

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 $\mu\text{g/l}$, which are less than the CUL of 208 $\mu\text{g/l}$ 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 $\mu\text{g/l}$, which exceeds the RL of 466 $\mu\text{g/l}$ 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.



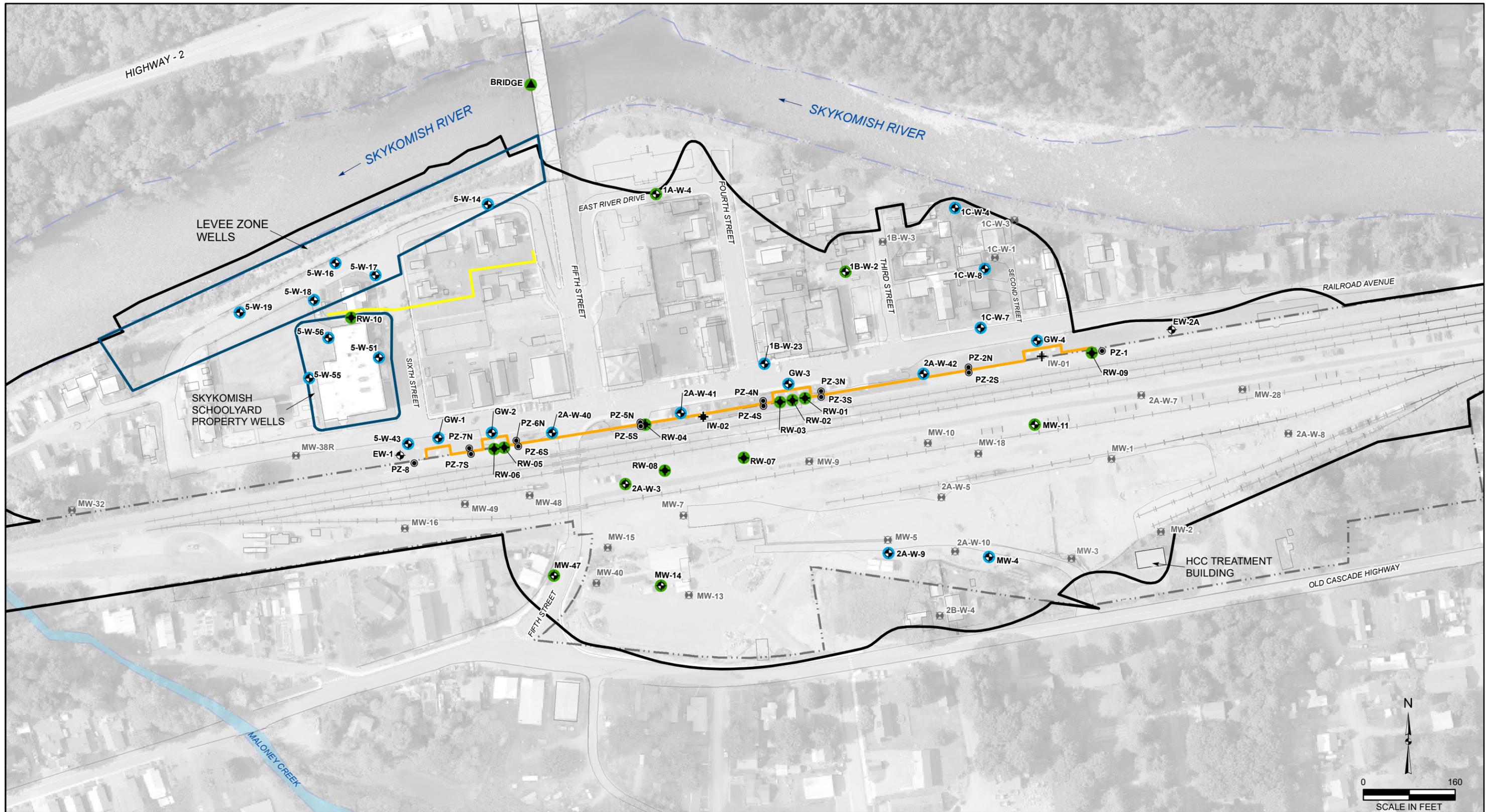
8.0 REFERENCES

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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
- 2A-W-41 ⚡ MONITORING WELL
- RW-4 ⚡ RECOVERY WELL
- PZ-5S ● PIEZOMETER
- IW-01 ⊕ DECOMMISSIONED INJECTION WELL
- IW-02 ⊕ INJECTION WELL
- BRIDGE 🌿 BRIDGE MEASURING POINT LOCATION GAUGED

- 🌿 RECOVERY WELL LOCATION GAUGED
- 🌿 MONITORING WELL LOCATION GAUGED
- ⚡ MONITORING WELL LOCATION SAMPLED FOR NWTTPH-Dx
- HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
- ⋯ BNSF RAILYARD BOUNDARY
- MECHANICALLY STABILIZED EARTH WALL

- ▭ 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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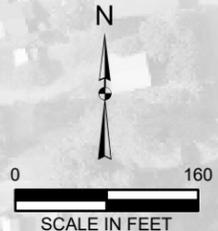
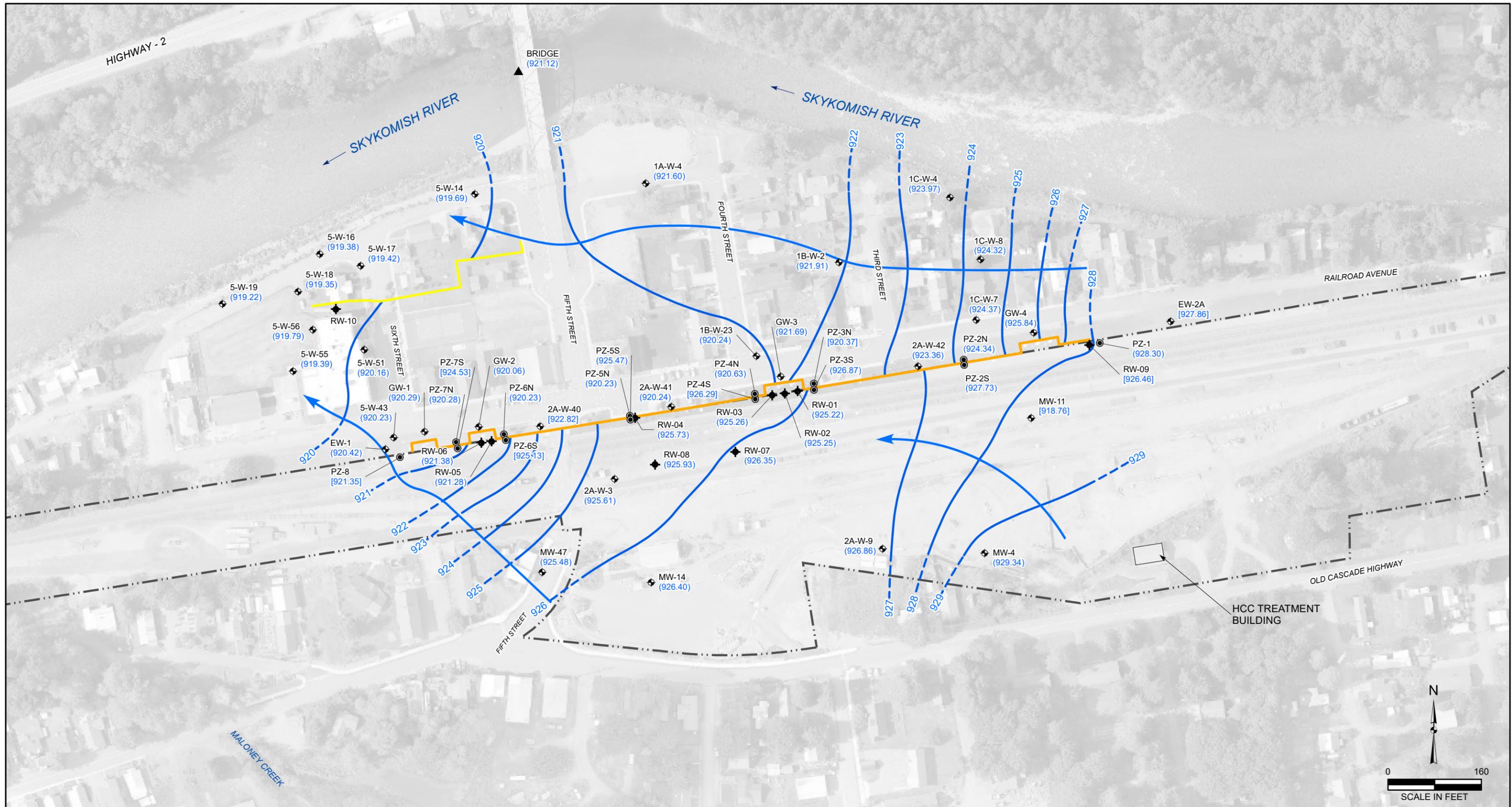
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Date: 3/24/2023

Disc Reference:

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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



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

- 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

- LEGEND**
- GROUNDWATER OR SURFACE WATER (SKYKOMISH RIVER) ELEVATION IN FEET NAVD88 (JUNE, 2020)
 - 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

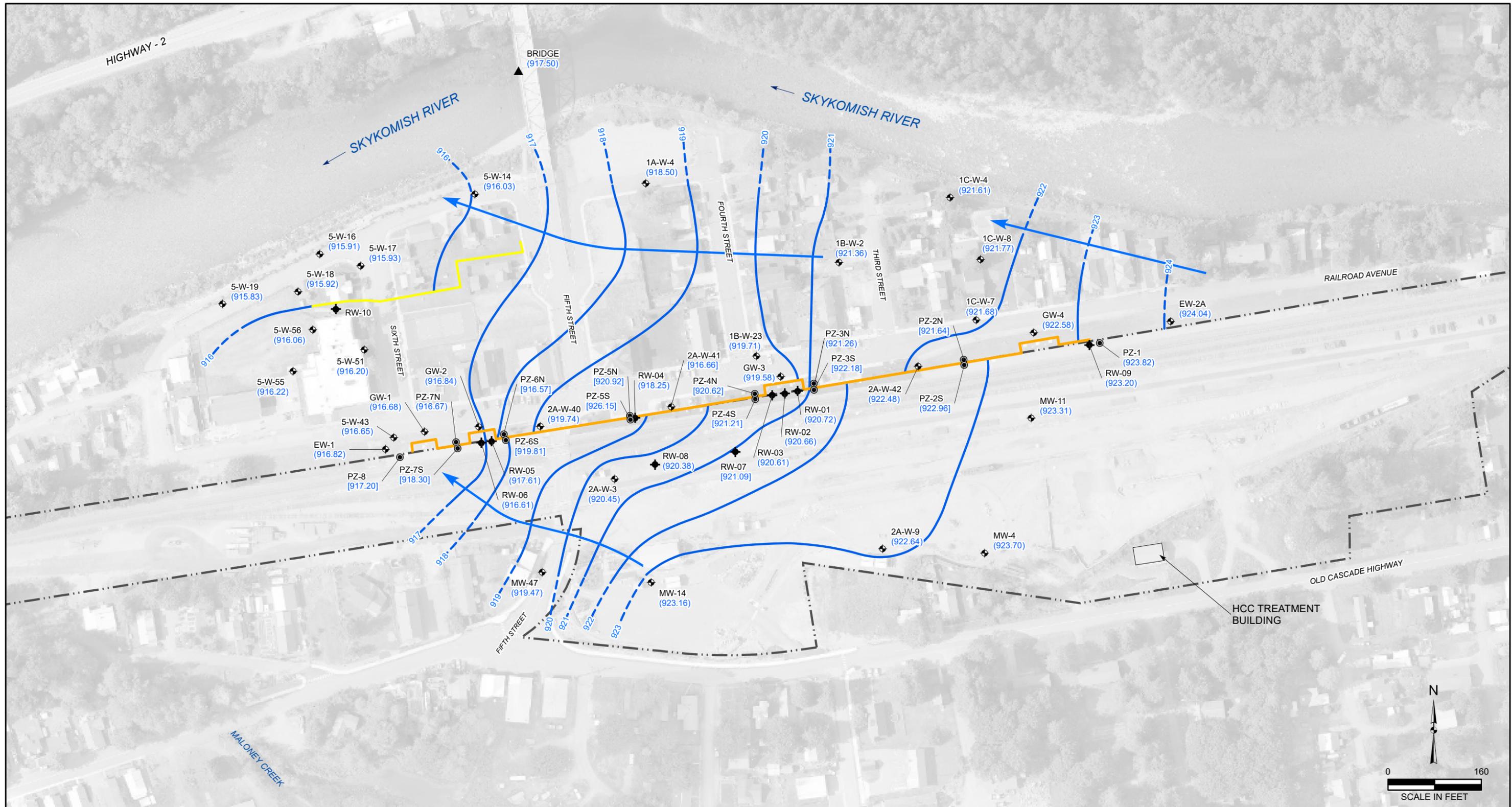
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FIGURE 2
 JUNE 2022
 GROUNDWATER ELEVATION CONTOUR MAP
 BNSF FORMER MAINTENANCE AND FUELING FACILITY
 SKYKOMISH, WASHINGTON
 FARALLON PN: 683-071



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) GROUNDWATER OR SURFACE WATER (SKYKOMISH RIVER) ELEVATION IN FEET NAVD88 (OCTOBER, 2022)
- [926.15] GROUNDWATER ELEVATION NOT USED FOR CONTOURING
- 923 - - - 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. GRAYS/SCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.



