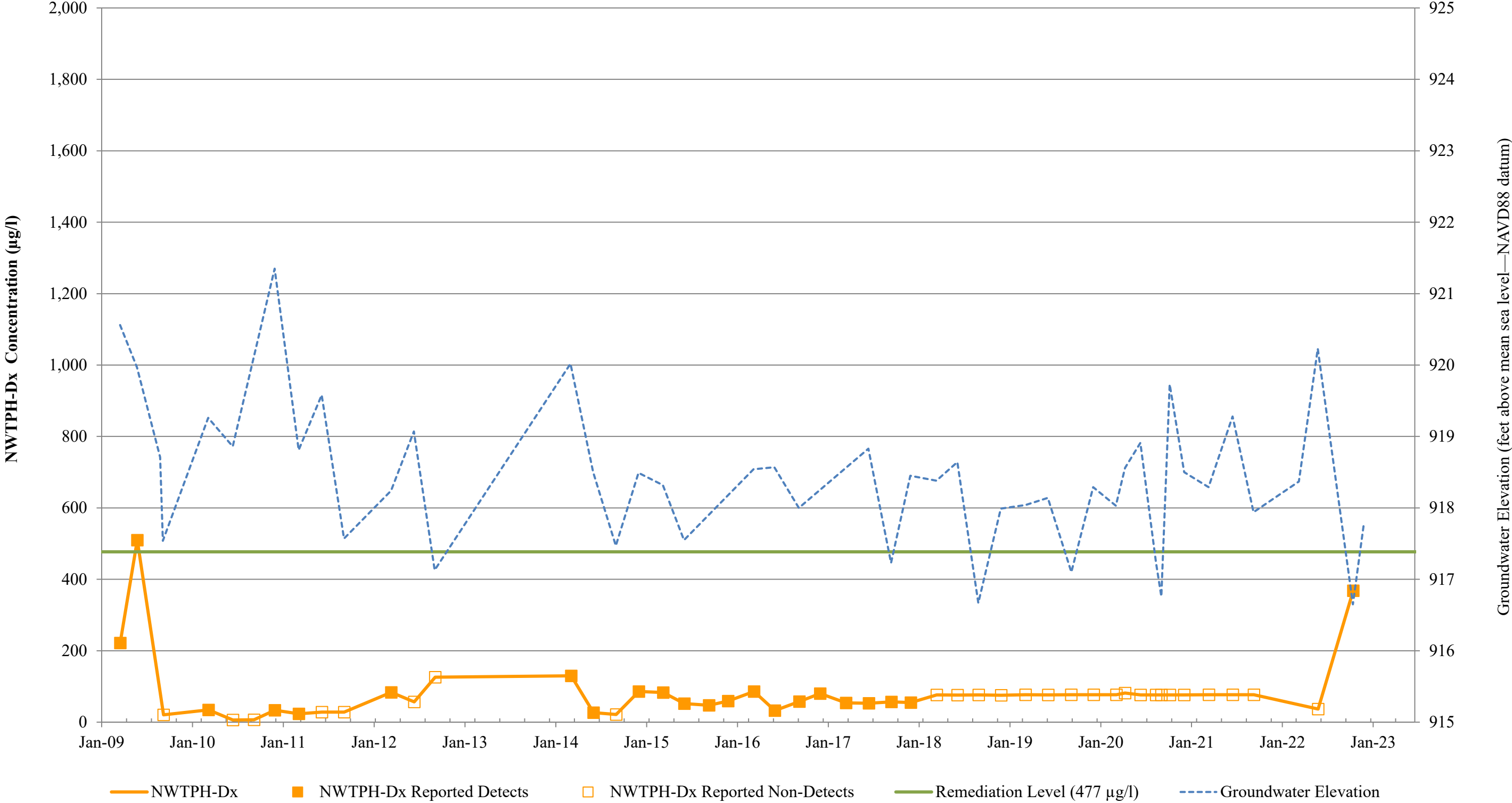
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-3



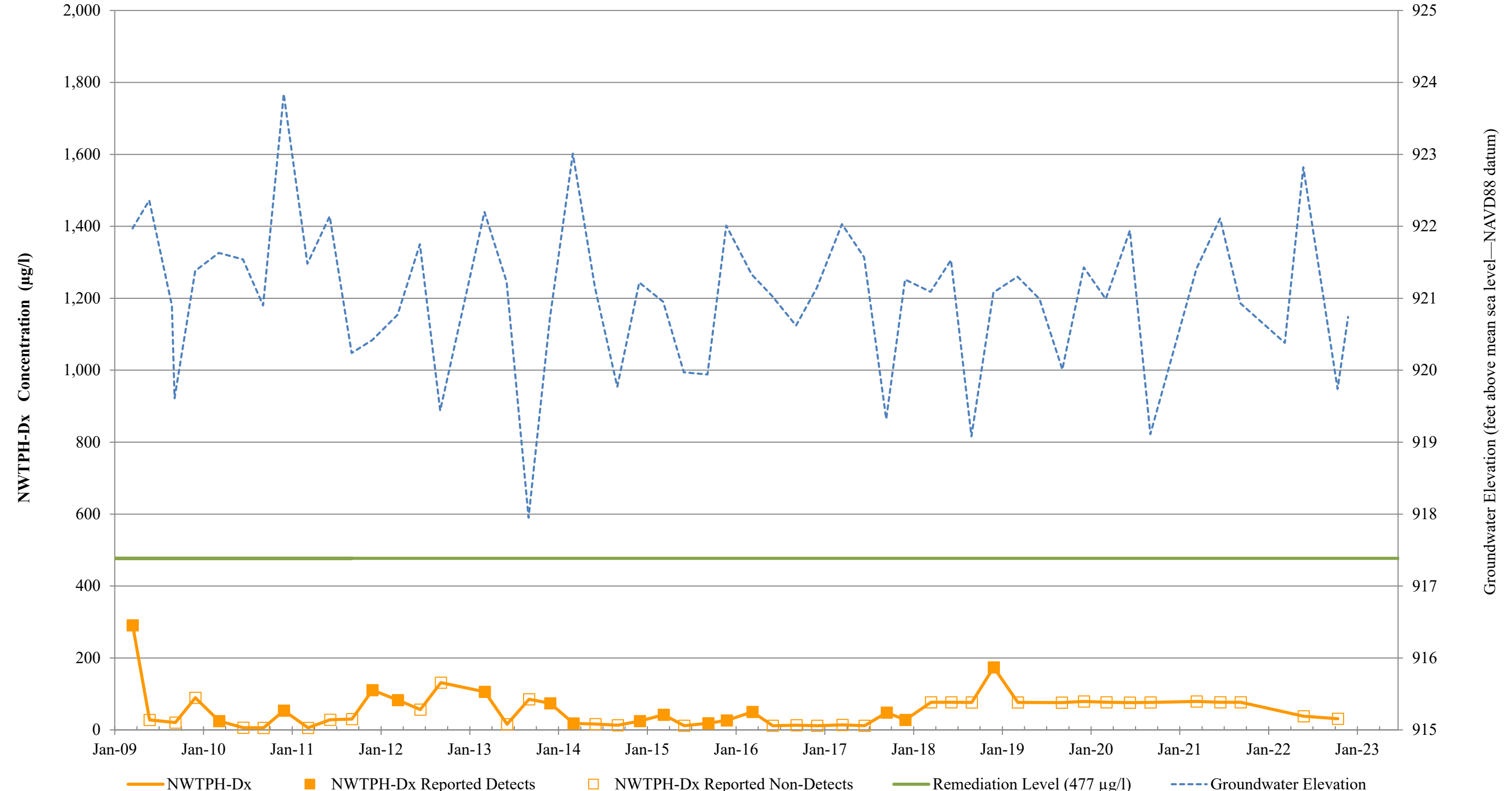
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-4



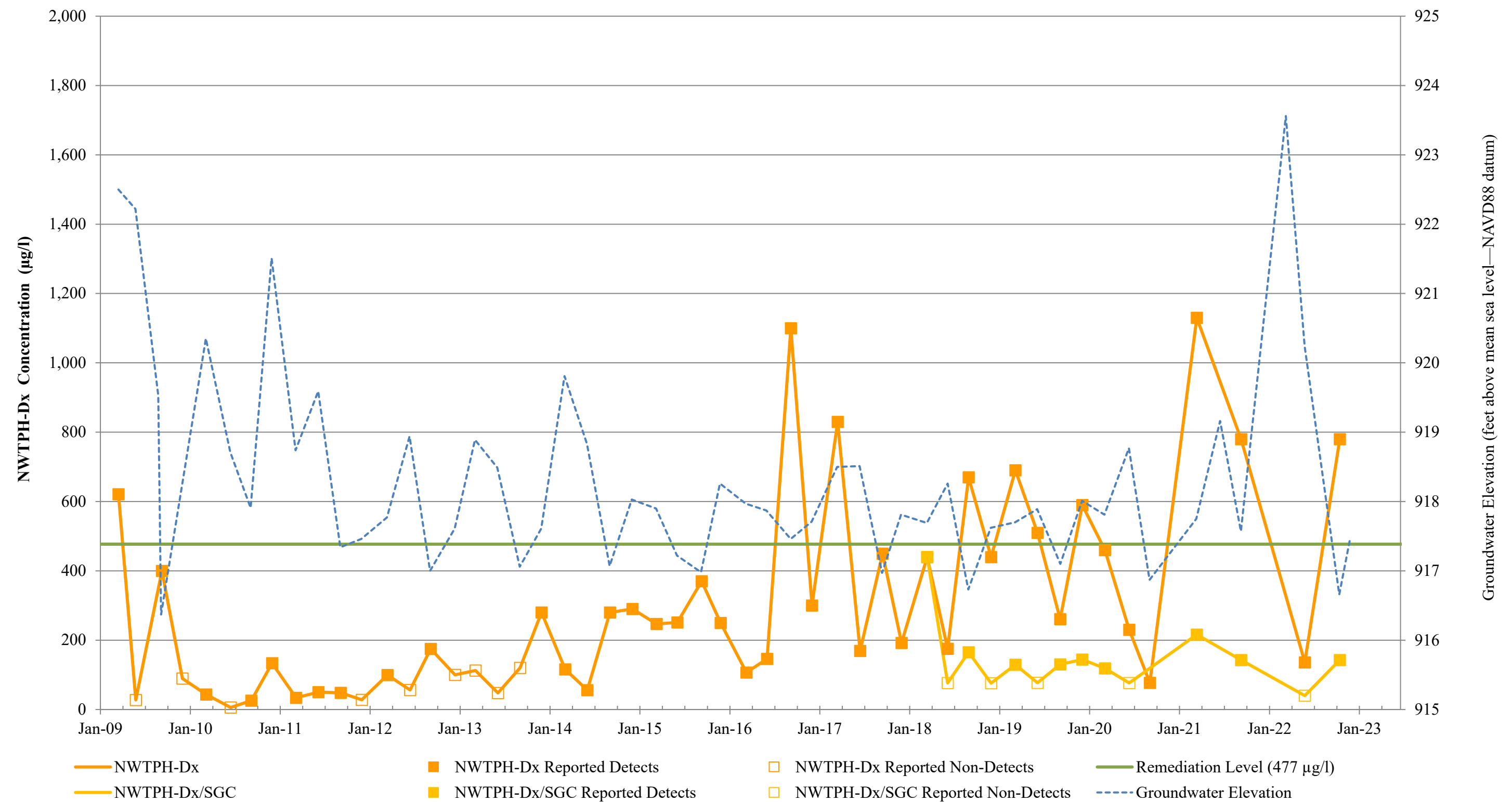
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-43



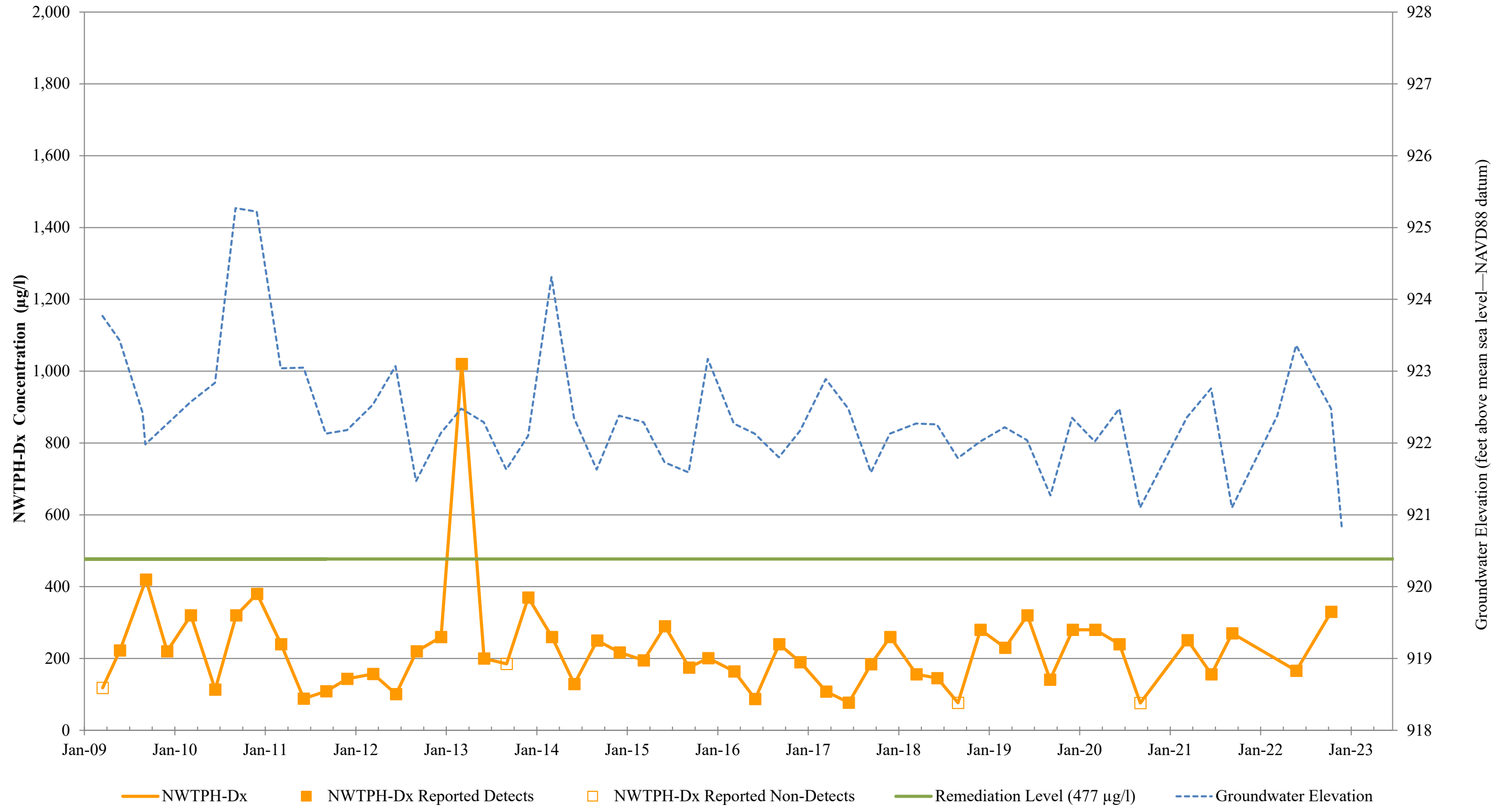
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-40



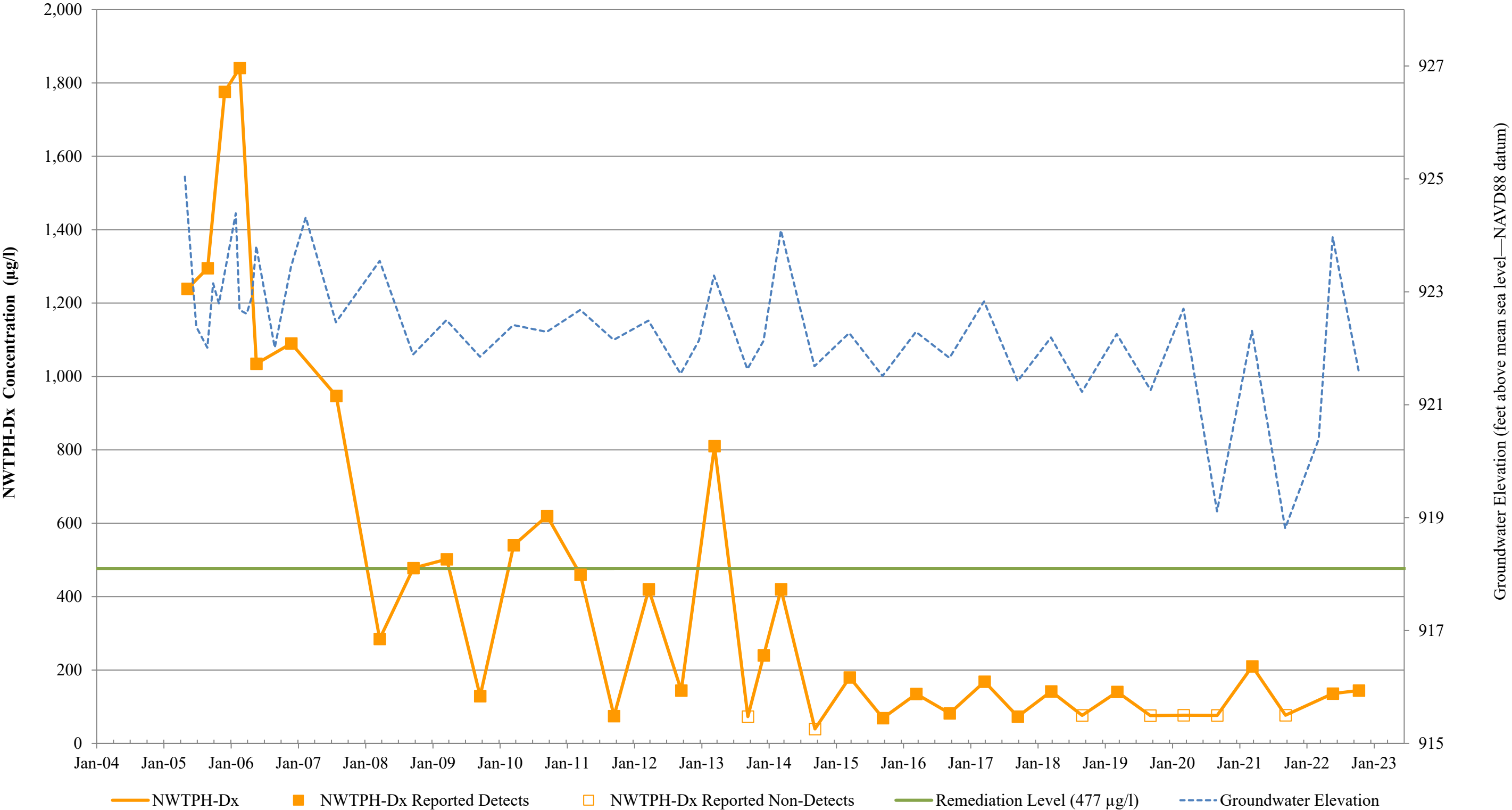
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-41



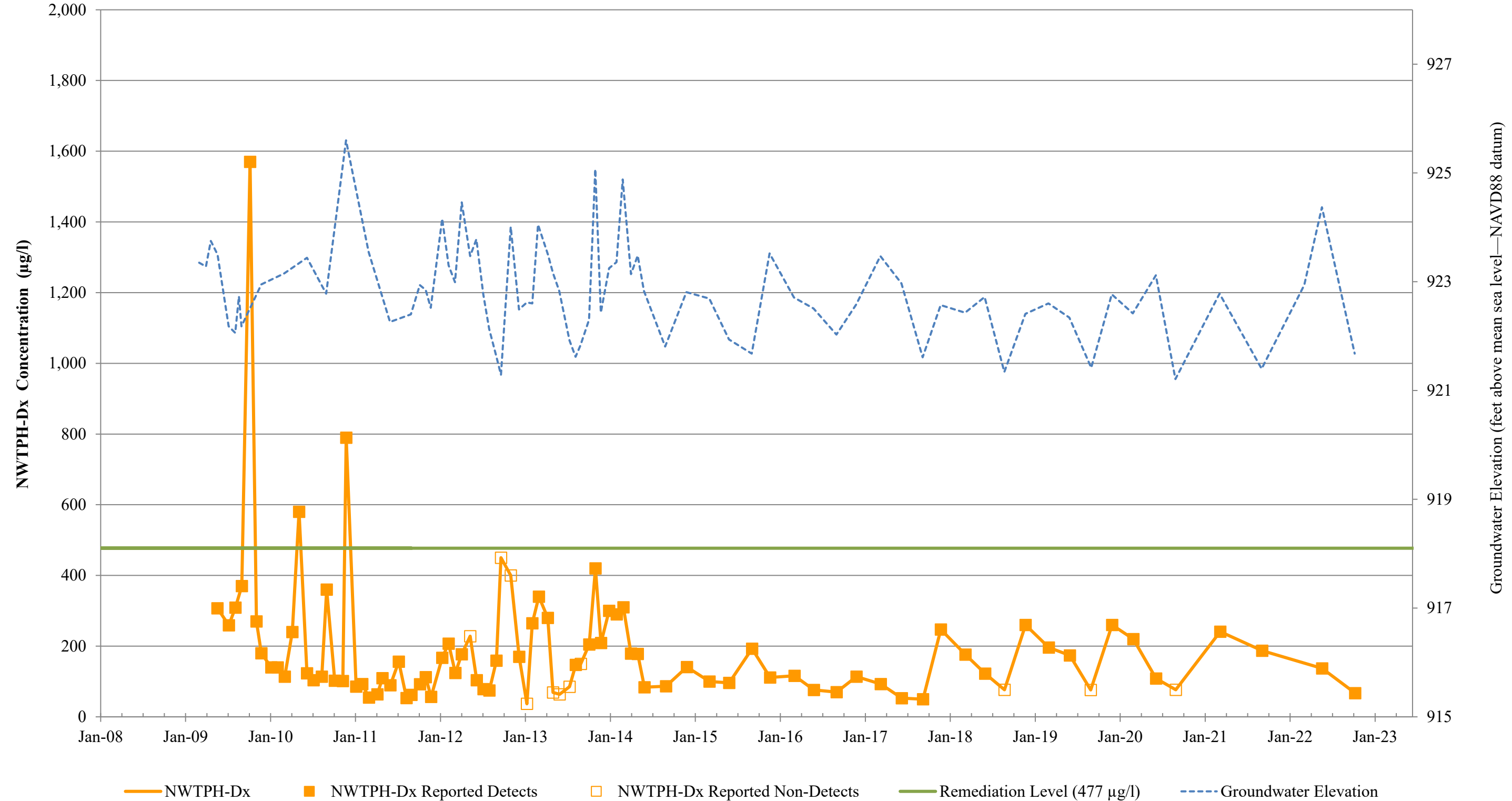
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-42



NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1C-W-4

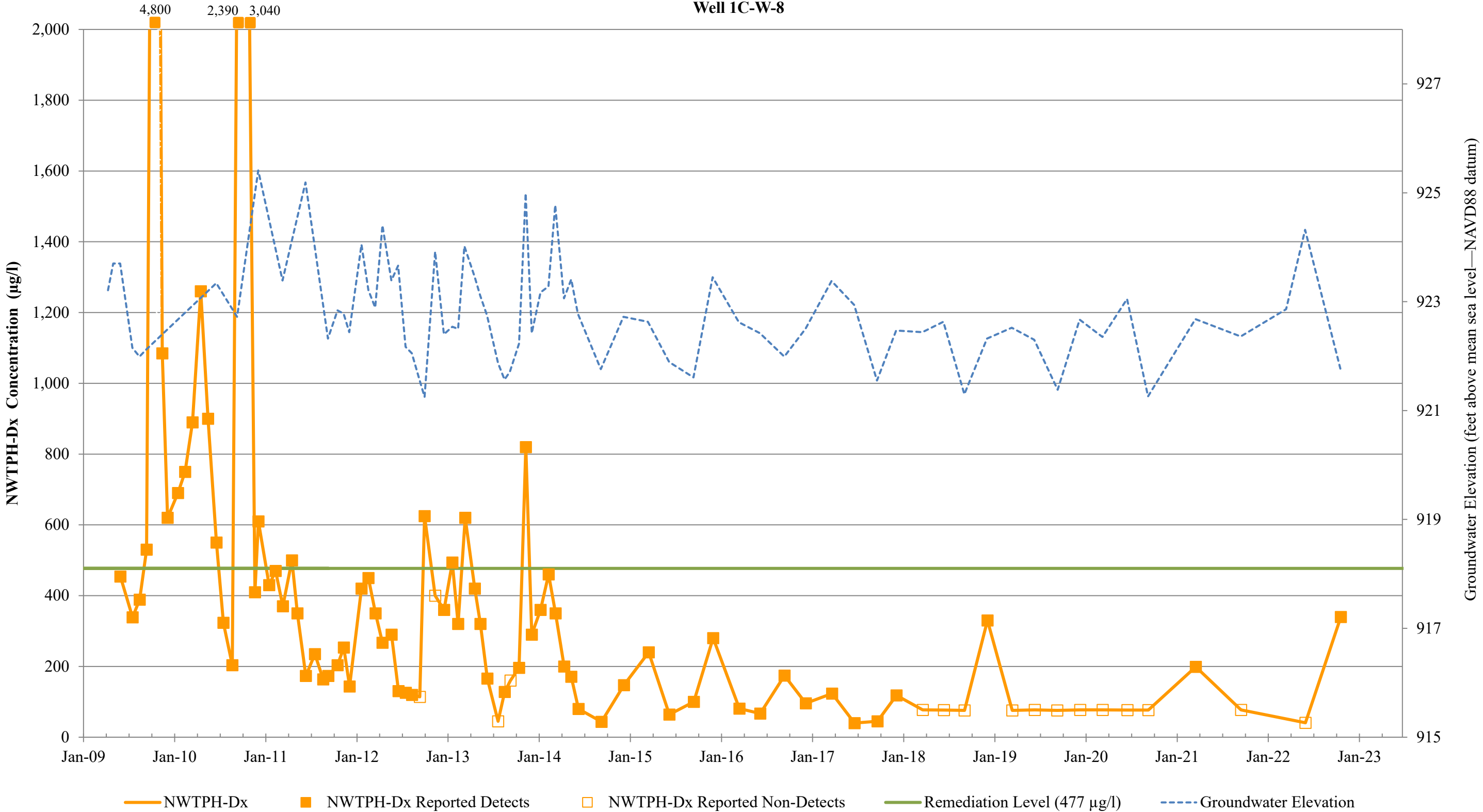


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1C-W-7

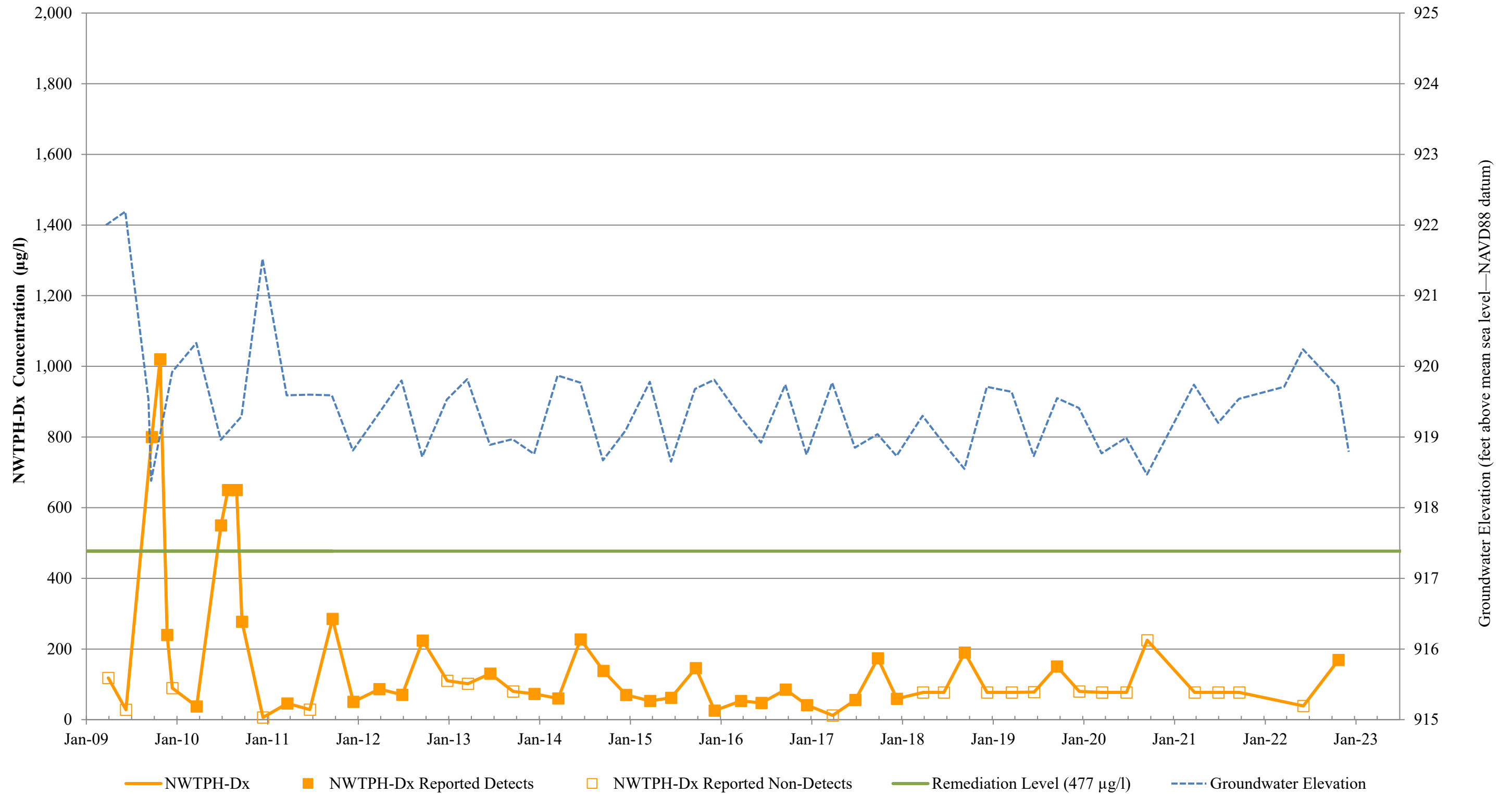


NWTPH-Dx concentrations exceeding the plot scale are shown above the plot area with the associated reported concentration value.

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1C-W-8

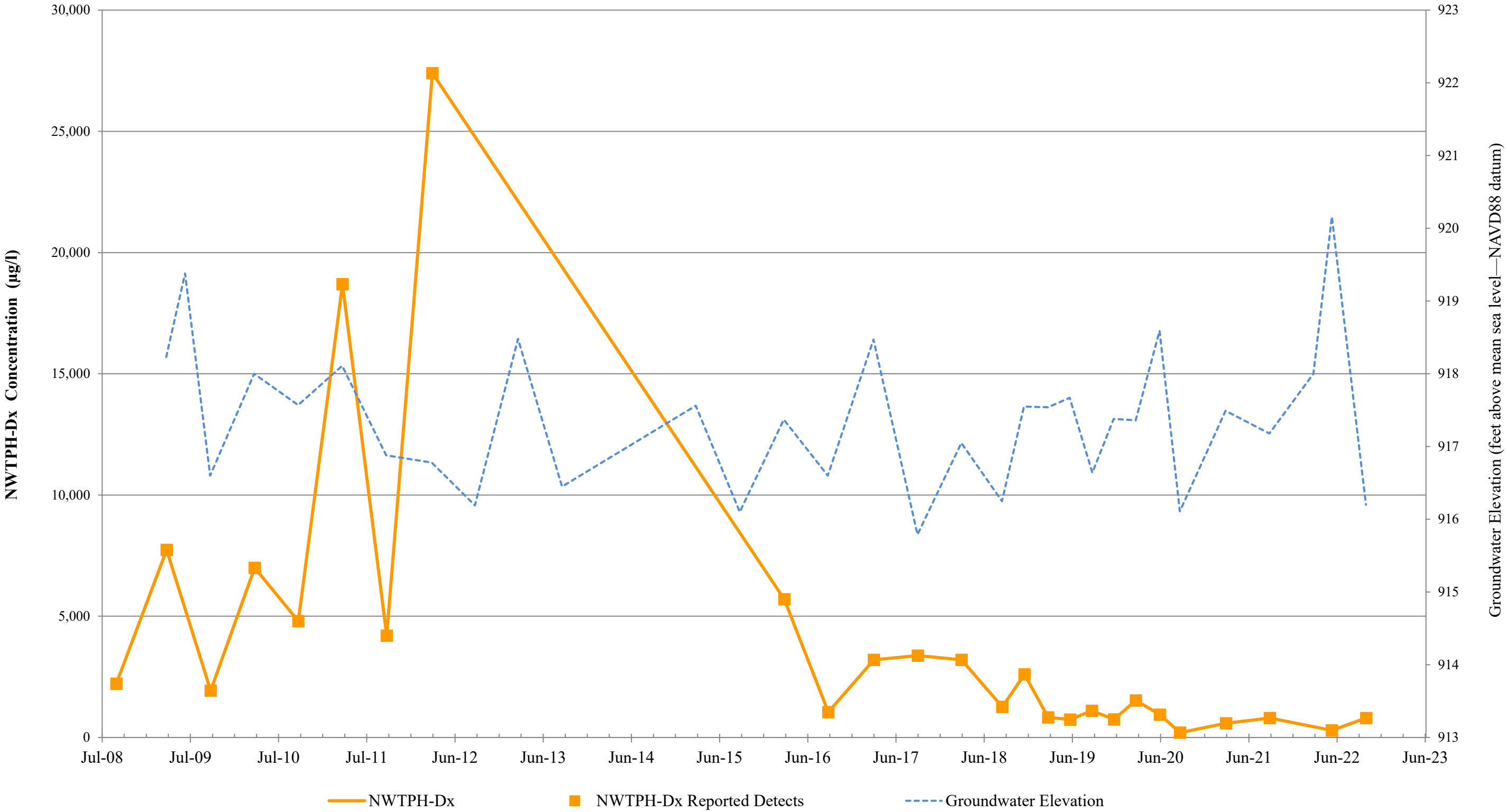


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1B-W-23

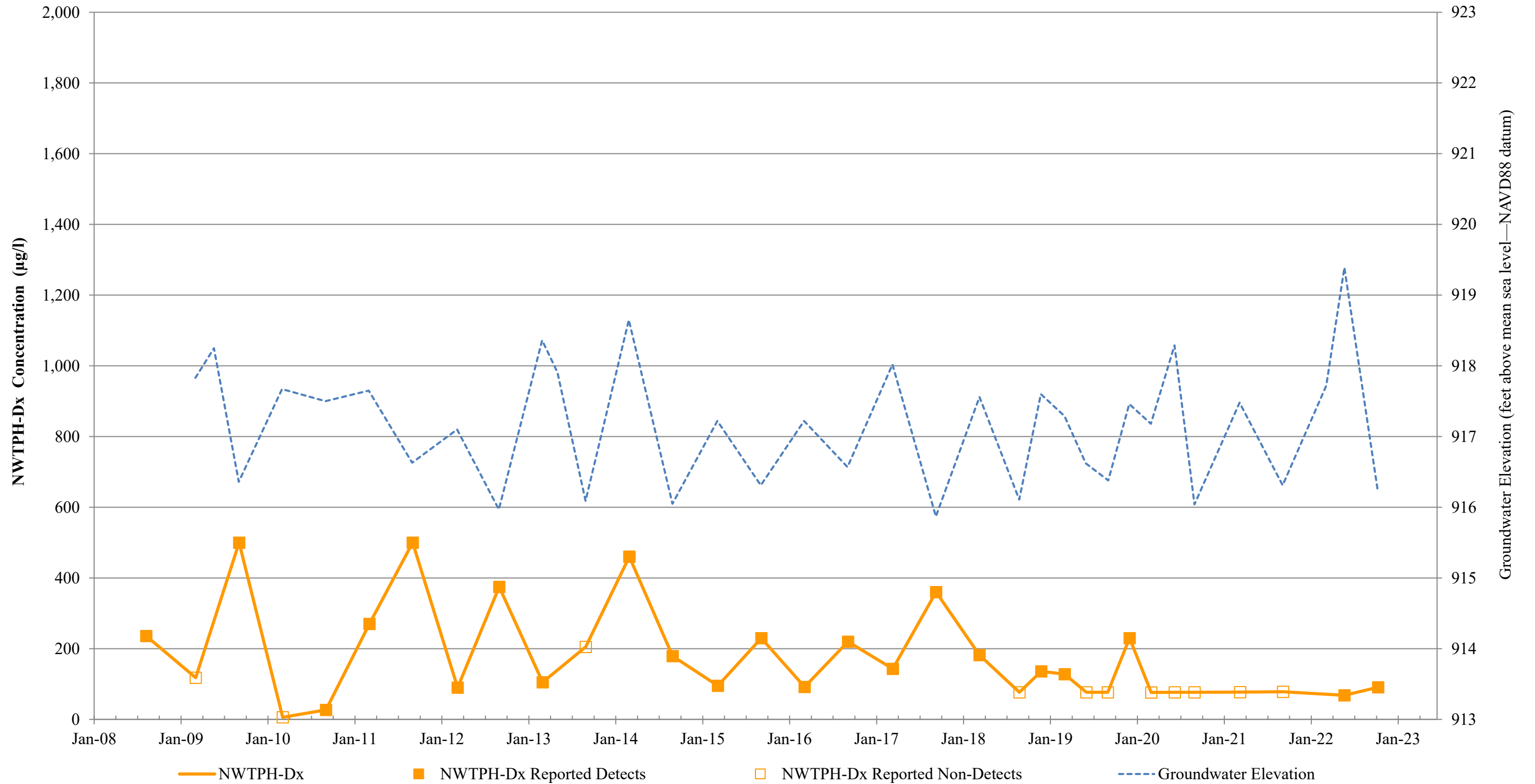


Note: Vertical scale is different from other plots; scale increased from 2,000 µg/l to 30,000 µg/l to show all data points.

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-51

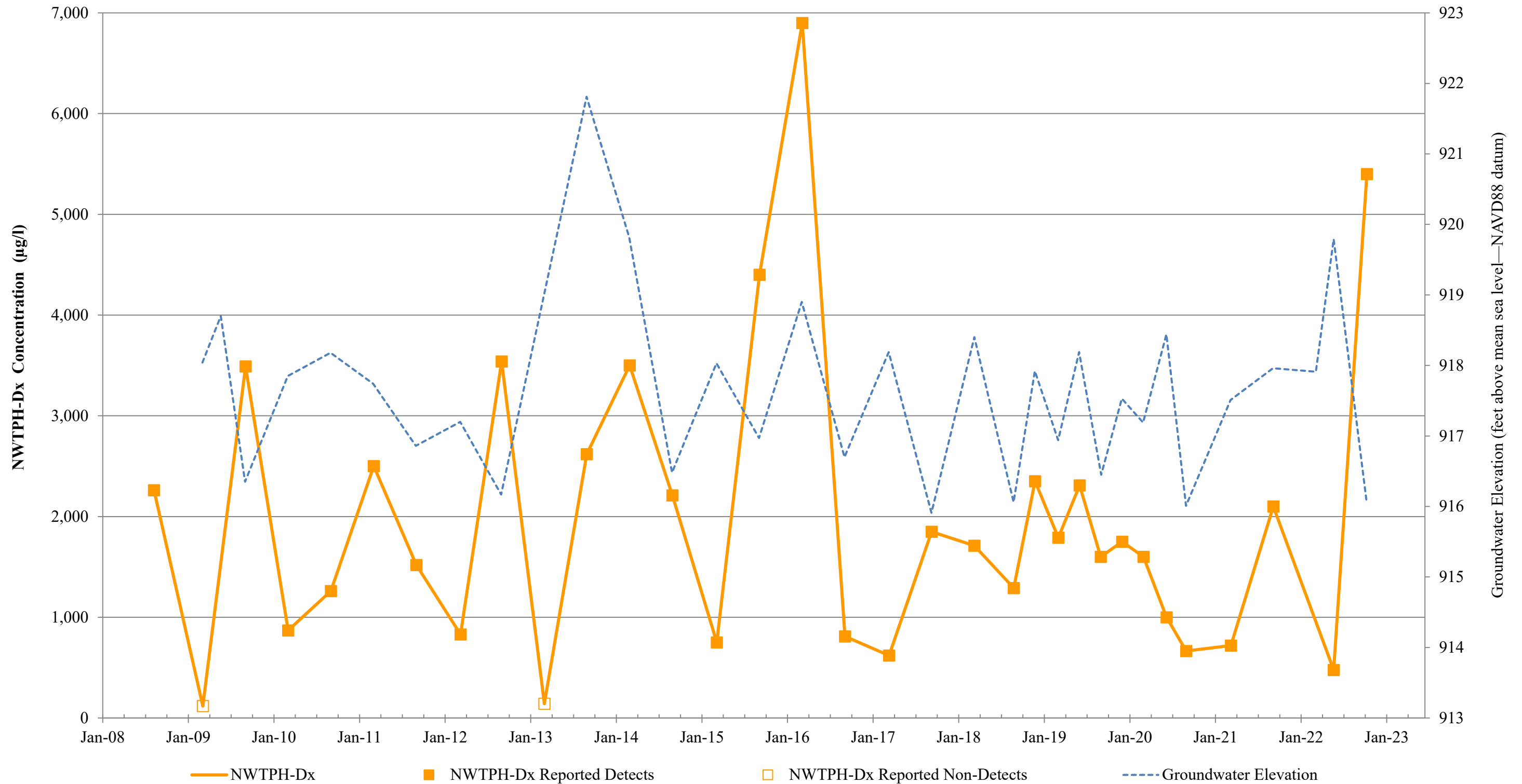


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-55

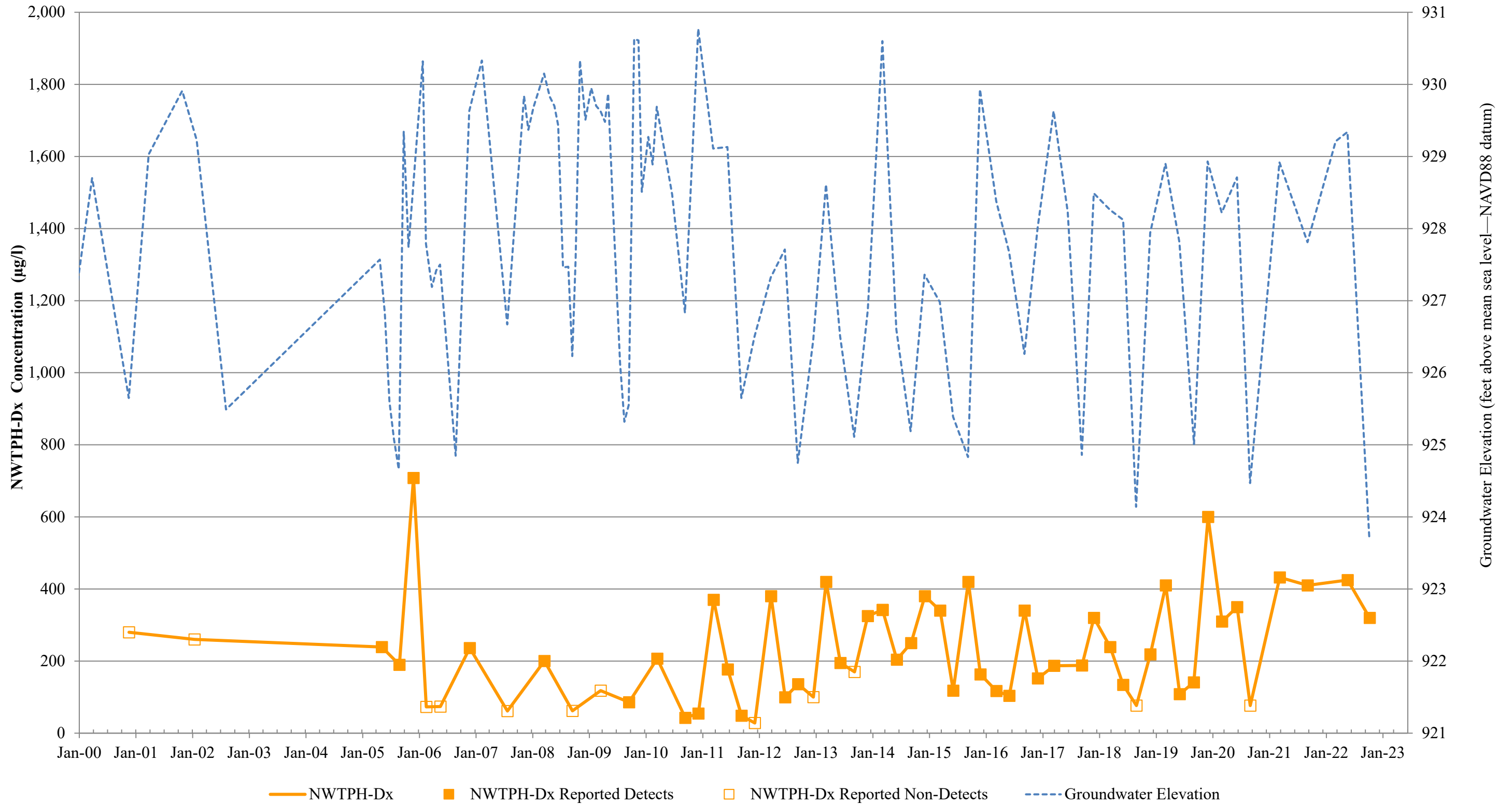


Note: Vertical scale is different from other plots; scale increased from 2,000 µg/l to 7,000 µg/l to show all data points.

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-56

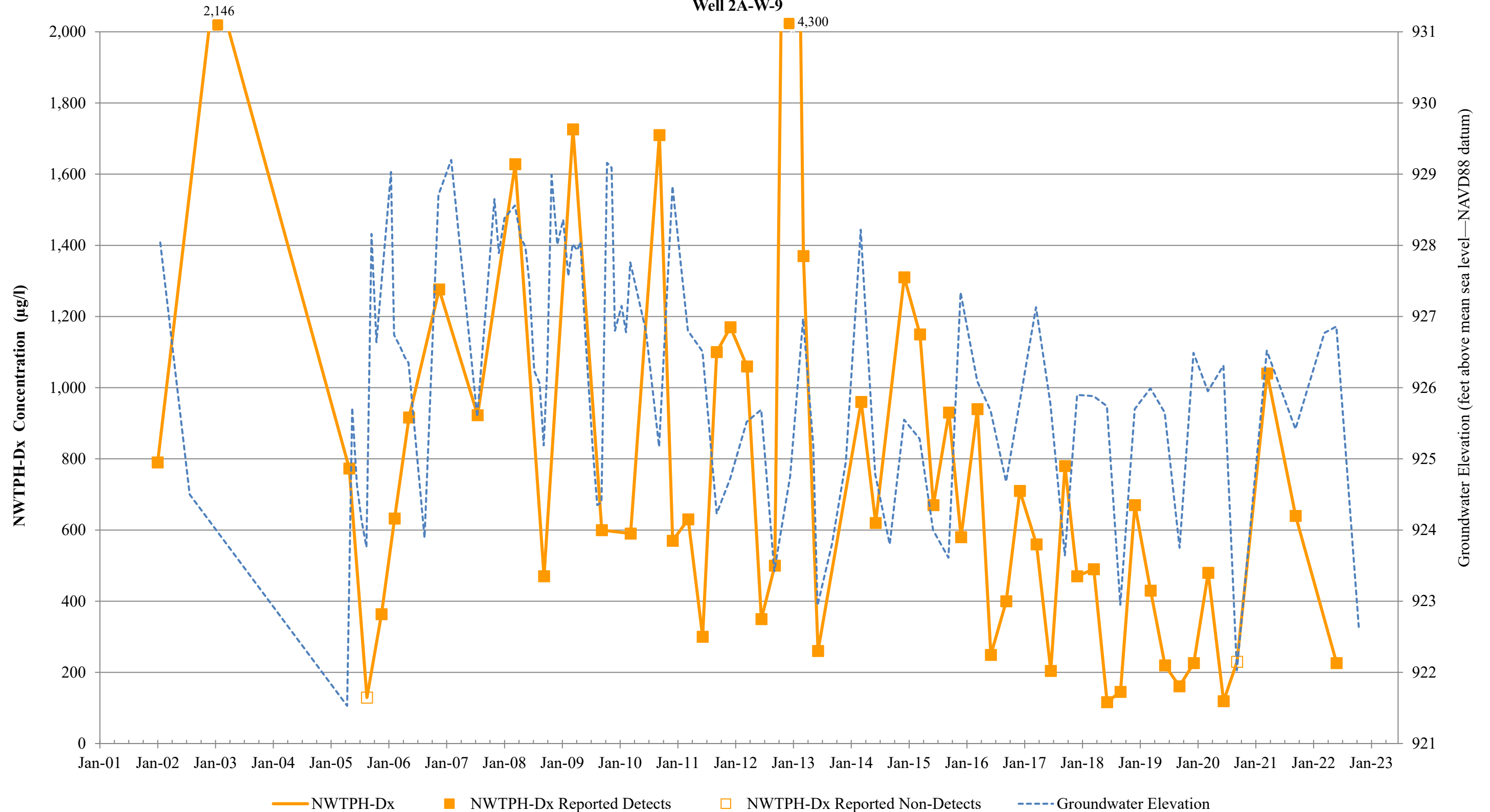


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well MW-4



NWTPH-Dx concentrations exceeding the plot scale are shown above the plot area with the associated reported concentration value.