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

FARALLON PN: 683-071

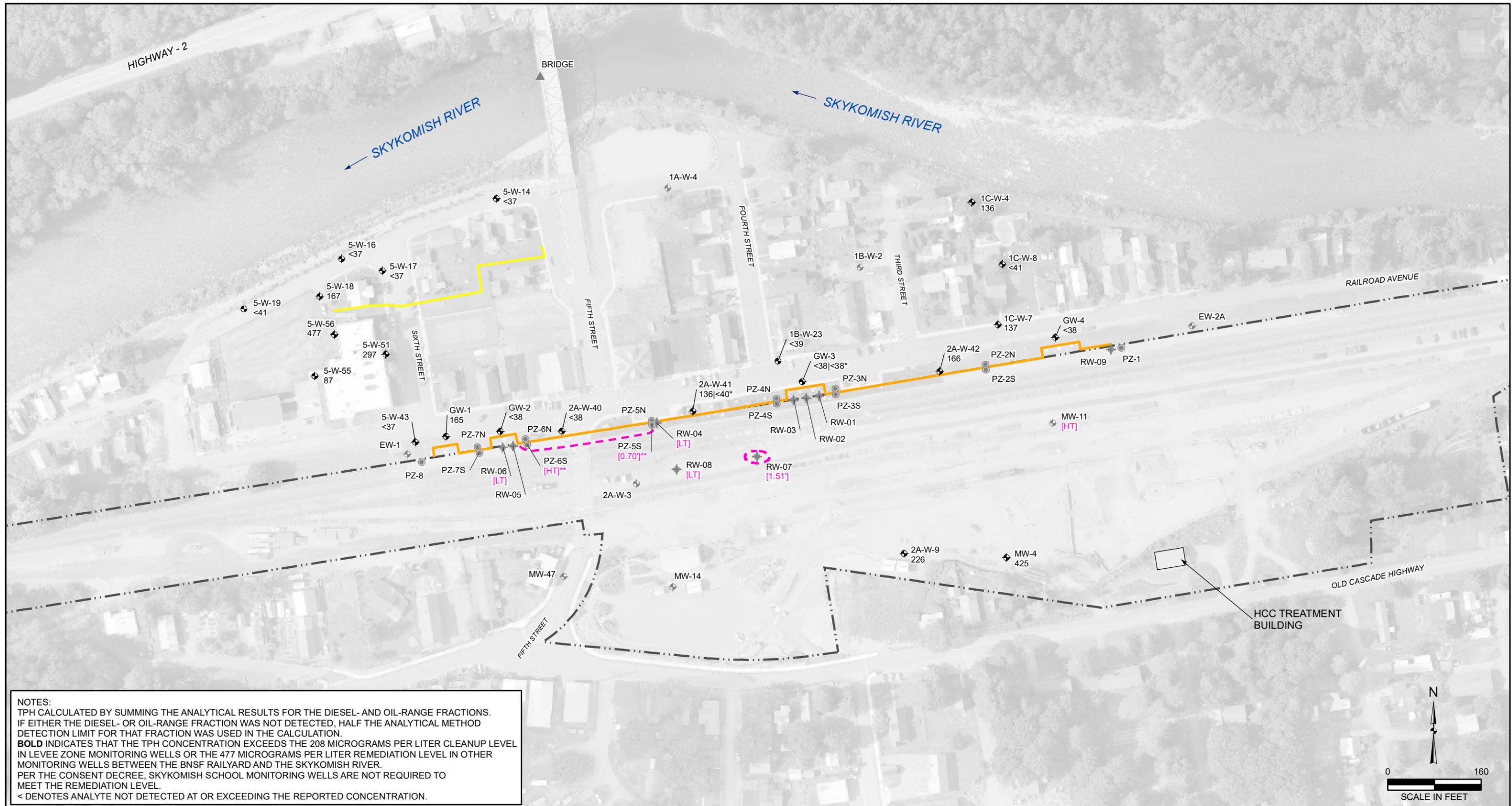
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NOTES:
 TPH CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE FRACTIONS. IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.
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 JUNE 2022.
—	HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
- · - · -	BNSF RAILYARD BOUNDARY
—	MECHANICALLY STABILIZED EARTH WALL
610	TOTAL PETROLEUM HYDROCARBONS (TPH) IN MICROGRAMS PER LITER
<41	TPH NOT DETECTED AT OR EXCEEDING THE GIVEN REPORTING LIMIT
40*	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
[1.51]	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

IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

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

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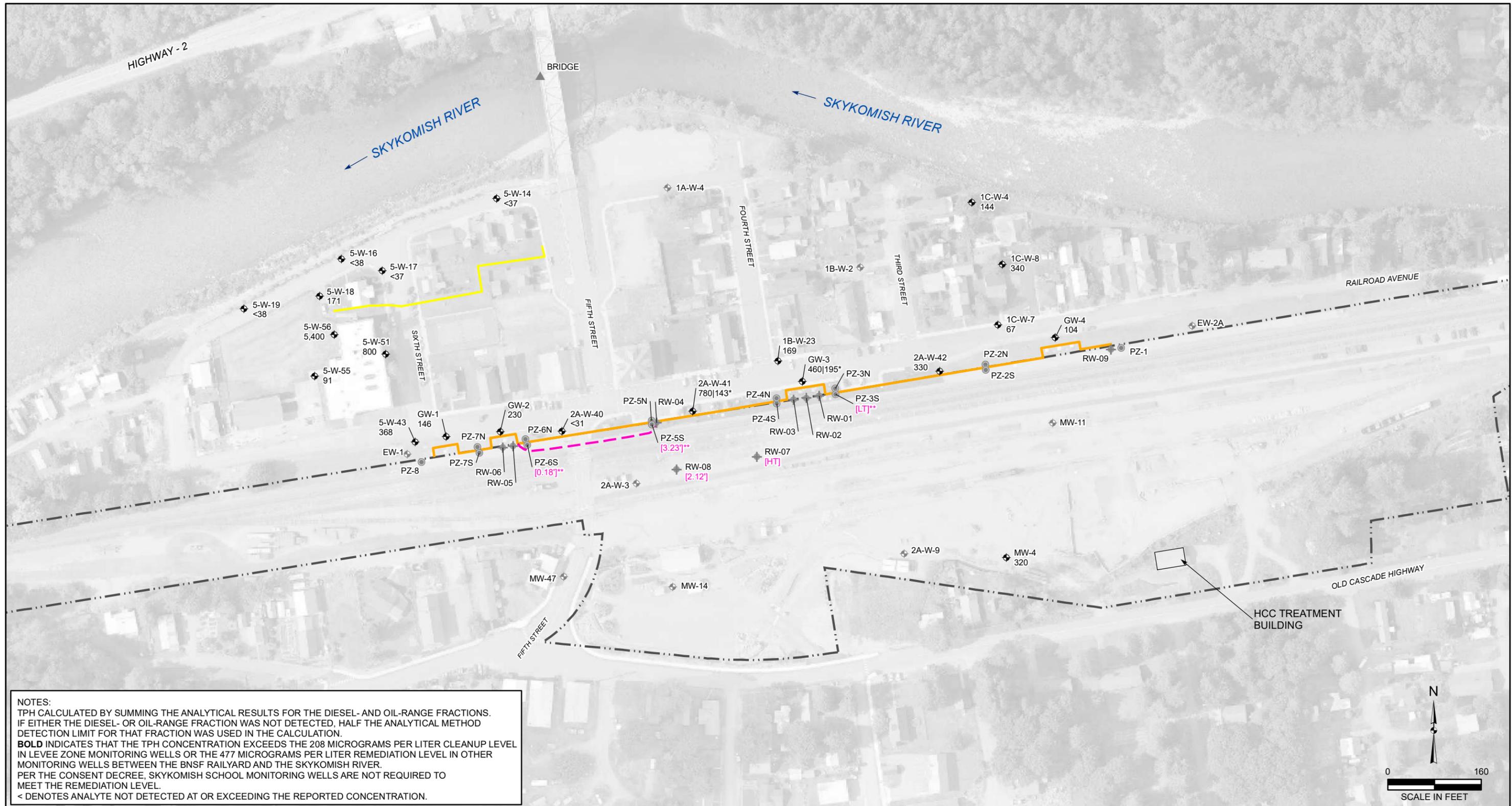
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FIGURE 4
 JUNE 2022
 TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
 BNSF FORMER MAINTENANCE
 AND FUELING FACILITY
 SKYKOMISH, WASHINGTON
 FARALLON PN: 683-071



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

IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

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



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 Elevation¹ (feet NAVD88)	Date	Depth to Water² (feet)	Water Elevation¹ (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	30	51	< 89	45	89	< 38
			< 51 ³	30 ³	51 ³	< 89 ³	45 ³	89 ³	< 38 ³
	10/27/2022	GW-3-102722	160	30	52	300	45	89	460
			< 52 ³	30 ³	52 ³	180 ³	45 ³	89 ³	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
<i>o</i> -Terphenyl	92		50 - 150				06/20/22 16:28	06/21/22 21:36	1

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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
<i>o</i> -Terphenyl	94		50 - 150				06/20/22 16:28	06/21/22 21:56	1

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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
<i>o</i> -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
<i>o</i> -Terphenyl	84		50 - 150				06/20/22 16:28	06/21/22 22:54	1

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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
<i>o</i> -Terphenyl	85		50 - 150				06/20/22 16:28	06/21/22 23:14	1

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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
<i>o</i> -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
<i>o</i> -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
<i>o</i> -Terphenyl	91		50 - 150				06/17/22 08:36	06/17/22 16:57	1

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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
<i>o-Terphenyl</i>	76		50 - 150				06/17/22 08:36	06/17/22 17:17	1

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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
<i>o</i> -Terphenyl	85		50 - 150				06/17/22 08:36	06/17/22 17:37	1

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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

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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

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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
<i>o</i> -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-Terphenyl</i>	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-Terphenyl</i>	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

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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
<i>o</i> -Terphenyl	88		50 - 150				06/17/22 08:36	06/17/22 21:59	1

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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
<i>o</i> -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
<i>o-Terphenyl</i>	83		50 - 150				06/20/22 09:32	06/21/22 16:22	1

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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
<i>o</i> -Terphenyl	75		50 - 150				06/20/22 09:32	06/21/22 16:42	1

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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
<i>o</i> -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-Terphenyl</i>	81		50 - 150				06/20/22 09:32	06/21/22 17:21	1

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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
<i>o-Terphenyl</i>	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-Terphenyl</i>	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
<i>o-Terphenyl</i>	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
<i>o</i> -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

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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
<i>o</i> -Terphenyl	78		50 - 150				06/20/22 09:32	06/21/22 19:38	1

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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-Terphenyl</i>	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
<i>o-Terphenyl</i>	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
<i>o-Terphenyl</i>	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-Terphenyl</i>	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

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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-Terphenyl</i>	74		50 - 150				06/21/22 09:25	06/21/22 19:14	1

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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
<i>o</i> -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

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

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	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
#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	MB	Limits			Prepared	Analyzed	Dil Fac	
	%Recovery	Qualifier							
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	LCS	Unit	D	%Rec	%Rec	Limits
		Result	Qualifier					
#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	LCS	Limits			%Recovery	Qualifier	
	%Recovery							
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	LCSD	Unit	D	%Rec	%Rec	Limits	RPD	RPD
		Result	Qualifier						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	LCSD	Limits			%Recovery	Qualifier			
	%Recovery									
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	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
#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	MB	Limits			Prepared	Analyzed	Dil Fac	
	%Recovery	Qualifier							
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	LCS	Unit	D	%Rec	%Rec	Limits
		Result	Qualifier					
#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		RPD	Limit
							Limits	RPD		
#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
							Prepared	Analyzed	Prepared	Analyzed	
#2 Diesel (C10-C24)	ND		0.055		mg/L		06/21/22 09:25	06/21/22 16:12	06/21/22 16:12	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	06/21/22 16:12	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		RPD	Limit
							Limits	RPD		
#2 Diesel (C10-C24)	4.00	3.00		mg/L		75	50 - 120			26
Motor Oil (>C24-C36)	4.00	3.37		mg/L		84	64 - 120			24

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		RPD	Limit
							Limits	RPD		
#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

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 MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
#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 MB	Limits			Prepared	Analyzed	Dil Fac	
		%Recovery		Qualifier					
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
Motor Oil (>C24-C36)	4.00	3.77		mg/L		94	64 - 120
Surrogate		LCS LCS	Limits			%Rec	
		%Recovery		Qualifier			
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 LCSD	Limits			%Rec			
		%Recovery		Qualifier					
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

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

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

Lab Chronicle

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

Job ID: 580-114630-1

Client Sample ID: 5-W-43-060722

Date Collected: 06/07/22 12:09

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-19

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch 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

Date Collected: 06/07/22 14:50

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-20

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch 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

Date Collected: 06/07/22 14:20

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-21

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch 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

Date Collected: 06/07/22 12:00

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-22

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch 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

Date Collected: 06/07/22 11:15

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-23

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch 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

Date Collected: 06/07/22 10:30

Date Received: 06/09/22 08:51

Lab Sample ID: 580-114630-24

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch 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

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

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

Lab Chronicle

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

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

Lab Sample ID: 580-114630-38

Date Collected: 06/08/22 10:50

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			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

Lab Sample ID: 580-114630-39

Date Collected: 06/08/22 10:05

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 21:16

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

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

Lab Sample ID: 580-114630-41

Date Collected: 06/08/22 09:37

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			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

Lab Sample ID: 580-114630-42

Date Collected: 06/08/22 10:00

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			394395	KLW	EETNW SE.	06/21/22 09:25
Total/NA	Analysis	NWTPH-Dx		1	394387	Y1F	EETNW SE.	06/21/22 18:14

Lab Chronicle

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

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

Lab Sample ID: 580-114630-44

Date Collected: 06/08/22 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			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

Lab Sample ID: 580-114630-45

Date Collected: 06/08/22 12:55

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			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

Lab Sample ID: 580-114630-46

Date Collected: 06/07/22 16:28

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 23:19

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

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

Lab Sample ID: 580-114630-48

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			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

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



580-114630 Chain of Custody

LABORATORY INFORMATION		LAB WORK ORDER:
Laboratory:	Project Manager:	SHIPMENT INFORMATION
Address:	Phone:	
City/State/ZIP:	Fax:	
		Shipment Method:
		Tracking Number:

BNSF PROJECT INFORMATION		CONSULTANT INFORMATION	
BNSF Project Number: 683-071	Project State of Origin: Skykomish	Company: Farallon	Project Number: 683-071
BNSF Project Name: BNSF Skykomish	Project City: Skykomish	Address: 975 5th Ave. NW	Project Manager: Amanda Meughnoit
BNSF Contact: Shane Duggross	BNSF Work Order No.:	City/State/ZIP: Issaquah WA. 98027	Email: A.Meughnoit@farallonconsulting.com
		Phone: 425 295 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?	NW TPH-DX NWTPH-DX + SGC

SAMPLE INFORMATION								COMMENTS	LAB USE
Sample Identification	Containers	Sample Collection			Filtered Y/N	Type (Comp/Grab)	Matrix		
		Date	Time	Sampler					
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-51-060622			17:18	GP	N	G	W		
4 5-W-55-060622			15:30	GP					
5 5-W-50-060622			14:51	GP					
6 2A-W-41-060722		6/7/22	14:50	MW				X	
7 2A-W-410-060722			14:50	MW					
8 1C-W-8-060722			12:03	MW					
9 1C-W-7-060722			11:55	MW					
10 EW-2A-060722			09:45	MW					
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 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

Laboratory: _____ Project Manager: _____

Address: _____ Phone: _____

City/State/ZIP: _____ Fax: _____

LAB WORK ORDER:

SHIPMENT INFORMATION

Shipment Method: _____

Tracking Number: _____

BNSF PROJECT INFORMATION

Project State of Origin: _____

BNSF Project Number: **683-071** Project City: **Skykomish**

BNSF Project Name: **BNSF Skykomish**

BNSF Contact: **Shane DeGross** BNSF Work Order No.: _____

CONSULTANT INFORMATION

Project Number: **683-071**

Company: **Farallon** Project Manager: **Amenda Meunier**

Address: **975 5th Ave. NW** Email: **Amenda@farallonconsulting.com**

City/State/ZIP: **Issaquah** Phone: **425 295 0800** Fax: _____

TURNAROUND TIME

1-day Rush 5- to 8-day Rush

2-day Rush Standard 10-Day

3-day Rush Other _____

DELIVERABLES

Other Deliverables? _____

BNSF Standard (Level II)

Level III EDD Req. Format? _____

Level IV _____

METHODS FOR ANALYSIS

NWTPH-DX	NWTPH-DX + SCAC									
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SAMPLE INFORMATION

Sample Identification	Containers	Sample Collection			Filtered Y/N	Type (Comp/ Grab)	Matrix	COMMENTS	LAB USE	
		Date	Time	Sampler						
16 1 ZA-W-40-060722	Z	6/7/22	15:46	GP	N	G	W	X		
2 GW-2-060722	↓	↓	15:07	GP						
3 GW-1-060722			14:17	GP						
4 S-W-43-060722			12:04	GP						
20 5 GW-3-060722			14:50	ES					X	
6 IB-W-23-060722			14:20	ES						
7 ZA-W-42-060722			12:00	ES						
8 1C-W-4060722			11:15	ES						
9 GW-4-060722			10:30	ES						
25 10 SY-AD-060822			6/8/22	11:45	GP					
11 SY-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 13:59	Received By: Emi Smith	Date/Time: 6/8/22 13:59	<p>Comments and Special Analytical Requirements: Email to Amenda@farallonconsulting.com</p>
Relinquished By: Emi Smith	Date/Time: 6/9/22 08:46	Received By: Sydney Lachoff	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. _____
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CHAIN OF CUSTODY	LABORATORY INFORMATION						LAB WORK ORDER:	
	Laboratory:			Project Manager:			SHIPMENT INFORMATION	
	Address:			Phone:			Shipment Method:	
City/State/ZIP:			Fax:			Tracking Number:		
BNSF PROJECT INFORMATION			CONSULTANT INFORMATION			Project Number: 683-071		
BNSF Project Number: 683-071			Company: Farallon			Project Manager: Amanda Augnaitis		
BNSF Project Name: BNSF Skykomish			Address: 475 5th Ave. NW			Email: Amanda@farallon.com		
BNSF Contact: Shane DeGross			City/State/ZIP: Issaquah			Phone: 425 245 0800 Fax:		
TURNAROUND TIME		DELIVERABLES				METHODS FOR ANALYSIS		
<input type="checkbox"/> 1-day Rush <input type="checkbox"/> 5- to 8-day Rush <input type="checkbox"/> 2-day Rush <input checked="" type="checkbox"/> Standard 10-Day <input type="checkbox"/> 3-day Rush <input type="checkbox"/> Other _____		<input type="checkbox"/> Other Deliverables? <input type="checkbox"/> BNSF Standard (Level II) <input type="checkbox"/> Level III <input type="checkbox"/> EDD Req. Format? <input type="checkbox"/> Level IV				COMMENTS LAB USE		
SAMPLE INFORMATION		Sample Collection		Filtered Y/N	Type (Comp/Grab)			Matrix
Sample Identification	Containers	Date	Time	Sampler				
1 S2-BD-060822	2	060822	10:25	ES	N	G	W	
2 S2-BU-060822			10:48	ES				
3 S4-CD-060822			12:15	ES				
4 S4-CU-060822			12:35	ES				
5 S4-BU-060822			12:20	MW				
6 S4-BD-060822			11:51	MW				
7 S3-AD-060822			11:12	MW				
8 S3-AU-060822			10:50	MW				
9 S1-BD-060822			10:05	MW				
10 S1-BU-060822			9:45	MW				
11 S1-AD-060822			9:37	GP				
12 S1-AU-060822			10:00	GP				
13 S3-BD-060822			10:40	GP				
14 S3-BU-060822			11:00	GP				
15 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 Harloff		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)



LABORATORY INFORMATION		LAB WORK ORDER:
Laboratory:	Project Manager:	SHIPMENT INFORMATION
Address:	Phone:	
City/State/ZIP:	Fax:	
Project State of Origin:		Shipment Method:
Project State of Origin:		Tracking Number:

BNSF PROJECT INFORMATION		CONSULTANT INFORMATION	
BNSF Project Number: 683-071	Project City: Skykomish	Company: Farallon	Project Number: 683-071
BNSF Project Name: BNSF Skykomish	BNSF Work Order No.:	Address: 975 Sth Ave NW	Project Manager: Amanda Meughnot
BNSF Contact: Shane DeGross		City/State/ZIP: Issaquah	Email: amanda.meughnot@farallonconsulting.com
		Phone: 425 245 0800	Fax:

TURNAROUND TIME	DELIVERABLES	Other Deliverables?
<input type="checkbox"/> 1-day Rush <input type="checkbox"/> 2-day Rush <input type="checkbox"/> 3-day Rush	<input type="checkbox"/> BNSF Standard (Level II) <input type="checkbox"/> Level III <input type="checkbox"/> Level IV	<input type="checkbox"/> 5- to 8-day Rush <input checked="" type="checkbox"/> Standard 10-Day <input type="checkbox"/> Other _____ <input type="checkbox"/> EDD Req. Format?

METHODS FOR ANALYSIS										COMMENTS	LAB USE
1	2	3	4	5	6	7	8	9	10		
NWTPH-DX											

SAMPLE INFORMATION								Filtered Y/N	Type (Comp/Grab)	Matrix
Sample Identification	Containers	Sample Collection			Date	Time	Sampler			
		Date	Time	Sampler						
46 1 ZA-W-9-060722	2	6/7/22	16:28	MN	N	G	W	X		
47 2 S-W-14-060822	2	6/8/22	13:48	6P	N	G	W	X		
MN										

Relinquished By: Max-Henry Nelson	Date/Time: 13:59 6/8/22	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 Salhoff	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.

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

2
Therm. ID: 1R8 Cor: 2.1 ° Unc: 2.3 °
Cooler Dsc: BB FedEx: _____
Packing: BUB UPS: _____
Cust. Seal: Yes ___ No ✓ Lab Cour: _____
Blue Ice: Wet Dry, None Other: Client
Dropoff

3
Therm. ID: 1R8 Cor: 1.1 ° Unc: 1.4 °
Cooler Dsc: BB FedEx: _____
Packing: BUB UPS: _____
Cust. Seal: Yes ___ No ✓ Lab Cour: _____
Blue Ice: Wet Dry, None Other: Client
Dropoff

4
Therm. ID: 1R8 Cor: 1.3 ° Unc: 1.5 °
Cooler Dsc: BB FedEx: _____
Packing: BUB UPS: _____
Cust. Seal: Yes ___ No ✓ Lab Cour: _____
Blue Ice: Wet Dry, None Other: Client
Dropoff

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-114630-1

Login Number: 114630

List Source: Eurofins Seattle

List Number: 1

Creator: Greene, Ashton R

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 <math><6\text{mm}</math> (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

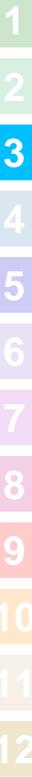
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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.
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 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
<i>o-Terphenyl</i>	62		50 - 150				11/10/22 11:52	11/12/22 01:18	1

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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

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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
<i>o</i> -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
<i>o</i> -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

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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
<i>o-Terphenyl</i>	67		50 - 150				11/10/22 11:52	11/12/22 02:13	1

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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

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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

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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
<i>o</i> -Terphenyl	71		50 - 150				11/09/22 09:28	11/10/22 21:03	1

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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
<i>o</i> -Terphenyl	80		50 - 150				11/09/22 09:28	11/10/22 21:24	1

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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
<i>o</i> -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
<i>o</i> -Terphenyl	71		50 - 150				11/09/22 09:28	11/10/22 22:04	1

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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
<i>o-Terphenyl</i>	80		50 - 150				11/09/22 09:28	11/10/22 22:24	1

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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
<i>o</i> -Terphenyl	53		50 - 150				11/10/22 11:52	11/12/22 03:09	1

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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
<i>o-Terphenyl</i>	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

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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

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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
<i>o</i> -Terphenyl	63		50 - 150				11/10/22 11:52	11/12/22 05:00	1

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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

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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
<i>o</i> -Terphenyl	78		50 - 150				11/09/22 09:28	11/10/22 22:44	1

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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
<i>o-Terphenyl</i>	67		50 - 150				11/09/22 09:28	11/10/22 23:04	1

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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
<i>o</i> -Terphenyl	61		50 - 150				11/09/22 09:28	11/10/22 23:45	1

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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

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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
<i>o</i> -Terphenyl	54		50 - 150				11/10/22 11:52	11/12/22 05:37	1

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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
<i>o</i> -Terphenyl	54		50 - 150				11/10/22 11:52	11/12/22 05:56	1

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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

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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

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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

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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

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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

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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

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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

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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-Terphenyl</i>	70		50 - 150				11/09/22 09:28	11/11/22 00:25	1

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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
<i>o</i> -Terphenyl	75		50 - 150				11/09/22 09:28	11/11/22 00:45	1

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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

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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

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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

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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

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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
<i>o</i> -Terphenyl	76		50 - 150				11/09/22 09:28	11/11/22 02:26	1

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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
<i>o</i> -Terphenyl	64		50 - 150				11/09/22 09:28	11/11/22 02:46	1

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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
<i>o</i> -Terphenyl	64		50 - 150				11/10/22 10:04	11/12/22 01:35	1

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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
<i>o</i> -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
<i>o</i> -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

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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
<i>o</i> -Terphenyl	66		50 - 150				11/10/22 10:04	11/12/22 02:35	1

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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	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
#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
	MB	MB	Limits			Prepared	Analyzed	Dil Fac	
Surrogate	%Recovery	Qualifier							
<i>o</i> -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	LCS	Unit	D	%Rec	%Rec Limits	
		Result	Qualifier					
#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	
	LCS	LCS	Limits			Prepared	Analyzed	Dil Fac
Surrogate	%Recovery	Qualifier						
<i>o</i> -Terphenyl	95		50 - 150			11/09/22 09:28	11/10/22 20:03	1

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	LCSD	Unit	D	%Rec	%Rec Limits	RPD	
		Result	Qualifier					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
	LCSD	LCSD	Limits			Prepared	Analyzed	Dil Fac	
Surrogate	%Recovery	Qualifier							
<i>o</i> -Terphenyl	81		50 - 150			11/09/22 09:28	11/10/22 20:03	1	

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	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
#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
	MB	MB	Limits			Prepared	Analyzed	Dil Fac	
Surrogate	%Recovery	Qualifier							
<i>o</i> -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	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
#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

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

Surrogate	LCS %Recovery	LCS 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		RPD	Limit
							Limits	RPD		
#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

Surrogate	LCSD %Recovery	LCSD 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
							Limits	RPD	Limits	RPD	
#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

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared		Analyzed		Dil Fac
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		RPD	Limit
							Limits	RPD		
#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			

Surrogate	LCS %Recovery	LCS 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		RPD	Limit
							Limits	RPD		
#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

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

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	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
#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	MB	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	LCS	Unit	D	%Rec	Limits
		Result	Qualifier				
#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	LCS	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	LCSD	Unit	D	%Rec	Limits	RPD	
		Result	Qualifier					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	LCSD	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

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

Lab Chronicle

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

Job ID: 580-119455-1

Client Sample ID: S3-AD-102722

Date Collected: 10/27/22 15:10

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-21

Matrix: Water

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

Date Collected: 10/26/22 10:42

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-22

Matrix: Water

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

Date Collected: 10/26/22 11:13

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-23

Matrix: Water

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

Date Collected: 10/26/22 12:21

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-24

Matrix: Water

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

Date Collected: 10/26/22 13:23

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-25

Matrix: Water

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

Date Collected: 10/27/22 09:35

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-26

Matrix: Water

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

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

Lab Chronicle

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

Job ID: 580-119455-1

Client Sample ID: S2-AU-102722

Date Collected: 10/27/22 14:08

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-33

Matrix: Water

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

Date Collected: 10/27/22 16:40

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-34

Matrix: Water

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

Date Collected: 10/27/22 17:00

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-35

Matrix: Water

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

Date Collected: 10/26/22 15:30

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-36

Matrix: Water

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

Date Collected: 10/26/22 14:38

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-37

Matrix: Water

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

Date Collected: 10/26/22 13:50

Date Received: 10/31/22 13:30

Lab Sample ID: 580-119455-38

Matrix: Water

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

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: Matlock, Pauline M		Carrier Tracking No(s):		COC No: 580-51107-14389.1			
Client Contact: Matthew Bowers <i>Amanda Meugniot</i>		Phone:		E-Mail: Pauline.Matlock@et.eurofinsus.com		State of Origin: WA		Page: Page 1 of 5			
Company: Farallon Consulting LLC		PWSID:		Analysis Requested Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> NWTPL_Dx - NWTPL-DX <i>Silica Gel Clean up</i>						Total Number of Containers 2	
Address: 975 5th Avenue NW Suite 100		Due Date Requested:									
City: Issaquah		TAT Requested (days): <i>Standard</i>									
State, Zip: WA, 98027		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No									
Phone:		PO #: 683-071									
Email: <i>ameugniot@farallonconsulting.com</i>		W/O #:		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) Other:							
Project Name: BNSF Skykomish Rush NPDES		Project #: 58005923									
Site: Washington		SSOW#:									
Tax Code 8800 BF10007215		Tax Code 8800 BF10007215									
Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)									
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Preservation Code:		Special Instructions/Note:	
S4-BU-102722		10-27-22		1638		Water		X			
S4-BU-102722		10-27-22		1638		Water		X			
S3-CD-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-AD-102722		10-27-22		1430		Water		X			
S-W-51-102622		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>Guini Sultan</i>		Date/Time: 10/27/22 2048		Company: Farallon		Received by: <i>Sydney Lamb</i>		Date/Time: 10/31/22 1330		Company: <i>EA</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: Matlock, Pauline M		Carrier Tracking No(s):		COC No: 580-51107-14389.2									
Client Contact: Matthew Bowser <i>Amanda Neugust</i>		Phone:		E-Mail: Pauline.Matlock@et.eurofinsus.com		State of Origin: WA		Page Page 2 of 5									
Company: Farallon Consulting LLC		PWSID:		Analysis Requested						Job #:							
Address: 975 5th Avenue NW Suite 100		Due Date Requested:		<table border="1"> <tr><td>Field Filtered Sample (Yes or No)</td><td></td></tr> <tr><td>Perform MS/MSD (Yes or No)</td><td></td></tr> <tr><td>NWTPH_Dx - NWTPH-DX</td><td></td></tr> </table>						Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		NWTPH_Dx - NWTPH-DX		Preservation Codes:	
Field Filtered Sample (Yes or No)																	
Perform MS/MSD (Yes or No)																	
NWTPH_Dx - NWTPH-DX																	
City: Issaquah		TAT Requested (days): Standard								A - HCL		M - Hexane					
State, Zip: WA, 98027		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No		B - NaOH		N - None											
Phone:		PO #: 683-071		C - Zn Acetate		O - AsNaO2											
Email: amneugust@farallonconsulting.com		WO #:		D - Nitric Acid		P - Na2O4S											
Project Name: BNSF Skykomish Rush NPDES		Tax Code 8800 BF10007215		E - NaHSO4		Q - Na2SO3											
Site: Washington		Project #: 58005923		F - MeOH		R - Na2S2O3											
		SSOW#:		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 - EDTA		Y - Trizma											
						Z - other (specify)											
						Other:											

Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=wastewater, 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:	
~~10-26-22~~ 2A-W-42-102622		10-26-22		1555				Water		X		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
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab 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>Suzanne</i>	Date/Time: 10/31/22 1330	Company: EA
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Yes No Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____

1
Therm. ID: 140 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

2
Therm. ID: 140 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: _____

3
Therm. ID: 140 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: _____

4
Therm. ID: 140 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: _____



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 <math><6\text{mm}</math> (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
Pauline.Matlock@et.eurofinsus.com
(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 Saylor. 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

<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.