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-9



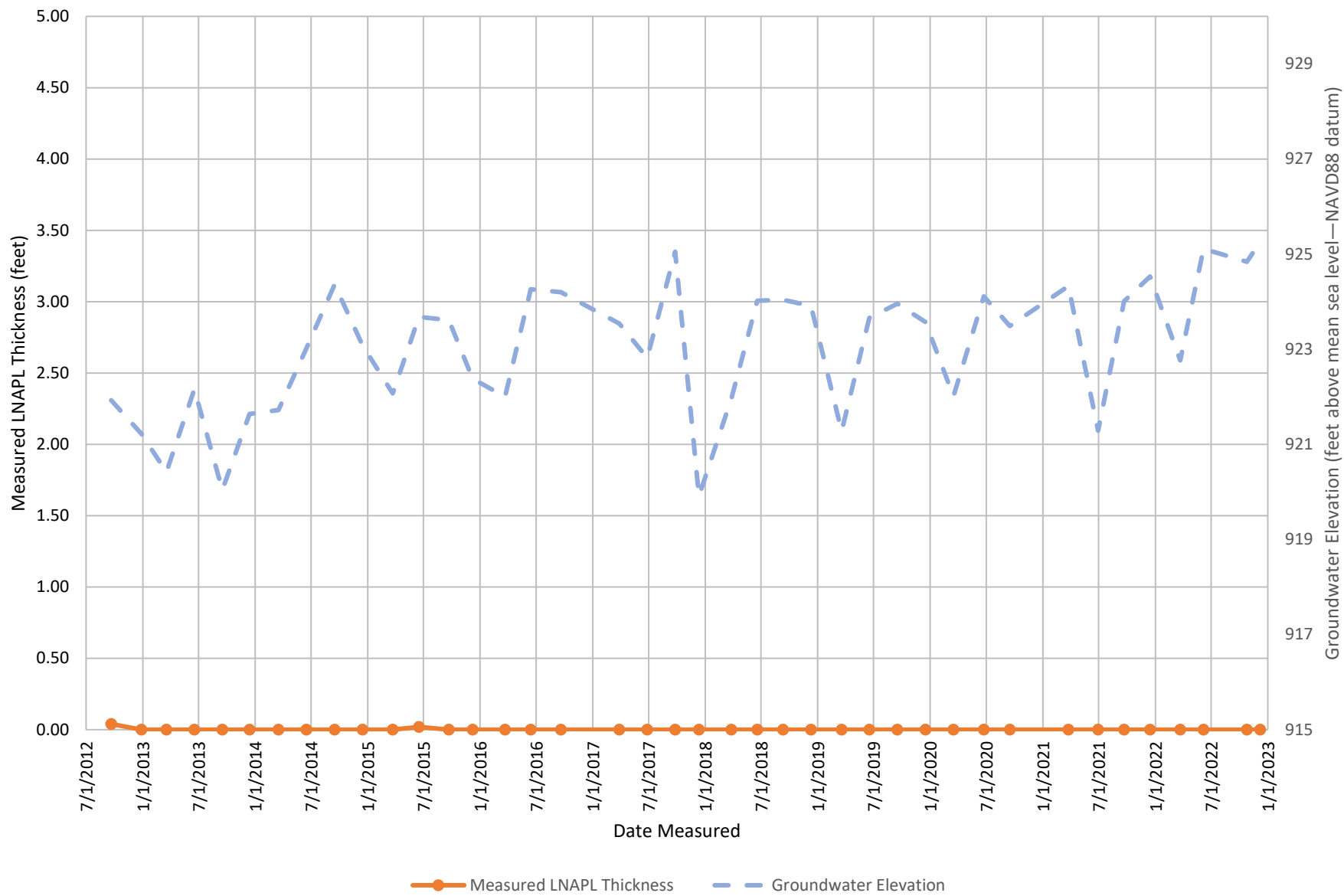
APPENDIX D
LNAPL TREND PLOTS

2022 ANNUAL LONG-TERM MONITORING REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

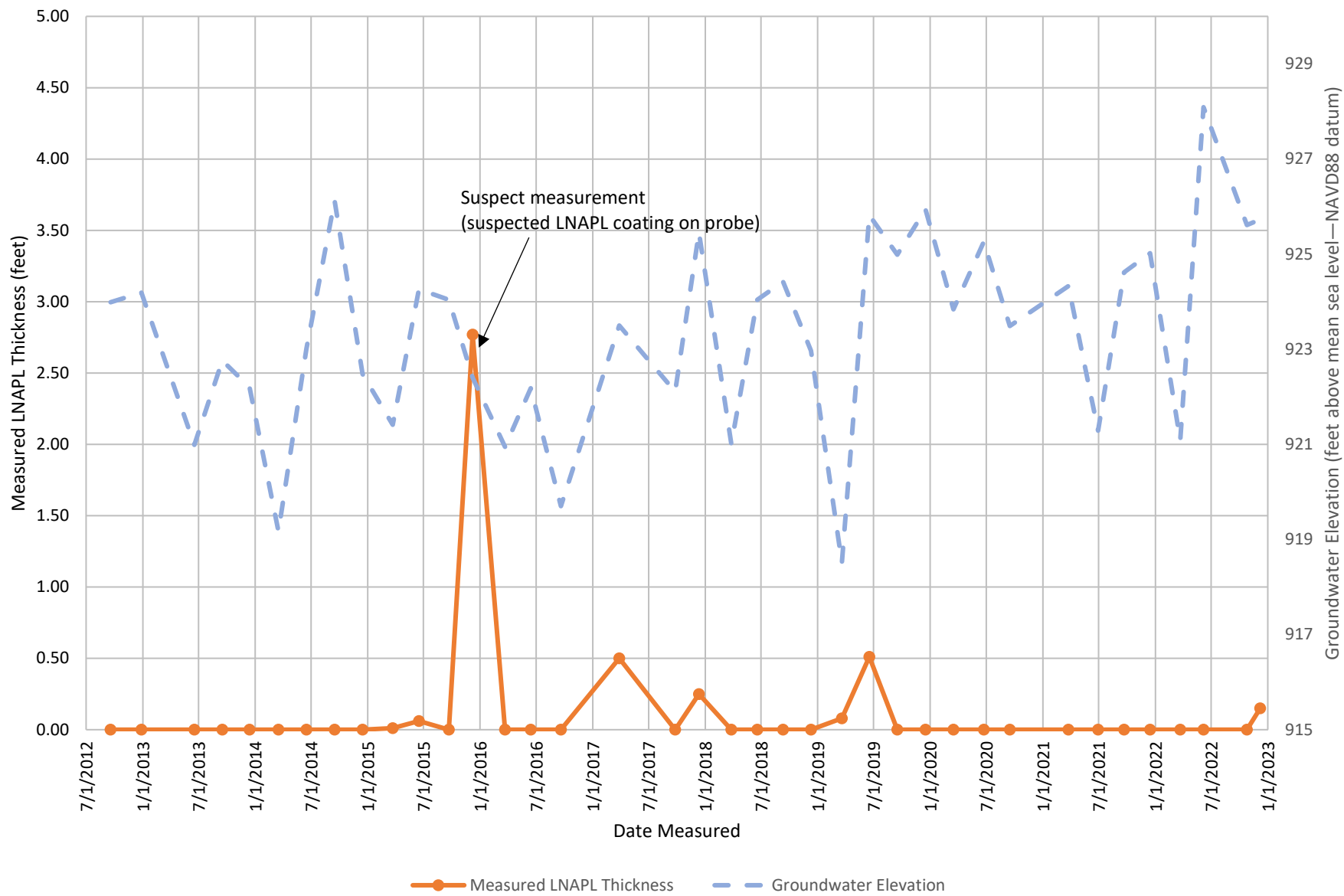
Well RW-03

LNAPL Thickness Measurements



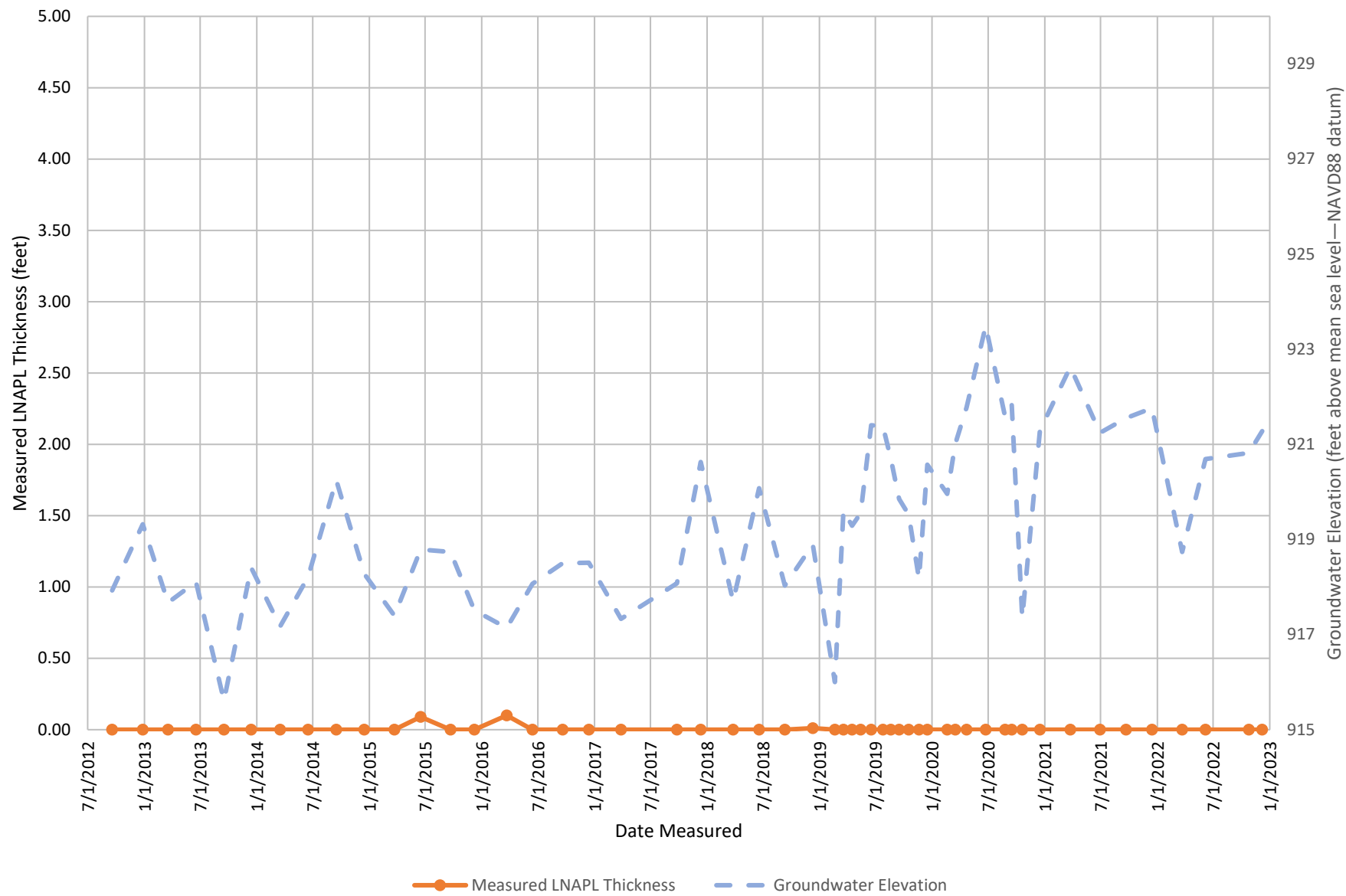
Well RW-04

LNAPL Thickness Measurements



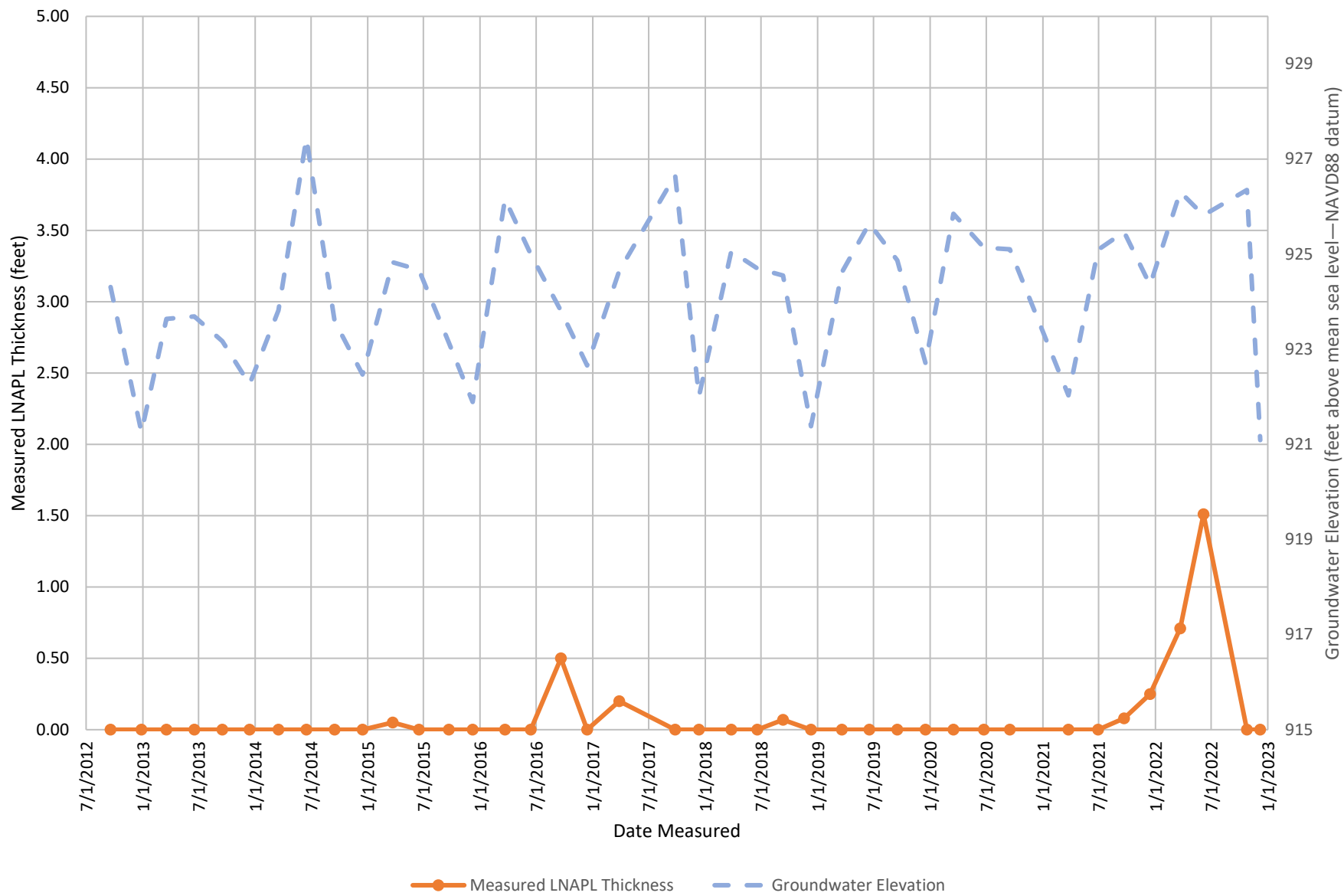
Well RW-05

LNAPL Thickness Measurements

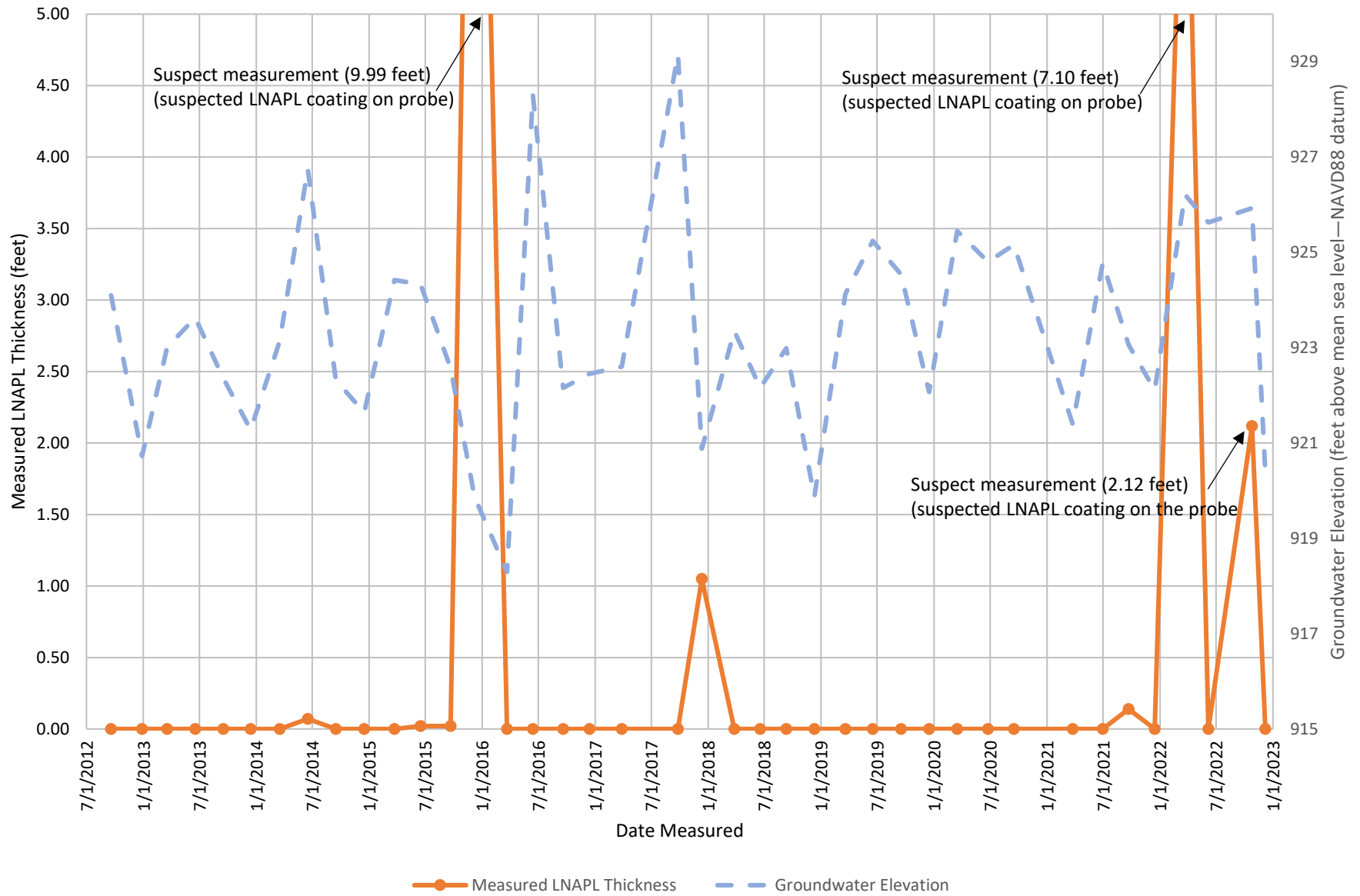


Well RW-07

LNAPL Thickness Measurements



Well RW-08 LNAPL Thickness Measurements



APPENDIX E
STATISTICAL ANALYSIS

2022 ANNUAL LONG-TERM MONITORING REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

Table E1
Statistical Evaluation of NWTPH-Dx Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

DRAFT - Issued for Client Review

Monitoring Well	NWTPH-Dx Groundwater Cleanup Target (µg/l)	95% UCL Data Date Range	Data Points	Number of Detects	Number of Non-Detects	Percent of Non-Detects	NWTPH-Dx 95% UCL ¹ (µg/l)	Percent of Sample Results that Exceed the Target (<10% to Pass)	Are any Sample Results Greater than Two Times the Target Concentration?	Does the Well Meet the 3-Part Statistical Test for Compliance?	Is Well under the Influence of an Engineering Control?	Trend Analysis at Wells Exceeding Cleanup Target	Comments	
Conditional Point of Compliance Wells (Levee Zone)														
5-W-14	CUL	208	2019-2022	10	0	10	100.0%	77	0%	No	Yes	Yes	NA	
5-W-16	CUL	208	2019-2022	10	0	10	100.0%	78	0%	No	Yes	Yes	NA	
5-W-17	CUL	208	2019-2022	10	0	10	100.0%	78	0%	No	Yes	Yes	NA	
5-W-18	CUL	208	2019-2022	10	2	8	80.0%	192	0%	No	Yes	Yes	NA	
5-W-19	CUL	208	2019-2022	10	1	9	90.0%	127	0%	No	Yes	Yes	NA	
Monitoring Wells North of Railyard and Outside the Levee Zone														
5-W-51	RL	477	2019-2022	10	10	0	0.0%	995	80%	Yes	No	Yes	Stable	Well is located in the schoolyard where remedial efforts were completed in 2018; effectiveness of remedial efforts is continuing to be evaluated.
5-W-55	RL	477	2019-2022	10	3	7	70.0%	230	0%	No	Yes	Yes	NA	
5-W-56	RL	477	2019-2022	10	10	0	0.0%	2,587	100%	Yes	No	Yes	Stable	Well is located in the schoolyard where remedial efforts were completed in 2018; effectiveness of remedial efforts is continuing to be evaluated.
1B-W-23	RL	477	2019-2022	10	1	9	90.0%	169	0%	No	Yes	Yes	NA	
2A-W-40	RL	477	2019-2022	10	1	9	90.0%	79	0%	No	Yes	Yes	NA	
2A-W-41	RL	477	2019-2022	10	8	2	20.0%	700	50%	Yes	No	Yes	Stable	
2A-W-42	RL	477	2019-2022	10	9	1	10.0%	276	0%	No	Yes	Yes	NA	
1C-W-4	RL	477	2018-2022	10	5	5	50.0%	144	0%	No	Yes	Yes	NA	
1C-W-7	RL	477	2019-2022	10	8	2	20.0%	197	0%	No	Yes	Yes	NA	
1C-W-8	RL	477	2019-2022	10	2	8	80.0%	340	0%	No	Yes	Yes	NA	
5-W-43	RL	477	2020-2022	14	3	11	78.6%	368	0%	No	Yes	Yes	NA	
GW-1	RL	477	2020-2022	14	4	10	71.4%	191	0%	No	Yes	Yes	NA	
GW-2	RL	477	2020-2022	14	3	11	78.6%	230	0%	No	Yes	Yes	NA	
GW-3	RL	477	2019-2022	10	7	3	30.0%	505	30%	No	No	Yes	Stable	
GW-4	RL	477	2019-2022	10	3	7	70.0%	141	0%	No	Yes	Yes	NA	
Monitoring Wells within the Railyard														
2A-W-9	RL	None*	2019-2022	10	9	1	10.0%	541	30%	Yes	No	No	Stable	Well is located within the BNSF rail yard near the southern property line.
MW-4	RL	None*	2019-2022	10	9	1	10.0%	414	20%	No	No	No	Stable	Well is located within the BNSF rail yard near the southern property line.