<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 Saylor. 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 FSsample 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 Saylor. 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

- 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.

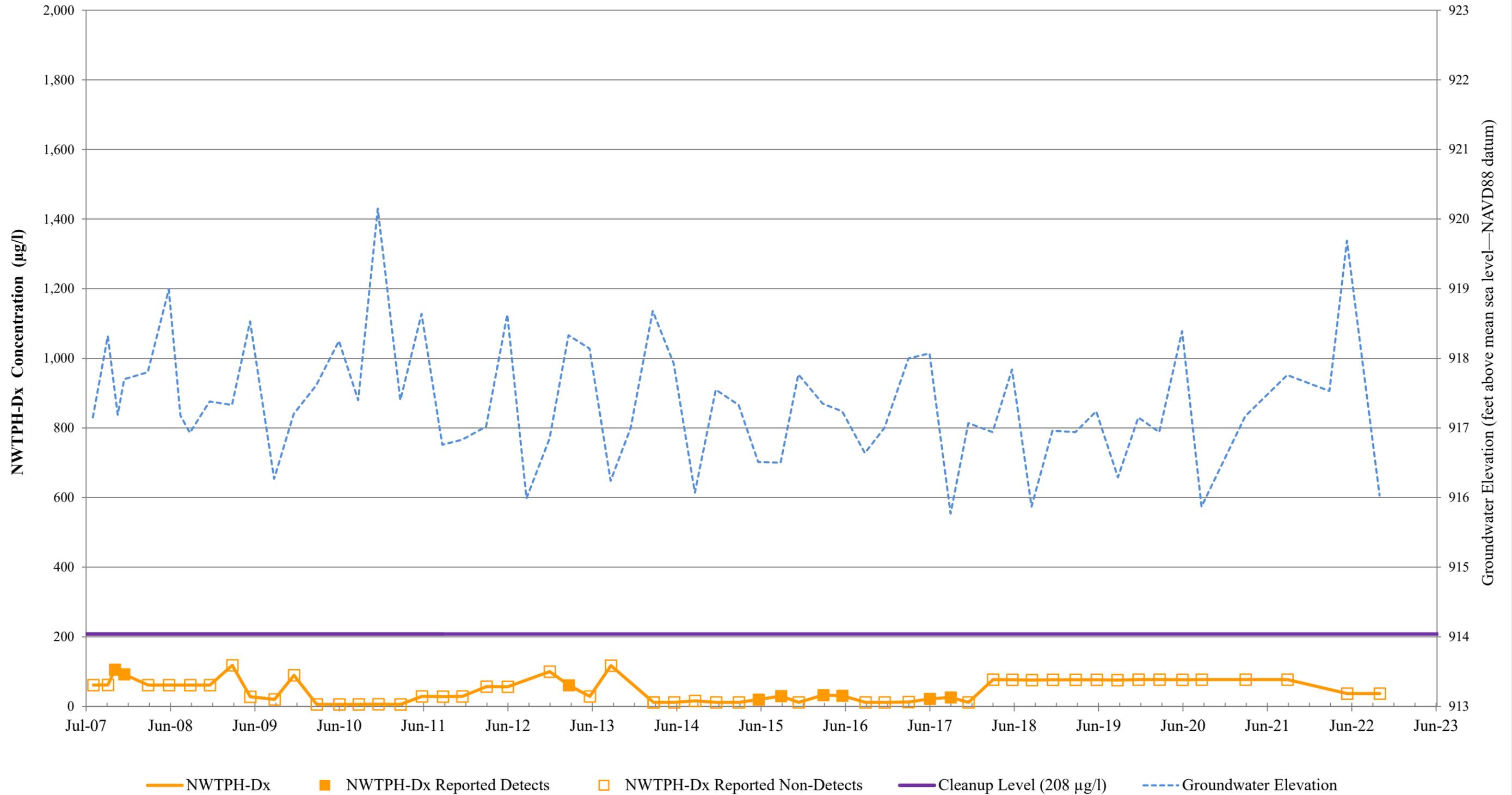
Note: the above criteria applies to NWTPH-Dx both with and without silica gel cleanup

APPENDIX C
NWTPH-Dx TREND PLOTS

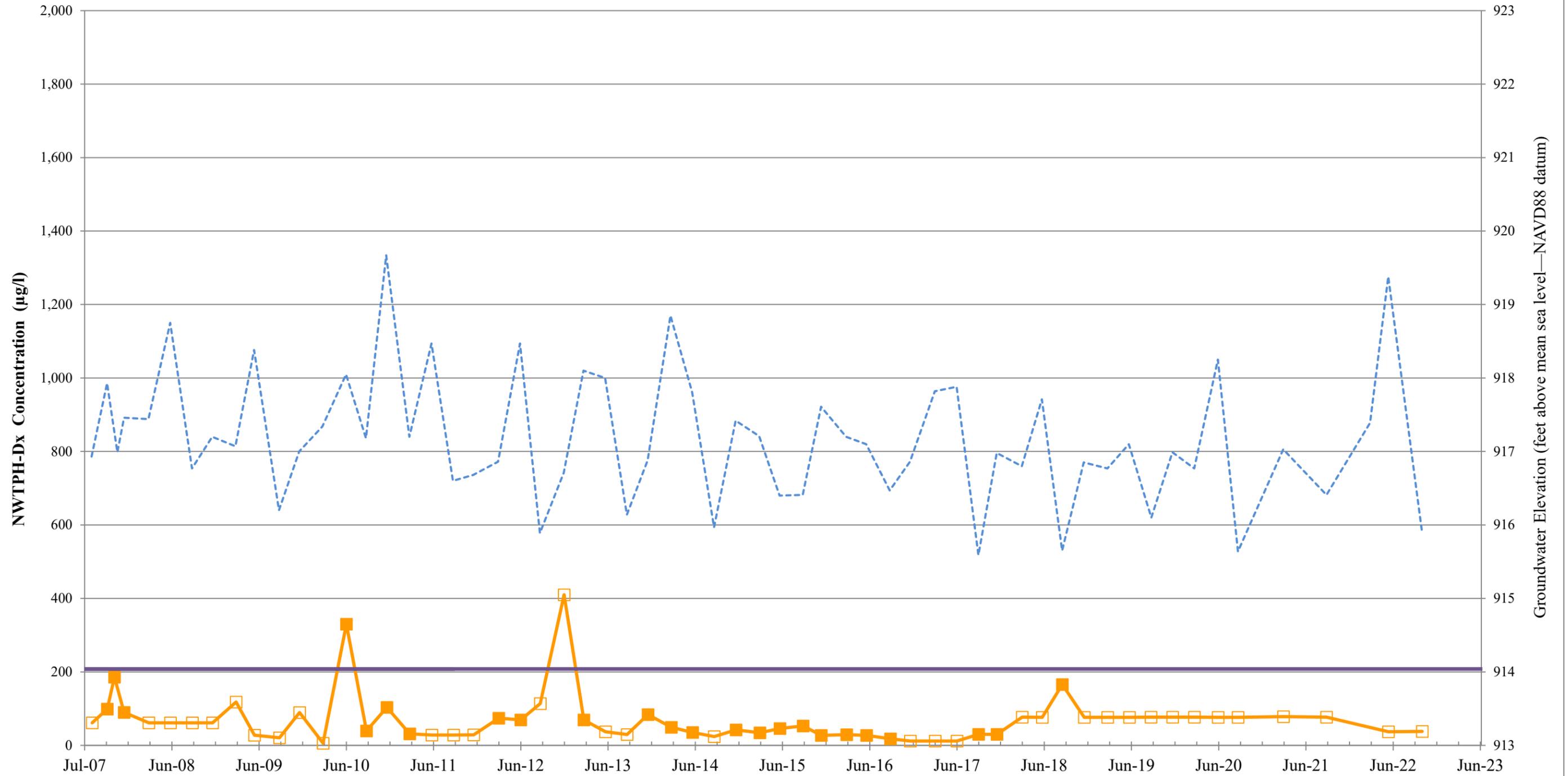
2022 ANNUAL LONG-TERM MONITORING REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-14