NOTES:

Results in **bold** denote NWTPH-Dx 95% UCL concentrations exceeding the specified cleanup target.

¹Where the number of reported non-detects is greater than 50%, the largest value in the data set is used in place of the 95% UCL.

CUL = Cleanup Level

µg/l = micrograms per liter

NWTPH-Dx = sum of total petroleum hydrocarbons as diesel-range organics and oil-range organics analyzed using Washington State Department of Ecology Method NWTPH-Dx

RL = Remediation Level

UCL = upper confidence limit

* Location is within the BNSF railyard and does not have a groundwater cleanup target; however, for statistical evaluation purposes, a cleanup target of 477 µg/l was used.

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.2 1/26/2023 7:30:04 AM								
5	From File			ProUCL_Input_2023-01-26.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10	NWTPH-Dx (1b-w-23)											
11												
12	General Statistics											
13	Total Number of Observations				10	Number of Distinct Observations				6		
14	Number of Detects				1	Number of Non-Detects				9		
15	Number of Distinct Detects				1	Number of Distinct Non-Detects				5		
16												
17	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
18	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
19												
20	The data set for variable NWTPH-Dx (1b-w-23) was not processed!											
21												
22												
23	NWTPH-Dx (1c-w-4)											
24												
25	General Statistics											
26	Total Number of Observations				10	Number of Distinct Observations				7		
27	Number of Detects				5	Number of Non-Detects				5		
28	Number of Distinct Detects				5	Number of Distinct Non-Detects				2		
29	Minimum Detect				136	Minimum Non-Detect				76		
30	Maximum Detect				210	Maximum Non-Detect				77		
31	Variance Detects				967.8	Percent Non-Detects				50%		
32	Mean Detects				154.6	SD Detects				31.11		
33	Median Detects				142	CV Detects				0.201		
34	Skewness Detects				2.185	Kurtosis Detects				4.827		
35	Mean of Logged Detects				5.027	SD of Logged Detects				0.18		
36												
37	Normal GOF Test on Detects Only											
38	Shapiro Wilk Test Statistic				0.643	Shapiro Wilk GOF Test						
39	1% Shapiro Wilk Critical Value				0.686	Detected Data Not Normal at 1% Significance Level						
40	Lilliefors Test Statistic				0.433	Lilliefors GOF Test						
41	1% Lilliefors Critical Value				0.396	Detected Data Not Normal at 1% Significance Level						
42	Detected Data Not Normal at 1% Significance Level											
43												
44	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
45	KM Mean				115.3	KM Standard Error of Mean				15.54		
46	90KM SD				43.95	95% KM (BCA) UCL				142.4		
47	95% KM (t) UCL				143.8	95% KM (Percentile Bootstrap) UCL				142		
48	95% KM (z) UCL				140.9	95% KM Bootstrap t UCL				133		
49	90% KM Chebyshev UCL				161.9	95% KM Chebyshev UCL				183		
50	97.5% KM Chebyshev UCL				212.3	99% KM Chebyshev UCL				269.9		
51												
52	Gamma GOF Tests on Detected Observations Only											
53	A-D Test Statistic				1.017	Anderson-Darling GOF Test						
54	5% A-D Critical Value				0.678	Detected Data Not Gamma Distributed at 5% Significance Level						
55	K-S Test Statistic				0.442	Kolmogorov-Smirnov GOF						
56	5% K-S Critical Value				0.357	Detected Data Not Gamma Distributed at 5% Significance Level						
57	Detected Data Not Gamma Distributed at 5% Significance Level											
58												
59	Gamma Statistics on Detected Data Only											
60	k hat (MLE)				35.86	k star (bias corrected MLE)				14.48		
61	Theta hat (MLE)				4.311	Theta star (bias corrected MLE)				10.68		
62	nu hat (MLE)				358.6	nu star (bias corrected)				144.8		
63	Mean (detects)				154.6							
64												
65	Gamma ROS Statistics using Imputed Non-Detects											

	A	B	C	D	E	F	G	H	I	J	K	L
66	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
67	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
68	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
69	This is especially true when the sample size is small.											
70	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
71	Minimum				51.11	Mean				116.3		
72	Maximum				210	Median				118.4		
73	SD				47.02	CV				0.404		
74	k hat (MLE)				6.68	k star (bias corrected MLE)				4.743		
75	Theta hat (MLE)				17.41	Theta star (bias corrected MLE)				24.52		
76	nu hat (MLE)				133.6	nu star (bias corrected)				94.86		
77	Adjusted Level of Significance (β)				0.0267							
78	Approximate Chi Square Value (94.86, α)				73.4	Adjusted Chi Square Value (94.86, β)				70.12		
79	95% Gamma Approximate UCL				150.3	95% Gamma Adjusted UCL				157.3		
80												
81	Estimates of Gamma Parameters using KM Estimates											
82	Mean (KM)				115.3	SD (KM)				43.95		
83	Variance (KM)				1932	SE of Mean (KM)				15.54		
84	k hat (KM)				6.882	k star (KM)				4.884		
85	nu hat (KM)				137.6	nu star (KM)				97.69		
86	theta hat (KM)				16.75	theta star (KM)				23.61		
87	80% gamma percentile (KM)				155.4	90% gamma percentile (KM)				185.2		
88	95% gamma percentile (KM)				212.3	99% gamma percentile (KM)				269.8		
89												
90	Gamma Kaplan-Meier (KM) Statistics											
91	Approximate Chi Square Value (97.69, α)				75.89	Adjusted Chi Square Value (97.69, β)				72.55		
92	95% KM Approximate Gamma UCL				148.4	95% KM Adjusted Gamma UCL				155.2		
93												
94	Lognormal GOF Test on Detected Observations Only											
95	Shapiro Wilk Test Statistic				0.664	Shapiro Wilk GOF Test						
96	10% Shapiro Wilk Critical Value				0.806	Detected Data Not Lognormal at 10% Significance Level						
97	Lilliefors Test Statistic				0.424	Lilliefors GOF Test						
98	10% Lilliefors Critical Value				0.319	Detected Data Not Lognormal at 10% Significance Level						
99	Detected Data Not Lognormal at 10% Significance Level											
100												
101	Lognormal ROS Statistics Using Imputed Non-Detects											
102	Mean in Original Scale				124.6	Mean in Log Scale				4.785		
103	SD in Original Scale				38.63	SD in Log Scale				0.294		
104	95% t UCL (assumes normality of ROS data)				147	95% Percentile Bootstrap UCL				145		
105	95% BCA Bootstrap UCL				148	95% Bootstrap t UCL				152.3		
106	95% H-UCL (Log ROS)				151.7							
107												
108	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
109	KM Mean (logged)				4.679	KM Geo Mean				107.6		
110	KM SD (logged)				0.366	95% Critical H Value (KM-Log)				2.049		
111	KM Standard Error of Mean (logged)				0.129	95% H-UCL (KM -Log)				147.8		
112	KM SD (logged)				0.366	95% Critical H Value (KM-Log)				2.049		
113	KM Standard Error of Mean (logged)				0.129							
114												
115	DL/2 Statistics											
116	DL/2 Normal					DL/2 Log-Transformed						
117	Mean in Original Scale				96.5	Mean in Log Scale				4.337		
118	SD in Original Scale				64.66	SD in Log Scale				0.737		
119	95% t UCL (Assumes normality)				134	95% H-Stat UCL				189.8		
120	DL/2 is not a recommended method, provided for comparisons and historical reasons											
121												
122	Nonparametric Distribution Free UCL Statistics											
123	Data do not follow a Discernible Distribution											
124												
125	Suggested UCL to Use											
126	95% KM (t) UCL				143.8							
127												
128	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
129	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
130	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L	
131													
132	NWTPH-Dx (1c-w-7)												
133													
134	General Statistics												
135	Total Number of Observations					10		Number of Distinct Observations					10
136	Number of Detects					8		Number of Non-Detects					2
137	Number of Distinct Detects					8		Number of Distinct Non-Detects					2
138	Minimum Detect					67		Minimum Non-Detect					76
139	Maximum Detect					260		Maximum Non-Detect					77
140	Variance Detects					4459		Percent Non-Detects					20%
141	Mean Detects					174.4		SD Detects					66.77
142	Median Detects					180.5		CV Detects					0.383
143	Skewness Detects					-0.351		Kurtosis Detects					-0.917
144	Mean of Logged Detects					5.081		SD of Logged Detects					0.458
145													
146	Normal GOF Test on Detects Only												
147	Shapiro Wilk Test Statistic					0.967		Shapiro Wilk GOF Test					
148	1% Shapiro Wilk Critical Value					0.749		Detected Data appear Normal at 1% Significance Level					
149	Lilliefors Test Statistic					0.128		Lilliefors GOF Test					
150	1% Lilliefors Critical Value					0.333		Detected Data appear Normal at 1% Significance Level					
151	Detected Data appear Normal at 1% Significance Level												
152	Note GOF tests may be unreliable for small sample sizes												
153													
154	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
155	KM Mean					152.9		KM Standard Error of Mean					23.82
156	90KM SD					70.47		95% KM (BCA) UCL					195.5
157	95% KM (t) UCL					196.6		95% KM (Percentile Bootstrap) UCL					191.8
158	95% KM (z) UCL					192.1		95% KM Bootstrap t UCL					196.2
159	90% KM Chebyshev UCL					224.4		95% KM Chebyshev UCL					256.7
160	97.5% KM Chebyshev UCL					301.7		99% KM Chebyshev UCL					389.9
161													
162	Gamma GOF Tests on Detected Observations Only												
163	A-D Test Statistic					0.27		Anderson-Darling GOF Test					
164	5% A-D Critical Value					0.718		Detected data appear Gamma Distributed at 5% Significance Level					
165	K-S Test Statistic					0.176		Kolmogorov-Smirnov GOF					
166	5% K-S Critical Value					0.295		Detected data appear Gamma Distributed at 5% Significance Level					
167	Detected data appear Gamma Distributed at 5% Significance Level												
168	Note GOF tests may be unreliable for small sample sizes												
169													
170	Gamma Statistics on Detected Data Only												
171	k hat (MLE)					6.37		k star (bias corrected MLE)					4.064
172	Theta hat (MLE)					27.38		Theta star (bias corrected MLE)					42.9
173	nu hat (MLE)					101.9		nu star (bias corrected)					65.03
174	Mean (detects)					174.4							
175													
176	Gamma ROS Statistics using Imputed Non-Detects												
177	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
178	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)												
179	For such situations, GROS method may yield incorrect values of UCLs and BTVs												
180	This is especially true when the sample size is small.												
181	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
182	Minimum					67		Mean					153.9
183	Maximum					260		Median					155.5
184	SD					72.95		CV					0.474
185	k hat (MLE)					4.467		k star (bias corrected MLE)					3.194
186	Theta hat (MLE)					34.46		Theta star (bias corrected MLE)					48.2
187	nu hat (MLE)					89.35		nu star (bias corrected)					63.88
188	Adjusted Level of Significance (β)					0.0267							
189	Approximate Chi Square Value (63.88, α)					46.49		Adjusted Chi Square Value (63.88, β)					43.92
190	95% Gamma Approximate UCL					211.5		95% Gamma Adjusted UCL					223.9
191													
192	Estimates of Gamma Parameters using KM Estimates												
193	Mean (KM)					152.9		SD (KM)					70.47
194	Variance (KM)					4966		SE of Mean (KM)					23.82
195	k hat (KM)					4.708		k star (KM)					3.362

	A	B	C	D	E	F	G	H	I	J	K	L
196					nu hat (KM)	94.16					nu star (KM)	67.24
197					theta hat (KM)	32.48					theta star (KM)	45.48
198					80% gamma percentile (KM)	215.2					90% gamma percentile (KM)	264.7
199					95% gamma percentile (KM)	310.7					99% gamma percentile (KM)	409.8
200												
201	Gamma Kaplan-Meier (KM) Statistics											
202					Approximate Chi Square Value (67.24, α)	49.37					Adjusted Chi Square Value (67.24, β)	46.72
203					95% KM Approximate Gamma UCL	208.3					95% KM Adjusted Gamma UCL	220.1
204												
205	Lognormal GOF Test on Detected Observations Only											
206					Shapiro Wilk Test Statistic	0.916					Shapiro Wilk GOF Test	
207					10% Shapiro Wilk Critical Value	0.851					Detected Data appear Lognormal at 10% Significance Level	
208					Lilliefors Test Statistic	0.193					Lilliefors GOF Test	
209					10% Lilliefors Critical Value	0.265					Detected Data appear Lognormal at 10% Significance Level	
210	Detected Data appear Lognormal at 10% Significance Level											
211	Note GOF tests may be unreliable for small sample sizes											
212												
213	Lognormal ROS Statistics Using Imputed Non-Detects											
214					Mean in Original Scale	154.4					Mean in Log Scale	4.926
215					SD in Original Scale	72.45					SD in Log Scale	0.519
216					95% t UCL (assumes normality of ROS data)	196.4					95% Percentile Bootstrap UCL	190.7
217					95% BCA Bootstrap UCL	190.3					95% Bootstrap t UCL	197.9
218					95% H-UCL (Log ROS)	232.5						
219												
220	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
221					KM Mean (logged)	4.905					KM Geo Mean	135
222					KM SD (logged)	0.519					95% Critical H Value (KM-Log)	2.247
223					KM Standard Error of Mean (logged)	0.175					95% H-UCL (KM -Log)	227.9
224					KM SD (logged)	0.519					95% Critical H Value (KM-Log)	2.247
225					KM Standard Error of Mean (logged)	0.175						
226												
227	DL/2 Statistics											
228					DL/2 Normal						DL/2 Log-Transformed	
229					Mean in Original Scale	147.2					Mean in Log Scale	4.793
230					SD in Original Scale	82.23					SD in Log Scale	0.728
231					95% t UCL (Assumes normality)	194.8					95% H-Stat UCL	294.2
232	DL/2 is not a recommended method, provided for comparisons and historical reasons											
233												
234	Nonparametric Distribution Free UCL Statistics											
235	Detected Data appear Normal Distributed at 1% Significance Level											
236												
237	Suggested UCL to Use											
238					95% KM (t) UCL	196.6						
239												
240	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
241	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
242	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
243												
244	NWTPH-Dx (1c-w-8)											
245												
246	General Statistics											
247					Total Number of Observations	10					Number of Distinct Observations	5
248					Number of Detects	2					Number of Non-Detects	8
249					Number of Distinct Detects	2					Number of Distinct Non-Detects	3
250					Minimum Detect	199					Minimum Non-Detect	41
251					Maximum Detect	340					Maximum Non-Detect	77
252					Variance Detects	9941					Percent Non-Detects	80%
253					Mean Detects	269.5					SD Detects	99.7
254					Median Detects	269.5					CV Detects	0.37
255					Skewness Detects	N/A					Kurtosis Detects	N/A
256					Mean of Logged Detects	5.561					SD of Logged Detects	0.379
257												
258	Warning: Data set has only 2 Detected Values.											
259	This is not enough to compute meaningful or reliable statistics and estimates.											
260												

	A	B	C	D	E	F	G	H	I	J	K	L
261												
262	Normal GOF Test on Detects Only											
263	Not Enough Data to Perform GOF Test											
264												
265	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
266	KM Mean					86.7	KM Standard Error of Mean					43.24
267	90KM SD					96.69	95% KM (BCA) UCL					N/A
268	95% KM (t) UCL					166	95% KM (Percentile Bootstrap) UCL					N/A
269	95% KM (z) UCL					157.8	95% KM Bootstrap t UCL					N/A
270	90% KM Chebyshev UCL					216.4	95% KM Chebyshev UCL					275.2
271	97.5% KM Chebyshev UCL					356.7	99% KM Chebyshev UCL					516.9
272												
273	Gamma GOF Tests on Detected Observations Only											
274	Not Enough Data to Perform GOF Test											
275												
276	Gamma Statistics on Detected Data Only											
277	k hat (MLE)					14.27	k star (bias corrected MLE)					N/A
278	Theta hat (MLE)					18.88	Theta star (bias corrected MLE)					N/A
279	nu hat (MLE)					57.09	nu star (bias corrected)					N/A
280	Mean (detects)					269.5						
281												
282	Estimates of Gamma Parameters using KM Estimates											
283	Mean (KM)					86.7	SD (KM)					96.69
284	Variance (KM)					9348	SE of Mean (KM)					43.24
285	k hat (KM)					0.804	k star (KM)					0.63
286	nu hat (KM)					16.08	nu star (KM)					12.59
287	theta hat (KM)					107.8	theta star (KM)					137.7
288	80% gamma percentile (KM)					142.9	90% gamma percentile (KM)					223.1
289	95% gamma percentile (KM)					306.6	99% gamma percentile (KM)					507.9
290												
291	Gamma Kaplan-Meier (KM) Statistics											
292						Adjusted Level of Significance (β)					0.0267	
293	Approximate Chi Square Value (12.59, α)					5.619	Adjusted Chi Square Value (12.59, β)					4.834
294	95% KM Approximate Gamma UCL					194.3	95% KM Adjusted Gamma UCL					225.8
295												
296	Lognormal GOF Test on Detected Observations Only											
297	Not Enough Data to Perform GOF Test											
298												
299	Lognormal ROS Statistics Using Imputed Non-Detects											
300	Mean in Original Scale					82.6	Mean in Log Scale					3.811
301	SD in Original Scale					106.1	SD in Log Scale					1.125
302	95% t UCL (assumes normality of ROS data)					144.1	95% Percentile Bootstrap UCL					139.6
303	95% BCA Bootstrap UCL					160.5	95% Bootstrap t UCL					312.5
304	95% H-UCL (Log ROS)					300.9						
305												
306	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
307	KM Mean (logged)					4.083	KM Geo Mean					59.33
308	KM SD (logged)					0.749	95% Critical H Value (KM-Log)					2.617
309	KM Standard Error of Mean (logged)					0.335	95% H-UCL (KM -Log)					150.9
310	KM SD (logged)					0.749	95% Critical H Value (KM-Log)					2.617
311	KM Standard Error of Mean (logged)					0.335						
312												
313	DL/2 Statistics											
314	DL/2 Normal					DL/2 Log-Transformed						
315	Mean in Original Scale					82.85	Mean in Log Scale					3.968
316	SD in Original Scale					104	SD in Log Scale					0.871
317	95% t UCL (Assumes normality)					143.1	95% H-Stat UCL					176.7
318	DL/2 is not a recommended method, provided for comparisons and historical reasons											
319												
320	Nonparametric Distribution Free UCL Statistics											
321	Data do not follow a Discernible Distribution											
322												
323	Suggested UCL to Use											
324	95% KM (t) UCL					166						
325												

A	B	C	D	E	F	G	H	I	J	K	L
326	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
327	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.										
328	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.										
329											
330	NWTPH-Dx (2a-w-40)										
331											
332	General Statistics										
333	Total Number of Observations				10	Number of Distinct Observations				6	
334	Number of Detects				1	Number of Non-Detects				9	
335	Number of Distinct Detects				1	Number of Distinct Non-Detects				5	
336											
337	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!										
338	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).										
339											
340	The data set for variable NWTPH-Dx (2a-w-40) was not processed!										
341											
342											
343	NWTPH-Dx (2a-w-41)										
344											
345	General Statistics										
346	Total Number of Observations				10	Number of Distinct Observations				9	
347	Number of Detects				8	Number of Non-Detects				2	
348	Number of Distinct Detects				7	Number of Distinct Non-Detects				2	
349	Minimum Detect				136	Minimum Non-Detect				77	
350	Maximum Detect				1130	Maximum Non-Detect				78	
351	Variance Detects				102627	Percent Non-Detects				20%	
352	Mean Detects				592.6	SD Detects				320.4	
353	Median Detects				612.5	CV Detects				0.541	
354	Skewness Detects				0.134	Kurtosis Detects				-0.117	
355	Mean of Logged Detects				6.208	SD of Logged Detects				0.702	
356											
357	Normal GOF Test on Detects Only										
358	Shapiro Wilk Test Statistic				0.968	Shapiro Wilk GOF Test					
359	1% Shapiro Wilk Critical Value				0.749	Detected Data appear Normal at 1% Significance Level					
360	Lilliefors Test Statistic				0.154	Lilliefors GOF Test					
361	1% Lilliefors Critical Value				0.333	Detected Data appear Normal at 1% Significance Level					
362	Detected Data appear Normal at 1% Significance Level										
363	Note GOF tests may be unreliable for small sample sizes										
364											
365	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
366	KM Mean				489.5	KM Standard Error of Mean				114.3	
367	90KM SD				338.2	95% KM (BCA) UCL				674.7	
368	95% KM (t) UCL				699.1	95% KM (Percentile Bootstrap) UCL				672.2	
369	95% KM (z) UCL				677.6	95% KM Bootstrap t UCL				731.2	
370	90% KM Chebyshev UCL				832.5	95% KM Chebyshev UCL				987.9	
371	97.5% KM Chebyshev UCL				1204	99% KM Chebyshev UCL				1627	
372											
373	Gamma GOF Tests on Detected Observations Only										
374	A-D Test Statistic				0.337	Anderson-Darling GOF Test					
375	5% A-D Critical Value				0.721	Detected data appear Gamma Distributed at 5% Significance Level					
376	K-S Test Statistic				0.199	Kolmogorov-Smirnov GOF					
377	5% K-S Critical Value				0.296	Detected data appear Gamma Distributed at 5% Significance Level					
378	Detected data appear Gamma Distributed at 5% Significance Level										
379	Note GOF tests may be unreliable for small sample sizes										
380											
381	Gamma Statistics on Detected Data Only										
382	k hat (MLE)				2.989	k star (bias corrected MLE)				1.951	
383	Theta hat (MLE)				198.3	Theta star (bias corrected MLE)				303.7	
384	nu hat (MLE)				47.82	nu star (bias corrected)				31.22	
385	Mean (detects)				592.6						
386											
387	Gamma ROS Statistics using Imputed Non-Detects										
388	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
389	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)										
390	For such situations, GROS method may yield incorrect values of UCLs and BTVs										