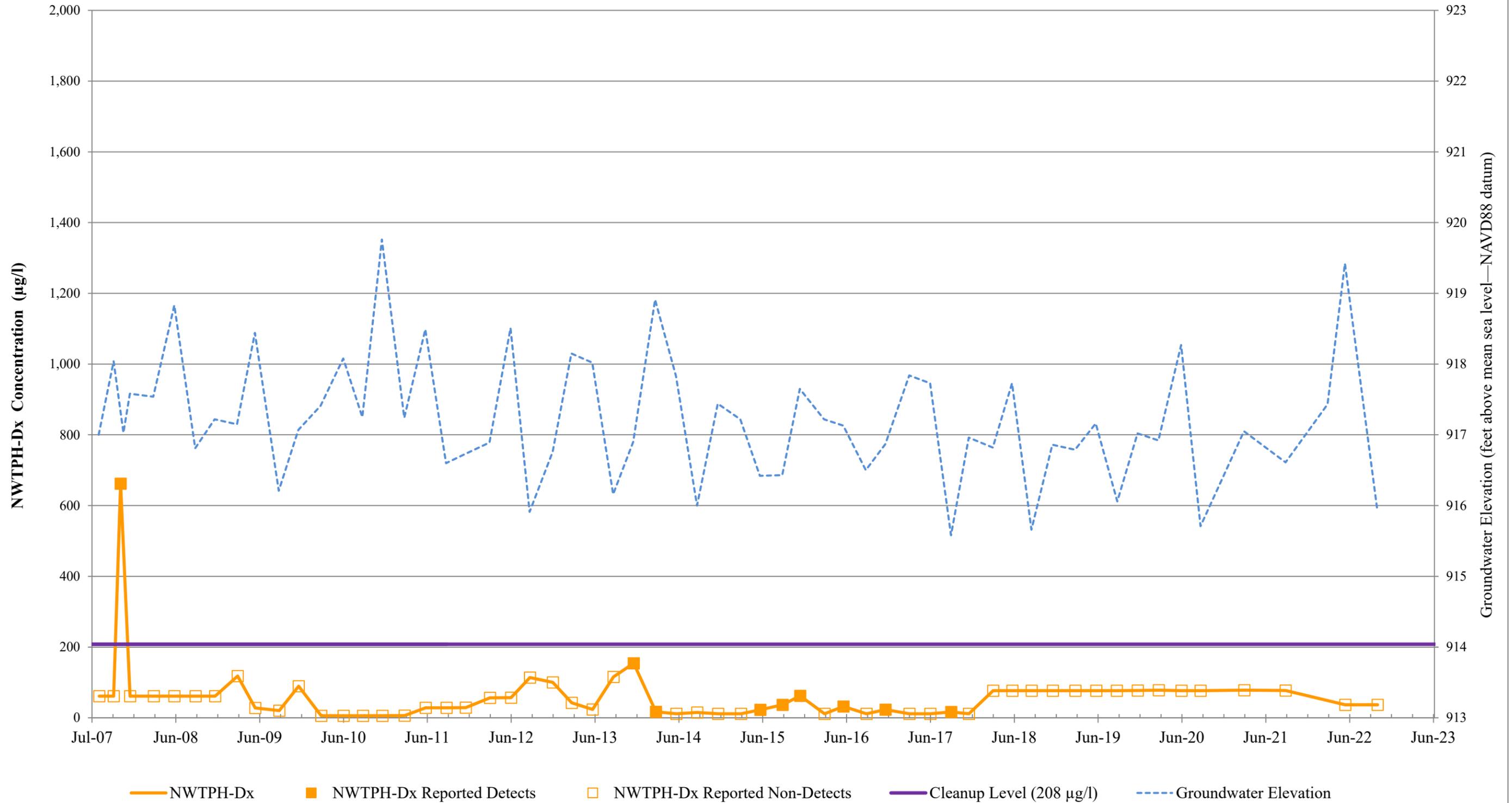


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-16

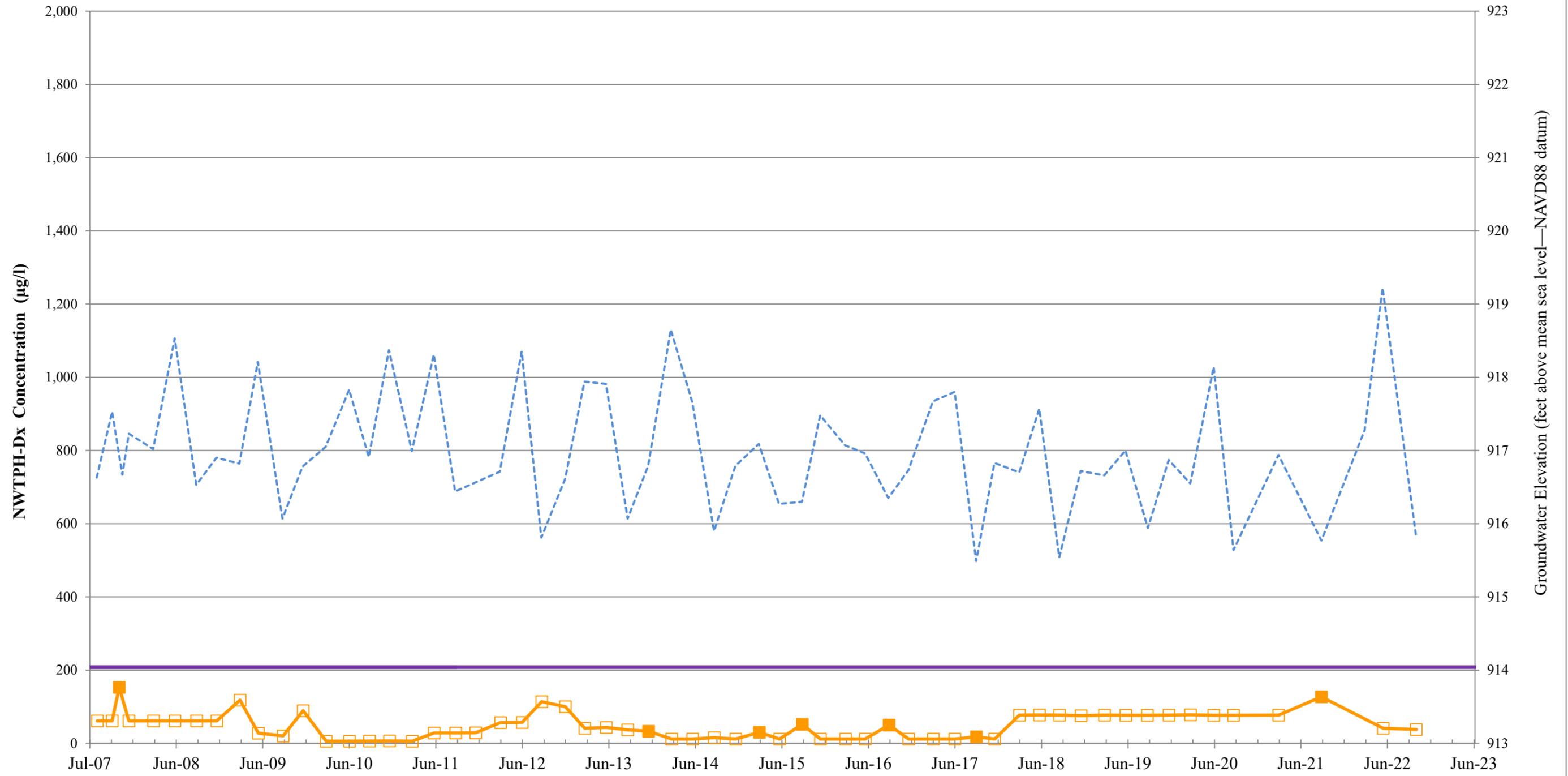


—■ NWTPH-Dx
 ■ NWTPH-Dx Reported Detects
 □ NWTPH-Dx Reported Non-Detects
 — Cleanup Level (208 µg/l)
 - - - Groundwater Elevation

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-17

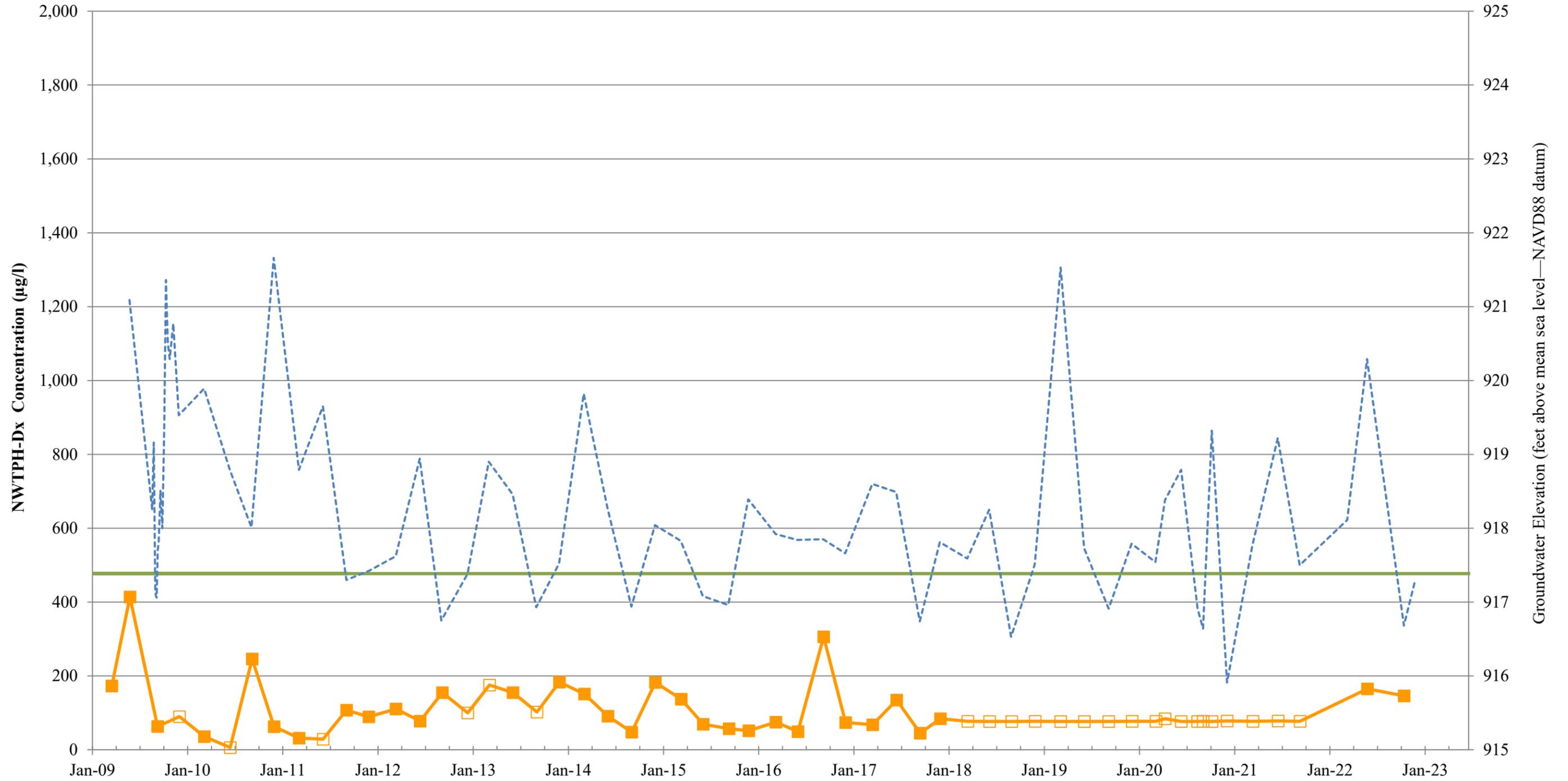


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-070
Well 5-W-19



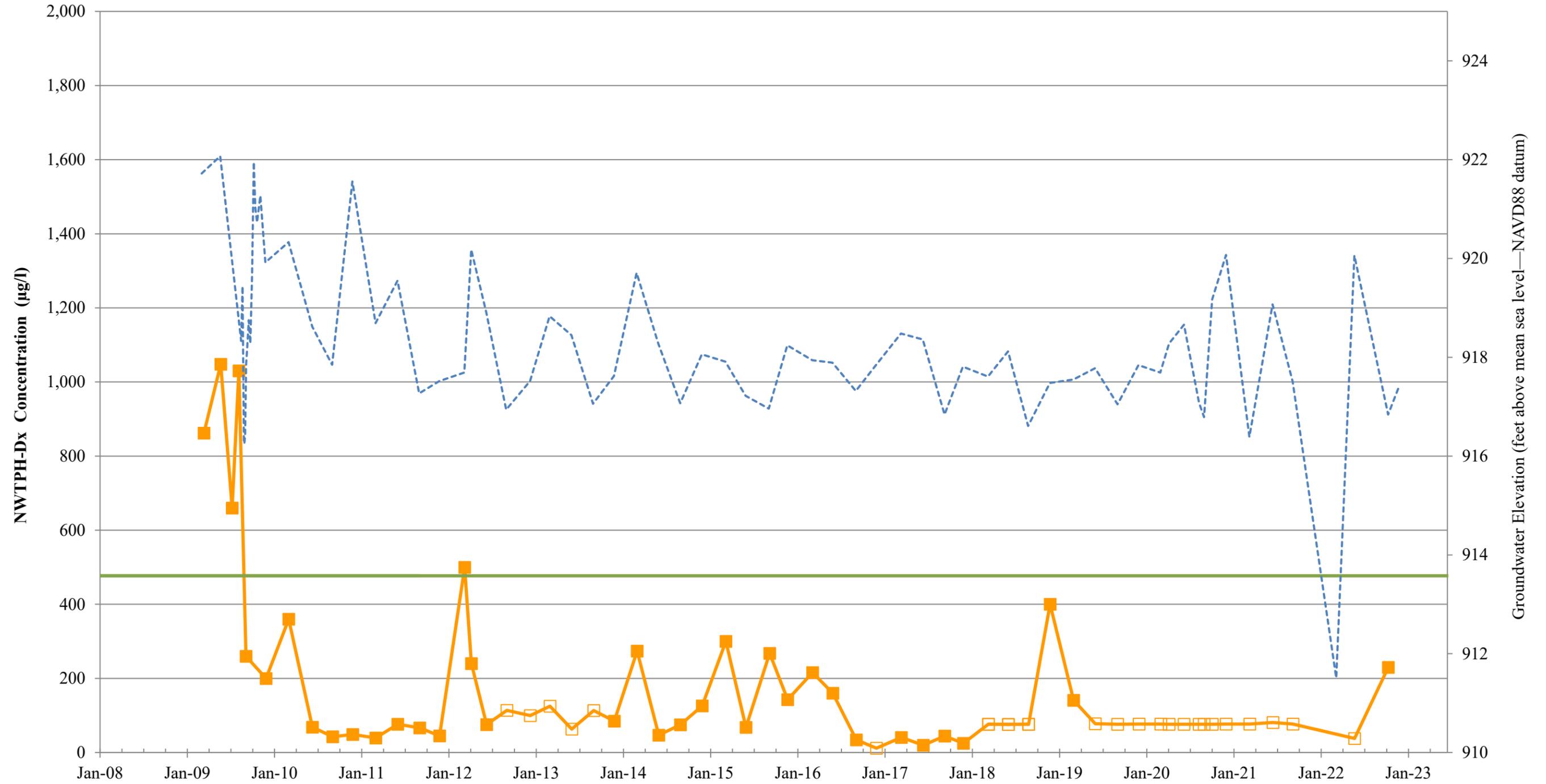
— NWTPH-Dx ■ NWTPH-Dx Reported Detects □ NWTPH-Dx Reported Non-Detects — Cleanup Level (208 µg/l) - - - Groundwater Elevation

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-1



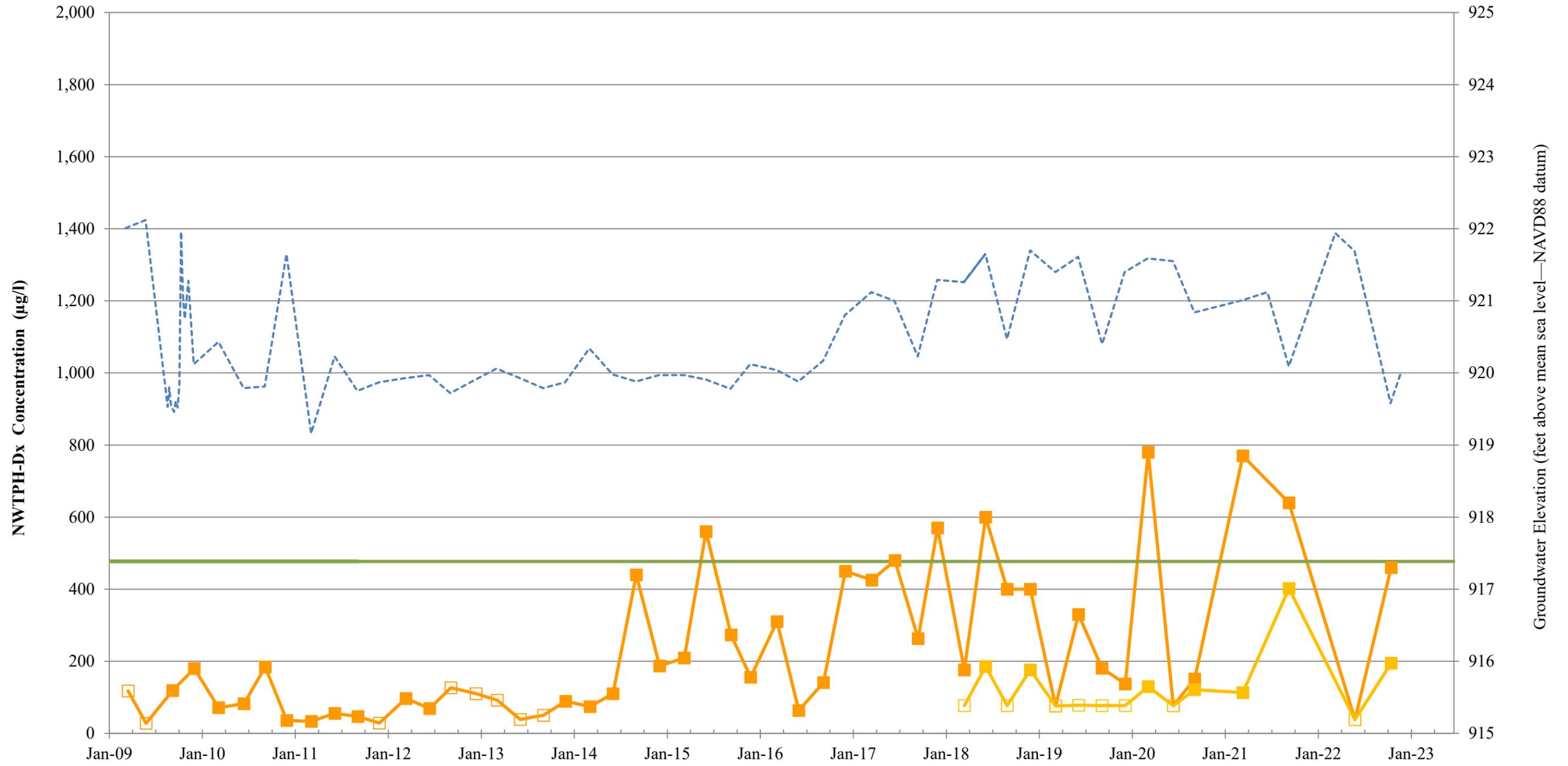
— NWTPH-Dx ■ NWTPH-Dx Reported Detects □ NWTPH-Dx Reported Non-Detects — Remediation Level (477 µg/l) - - - Groundwater Elevation