	A	B	C	D	E	F	G	H	I	J	K	L
391	This is especially true when the sample size is small.											
392	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
393					Minimum	26.86					Mean	479.5
394					Maximum	1130					Median	525
395					SD	369.8					CV	0.771
396					k hat (MLE)	1.047					k star (bias corrected MLE)	0.8
397					Theta hat (MLE)	457.8					Theta star (bias corrected MLE)	599.4
398					nu hat (MLE)	20.95					nu star (bias corrected)	16
399					Adjusted Level of Significance (β)	0.0267						
400					Approximate Chi Square Value (16.00, α)	7.96					Adjusted Chi Square Value (16.00, β)	6.997
401					95% Gamma Approximate UCL	963.6					95% Gamma Adjusted UCL	1096
402												
403	Estimates of Gamma Parameters using KM Estimates											
404					Mean (KM)	489.5					SD (KM)	338.2
405					Variance (KM)	114378					SE of Mean (KM)	114.3
406					k hat (KM)	2.095					k star (KM)	1.533
407					nu hat (KM)	41.9					nu star (KM)	30.66
408					theta hat (KM)	233.7					theta star (KM)	319.3
409					80% gamma percentile (KM)	755.5					90% gamma percentile (KM)	1015
410					95% gamma percentile (KM)	1266					99% gamma percentile (KM)	1832
411												
412	Gamma Kaplan-Meier (KM) Statistics											
413					Approximate Chi Square Value (30.66, α)	19.01					Adjusted Chi Square Value (30.66, β)	17.44
414					95% KM Approximate Gamma UCL	789.4					95% KM Adjusted Gamma UCL	860.8
415												
416	Lognormal GOF Test on Detected Observations Only											
417					Shapiro Wilk Test Statistic	0.902					Shapiro Wilk GOF Test	
418					10% Shapiro Wilk Critical Value	0.851					Detected Data appear Lognormal at 10% Significance Level	
419					Lilliefors Test Statistic	0.222					Lilliefors GOF Test	
420					10% Lilliefors Critical Value	0.265					Detected Data appear Lognormal at 10% Significance Level	
421	Detected Data appear Lognormal at 10% Significance Level											
422	Note GOF tests may be unreliable for small sample sizes											
423												
424	Lognormal ROS Statistics Using Imputed Non-Detects											
425					Mean in Original Scale	494.3					Mean in Log Scale	5.889
426					SD in Original Scale	350.5					SD in Log Scale	0.914
427					95% t UCL (assumes normality of ROS data)	697.4					95% Percentile Bootstrap UCL	672.6
428					95% BCA Bootstrap UCL	676.1					95% Bootstrap t UCL	709.5
429					95% H-UCL (Log ROS)	1339						
430												
431	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
432					KM Mean (logged)	5.835					KM Geo Mean	342.1
433					KM SD (logged)	0.949					95% Critical H Value (KM-Log)	3
434					KM Standard Error of Mean (logged)	0.321					95% H-UCL (KM -Log)	1387
435					KM SD (logged)	0.949					95% Critical H Value (KM-Log)	3
436					KM Standard Error of Mean (logged)	0.321						
437												
438	DL/2 Statistics											
439					DL/2 Normal						DL/2 Log-Transformed	
440					Mean in Original Scale	481.9					Mean in Log Scale	5.698
441					SD in Original Scale	366.5					SD in Log Scale	1.241
442					95% t UCL (Assumes normality)	694.3					95% H-Stat UCL	2878
443	DL/2 is not a recommended method, provided for comparisons and historical reasons											
444												
445	Nonparametric Distribution Free UCL Statistics											
446	Detected Data appear Normal Distributed at 1% Significance Level											
447												
448	Suggested UCL to Use											
449					95% KM (t) UCL	699.1						
450												
451	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
452	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
453	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
454												
455	NWTPH-Dx (2a-w-42)											

	A	B	C	D	E	F	G	H	I	J	K	L
456												
457	General Statistics											
458	Total Number of Observations					10	Number of Distinct Observations					8
459	Number of Detects					9	Number of Non-Detects					1
460	Number of Distinct Detects					7	Number of Distinct Non-Detects					1
461	Minimum Detect					156	Minimum Non-Detect					76
462	Maximum Detect					330	Maximum Non-Detect					76
463	Variance Detects					3123	Percent Non-Detects					10%
464	Mean Detects					249.2	SD Detects					55.89
465	Median Detects					270	CV Detects					0.224
466	Skewness Detects					-0.722	Kurtosis Detects					0.0478
467	Mean of Logged Detects					5.493	SD of Logged Detects					0.25
468												
469	Normal GOF Test on Detects Only											
470	Shapiro Wilk Test Statistic					0.89	Shapiro Wilk GOF Test					
471	1% Shapiro Wilk Critical Value					0.764	Detected Data appear Normal at 1% Significance Level					
472	Lilliefors Test Statistic					0.212	Lilliefors GOF Test					
473	1% Lilliefors Critical Value					0.316	Detected Data appear Normal at 1% Significance Level					
474	Detected Data appear Normal at 1% Significance Level											
475	Note GOF tests may be unreliable for small sample sizes											
476												
477	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
478	KM Mean					231.9	KM Standard Error of Mean					24.19
479	90KM SD					72.11	95% KM (BCA) UCL					266.3
480	95% KM (t) UCL					276.2	95% KM (Percentile Bootstrap) UCL					268.6
481	95% KM (z) UCL					271.7	95% KM Bootstrap t UCL					268.2
482	90% KM Chebyshev UCL					304.5	95% KM Chebyshev UCL					337.3
483	97.5% KM Chebyshev UCL					382.9	99% KM Chebyshev UCL					472.5
484												
485	Gamma GOF Tests on Detected Observations Only											
486	A-D Test Statistic					0.712	Anderson-Darling GOF Test					
487	5% A-D Critical Value					0.721	Detected data appear Gamma Distributed at 5% Significance Level					
488	K-S Test Statistic					0.242	Kolmogorov-Smirnov GOF					
489	5% K-S Critical Value					0.279	Detected data appear Gamma Distributed at 5% Significance Level					
490	Detected data appear Gamma Distributed at 5% Significance Level											
491	Note GOF tests may be unreliable for small sample sizes											
492												
493	Gamma Statistics on Detected Data Only											
494	k hat (MLE)					19.59	k star (bias corrected MLE)					13.13
495	Theta hat (MLE)					12.72	Theta star (bias corrected MLE)					18.97
496	nu hat (MLE)					352.6	nu star (bias corrected)					236.4
497	Mean (detects)					249.2						
498												
499	Gamma ROS Statistics using Imputed Non-Detects											
500	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
501	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
502	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
503	This is especially true when the sample size is small.											
504	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
505	Minimum					136.4	Mean					237.9
506	Maximum					330	Median					260.5
507	SD					63.63	CV					0.267
508	k hat (MLE)					13.64	k star (bias corrected MLE)					9.612
509	Theta hat (MLE)					17.45	Theta star (bias corrected MLE)					24.75
510	nu hat (MLE)					272.7	nu star (bias corrected)					192.2
511	Adjusted Level of Significance (β)					0.0267						
512	Approximate Chi Square Value (192.25, α)					161.2	Adjusted Chi Square Value (192.25, β)					156.2
513	95% Gamma Approximate UCL					283.8	95% Gamma Adjusted UCL					292.8
514												
515	Estimates of Gamma Parameters using KM Estimates											
516	Mean (KM)					231.9	SD (KM)					72.11
517	Variance (KM)					5199	SE of Mean (KM)					24.19
518	k hat (KM)					10.34	k star (KM)					7.307
519	nu hat (KM)					206.9	nu star (KM)					146.1
520	theta hat (KM)					22.42	theta star (KM)					31.74

	A	B	C	D	E	F	G	H	I	J	K	L
521				80% gamma percentile (KM)		299.3				90% gamma percentile (KM)		346.4
522				95% gamma percentile (KM)		388.6				99% gamma percentile (KM)		476.5
523												
524	Gamma Kaplan-Meier (KM) Statistics											
525				Approximate Chi Square Value (146.14, α)		119.2				Adjusted Chi Square Value (146.14, β)		115
526				95% KM Approximate Gamma UCL		284.3				95% KM Adjusted Gamma UCL		294.8
527												
528	Lognormal GOF Test on Detected Observations Only											
529				Shapiro Wilk Test Statistic		0.842				Shapiro Wilk GOF Test		
530				10% Shapiro Wilk Critical Value		0.859				Detected Data Not Lognormal at 10% Significance Level		
531				Lilliefors Test Statistic		0.259				Lilliefors GOF Test		
532				10% Lilliefors Critical Value		0.252				Detected Data Not Lognormal at 10% Significance Level		
533	Detected Data Not Lognormal at 10% Significance Level											
534												
535	Lognormal ROS Statistics Using Imputed Non-Detects											
536				Mean in Original Scale		238.1				Mean in Log Scale		5.436
537				SD in Original Scale		63.27				SD in Log Scale		0.295
538				95% t UCL (assumes normality of ROS data)		274.8				95% Percentile Bootstrap UCL		268.7
539				95% BCA Bootstrap UCL		265.9				95% Bootstrap t UCL		272.4
540				95% H-UCL (Log ROS)		291.1						
541												
542	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
543				KM Mean (logged)		5.376				KM Geo Mean		216.2
544				KM SD (logged)		0.414				95% Critical H Value (KM-Log)		2.106
545				KM Standard Error of Mean (logged)		0.139				95% H-UCL (KM -Log)		315.1
546				KM SD (logged)		0.414				95% Critical H Value (KM-Log)		2.106
547				KM Standard Error of Mean (logged)		0.139						
548												
549	DL/2 Statistics											
550				DL/2 Normal						DL/2 Log-Transformed		
551				Mean in Original Scale		228.1				Mean in Log Scale		5.307
552				SD in Original Scale		85.08				SD in Log Scale		0.632
553				95% t UCL (Assumes normality)		277.4				95% H-Stat UCL		410.2
554	DL/2 is not a recommended method, provided for comparisons and historical reasons											
555												
556	Nonparametric Distribution Free UCL Statistics											
557	Detected Data appear Normal Distributed at 1% Significance Level											
558												
559	Suggested UCL to Use											
560				95% KM (t) UCL		276.2						
561												
562	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL..											
563	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
564	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
565												
566	NWTPH-Dx (2a-w-9)											
567												
568	General Statistics											
569				Total Number of Observations		10				Number of Distinct Observations		9
570				Number of Detects		9				Number of Non-Detects		1
571				Number of Distinct Detects		8				Number of Distinct Non-Detects		1
572				Minimum Detect		119				Minimum Non-Detect		230
573				Maximum Detect		1040				Maximum Non-Detect		230
574				Variance Detects		87895				Percent Non-Detects		10%
575				Mean Detects		393.6				SD Detects		296.5
576				Median Detects		226				CV Detects		0.753
577				Skewness Detects		1.467				Kurtosis Detects		1.998
578				Mean of Logged Detects		5.749				SD of Logged Detects		0.703
579												
580	Normal GOF Test on Detects Only											
581				Shapiro Wilk Test Statistic		0.84				Shapiro Wilk GOF Test		
582				1% Shapiro Wilk Critical Value		0.764				Detected Data appear Normal at 1% Significance Level		
583				Lilliefors Test Statistic		0.27				Lilliefors GOF Test		
584				1% Lilliefors Critical Value		0.316				Detected Data appear Normal at 1% Significance Level		
585	Detected Data appear Normal at 1% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
586	Note GOF tests may be unreliable for small sample sizes											
587												
588	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
589	KM Mean				373.2	KM Standard Error of Mean					91.51	
590	90KM SD				272.4	95% KM (BCA) UCL					534.9	
591	95% KM (t) UCL				541	95% KM (Percentile Bootstrap) UCL					525.1	
592	95% KM (z) UCL				523.8	95% KM Bootstrap t UCL					680.9	
593	90% KM Chebyshev UCL				647.8	95% KM Chebyshev UCL					772.1	
594	97.5% KM Chebyshev UCL				944.7	99% KM Chebyshev UCL					1284	
595												
596	Gamma GOF Tests on Detected Observations Only											
597	A-D Test Statistic				0.383	Anderson-Darling GOF Test						
598	5% A-D Critical Value				0.729	Detected data appear Gamma Distributed at 5% Significance Level						
599	K-S Test Statistic				0.266	Kolmogorov-Smirnov GOF						
600	5% K-S Critical Value				0.282	Detected data appear Gamma Distributed at 5% Significance Level						
601	Detected data appear Gamma Distributed at 5% Significance Level											
602	Note GOF tests may be unreliable for small sample sizes											
603												
604	Gamma Statistics on Detected Data Only											
605	k hat (MLE)				2.364	k star (bias corrected MLE)					1.65	
606	Theta hat (MLE)				166.5	Theta star (bias corrected MLE)					238.5	
607	nu hat (MLE)				42.55	nu star (bias corrected)					29.7	
608	Mean (detects)				393.6							
609												
610	Gamma ROS Statistics using Imputed Non-Detects											
611	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
612	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
613	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
614	This is especially true when the sample size is small.											
615	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
616	Minimum				119	Mean					372.4	
617	Maximum				1040	Median					226	
618	SD				287.4	CV					0.772	
619	k hat (MLE)				2.372	k star (bias corrected MLE)					1.727	
620	Theta hat (MLE)				157	Theta star (bias corrected MLE)					215.7	
621	nu hat (MLE)				47.44	nu star (bias corrected)					34.54	
622	Adjusted Level of Significance (β)				0.0267							
623	Approximate Chi Square Value (34.54, α)				22.09	Adjusted Chi Square Value (34.54, β)					20.38	
624	95% Gamma Approximate UCL				582.2	95% Gamma Adjusted UCL					631.1	
625												
626	Estimates of Gamma Parameters using KM Estimates											
627	Mean (KM)				373.2	SD (KM)					272.4	
628	Variance (KM)				74218	SE of Mean (KM)					91.51	
629	k hat (KM)				1.877	k star (KM)					1.381	
630	nu hat (KM)				37.54	nu star (KM)					27.61	
631	theta hat (KM)				198.8	theta star (KM)					270.4	
632	80% gamma percentile (KM)				582.7	90% gamma percentile (KM)					793.7	
633	95% gamma percentile (KM)				999.8	99% gamma percentile (KM)					1468	
634												
635	Gamma Kaplan-Meier (KM) Statistics											
636	Approximate Chi Square Value (27.61, α)				16.63	Adjusted Chi Square Value (27.61, β)					15.16	
637	95% KM Approximate Gamma UCL				619.9	95% KM Adjusted Gamma UCL					679.7	
638												
639	Lognormal GOF Test on Detected Observations Only											
640	Shapiro Wilk Test Statistic				0.952	Shapiro Wilk GOF Test						
641	10% Shapiro Wilk Critical Value				0.859	Detected Data appear Lognormal at 10% Significance Level						
642	Lilliefors Test Statistic				0.235	Lilliefors GOF Test						
643	10% Lilliefors Critical Value				0.252	Detected Data appear Lognormal at 10% Significance Level						
644	Detected Data appear Lognormal at 10% Significance Level											
645	Note GOF tests may be unreliable for small sample sizes											
646												
647	Lognormal ROS Statistics Using Imputed Non-Detects											
648	Mean in Original Scale				373.9	Mean in Log Scale					5.702	
649	SD in Original Scale				286.3	SD in Log Scale					0.679	
650	95% t UCL (assumes normality of ROS data)				539.9	95% Percentile Bootstrap UCL					523.9	

	A	B	C	D	E	F	G	H	I	J	K	L
651	95% BCA Bootstrap UCL					564.8	95% Bootstrap t UCL					666.5
652	95% H-UCL (Log ROS)					663.4						
653												
654	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
655	KM Mean (logged)					5.696	KM Geo Mean					297.7
656	KM SD (logged)					0.653	95% Critical H Value (KM-Log)					2.453
657	KM Standard Error of Mean (logged)					0.221	95% H-UCL (KM -Log)					628.8
658	KM SD (logged)					0.653	95% Critical H Value (KM-Log)					2.453
659	KM Standard Error of Mean (logged)					0.221						
660												
661	DL/2 Statistics											
662	DL/2 Normal					DL/2 Log-Transformed						
663	Mean in Original Scale					365.7	Mean in Log Scale					5.649
664	SD in Original Scale					293.1	SD in Log Scale					0.735
665	95% t UCL (Assumes normality)					535.6	95% H-Stat UCL					701.6
666	DL/2 is not a recommended method, provided for comparisons and historical reasons											
667												
668	Nonparametric Distribution Free UCL Statistics											
669	Detected Data appear Normal Distributed at 1% Significance Level											
670												
671	Suggested UCL to Use											
672	95% KM (t) UCL					541						
673												
674	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
675	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
676	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
677												
678	NWTPH-Dx (5-w-14)											
679												
680	General Statistics											
681	Total Number of Observations					10	Number of Distinct Observations					3
682	Number of Detects					0	Number of Non-Detects					10
683	Number of Distinct Detects					0	Number of Distinct Non-Detects					3
684												
685	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
686	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
687	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
688												
689	The data set for variable NWTPH-Dx (5-w-14) was not processed!											
690												
691												
692	NWTPH-Dx (5-w-16)											
693												
694	General Statistics											
695	Total Number of Observations					10	Number of Distinct Observations					4
696	Number of Detects					0	Number of Non-Detects					10
697	Number of Distinct Detects					0	Number of Distinct Non-Detects					4
698												
699	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
700	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
701	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
702												
703	The data set for variable NWTPH-Dx (5-w-16) was not processed!											
704												
705												
706	NWTPH-Dx (5-w-17)											
707												
708	General Statistics											
709	Total Number of Observations					10	Number of Distinct Observations					3
710	Number of Detects					0	Number of Non-Detects					10
711	Number of Distinct Detects					0	Number of Distinct Non-Detects					3
712												
713	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
714	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
715	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											

	A	B	C	D	E	F	G	H	I	J	K	L	
716													
717	The data set for variable NWTPH-Dx (5-w-17) was not processed!												
718													
719													
720	NWTPH-Dx (5-w-18)												
721													
722	General Statistics												
723	Total Number of Observations					10		Number of Distinct Observations				3	
724	Number of Detects					2		Number of Non-Detects				8	
725	Number of Distinct Detects					2		Number of Distinct Non-Detects				1	
726	Minimum Detect					167		Minimum Non-Detect				77	
727	Maximum Detect					171		Maximum Non-Detect				77	
728	Variance Detects					8		Percent Non-Detects				80%	
729	Mean Detects					169		SD Detects				2.828	
730	Median Detects					169		CV Detects				0.0167	
731	Skewness Detects					N/A		Kurtosis Detects				N/A	
732	Mean of Logged Detects					5.13		SD of Logged Detects				0.0167	
733													
734	Warning: Data set has only 2 Detected Values.												
735	This is not enough to compute meaningful or reliable statistics and estimates.												
736													
737													
738	Normal GOF Test on Detects Only												
739	Not Enough Data to Perform GOF Test												
740													
741	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
742	KM Mean					95.4		KM Standard Error of Mean				16.46	
743	90KM SD					36.81		95% KM (BCA) UCL				N/A	
744	95% KM (t) UCL					125.6		95% KM (Percentile Bootstrap) UCL				N/A	
745	95% KM (z) UCL					122.5		95% KM Bootstrap t UCL				N/A	
746	90% KM Chebyshev UCL					144.8		95% KM Chebyshev UCL				167.2	
747	97.5% KM Chebyshev UCL					198.2		99% KM Chebyshev UCL				259.2	
748													
749	Gamma GOF Tests on Detected Observations Only												
750	Not Enough Data to Perform GOF Test												
751													
752	Gamma Statistics on Detected Data Only												
753	k hat (MLE)					7140		k star (bias corrected MLE)				N/A	
754	Theta hat (MLE)					0.0237		Theta star (bias corrected MLE)				N/A	
755	nu hat (MLE)					28560		nu star (bias corrected)				N/A	
756	Mean (detects)					169							
757													
758	Estimates of Gamma Parameters using KM Estimates												
759	Mean (KM)					95.4		SD (KM)				36.81	
760	Variance (KM)					1355		SE of Mean (KM)				16.46	
761	k hat (KM)					6.717		k star (KM)				4.768	
762	nu hat (KM)					134.3		nu star (KM)				95.36	
763	theta hat (KM)					14.2		theta star (KM)				20.01	
764	80% gamma percentile (KM)					128.9		90% gamma percentile (KM)				153.9	
765	95% gamma percentile (KM)					176.7		99% gamma percentile (KM)				225.1	
766													
767	Gamma Kaplan-Meier (KM) Statistics												
768							Adjusted Level of Significance (β)				0.0267		
769	Approximate Chi Square Value (95.36, α)					73.84		Adjusted Chi Square Value (95.36, β)				70.56	
770	95% KM Approximate Gamma UCL					123.2		95% KM Adjusted Gamma UCL				128.9	
771													
772	Lognormal GOF Test on Detected Observations Only												
773	Not Enough Data to Perform GOF Test												
774													
775	Lognormal ROS Statistics Using Imputed Non-Detects												
776	Mean in Original Scale					156.5		Mean in Log Scale				5.052	
777	SD in Original Scale					8.475		SD in Log Scale				0.0539	
778	95% t UCL (assumes normality of ROS data)					161.4		95% Percentile Bootstrap UCL				160.7	
779	95% BCA Bootstrap UCL					160.7		95% Bootstrap t UCL				161.8	
780	95% H-UCL (Log ROS)					N/A							

	A	B	C	D	E	F	G	H	I	J	K	L	
781													
782	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
783	KM Mean (logged)					4.501	KM Geo Mean					90.11	
784	KM SD (logged)					0.314	95% Critical H Value (KM-Log)					1.992	
785	KM Standard Error of Mean (logged)					0.141	95% H-UCL (KM -Log)					116.7	
786	KM SD (logged)					0.314	95% Critical H Value (KM-Log)					1.992	
787	KM Standard Error of Mean (logged)					0.141							
788													
789	DL/2 Statistics												
790	DL/2 Normal					DL/2 Log-Transformed							
791	Mean in Original Scale					64.6	Mean in Log Scale					3.946	
792	SD in Original Scale					55.03	SD in Log Scale					0.624	
793	95% t UCL (Assumes normality)					96.5	95% H-Stat UCL					103.7	
794	DL/2 is not a recommended method, provided for comparisons and historical reasons												
795													
796	Nonparametric Distribution Free UCL Statistics												
797	Data do not follow a Discernible Distribution												
798													
799	Suggested UCL to Use												
800	95% KM (t) UCL					125.6							
801													
802	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
803	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.												
804	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
805													
806	NWTPH-Dx (5-w-19)												
807													
808	General Statistics												
809	Total Number of Observations					10	Number of Distinct Observations					5	
810	Number of Detects					1	Number of Non-Detects					9	
811	Number of Distinct Detects					1	Number of Distinct Non-Detects					4	
812													
813	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!												
814	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).												
815													
816	The data set for variable NWTPH-Dx (5-w-19) was not processed!												
817													
818													
819	NWTPH-Dx (5-w-43)												
820													
821	General Statistics												
822	Total Number of Observations					14	Number of Distinct Observations					6	
823	Number of Detects					3	Number of Non-Detects					11	
824	Number of Distinct Detects					3	Number of Distinct Non-Detects					3	
825	Minimum Detect					88	Minimum Non-Detect					37	
826	Maximum Detect					368	Maximum Non-Detect					82	
827	Variance Detects					19900	Percent Non-Detects					78.57%	
828	Mean Detects					218	SD Detects					141.1	
829	Median Detects					198	CV Detects					0.647	
830	Skewness Detects					0.625	Kurtosis Detects					N/A	
831	Mean of Logged Detects					5.225	SD of Logged Detects					0.717	
832													
833	Warning: Data set has only 3 Detected Values.												
834	This is not enough to compute meaningful or reliable statistics and estimates.												
835													
836													
837	Normal GOF Test on Detects Only												
838	Shapiro Wilk Test Statistic					0.985	Shapiro Wilk GOF Test						
839	1% Shapiro Wilk Critical Value					0.753	Detected Data appear Normal at 1% Significance Level						
840	Lilliefors Test Statistic					0.223	Lilliefors GOF Test						
841	1% Lilliefors Critical Value					0.429	Detected Data appear Normal at 1% Significance Level						
842	Detected Data appear Normal at 1% Significance Level												
843	Note GOF tests may be unreliable for small sample sizes												
844													
845	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												

	A	B	C	D	E	F	G	H	I	J	K	L
846					KM Mean	75.79	KM Standard Error of Mean					29.93
847					90KM SD	91.43	95% KM (BCA) UCL					N/A
848					95% KM (t) UCL	128.8	95% KM (Percentile Bootstrap) UCL					N/A
849					95% KM (z) UCL	125	95% KM Bootstrap t UCL					N/A
850					90% KM Chebyshev UCL	165.6	95% KM Chebyshev UCL					206.2
851					97.5% KM Chebyshev UCL	262.7	99% KM Chebyshev UCL					373.5
852												
853	Gamma GOF Tests on Detected Observations Only											
854					A-D Test Statistic	0.245	Anderson-Darling GOF Test					
855					5% A-D Critical Value	0.636	Detected data appear Gamma Distributed at 5% Significance Level					
856					K-S Test Statistic	0.224	Kolmogorov-Smirnov GOF					
857					5% K-S Critical Value	0.434	Detected data appear Gamma Distributed at 5% Significance Level					
858	Detected Data Not Gamma Distributed at 5% Significance Level											
859												
860	Gamma Statistics on Detected Data Only											
861					k hat (MLE)	3.284	k star (bias corrected MLE)					N/A
862					Theta hat (MLE)	66.39	Theta star (bias corrected MLE)					N/A
863					nu hat (MLE)	19.7	nu star (bias corrected)					N/A
864					Mean (detects)	218						
865												
866	Gamma ROS Statistics using Imputed Non-Detects											
867	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
868	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
869	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
870	This is especially true when the sample size is small.											
871	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
872					Minimum	0.01	Mean					46.72
873					Maximum	368	Median					0.01
874					SD	108.1	CV					2.313
875					k hat (MLE)	0.124	k star (bias corrected MLE)					0.145
876					Theta hat (MLE)	375.5	Theta star (bias corrected MLE)					321.4
877					nu hat (MLE)	3.484	nu star (bias corrected)					4.07
878					Adjusted Level of Significance (β)	0.0312						
879					Approximate Chi Square Value (4.07, α)	0.75	Adjusted Chi Square Value (4.07, β)					0.585
880					95% Gamma Approximate UCL	253.7	95% Gamma Adjusted UCL					N/A
881												
882	Estimates of Gamma Parameters using KM Estimates											
883					Mean (KM)	75.79	SD (KM)					91.43
884					Variance (KM)	8359	SE of Mean (KM)					29.93
885					k hat (KM)	0.687	k star (KM)					0.588
886					nu hat (KM)	19.24	nu star (KM)					16.45
887					theta hat (KM)	110.3	theta star (KM)					129
888					80% gamma percentile (KM)	124.9	90% gamma percentile (KM)					198
889					95% gamma percentile (KM)	274.8	99% gamma percentile (KM)					460.7
890												
891	Gamma Kaplan-Meier (KM) Statistics											
892					Approximate Chi Square Value (16.45, α)	8.281	Adjusted Chi Square Value (16.45, β)					7.523
893					95% KM Approximate Gamma UCL	150.6	95% KM Adjusted Gamma UCL					165.7
894												
895	Lognormal GOF Test on Detected Observations Only											
896					Shapiro Wilk Test Statistic	0.994	Shapiro Wilk GOF Test					
897					10% Shapiro Wilk Critical Value	0.789	Detected Data appear Lognormal at 10% Significance Level					
898					Lilliefors Test Statistic	0.202	Lilliefors GOF Test					
899					10% Lilliefors Critical Value	0.389	Detected Data appear Lognormal at 10% Significance Level					
900	Detected Data appear Lognormal at 10% Significance Level											
901	Note GOF tests may be unreliable for small sample sizes											
902												
903	Lognormal ROS Statistics Using Imputed Non-Detects											
904					Mean in Original Scale	54.03	Mean in Log Scale					2.38
905					SD in Original Scale	105.1	SD in Log Scale					1.937
906					95% t UCL (assumes normality of ROS data)	103.8	95% Percentile Bootstrap UCL					102.2
907					95% BCA Bootstrap UCL	122.4	95% Bootstrap t UCL					242.1
908					95% H-UCL (Log ROS)	810.8						
909												
910	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											

[illegible]

	A	B	C	D	E	F	G	H	I	J	K	L	
976	Shapiro Wilk Test Statistic					0.896	Shapiro Wilk Lognormal GOF Test						
977	10% Shapiro Wilk Critical Value					0.869	Data appear Lognormal at 10% Significance Level						
978	Lilliefors Test Statistic					0.26	Lilliefors Lognormal GOF Test						
979	10% Lilliefors Critical Value					0.241	Data Not Lognormal at 10% Significance Level						
980	Data appear Approximate Lognormal at 10% Significance Level												
981													
982	Lognormal Statistics												
983	Minimum of Logged Data					5.303	Mean of logged Data					6.516	
984	Maximum of Logged Data					7.333	SD of logged Data					0.601	
985													
986	Assuming Lognormal Distribution												
987	95% H-UCL					1302	90% Chebyshev (MVUE) UCL					1257	
988	95% Chebyshev (MVUE) UCL					1467	97.5% Chebyshev (MVUE) UCL					1758	
989	99% Chebyshev (MVUE) UCL					2330							
990													
991	Nonparametric Distribution Free UCL Statistics												
992	Data appear to follow a Discernible Distribution												
993													
994	Nonparametric Distribution Free UCLs												
995	95% CLT UCL					972.3	95% BCA Bootstrap UCL					987	
996	95% Standard Bootstrap UCL					964.4	95% Bootstrap-t UCL					1017	
997	95% Hall's Bootstrap UCL					1083	95% Percentile Bootstrap UCL					969.5	
998	90% Chebyshev(Mean, Sd) UCL					1135	95% Chebyshev(Mean, Sd) UCL					1298	
999	97.5% Chebyshev(Mean, Sd) UCL					1525	99% Chebyshev(Mean, Sd) UCL					1970	
1000													
1001	Suggested UCL to Use												
1002	95% Student's-t UCL					995							
1003													
1004	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
1005	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.												
1006	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
1007													
1008	NWTPH-Dx (5-w-55)												
1009													
1010	General Statistics												
1011	Total Number of Observations					10	Number of Distinct Observations					6	
1012	Number of Detects					3	Number of Non-Detects					7	
1013	Number of Distinct Detects					3	Number of Distinct Non-Detects					3	
1014	Minimum Detect					68	Minimum Non-Detect					76	
1015	Maximum Detect					230	Maximum Non-Detect					78	
1016	Variance Detects					7682	Percent Non-Detects					70%	
1017	Mean Detects					129.7	SD Detects					87.65	
1018	Median Detects					91	CV Detects					0.676	
1019	Skewness Detects					1.599	Kurtosis Detects					N/A	
1020	Mean of Logged Detects					4.723	SD of Logged Detects					0.636	
1021													
1022	Warning: Data set has only 3 Detected Values.												
1023	This is not enough to compute meaningful or reliable statistics and estimates.												
1024													
1025													
1026	Normal GOF Test on Detects Only												
1027	Shapiro Wilk Test Statistic					0.854	Shapiro Wilk GOF Test						
1028	1% Shapiro Wilk Critical Value					0.753	Detected Data appear Normal at 1% Significance Level						
1029	Lilliefors Test Statistic					0.337	Lilliefors GOF Test						
1030	1% Lilliefors Critical Value					0.429	Detected Data appear Normal at 1% Significance Level						
1031	Detected Data appear Normal at 1% Significance Level												
1032	Note GOF tests may be unreliable for small sample sizes												
1033													
1034	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
1035	KM Mean					86.5	KM Standard Error of Mean					18.72	
1036	90KM SD					48.32	95% KM (BCA) UCL					N/A	
1037	95% KM (t) UCL					120.8	95% KM (Percentile Bootstrap) UCL					N/A	
1038	95% KM (z) UCL					117.3	95% KM Bootstrap t UCL					N/A	
1039	90% KM Chebyshev UCL					142.6	95% KM Chebyshev UCL					168.1	
1040	97.5% KM Chebyshev UCL					203.4	99% KM Chebyshev UCL					272.7	

	A	B	C	D	E	F	G	H	I	J	K	L
1041												
1042	Gamma GOF Tests on Detected Observations Only											
1043	A-D Test Statistic					0.396	Anderson-Darling GOF Test					
1044	5% A-D Critical Value					0.636	Detected data appear Gamma Distributed at 5% Significance Level					
1045	K-S Test Statistic					0.344	Kolmogorov-Smirnov GOF					
1046	5% K-S Critical Value					0.434	Detected data appear Gamma Distributed at 5% Significance Level					
1047	Detected Data Not Gamma Distributed at 5% Significance Level											
1048												
1049	Gamma Statistics on Detected Data Only											
1050	k hat (MLE)					3.676	k star (bias corrected MLE)					N/A
1051	Theta hat (MLE)					35.28	Theta star (bias corrected MLE)					N/A
1052	nu hat (MLE)					22.05	nu star (bias corrected)					N/A
1053	Mean (detects)					129.7						
1054												
1055	Gamma ROS Statistics using Imputed Non-Detects											
1056	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1057	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1058	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1059	This is especially true when the sample size is small.											
1060	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1061	Minimum					11.28	Mean					75.65
1062	Maximum					230	Median					59.97
1063	SD					59.83	CV					0.791
1064	k hat (MLE)					2.155	k star (bias corrected MLE)					1.575
1065	Theta hat (MLE)					35.11	Theta star (bias corrected MLE)					48.03
1066	nu hat (MLE)					43.09	nu star (bias corrected)					31.5
1067	Adjusted Level of Significance (β)					0.0267						
1068	Approximate Chi Square Value (31.50, α)					19.67	Adjusted Chi Square Value (31.50, β)					18.07
1069	95% Gamma Approximate UCL					121.1	95% Gamma Adjusted UCL					N/A
1070												
1071	Estimates of Gamma Parameters using KM Estimates											
1072	Mean (KM)					86.5	SD (KM)					48.32
1073	Variance (KM)					2335	SE of Mean (KM)					18.72
1074	k hat (KM)					3.204	k star (KM)					2.31
1075	nu hat (KM)					64.09	nu star (KM)					46.19
1076	theta hat (KM)					26.99	theta star (KM)					37.45
1077	80% gamma percentile (KM)					127.3	90% gamma percentile (KM)					162.7
1078	95% gamma percentile (KM)					196.2	99% gamma percentile (KM)					269.8
1079												
1080	Gamma Kaplan-Meier (KM) Statistics											
1081	Approximate Chi Square Value (46.19, α)					31.6	Adjusted Chi Square Value (46.19, β)					29.51
1082	95% KM Approximate Gamma UCL					126.5	95% KM Adjusted Gamma UCL					135.4
1083												
1084	Lognormal GOF Test on Detected Observations Only											
1085	Shapiro Wilk Test Statistic					0.917	Shapiro Wilk GOF Test					
1086	10% Shapiro Wilk Critical Value					0.789	Detected Data appear Lognormal at 10% Significance Level					
1087	Lilliefors Test Statistic					0.297	Lilliefors GOF Test					
1088	10% Lilliefors Critical Value					0.389	Detected Data appear Lognormal at 10% Significance Level					
1089	Detected Data appear Lognormal at 10% Significance Level											
1090	Note GOF tests may be unreliable for small sample sizes											
1091												
1092	Lognormal ROS Statistics Using Imputed Non-Detects											
1093	Mean in Original Scale					83.17	Mean in Log Scale					4.297
1094	SD in Original Scale					54.15	SD in Log Scale					0.478
1095	95% t UCL (assumes normality of ROS data)					114.6	95% Percentile Bootstrap UCL					114.1
1096	95% BCA Bootstrap UCL					127.6	95% Bootstrap t UCL					163.3
1097	95% H-UCL (Log ROS)					116.7						
1098												
1099	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1100	KM Mean (logged)					4.371	KM Geo Mean					79.08
1101	KM SD (logged)					0.366	95% Critical H Value (KM-Log)					2.049
1102	KM Standard Error of Mean (logged)					0.142	95% H-UCL (KM -Log)					108.6
1103	KM SD (logged)					0.366	95% Critical H Value (KM-Log)					2.049
1104	KM Standard Error of Mean (logged)					0.142						
1105												

	A	B	C	D	E	F	G	H	I	J	K	L		
1106	DL/2 Statistics													
1107	DL/2 Normal						DL/2 Log-Transformed							
1108	Mean in Original Scale						65.85	Mean in Log Scale						3.972
1109	SD in Original Scale						60.39	SD in Log Scale						0.599
1110	95% t UCL (Assumes normality)						100.9	95% H-Stat UCL						101.8
1111	DL/2 is not a recommended method, provided for comparisons and historical reasons													
1112														
1113	Nonparametric Distribution Free UCL Statistics													
1114	Detected Data appear Normal Distributed at 1% Significance Level													
1115														
1116	Suggested UCL to Use													
1117	95% KM (t) UCL						120.8							
1118														
1119	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.													
1120	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.													
1121	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.													
1122														
1123														
1124	NWTPH-Dx (5-w-56)													
1125														
1126	General Statistics													
1127	Total Number of Observations						10	Number of Distinct Observations						9
1128								Number of Missing Observations						0
1129	Minimum						477	Mean						1762
1130	Maximum						5400	Median						1600
1131	SD						1423	Std. Error of Mean						450
1132	Coefficient of Variation						0.807	Skewness						2.088
1133														
1134	Normal GOF Test													
1135	Shapiro Wilk Test Statistic						0.773	Shapiro Wilk GOF Test						
1136	1% Shapiro Wilk Critical Value						0.781	Data Not Normal at 1% Significance Level						
1137	Lilliefors Test Statistic						0.25	Lilliefors GOF Test						
1138	1% Lilliefors Critical Value						0.304	Data appear Normal at 1% Significance Level						
1139	Data appear Approximate Normal at 1% Significance Level													
1140														
1141	Assuming Normal Distribution													
1142	95% Normal UCL						95% UCLs (Adjusted for Skewness)							
1143	95% Student's-t UCL						2587	95% Adjusted-CLT UCL (Chen-1995)						2820
1144								95% Modified-t UCL (Johnson-1978)						2637
1145														
1146	Gamma GOF Test													
1147	A-D Test Statistic						0.35	Anderson-Darling Gamma GOF Test						
1148	5% A-D Critical Value						0.735	Detected data appear Gamma Distributed at 5% Significance Level						
1149	K-S Test Statistic						0.16	Kolmogorov-Smirnov Gamma GOF Test						
1150	5% K-S Critical Value						0.269	Detected data appear Gamma Distributed at 5% Significance Level						
1151	Detected data appear Gamma Distributed at 5% Significance Level													
1152														
1153	Gamma Statistics													
1154	k hat (MLE)						2.256	k star (bias corrected MLE)						1.646
1155	Theta hat (MLE)						781.1	Theta star (bias corrected MLE)						1071
1156	nu hat (MLE)						45.12	nu star (bias corrected)						32.92
1157	MLE Mean (bias corrected)						1762	MLE Sd (bias corrected)						1374
1158								Approximate Chi Square Value (0.05)						20.8
1159	Adjusted Level of Significance						0.0267	Adjusted Chi Square Value						19.14
1160														
1161	Assuming Gamma Distribution													
1162	95% Approximate Gamma UCL						2789	95% Adjusted Gamma UCL						3030
1163														
1164	Lognormal GOF Test													
1165	Shapiro Wilk Test Statistic						0.961	Shapiro Wilk Lognormal GOF Test						
1166	10% Shapiro Wilk Critical Value						0.869	Data appear Lognormal at 10% Significance Level						
1167	Lilliefors Test Statistic						0.178	Lilliefors Lognormal GOF Test						
1168	10% Lilliefors Critical Value						0.241	Data appear Lognormal at 10% Significance Level						
1169	Data appear Lognormal at 10% Significance Level													
1170														

	A	B	C	D	E	F	G	H	I	J	K	L
1171	Lognormal Statistics											
1172	Minimum of Logged Data					6.168	Mean of logged Data					7.237
1173	Maximum of Logged Data					8.594	SD of logged Data					0.714
1174												
1175	Assuming Lognormal Distribution											
1176	95% H-UCL					3296	90% Chebyshev (MVUE) UCL					2956
1177	95% Chebyshev (MVUE) UCL					3508	97.5% Chebyshev (MVUE) UCL					4272
1178	99% Chebyshev (MVUE) UCL					5775						
1179												
1180	Nonparametric Distribution Free UCL Statistics											
1181	Data appear to follow a Discernible Distribution											
1182												
1183	Nonparametric Distribution Free UCLs											
1184	95% CLT UCL					2502	95% BCA Bootstrap UCL					2776
1185	95% Standard Bootstrap UCL					2468	95% Bootstrap-t UCL					3174
1186	95% Hall's Bootstrap UCL					5784	95% Percentile Bootstrap UCL					2552
1187	90% Chebyshev(Mean, Sd) UCL					3112	95% Chebyshev(Mean, Sd) UCL					3724
1188	97.5% Chebyshev(Mean, Sd) UCL					4572	99% Chebyshev(Mean, Sd) UCL					6239
1189												
1190	Suggested UCL to Use											
1191	95% Student's-t UCL					2587						
1192												
1193	When a data set follows an approximate distribution passing only one of the GOF tests,											
1194	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
1195												
1196	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1197	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
1198	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1199												
1200	NWTPH-Dx (gw-1)											
1201												
1202	General Statistics											
1203	Total Number of Observations					14	Number of Distinct Observations					7
1204	Number of Detects					4	Number of Non-Detects					10
1205	Number of Distinct Detects					4	Number of Distinct Non-Detects					3
1206	Minimum Detect					116	Minimum Non-Detect					77
1207	Maximum Detect					191	Maximum Non-Detect					84
1208	Variance Detects					999	Percent Non-Detects					71.43%
1209	Mean Detects					154.5	SD Detects					31.61
1210	Median Detects					155.5	CV Detects					0.205
1211	Skewness Detects					-0.167	Kurtosis Detects					-0.176
1212	Mean of Logged Detects					5.024	SD of Logged Detects					0.211
1213												
1214	Normal GOF Test on Detects Only											
1215	Shapiro Wilk Test Statistic					0.999	Shapiro Wilk GOF Test					
1216	1% Shapiro Wilk Critical Value					0.687	Detected Data appear Normal at 1% Significance Level					
1217	Lilliefors Test Statistic					0.144	Lilliefors GOF Test					
1218	1% Lilliefors Critical Value					0.413	Detected Data appear Normal at 1% Significance Level					
1219	Detected Data appear Normal at 1% Significance Level											
1220	Note GOF tests may be unreliable for small sample sizes											
1221												
1222	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1223	KM Mean					99.14	KM Standard Error of Mean					11.71
1224	90KM SD					37.95	95% KM (BCA) UCL					N/A
1225	95% KM (t) UCL					119.9	95% KM (Percentile Bootstrap) UCL					N/A
1226	95% KM (z) UCL					118.4	95% KM Bootstrap t UCL					N/A
1227	90% KM Chebyshev UCL					134.3	95% KM Chebyshev UCL					150.2
1228	97.5% KM Chebyshev UCL					172.3	99% KM Chebyshev UCL					215.7
1229												
1230	Gamma GOF Tests on Detected Observations Only											
1231	A-D Test Statistic					0.204	Anderson-Darling GOF Test					
1232	5% A-D Critical Value					0.657	Detected data appear Gamma Distributed at 5% Significance Level					
1233	K-S Test Statistic					0.177	Kolmogorov-Smirnov GOF					
1234	5% K-S Critical Value					0.394	Detected data appear Gamma Distributed at 5% Significance Level					
1235	Detected data appear Gamma Distributed at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
1236	Note GOF tests may be unreliable for small sample sizes											
1237												
1238	Gamma Statistics on Detected Data Only											
1239	k hat (MLE)				30.77	k star (bias corrected MLE)						7.858
1240	Theta hat (MLE)				5.022	Theta star (bias corrected MLE)						19.66
1241	nu hat (MLE)				246.1	nu star (bias corrected)						62.86
1242	Mean (detects)				154.5							
1243												
1244	Gamma ROS Statistics using Imputed Non-Detects											
1245	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1246	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1247	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1248	This is especially true when the sample size is small.											
1249	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1250	Minimum				0.01	Mean						71.25
1251	Maximum				191	Median						56.83
1252	SD				62.05	CV						0.871
1253	k hat (MLE)				0.466	k star (bias corrected MLE)						0.414
1254	Theta hat (MLE)				152.8	Theta star (bias corrected MLE)						172.1
1255	nu hat (MLE)				13.05	nu star (bias corrected)						11.59
1256	Adjusted Level of Significance (β)				0.0312							
1257	Approximate Chi Square Value (11.59, α)				4.959	Adjusted Chi Square Value (11.59, β)						4.397
1258	95% Gamma Approximate UCL				166.5	95% Gamma Adjusted UCL						N/A
1259												
1260	Estimates of Gamma Parameters using KM Estimates											
1261	Mean (KM)				99.14	SD (KM)						37.95
1262	Variance (KM)				1440	SE of Mean (KM)						11.71
1263	k hat (KM)				6.827	k star (KM)						5.411
1264	nu hat (KM)				191.1	nu star (KM)						151.5
1265	theta hat (KM)				14.52	theta star (KM)						18.32
1266	80% gamma percentile (KM)				132.1	90% gamma percentile (KM)						156.2
1267	95% gamma percentile (KM)				178	99% gamma percentile (KM)						224.1
1268												
1269	Gamma Kaplan-Meier (KM) Statistics											
1270	Approximate Chi Square Value (151.52, α)				124.1	Adjusted Chi Square Value (151.52, β)						120.8
1271	95% KM Approximate Gamma UCL				121.1	95% KM Adjusted Gamma UCL						124.4
1272												
1273	Lognormal GOF Test on Detected Observations Only											
1274	Shapiro Wilk Test Statistic				0.988	Shapiro Wilk GOF Test						
1275	10% Shapiro Wilk Critical Value				0.792	Detected Data appear Lognormal at 10% Significance Level						
1276	Lilliefors Test Statistic				0.174	Lilliefors GOF Test						
1277	10% Lilliefors Critical Value				0.346	Detected Data appear Lognormal at 10% Significance Level						
1278	Detected Data appear Lognormal at 10% Significance Level											
1279	Note GOF tests may be unreliable for small sample sizes											
1280												
1281	Lognormal ROS Statistics Using Imputed Non-Detects											
1282	Mean in Original Scale				91.38	Mean in Log Scale						4.404
1283	SD in Original Scale				46.57	SD in Log Scale						0.481
1284	95% t UCL (assumes normality of ROS data)				113.4	95% Percentile Bootstrap UCL						112
1285	95% BCA Bootstrap UCL				113.3	95% Bootstrap t UCL						122.5
1286	95% H-UCL (Log ROS)				120							
1287												
1288	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1289	KM Mean (logged)				4.538	KM Geo Mean						93.51
1290	KM SD (logged)				0.322	95% Critical H Value (KM-Log)						1.913
1291	KM Standard Error of Mean (logged)				0.0995	95% H-UCL (KM -Log)						116.9
1292	KM SD (logged)				0.322	95% Critical H Value (KM-Log)						1.913
1293	KM Standard Error of Mean (logged)				0.0995							
1294												
1295	DL/2 Statistics											
1296	DL/2 Normal					DL/2 Log-Transformed						
1297	Mean in Original Scale				71.96	Mean in Log Scale						4.051
1298	SD in Original Scale				56.27	SD in Log Scale						0.647
1299	95% t UCL (Assumes normality)				98.59	95% H-Stat UCL						106.5
1300	DL/2 is not a recommended method, provided for comparisons and historical reasons											