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-2



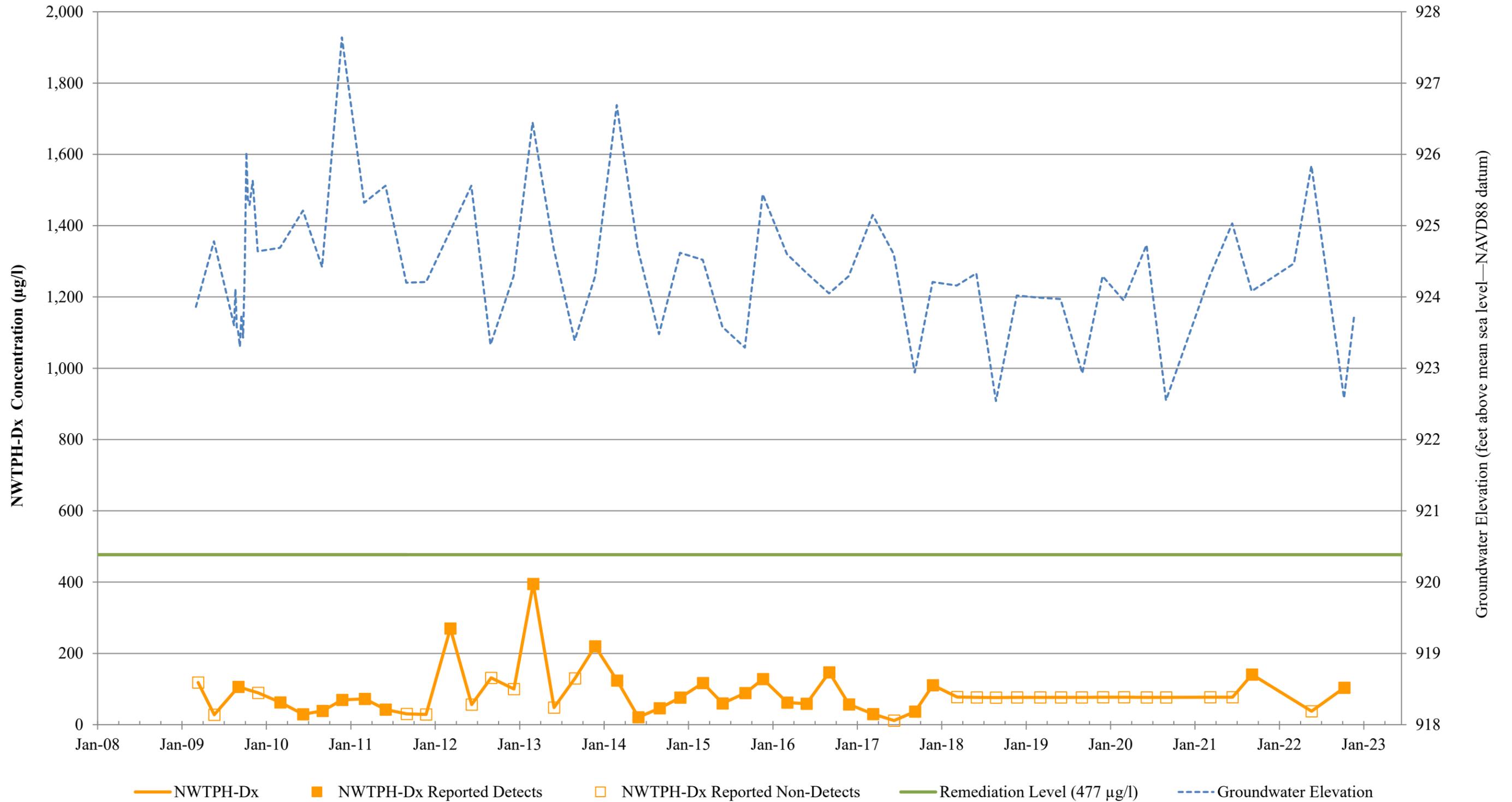
—■ NWTPH-Dx
 ■ NWTPH-Dx Reported Detects
 NWTPH-Dx Reported Non-Detects
 — Remediation Level (477 µg/l)
 - - - Groundwater Elevation

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-3

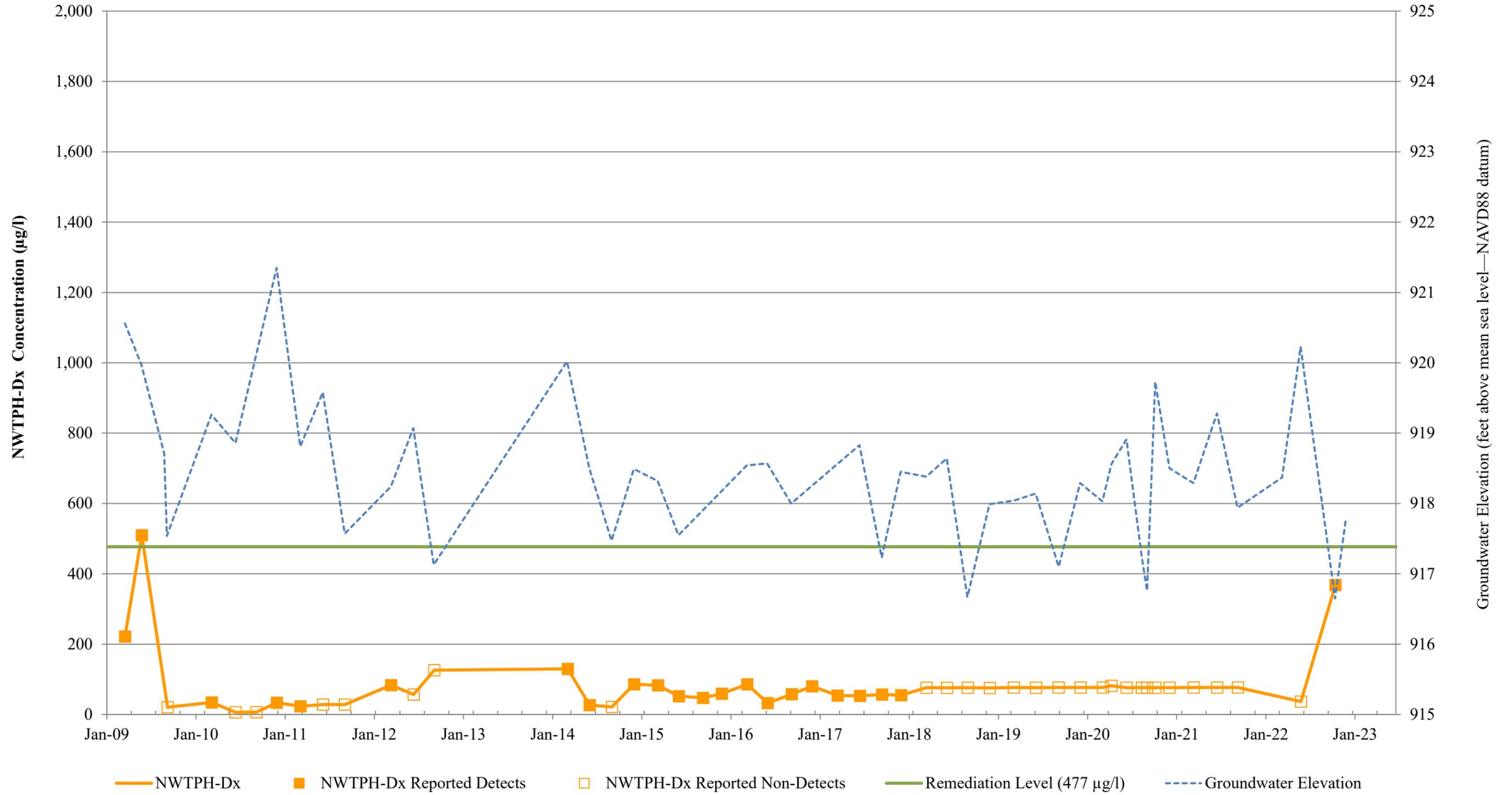


- NWTPH-Dx
- NWTPH-Dx/SGC
- NWTPH-Dx Reported Detects
- NWTPH-Dx/SGC Reported Detects
- NWTPH-Dx Reported Non-Detects
- NWTPH-Dx/SGC Reported Non-Detects
- Remediation Level (477 µg/l)
- - - Groundwater Elevation

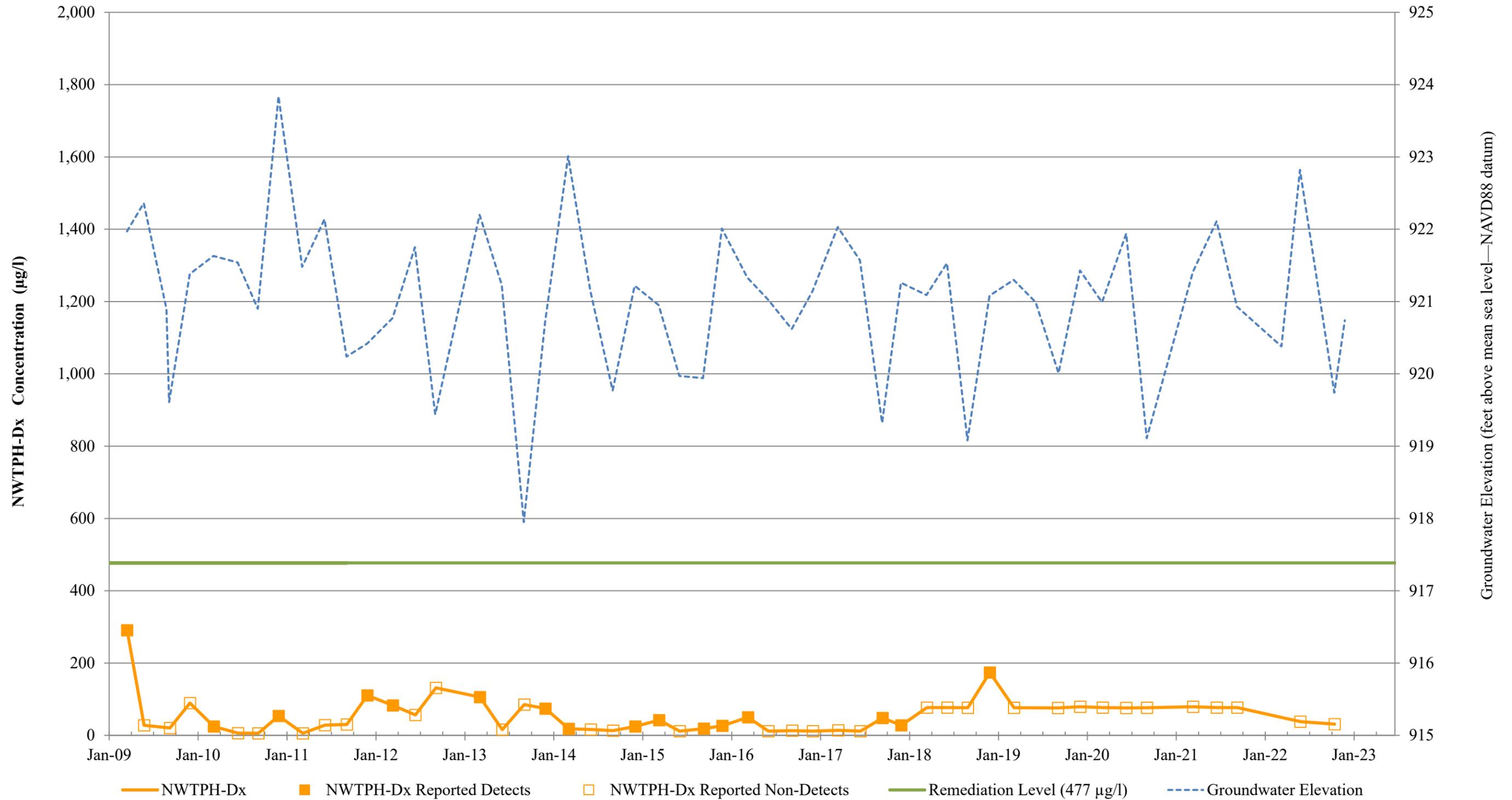
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well GW-4