	A	B	C	D	E	F	G	H	I	J	K	L
1301												
1302	Nonparametric Distribution Free UCL Statistics											
1303	Detected Data appear Normal Distributed at 1% Significance Level											
1304												
1305	Suggested UCL to Use											
1306	95% KM (t) UCL					119.9						
1307												
1308	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1309	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
1310	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1311												
1312	NWTPH-Dx (gw-2)											
1313												
1314	General Statistics											
1315	Total Number of Observations					14	Number of Distinct Observations					6
1316	Number of Detects					3	Number of Non-Detects					11
1317	Number of Distinct Detects					3	Number of Distinct Non-Detects					3
1318	Minimum Detect					68	Minimum Non-Detect					38
1319	Maximum Detect					230	Maximum Non-Detect					81
1320	Variance Detects					6737	Percent Non-Detects					78.57%
1321	Mean Detects					141.3	SD Detects					82.08
1322	Median Detects					126	CV Detects					0.581
1323	Skewness Detects					0.811	Kurtosis Detects					N/A
1324	Mean of Logged Detects					4.831	SD of Logged Detects					0.609
1325												
1326	Warning: Data set has only 3 Detected Values.											
1327	This is not enough to compute meaningful or reliable statistics and estimates.											
1328												
1329												
1330	Normal GOF Test on Detects Only											
1331	Shapiro Wilk Test Statistic					0.974	Shapiro Wilk GOF Test					
1332	1% Shapiro Wilk Critical Value					0.753	Detected Data appear Normal at 1% Significance Level					
1333	Lilliefors Test Statistic					0.241	Lilliefors GOF Test					
1334	1% Lilliefors Critical Value					0.429	Detected Data appear Normal at 1% Significance Level					
1335	Detected Data appear Normal at 1% Significance Level											
1336	Note GOF tests may be unreliable for small sample sizes											
1337												
1338	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1339	KM Mean					70.86	KM Standard Error of Mean					19.24
1340	90KM SD					49.92	95% KM (BCA) UCL					N/A
1341	95% KM (t) UCL					104.9	95% KM (Percentile Bootstrap) UCL					N/A
1342	95% KM (z) UCL					102.5	95% KM Bootstrap t UCL					N/A
1343	90% KM Chebyshev UCL					128.6	95% KM Chebyshev UCL					154.7
1344	97.5% KM Chebyshev UCL					191	99% KM Chebyshev UCL					262.3
1345												
1346	Gamma GOF Tests on Detected Observations Only											
1347	A-D Test Statistic					0.249	Anderson-Darling GOF Test					
1348	5% A-D Critical Value					0.637	Detected data appear Gamma Distributed at 5% Significance Level					
1349	K-S Test Statistic					0.229	Kolmogorov-Smirnov GOF					
1350	5% K-S Critical Value					0.434	Detected data appear Gamma Distributed at 5% Significance Level					
1351	Detected Data Not Gamma Distributed at 5% Significance Level											
1352												
1353	Gamma Statistics on Detected Data Only											
1354	k hat (MLE)					4.332	k star (bias corrected MLE)					N/A
1355	Theta hat (MLE)					32.62	Theta star (bias corrected MLE)					N/A
1356	nu hat (MLE)					25.99	nu star (bias corrected)					N/A
1357	Mean (detects)					141.3						
1358												
1359	Gamma ROS Statistics using Imputed Non-Detects											
1360	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1361	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1362	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1363	This is especially true when the sample size is small.											
1364	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1365	Minimum					0.01	Mean					48.75

	A	B	C	D	E	F	G	H	I	J	K	L	
1366	Maximum					230	Median					18.85	
1367	SD					66.26	CV					1.359	
1368	k hat (MLE)					0.237	k star (bias corrected MLE)					0.234	
1369	Theta hat (MLE)					206	Theta star (bias corrected MLE)					208.7	
1370	nu hat (MLE)					6.627	nu star (bias corrected)					6.54	
1371	Adjusted Level of Significance (β)					0.0312							
1372	Approximate Chi Square Value (6.54, α)					1.922	Adjusted Chi Square Value (6.54, β)					1.608	
1373	95% Gamma Approximate UCL					165.9	95% Gamma Adjusted UCL					N/A	
1374													
1375	Estimates of Gamma Parameters using KM Estimates												
1376	Mean (KM)					70.86	SD (KM)					49.92	
1377	Variance (KM)					2492	SE of Mean (KM)					19.24	
1378	k hat (KM)					2.014	k star (KM)					1.63	
1379	nu hat (KM)					56.4	nu star (KM)					45.65	
1380	theta hat (KM)					35.18	theta star (KM)					43.46	
1381	80% gamma percentile (KM)					108.6	90% gamma percentile (KM)					144.7	
1382	95% gamma percentile (KM)					179.5	99% gamma percentile (KM)					257.8	
1383													
1384	Gamma Kaplan-Meier (KM) Statistics												
1385	Approximate Chi Square Value (45.65, α)					31.15	Adjusted Chi Square Value (45.65, β)					29.57	
1386	95% KM Approximate Gamma UCL					103.8	95% KM Adjusted Gamma UCL					109.4	
1387													
1388	Lognormal GOF Test on Detected Observations Only												
1389	Shapiro Wilk Test Statistic					1	Shapiro Wilk GOF Test						
1390	10% Shapiro Wilk Critical Value					0.789	Detected Data appear Lognormal at 10% Significance Level						
1391	Lilliefors Test Statistic					0.176	Lilliefors GOF Test						
1392	10% Lilliefors Critical Value					0.389	Detected Data appear Lognormal at 10% Significance Level						
1393	Detected Data appear Lognormal at 10% Significance Level												
1394	Note GOF tests may be unreliable for small sample sizes												
1395													
1396	Lognormal ROS Statistics Using Imputed Non-Detects												
1397	Mean in Original Scale					63.72	Mean in Log Scale					3.873	
1398	SD in Original Scale					56.81	SD in Log Scale					0.754	
1399	95% t UCL (assumes normality of ROS data)					90.61	95% Percentile Bootstrap UCL					89.32	
1400	95% BCA Bootstrap UCL					98.34	95% Bootstrap t UCL					119.4	
1401	95% H-UCL (Log ROS)					105.9							
1402													
1403	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
1404	KM Mean (logged)					4.101	KM Geo Mean					60.41	
1405	KM SD (logged)					0.514	95% Critical H Value (KM-Log)					2.025	
1406	KM Standard Error of Mean (logged)					0.259	95% H-UCL (KM -Log)					92.04	
1407	KM SD (logged)					0.514	95% Critical H Value (KM-Log)					2.025	
1408	KM Standard Error of Mean (logged)					0.259							
1409													
1410	DL/2 Statistics												
1411	DL/2 Normal					DL/2 Log-Transformed							
1412	Mean in Original Scale					59.29	Mean in Log Scale					3.857	
1413	SD in Original Scale					55.15	SD in Log Scale					0.61	
1414	95% t UCL (Assumes normality)					85.39	95% H-Stat UCL					82.94	
1415	DL/2 is not a recommended method, provided for comparisons and historical reasons												
1416													
1417	Nonparametric Distribution Free UCL Statistics												
1418	Detected Data appear Normal Distributed at 1% Significance Level												
1419													
1420	Suggested UCL to Use												
1421	95% KM (t) UCL					104.9							
1422													
1423	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
1424	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.												
1425	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
1426													
1427	NWTPH-Dx (gw-3)												
1428													
1429	General Statistics												
1430	Total Number of Observations					10	Number of Distinct Observations					9	

	A	B	C	D	E	F	G	H	I	J	K	L
1431					Number of Detects	7					Number of Non-Detects	3
1432					Number of Distinct Detects	7					Number of Distinct Non-Detects	2
1433					Minimum Detect	137					Minimum Non-Detect	38
1434					Maximum Detect	780					Maximum Non-Detect	77
1435					Variance Detects	86905					Percent Non-Detects	30%
1436					Mean Detects	441.9					SD Detects	294.8
1437					Median Detects	460					CV Detects	0.667
1438					Skewness Detects	0.0477					Kurtosis Detects	-2.386
1439					Mean of Logged Detects	5.84					SD of Logged Detects	0.811
1440												
1441	Normal GOF Test on Detects Only											
1442					Shapiro Wilk Test Statistic	0.826					Shapiro Wilk GOF Test	
1443					1% Shapiro Wilk Critical Value	0.73					Detected Data appear Normal at 1% Significance Level	
1444					Lilliefors Test Statistic	0.263					Lilliefors GOF Test	
1445					1% Lilliefors Critical Value	0.35					Detected Data appear Normal at 1% Significance Level	
1446	Detected Data appear Normal at 1% Significance Level											
1447	Note GOF tests may be unreliable for small sample sizes											
1448												
1449	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1450					KM Mean	320.7					KM Standard Error of Mean	100.4
1451					90KM SD	293.9					95% KM (BCA) UCL	482.7
1452					95% KM (t) UCL	504.7					95% KM (Percentile Bootstrap) UCL	482.9
1453					95% KM (z) UCL	485.8					95% KM Bootstrap t UCL	536.7
1454					90% KM Chebyshev UCL	621.9					95% KM Chebyshev UCL	758.3
1455					97.5% KM Chebyshev UCL	947.7					99% KM Chebyshev UCL	1320
1456												
1457	Gamma GOF Tests on Detected Observations Only											
1458					A-D Test Statistic	0.695					Anderson-Darling GOF Test	
1459					5% A-D Critical Value	0.715					Detected data appear Gamma Distributed at 5% Significance Level	
1460					K-S Test Statistic	0.285					Kolmogorov-Smirnov GOF	
1461					5% K-S Critical Value	0.315					Detected data appear Gamma Distributed at 5% Significance Level	
1462	Detected data appear Gamma Distributed at 5% Significance Level											
1463	Note GOF tests may be unreliable for small sample sizes											
1464												
1465	Gamma Statistics on Detected Data Only											
1466					k hat (MLE)	2.143					k star (bias corrected MLE)	1.32
1467					Theta hat (MLE)	206.2					Theta star (bias corrected MLE)	334.8
1468					nu hat (MLE)	30					nu star (bias corrected)	18.48
1469					Mean (detects)	441.9						
1470												
1471	Gamma ROS Statistics using Imputed Non-Detects											
1472	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1473	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1474	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1475	This is especially true when the sample size is small.											
1476	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1477					Minimum	0.01					Mean	309.3
1478					Maximum	780					Median	153
1479					SD	321.7					CV	1.04
1480					k hat (MLE)	0.237					k star (bias corrected MLE)	0.232
1481					Theta hat (MLE)	1307					Theta star (bias corrected MLE)	1331
1482					nu hat (MLE)	4.733					nu star (bias corrected)	4.646
1483					Adjusted Level of Significance (β)	0.0267						
1484					Approximate Chi Square Value (4.65, α)	0.993					Adjusted Chi Square Value (4.65, β)	0.736
1485					95% Gamma Approximate UCL	1448					95% Gamma Adjusted UCL	1954
1486												
1487	Estimates of Gamma Parameters using KM Estimates											
1488					Mean (KM)	320.7					SD (KM)	293.9
1489					Variance (KM)	86394					SE of Mean (KM)	100.4
1490					k hat (KM)	1.19					k star (KM)	0.9
1491					nu hat (KM)	23.81					nu star (KM)	18
1492					theta hat (KM)	269.4					theta star (KM)	356.3
1493					80% gamma percentile (KM)	520.3					90% gamma percentile (KM)	757.8
1494					95% gamma percentile (KM)	997.4					99% gamma percentile (KM)	1558
1495												

	A	B	C	D	E	F	G	H	I	J	K	L
1496	Gamma Kaplan-Meier (KM) Statistics											
1497	Approximate Chi Square Value (18.00, α)					9.391	Adjusted Chi Square Value (18.00, β)					8.331
1498	95% KM Approximate Gamma UCL					614.7	95% KM Adjusted Gamma UCL					692.9
1499												
1500	Lognormal GOF Test on Detected Observations Only											
1501	Shapiro Wilk Test Statistic					0.799	Shapiro Wilk GOF Test					
1502	10% Shapiro Wilk Critical Value					0.838	Detected Data Not Lognormal at 10% Significance Level					
1503	Lilliefors Test Statistic					0.265	Lilliefors GOF Test					
1504	10% Lilliefors Critical Value					0.28	Detected Data appear Lognormal at 10% Significance Level					
1505	Detected Data appear Approximate Lognormal at 10% Significance Level											
1506	Note GOF tests may be unreliable for small sample sizes											
1507												
1508	Lognormal ROS Statistics Using Imputed Non-Detects											
1509	Mean in Original Scale					324.6	Mean in Log Scale					5.259
1510	SD in Original Scale					306	SD in Log Scale					1.153
1511	95% t UCL (assumes normality of ROS data)					502	95% Percentile Bootstrap UCL					482
1512	95% BCA Bootstrap UCL					487.1	95% Bootstrap t UCL					547.2
1513	95% H-UCL (Log ROS)					1397						
1514												
1515	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1516	KM Mean (logged)					5.179	KM Geo Mean					177.5
1517	KM SD (logged)					1.189	95% Critical H Value (KM-Log)					3.504
1518	KM Standard Error of Mean (logged)					0.406	95% H-UCL (KM -Log)					1443
1519	KM SD (logged)					1.189	95% Critical H Value (KM-Log)					3.504
1520	KM Standard Error of Mean (logged)					0.406						
1521												
1522	DL/2 Statistics											
1523	DL/2 Normal					DL/2 Log-Transformed						
1524	Mean in Original Scale					318.9	Mean in Log Scale					5.112
1525	SD in Original Scale					311.7	SD in Log Scale					1.359
1526	95% t UCL (Assumes normality)					499.6	95% H-Stat UCL					2430
1527	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1528												
1529	Nonparametric Distribution Free UCL Statistics											
1530	Detected Data appear Normal Distributed at 1% Significance Level											
1531												
1532	Suggested UCL to Use											
1533	95% KM (t) UCL					504.7						
1534												
1535	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1536	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
1537	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1538												
1539	NWTPH-Dx (gw-4)											
1540												
1541	General Statistics											
1542	Total Number of Observations					10	Number of Distinct Observations					5
1543	Number of Detects					3	Number of Non-Detects					7
1544	Number of Distinct Detects					3	Number of Distinct Non-Detects					2
1545	Minimum Detect					104	Minimum Non-Detect					38
1546	Maximum Detect					141	Maximum Non-Detect					77
1547	Variance Detects					342.3	Percent Non-Detects					70%
1548	Mean Detects					122.7	SD Detects					18.5
1549	Median Detects					123	CV Detects					0.151
1550	Skewness Detects					-0.081	Kurtosis Detects					N/A
1551	Mean of Logged Detects					4.802	SD of Logged Detects					0.152
1552												
1553	Warning: Data set has only 3 Detected Values.											
1554	This is not enough to compute meaningful or reliable statistics and estimates.											
1555												
1556												
1557	Normal GOF Test on Detects Only											
1558	Shapiro Wilk Test Statistic					1	Shapiro Wilk GOF Test					
1559	1% Shapiro Wilk Critical Value					0.753	Detected Data appear Normal at 1% Significance Level					
1560	Lilliefors Test Statistic					0.177	Lilliefors GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L	
1561	1% Lilliefors Critical Value					0.429	Detected Data appear Normal at 1% Significance Level						
1562	Detected Data appear Normal at 1% Significance Level												
1563	Note GOF tests may be unreliable for small sample sizes												
1564													
1565	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
1566	KM Mean					63.4	KM Standard Error of Mean					15.36	
1567	90KM SD					39.67	95% KM (BCA) UCL					N/A	
1568	95% KM (t) UCL					91.57	95% KM (Percentile Bootstrap) UCL					N/A	
1569	95% KM (z) UCL					88.67	95% KM Bootstrap t UCL					N/A	
1570	90% KM Chebyshev UCL					109.5	95% KM Chebyshev UCL					130.4	
1571	97.5% KM Chebyshev UCL					159.4	99% KM Chebyshev UCL					216.3	
1572													
1573	Gamma GOF Tests on Detected Observations Only												
1574	A-D Test Statistic					0.248	Anderson-Darling GOF Test						
1575	5% A-D Critical Value					0.634	Detected data appear Gamma Distributed at 5% Significance Level						
1576	K-S Test Statistic					0.229	Kolmogorov-Smirnov GOF						
1577	5% K-S Critical Value					0.431	Detected data appear Gamma Distributed at 5% Significance Level						
1578	Detected Data Not Gamma Distributed at 5% Significance Level												
1579													
1580	Gamma Statistics on Detected Data Only												
1581	k hat (MLE)					65.17	k star (bias corrected MLE)					N/A	
1582	Theta hat (MLE)					1.882	Theta star (bias corrected MLE)					N/A	
1583	nu hat (MLE)					391	nu star (bias corrected)					N/A	
1584	Mean (detects)					122.7							
1585													
1586	Gamma ROS Statistics using Imputed Non-Detects												
1587	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1588	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)												
1589	For such situations, GROS method may yield incorrect values of UCLs and BTVs												
1590	This is especially true when the sample size is small.												
1591	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
1592	Minimum					8.239	Mean					69.85	
1593	Maximum					141	Median					61.42	
1594	SD					42.32	CV					0.606	
1595	k hat (MLE)					2.26	k star (bias corrected MLE)					1.649	
1596	Theta hat (MLE)					30.9	Theta star (bias corrected MLE)					42.36	
1597	nu hat (MLE)					45.21	nu star (bias corrected)					32.98	
1598	Adjusted Level of Significance (β)					0.0267							
1599	Approximate Chi Square Value (32.98, α)					20.85	Adjusted Chi Square Value (32.98, β)					19.19	
1600	95% Gamma Approximate UCL					110.5	95% Gamma Adjusted UCL					N/A	
1601													
1602	Estimates of Gamma Parameters using KM Estimates												
1603	Mean (KM)					63.4	SD (KM)					39.67	
1604	Variance (KM)					1574	SE of Mean (KM)					15.36	
1605	k hat (KM)					2.554	k star (KM)					1.854	
1606	nu hat (KM)					51.08	nu star (KM)					37.09	
1607	theta hat (KM)					24.82	theta star (KM)					34.19	
1608	80% gamma percentile (KM)					95.76	90% gamma percentile (KM)					125.5	
1609	95% gamma percentile (KM)					154	99% gamma percentile (KM)					217.6	
1610													
1611	Gamma Kaplan-Meier (KM) Statistics												
1612	Approximate Chi Square Value (37.09, α)					24.15	Adjusted Chi Square Value (37.09, β)					22.35	
1613	95% KM Approximate Gamma UCL					97.38	95% KM Adjusted Gamma UCL					105.2	
1614													
1615	Lognormal GOF Test on Detected Observations Only												
1616	Shapiro Wilk Test Statistic					0.996	Shapiro Wilk GOF Test						
1617	10% Shapiro Wilk Critical Value					0.789	Detected Data appear Lognormal at 10% Significance Level						
1618	Lilliefors Test Statistic					0.194	Lilliefors GOF Test						
1619	10% Lilliefors Critical Value					0.389	Detected Data appear Lognormal at 10% Significance Level						
1620	Detected Data appear Lognormal at 10% Significance Level												
1621	Note GOF tests may be unreliable for small sample sizes												
1622													
1623	Lognormal ROS Statistics Using Imputed Non-Detects												
1624	Mean in Original Scale					81.74	Mean in Log Scale					4.339	
1625	SD in Original Scale					31.67	SD in Log Scale					0.375	

	A	B	C	D	E	F	G	H	I	J	K	L
1626	95% t UCL (assumes normality of ROS data)					100.1	95% Percentile Bootstrap UCL					98.12
1627	95% BCA Bootstrap UCL					99.55	95% Bootstrap t UCL					105.3
1628	95% H-UCL (Log ROS)					106.4						
1629												
1630	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1631	KM Mean (logged)					3.987	KM Geo Mean					53.88
1632	KM SD (logged)					0.538	95% Critical H Value (KM-Log)					2.274
1633	KM Standard Error of Mean (logged)					0.208	95% H-UCL (KM -Log)					93.61
1634	KM SD (logged)					0.538	95% Critical H Value (KM-Log)					2.274
1635	KM Standard Error of Mean (logged)					0.208						
1636												
1637	DL/2 Statistics											
1638	DL/2 Normal					DL/2 Log-Transformed						
1639	Mean in Original Scale					61.8	Mean in Log Scale					3.925
1640	SD in Original Scale					43.32	SD in Log Scale					0.647
1641	95% t UCL (Assumes normality)					86.91	95% H-Stat UCL					105.8
1642	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1643												
1644	Nonparametric Distribution Free UCL Statistics											
1645	Detected Data appear Normal Distributed at 1% Significance Level											
1646												
1647	Suggested UCL to Use											
1648	95% KM (t) UCL					91.57						
1649												
1650	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1651	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
1652	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1653												
1654	NWTPH-Dx (mw-4)											
1655												
1656	General Statistics											
1657	Total Number of Observations					10	Number of Distinct Observations					10
1658	Number of Detects					9	Number of Non-Detects					1
1659	Number of Distinct Detects					9	Number of Distinct Non-Detects					1
1660	Minimum Detect					109	Minimum Non-Detect					77
1661	Maximum Detect					600	Maximum Non-Detect					77
1662	Variance Detects					22800	Percent Non-Detects					10%
1663	Mean Detects					344.1	SD Detects					151
1664	Median Detects					350	CV Detects					0.439
1665	Skewness Detects					-0.148	Kurtosis Detects					0.153
1666	Mean of Logged Detects					5.726	SD of Logged Detects					0.554
1667												
1668	Normal GOF Test on Detects Only											
1669	Shapiro Wilk Test Statistic					0.943	Shapiro Wilk GOF Test					
1670	1% Shapiro Wilk Critical Value					0.764	Detected Data appear Normal at 1% Significance Level					
1671	Lilliefors Test Statistic					0.188	Lilliefors GOF Test					
1672	1% Lilliefors Critical Value					0.316	Detected Data appear Normal at 1% Significance Level					
1673	Detected Data appear Normal at 1% Significance Level											
1674	Note GOF tests may be unreliable for small sample sizes											
1675												
1676	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1677	KM Mean					317.4	KM Standard Error of Mean					52.67
1678	90KM SD					157	95% KM (BCA) UCL					403
1679	95% KM (t) UCL					414	95% KM (Percentile Bootstrap) UCL					396.7
1680	95% KM (z) UCL					404	95% KM Bootstrap t UCL					406.5
1681	90% KM Chebyshev UCL					475.4	95% KM Chebyshev UCL					547
1682	97.5% KM Chebyshev UCL					646.3	99% KM Chebyshev UCL					841.5
1683												
1684	Gamma GOF Tests on Detected Observations Only											
1685	A-D Test Statistic					0.543	Anderson-Darling GOF Test					
1686	5% A-D Critical Value					0.724	Detected data appear Gamma Distributed at 5% Significance Level					
1687	K-S Test Statistic					0.254	Kolmogorov-Smirnov GOF					
1688	5% K-S Critical Value					0.28	Detected data appear Gamma Distributed at 5% Significance Level					
1689	Detected data appear Gamma Distributed at 5% Significance Level											
1690	Note GOF tests may be unreliable for small sample sizes											

	A	B	C	D	E	F	G	H	I	J	K	L
1691												
1692	Gamma Statistics on Detected Data Only											
1693					k hat (MLE)	4.52					k star (bias corrected MLE)	3.087
1694					Theta hat (MLE)	76.13					Theta star (bias corrected MLE)	111.5
1695					nu hat (MLE)	81.36					nu star (bias corrected)	55.57
1696					Mean (detects)	344.1						
1697												
1698	Gamma ROS Statistics using Imputed Non-Detects											
1699	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1700	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1701	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1702	This is especially true when the sample size is small.											
1703	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1704					Minimum	72.91					Mean	317
1705					Maximum	600					Median	335
1706					SD	166.2					CV	0.524
1707					k hat (MLE)	2.992					k star (bias corrected MLE)	2.161
1708					Theta hat (MLE)	105.9					Theta star (bias corrected MLE)	146.7
1709					nu hat (MLE)	59.85					nu star (bias corrected)	43.23
1710					Adjusted Level of Significance (β)	0.0267						
1711					Approximate Chi Square Value (43.23, α)	29.15					Adjusted Chi Square Value (43.23, β)	27.16
1712					95% Gamma Approximate UCL	470					95% Gamma Adjusted UCL	504.6
1713												
1714	Estimates of Gamma Parameters using KM Estimates											
1715					Mean (KM)	317.4					SD (KM)	157
1716					Variance (KM)	24661					SE of Mean (KM)	52.67
1717					k hat (KM)	4.085					k star (KM)	2.926
1718					nu hat (KM)	81.7					nu star (KM)	58.52
1719					theta hat (KM)	77.7					theta star (KM)	108.5
1720					80% gamma percentile (KM)	454.1					90% gamma percentile (KM)	566.2
1721					95% gamma percentile (KM)	670.9					99% gamma percentile (KM)	898.2
1722												
1723	Gamma Kaplan-Meier (KM) Statistics											
1724					Approximate Chi Square Value (58.52, α)	41.94					Adjusted Chi Square Value (58.52, β)	39.51
1725					95% KM Approximate Gamma UCL	443					95% KM Adjusted Gamma UCL	470.2
1726												
1727	Lognormal GOF Test on Detected Observations Only											
1728					Shapiro Wilk Test Statistic	0.861					Shapiro Wilk GOF Test	
1729					10% Shapiro Wilk Critical Value	0.859					Detected Data appear Lognormal at 10% Significance Level	
1730					Lilliefors Test Statistic	0.285					Lilliefors GOF Test	
1731					10% Lilliefors Critical Value	0.252					Detected Data Not Lognormal at 10% Significance Level	
1732	Detected Data appear Approximate Lognormal at 10% Significance Level											
1733	Note GOF tests may be unreliable for small sample sizes											
1734												
1735	Lognormal ROS Statistics Using Imputed Non-Detects											
1736					Mean in Original Scale	318.4					Mean in Log Scale	5.601
1737					SD in Original Scale	163.9					SD in Log Scale	0.656
1738					95% t UCL (assumes normality of ROS data)	413.4					95% Percentile Bootstrap UCL	400
1739					95% BCA Bootstrap UCL	399.8					95% Bootstrap t UCL	414
1740					95% H-UCL (Log ROS)	574.4						
1741												
1742	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1743					KM Mean (logged)	5.588					KM Geo Mean	267.2
1744					KM SD (logged)	0.646					95% Critical H Value (KM-Log)	2.441
1745					KM Standard Error of Mean (logged)	0.217					95% H-UCL (KM -Log)	556.8
1746					KM SD (logged)	0.646					95% Critical H Value (KM-Log)	2.441
1747					KM Standard Error of Mean (logged)	0.217						
1748												
1749	DL/2 Statistics											
1750	DL/2 Normal					DL/2 Log-Transformed						
1751					Mean in Original Scale	313.6					Mean in Log Scale	5.519
1752					SD in Original Scale	172.1					SD in Log Scale	0.839
1753					95% t UCL (Assumes normality)	413.3					95% H-Stat UCL	771.3
1754	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1755												

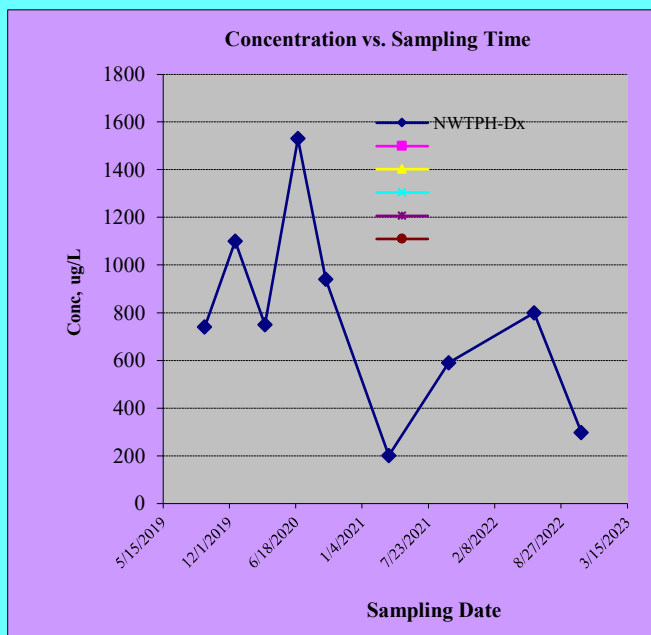
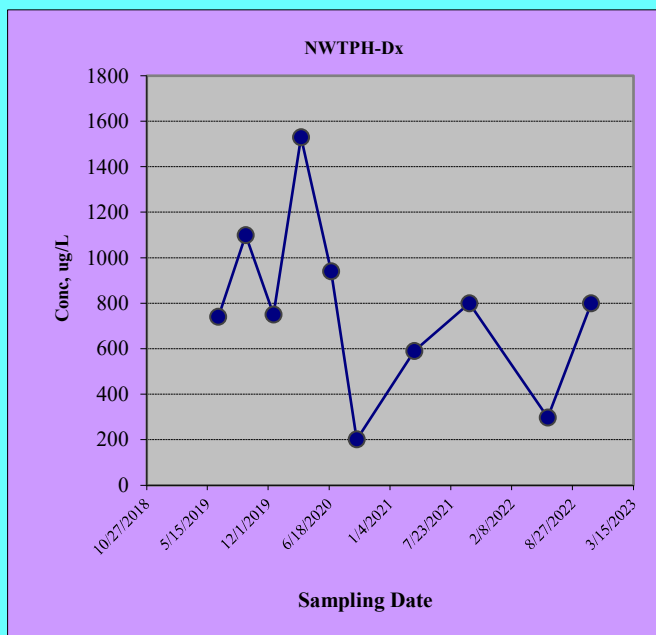
	A	B	C	D	E	F	G	H	I	J	K	L
1756	Nonparametric Distribution Free UCL Statistics											
1757	Detected Data appear Normal Distributed at 1% Significance Level											
1758												
1759	Suggested UCL to Use											
1760	95% KM (t) UCL				414							
1761												
1762	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1763	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
1764	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1765												

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)Site Name: *BNSF Skykomish*Site Address: *Skykomish, WA*Additional Description: *2022 Annual LTM*Well (Sampling) Location? **5-W-51**Level of Confidence (Decision Criteria)? **85%****1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	NWTPH-Dx					
#1	6/19/2019	740					
#2	9/17/2019	1100					
#3	12/18/2019	750					
#4	3/17/2020	1530					
#5	6/24/2020	940					
#6	9/16/2020	201					
#7	3/25/2021	590					
#8	9/22/2021	800					
#9	6/6/2022	297					
#10	10/26/2022	800					
#11							
#12							
#13							
#14							
#15							
#16							

2. Mann-Kendall Non-parametric Statistical Test Results

Hazardous Substance?	NWTPH-Dx					
Confidence Level Calculated?	70.00%	NA	NA	NA	NA	NA
Plume Stability?	Stable	NA	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1	n<4	n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	-8	0	0	0	0	0
Number of Sampling Rounds?	10	0	0	0	0	0
Average Concentration?	774.80	NA	NA	NA	NA	NA
Standard Deviation?	379.79	NA	NA	NA	NA	NA
Coefficient of Variation?	0.49	NA	NA	NA	NA	NA
Blank if No Errors found		n<4	n<4	n<4	n<4	n<4

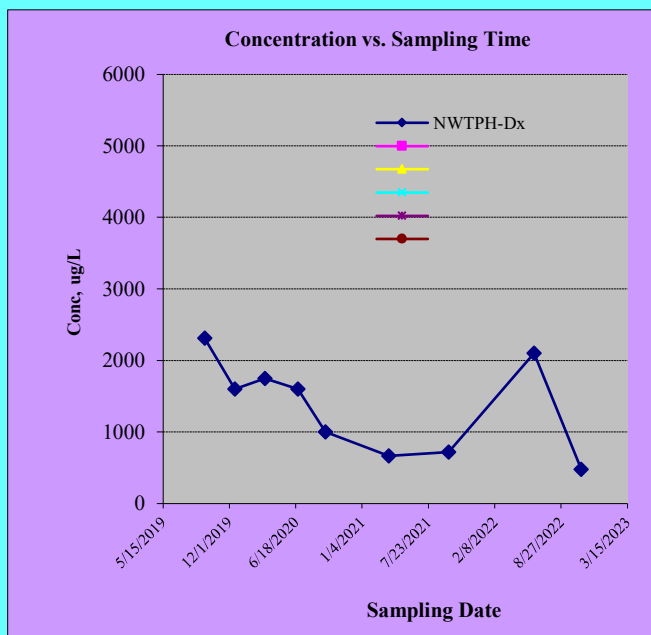
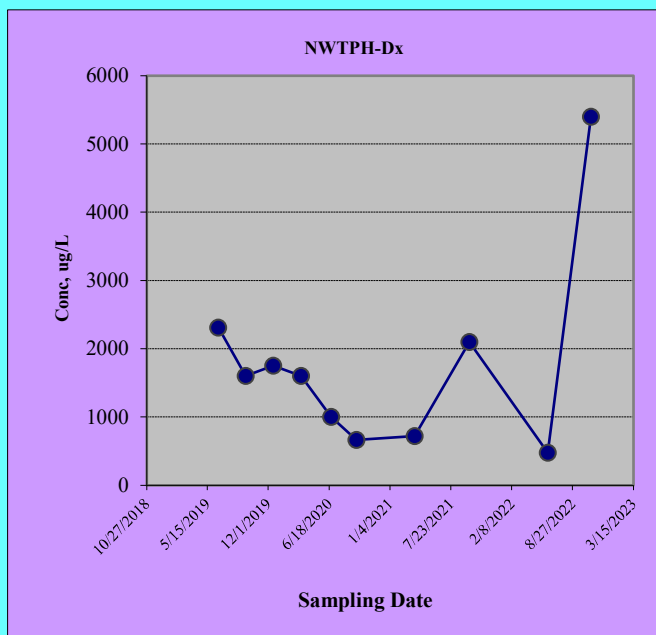
3. Temporal Trend: Plot of Concentration vs. Sampling TimeHazardous substance? **NWTPH-Dx**Plume Stability? **Stable**

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)Site Name: *BNSF Skykomish*Site Address: *Skykomish, WA*Additional Description: *2022 Annual LTM*Well (Sampling) Location? **5-W-56**Level of Confidence (Decision Criteria)? **85%****1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	NWTPH-Dx					
#1	6/19/2019	2310					
#2	9/17/2019	1600					
#3	12/17/2019	1750					
#4	3/17/2020	1600					
#5	6/24/2020	1000					
#6	9/15/2020	665					
#7	3/25/2021	720					
#8	9/22/2021	2100					
#9	6/6/2022	477					
#10	10/26/2022	5400					
#11							
#12							
#13							
#14							
#15							
#16							

2. Mann-Kendall Non-parametric Statistical Test Results

Hazardous Substance?	NWTPH-Dx					
Confidence Level Calculated?	75.80%	NA	NA	NA	NA	NA
Plume Stability?	Stable	NA	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1	n<4	n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	-10	0	0	0	0	0
Number of Sampling Rounds?	10	0	0	0	0	0
Average Concentration?	1762.20	NA	NA	NA	NA	NA
Standard Deviation?	1422.96	NA	NA	NA	NA	NA
Coefficient of Variation?	0.81	NA	NA	NA	NA	NA
Blank if No Errors found		n<4	n<4	n<4	n<4	n<4

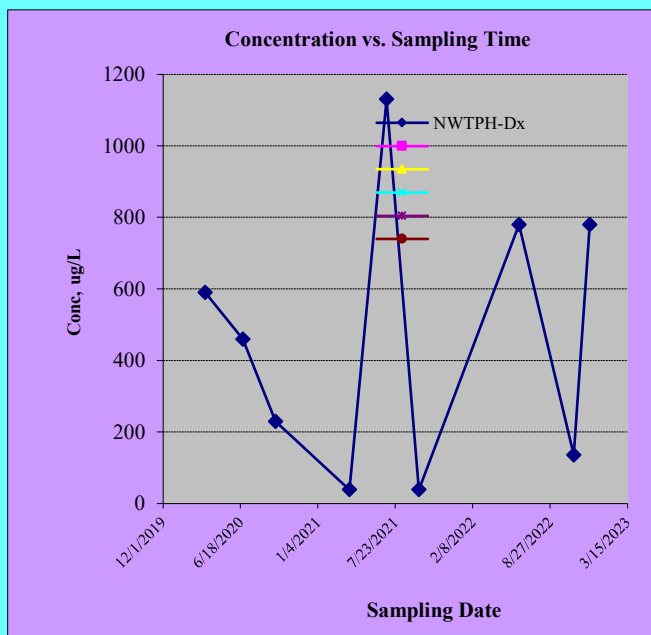
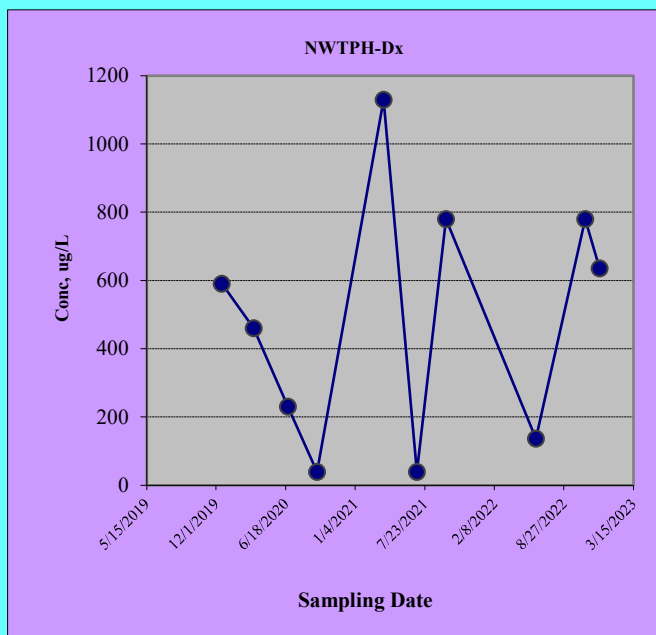
3. Temporal Trend: Plot of Concentration vs. Sampling TimeHazardous substance? **NWTPH-Dx**Plume Stability? **Stable**

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)Site Name: *BNSF Skykomish*Site Address: *Skykomish, WA*Additional Description: *2022 Annual LTM*Well (Sampling) Location? **2A-W-41**Level of Confidence (Decision Criteria)? **85%****1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	NWTPH-Dx					
#1	12/17/2019	590					
#2	3/18/2020	460					
#3	6/24/2020	230					
#4	9/16/2020	39					
#5	3/26/2021	1130					
#6	6/30/2021	39					
#7	9/22/2021	780					
#8	6/7/2022	136					
#9	10/27/2022	780					
#10	12/7/2022	635					
#11							
#12							
#13							
#14							
#15							
#16							

2. Mann-Kendall Non-parametric Statistical Test Results

Hazardous Substance?	NWTPH-Dx					
Confidence Level Calculated?	56.90%	NA	NA	NA	NA	NA
Plume Stability?	Stable	NA	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1	n<4	n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	3	0	0	0	0	0
Number of Sampling Rounds?	10	0	0	0	0	0
Average Concentration?	481.90	NA	NA	NA	NA	NA
Standard Deviation?	366.48	NA	NA	NA	NA	NA
Coefficient of Variation?	0.76	NA	NA	NA	NA	NA
Blank if No Errors found		n<4	n<4	n<4	n<4	n<4

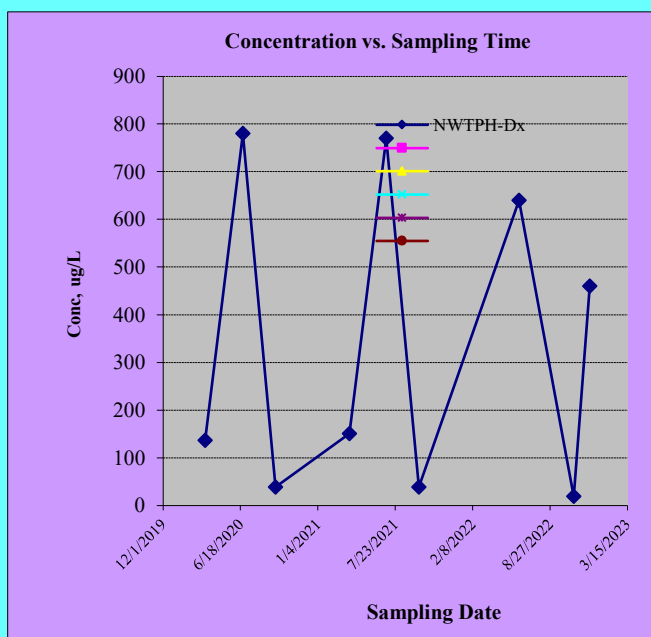
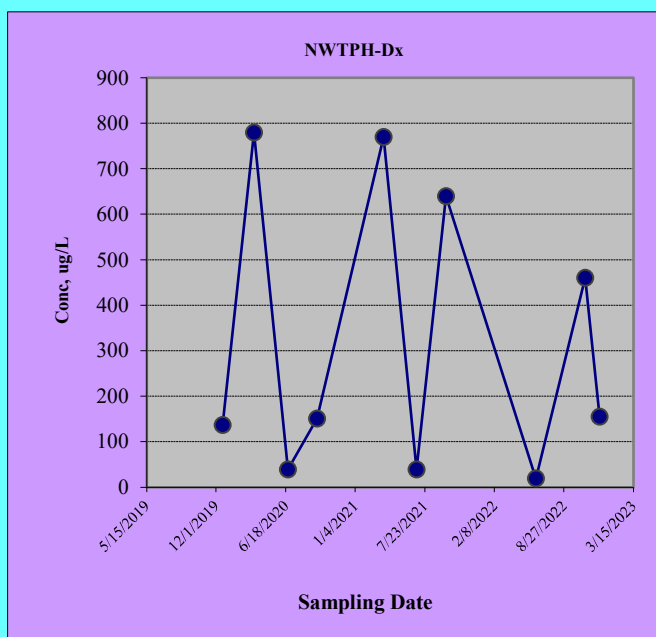
3. Temporal Trend: Plot of Concentration vs. Sampling TimeHazardous substance? **NWTPH-Dx**Plume Stability? **Stable**

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)Site Name: *BNSF Skykomish*Site Address: *Skykomish, WA*Additional Description: *2022 Annual LTM*Well (Sampling) Location? **GW-3**Level of Confidence (Decision Criteria)? **85%****1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	NWTPH-Dx					
#1	12/19/2019	137					
#2	3/18/2020	780					
#3	6/24/2020	39					
#4	9/16/2020	151					
#5	3/26/2021	770					
#6	6/29/2021	39					
#7	9/22/2021	640					
#8	6/7/2022	19					
#9	10/27/2022	460					
#10	12/7/2022	155					
#11							
#12							
#13							
#14							
#15							
#16							

2. Mann-Kendall Non-parametric Statistical Test Results

Hazardous Substance?	NWTPH-Dx					
Confidence Level Calculated?	56.90%	NA	NA	NA	NA	NA
Plume Stability?	Stable	NA	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1	n<4	n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	-4	0	0	0	0	0
Number of Sampling Rounds?	10	0	0	0	0	0
Average Concentration?	319.00	NA	NA	NA	NA	NA
Standard Deviation?	311.61	NA	NA	NA	NA	NA
Coefficient of Variation?	0.98	NA	NA	NA	NA	NA
Blank if No Errors found		n<4	n<4	n<4	n<4	n<4

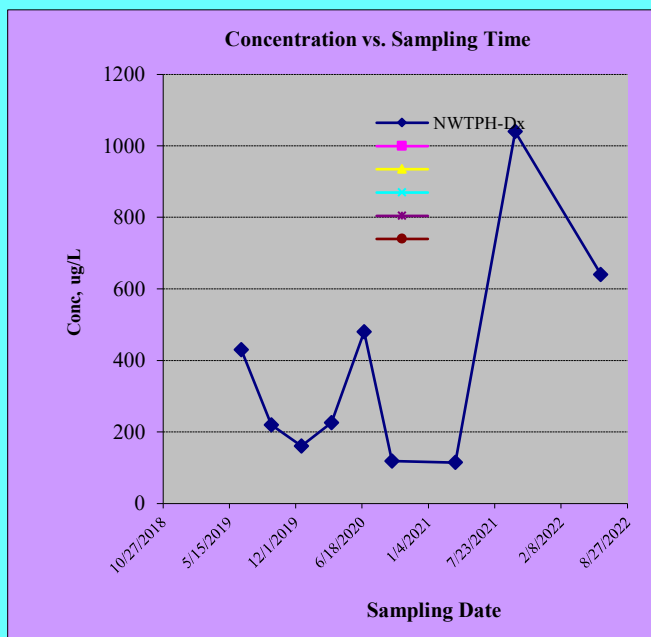
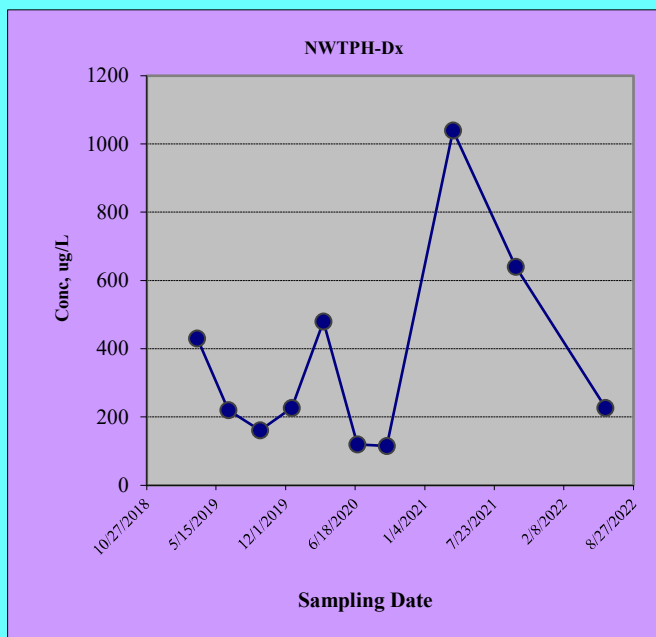
3. Temporal Trend: Plot of Concentration vs. Sampling TimeHazardous substance? **NWTPH-Dx**Plume Stability? **Stable**

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)Site Name: *BNSF Skykomish*Site Address: *Skykomish, WA*Additional Description: *2022 Annual LTM*Well (Sampling) Location? **2A-W-9**Level of Confidence (Decision Criteria)? **85%****1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	NWTPH-Dx					
#1	3/21/2019	430					
#2	6/19/2019	220					
#3	9/18/2019	161					
#4	12/18/2019	226					
#5	3/18/2020	480					
#6	6/24/2020	119					
#7	9/16/2020	115					
#8	3/26/2021	1040					
#9	9/22/2021	640					
#10	6/7/2022	226					
#11							
#12							
#13							
#14							
#15							
#16							

2. Mann-Kendall Non-parametric Statistical Test Results

Hazardous Substance?	NWTPH-Dx					
Confidence Level Calculated?	56.90%	NA	NA	NA	NA	NA
Plume Stability?	Stable	NA	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1	n<4	n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	4	0	0	0	0	0
Number of Sampling Rounds?	10	0	0	0	0	0
Average Concentration?	365.70	NA	NA	NA	NA	NA
Standard Deviation?	293.07	NA	NA	NA	NA	NA
Coefficient of Variation?	0.80	NA	NA	NA	NA	NA
Blank if No Errors found		n<4	n<4	n<4	n<4	n<4

3. Temporal Trend: Plot of Concentration vs. Sampling TimeHazardous substance? **NWTPH-Dx**Plume Stability? **Stable**

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)Site Name: *BNSF Skykomish*Site Address: *Skykomish, WA*Additional Description: *2022 Annual LTM*Well (Sampling) Location? **MW-4**Level of Confidence (Decision Criteria)? **85%****1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	NWTPH-Dx					
#1	6/19/2019	109					
#2	9/18/2019	141					
#3	12/19/2019	600					
#4	3/18/2020	310					
#5	6/24/2020	350					
#6	9/16/2020	39					
#7	3/26/2021	432					
#8	9/22/2021	410					
#9	6/7/2022	425					
#10	10/27/2022	320					
#11							
#12							
#13							
#14							
#15							
#16							

2. Mann-Kendall Non-parametric Statistical Test Results

Hazardous Substance?	NWTPH-Dx					
Confidence Level Calculated?	81.00%	NA	NA	NA	NA	NA
Plume Stability?	Stable	NA	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1	n<4	n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	11	0	0	0	0	0
Number of Sampling Rounds?	10	0	0	0	0	0
Average Concentration?	313.60	NA	NA	NA	NA	NA
Standard Deviation?	171.98	NA	NA	NA	NA	NA
Coefficient of Variation?	0.55	NA	NA	NA	NA	NA
Blank if No Errors found		n<4	n<4	n<4	n<4	n<4

3. Temporal Trend: Plot of Concentration vs. Sampling TimeHazardous substance? **NWTPH-Dx**Plume Stability? **Stable**