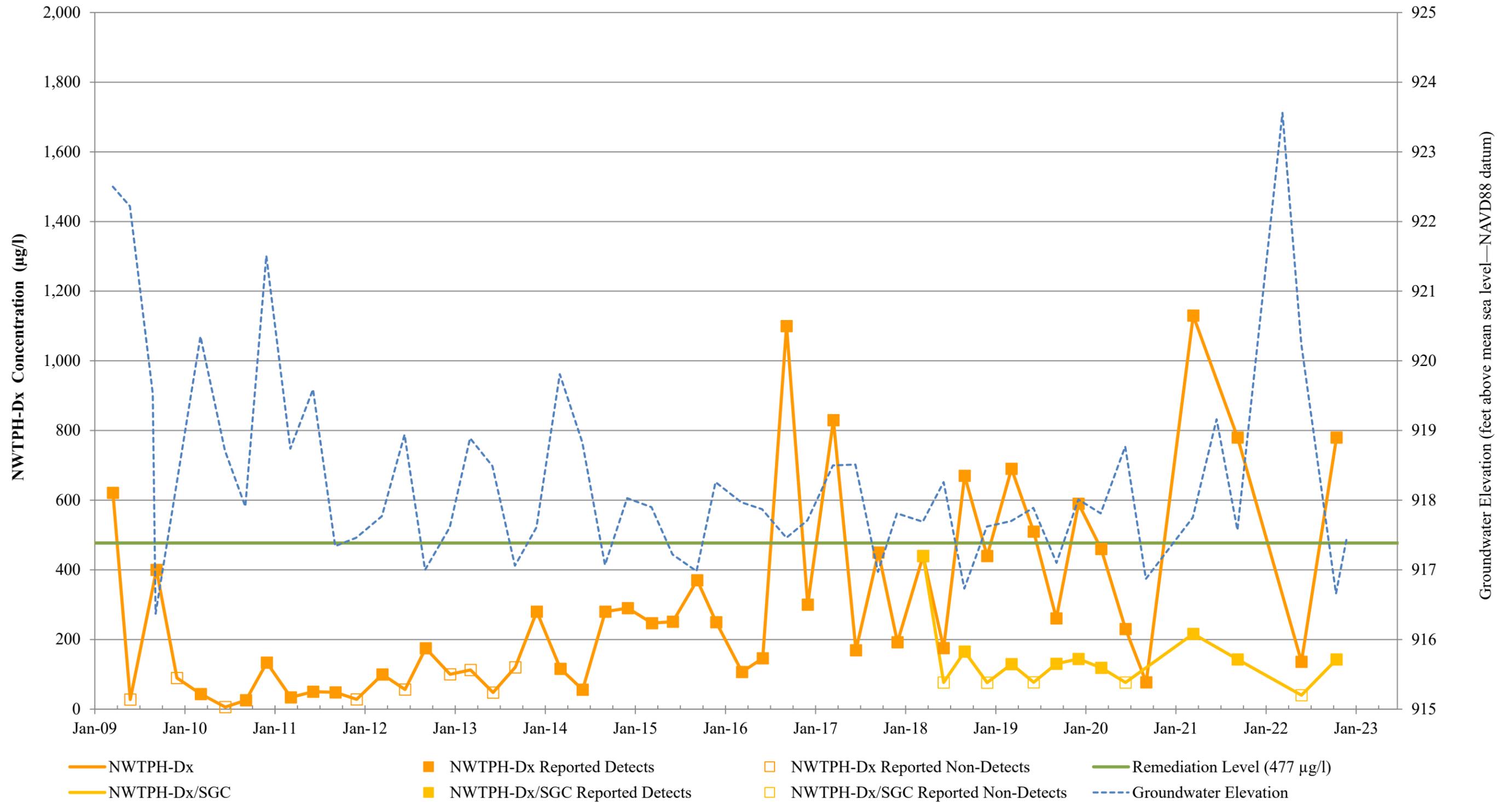
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-43



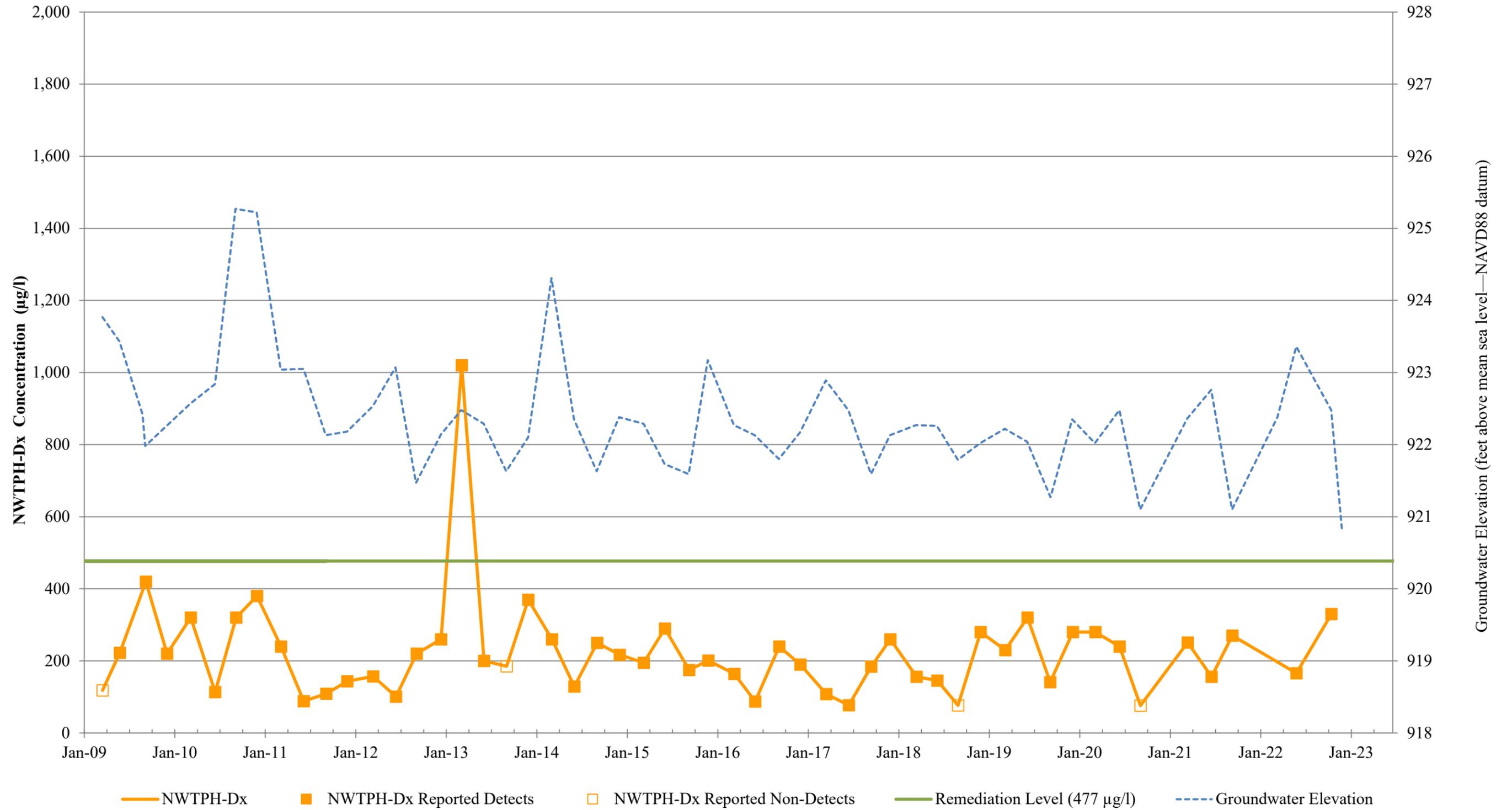
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-40



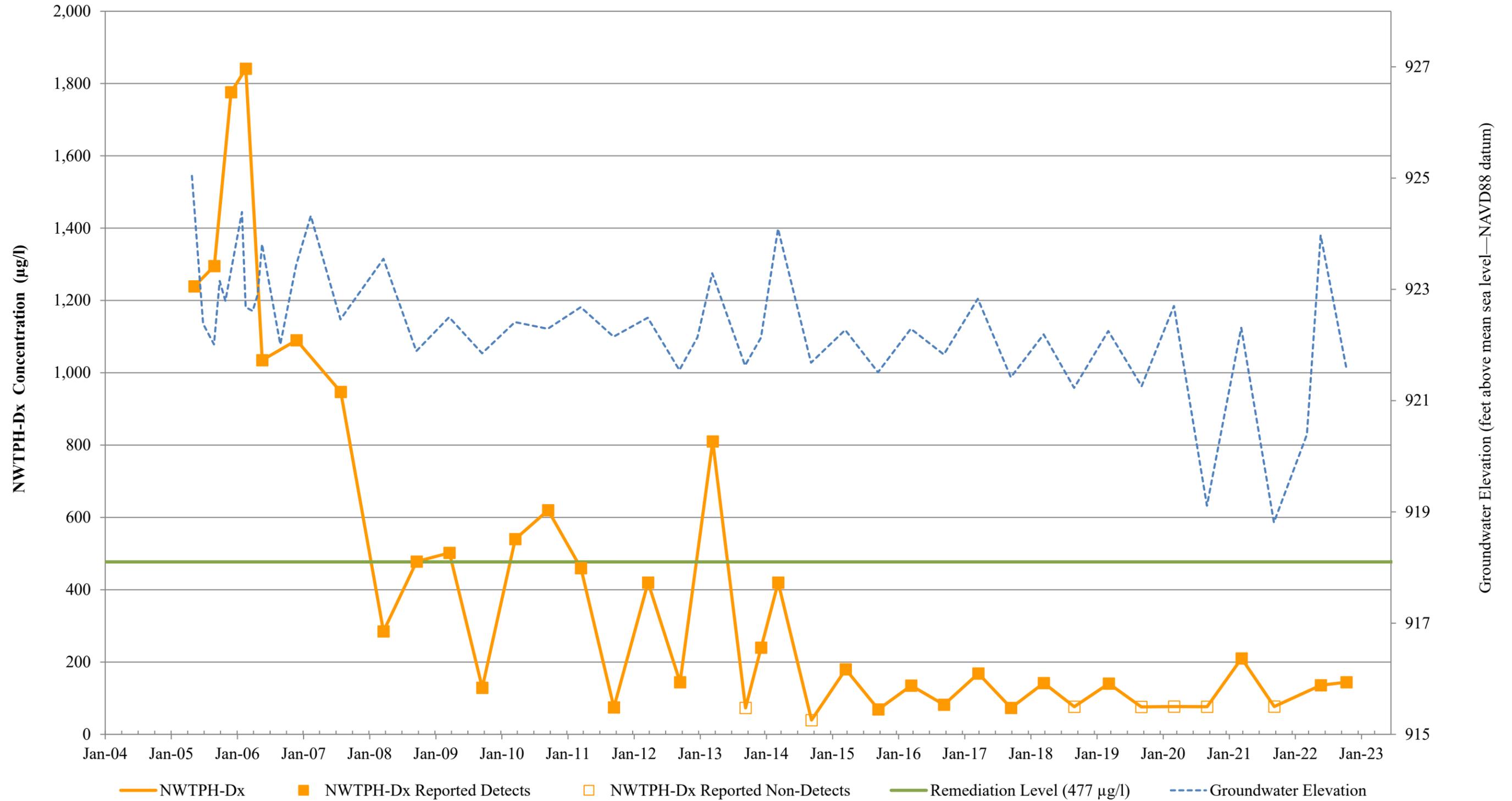
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-41



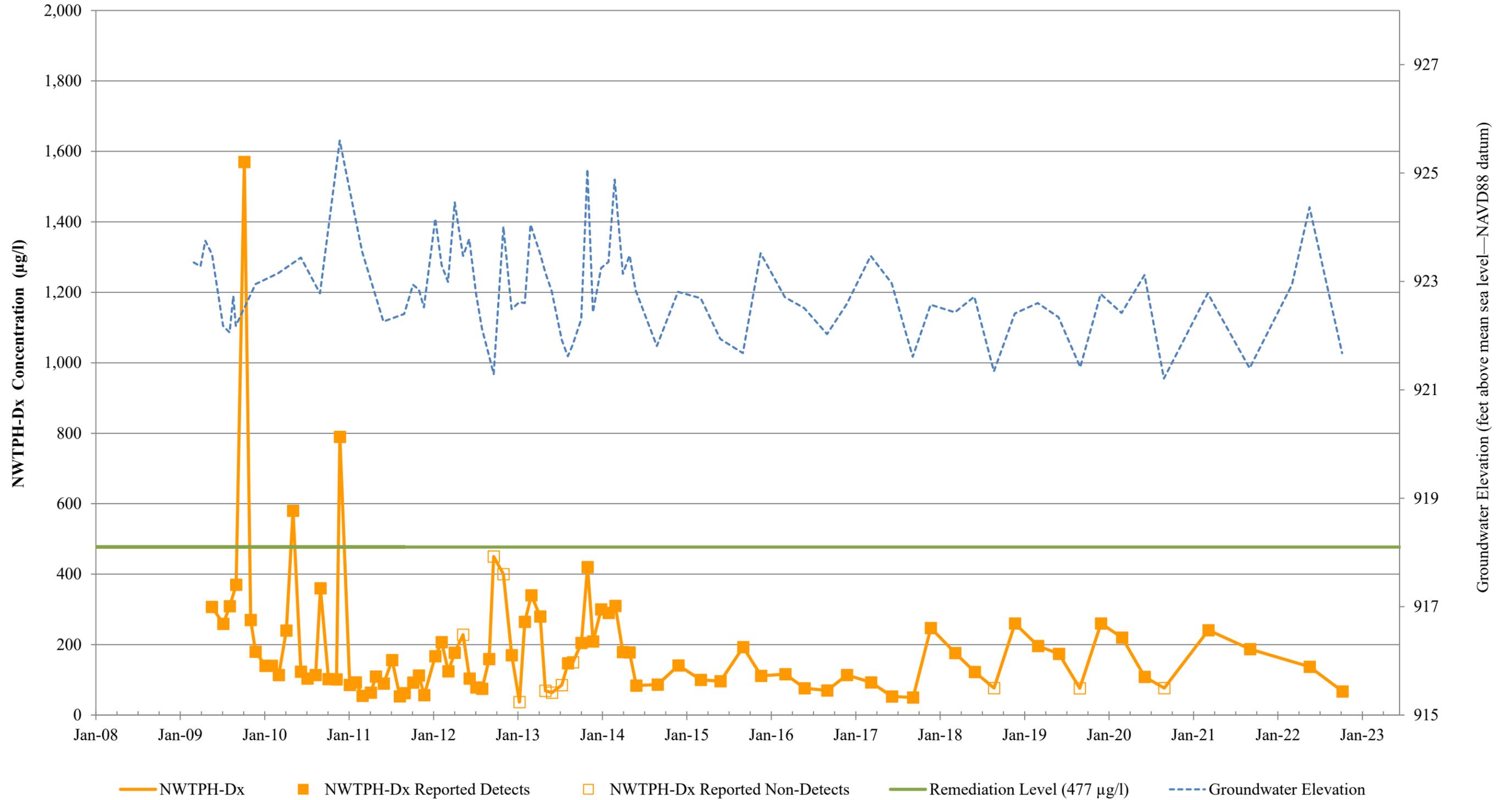
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-42



NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1C-W-4

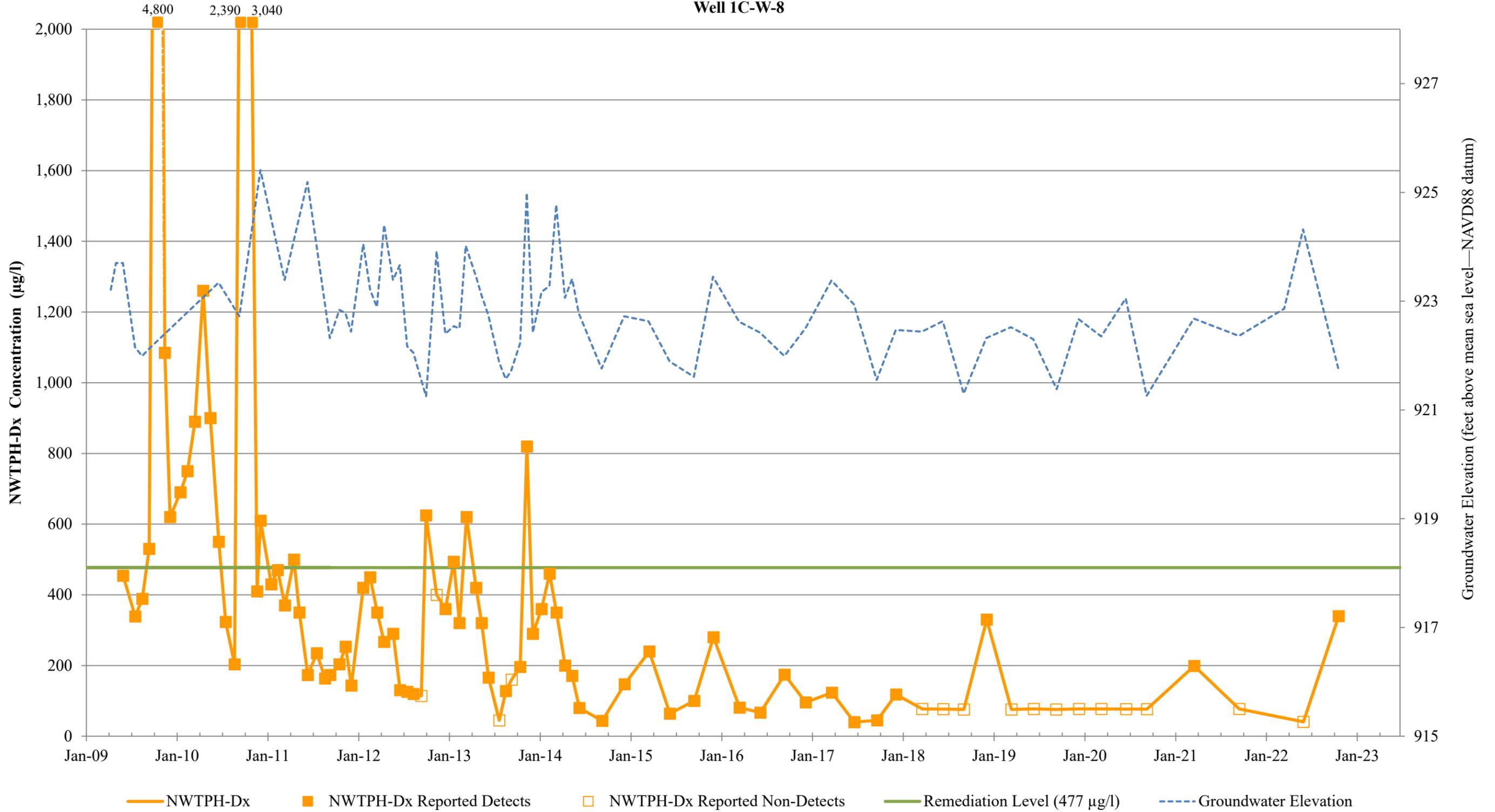


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1C-W-7

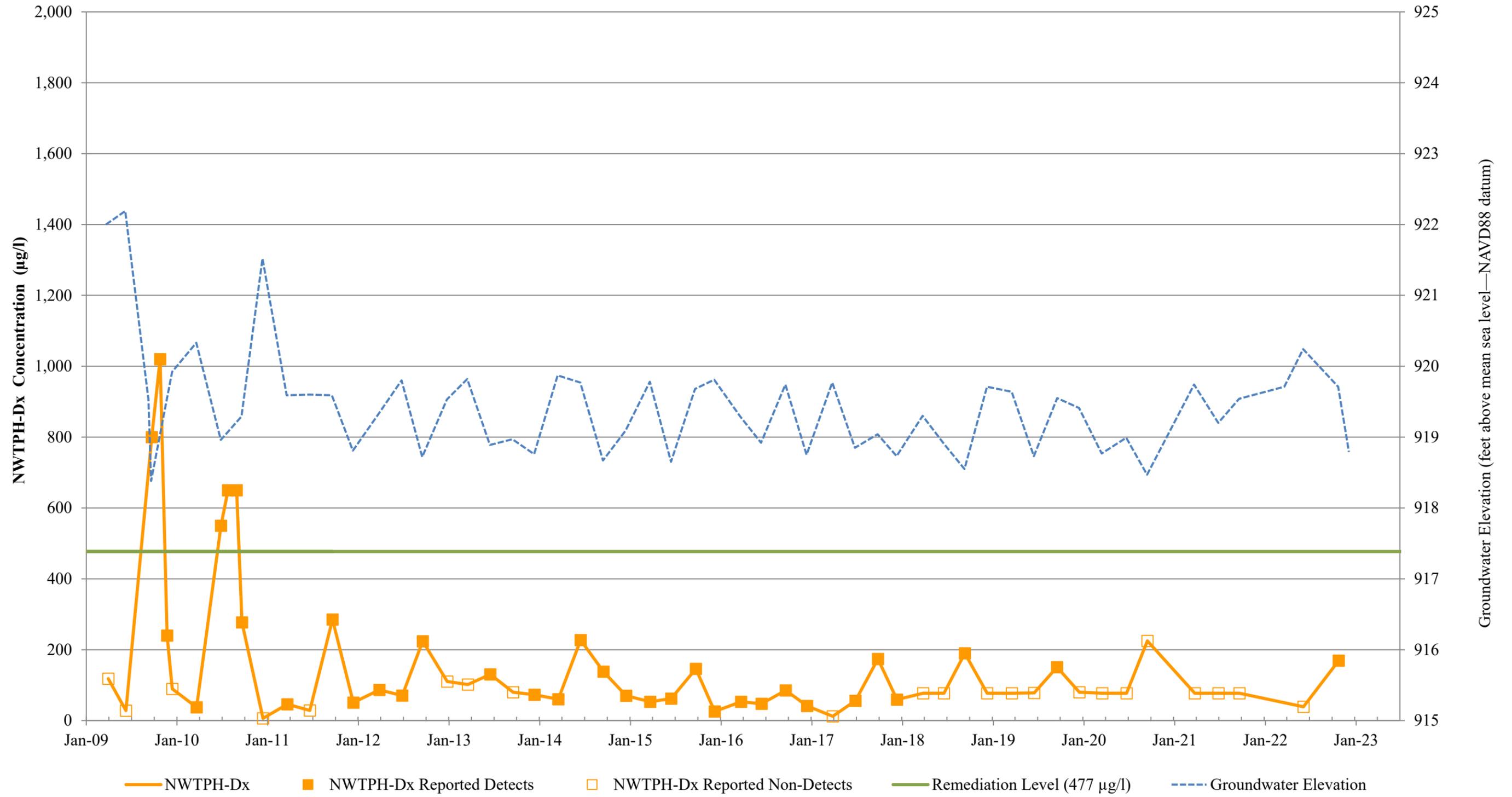


NWTPH-Dx concentrations exceeding the plot scale are shown above the plot area with the associated reported concentration value.

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1C-W-8

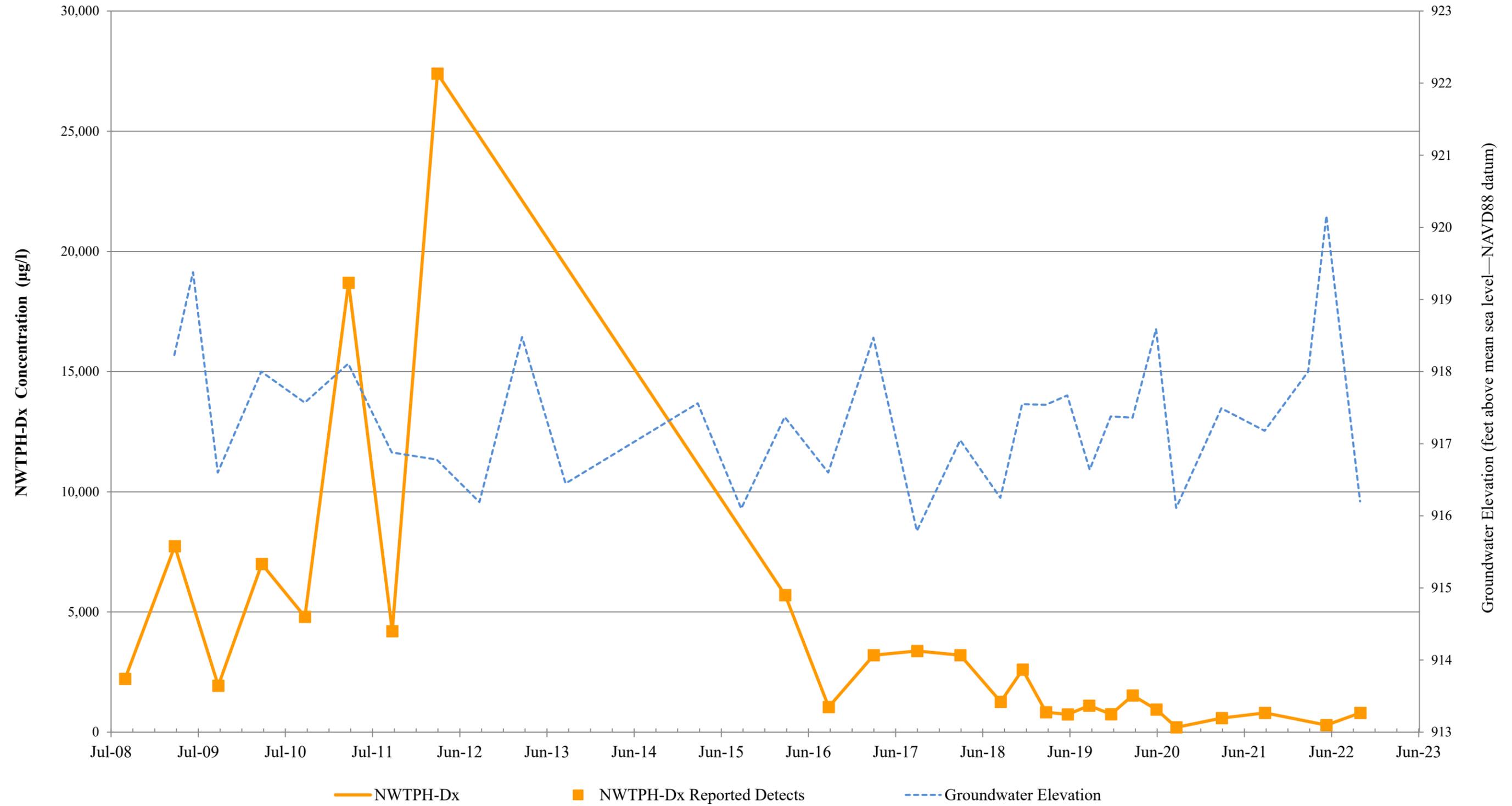


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 1B-W-23

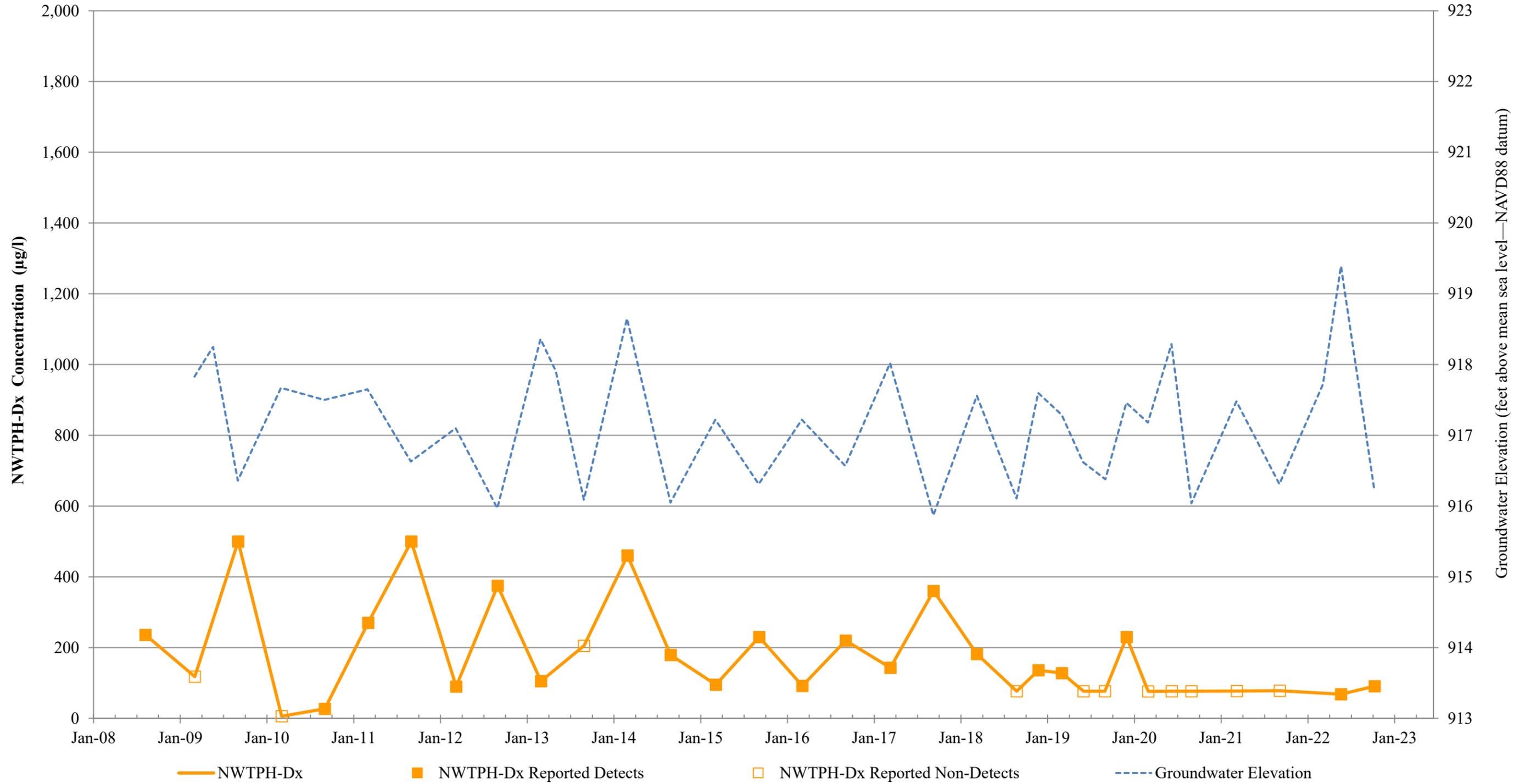


Note: Vertical scale is different from other plots; scale increased from 2,000 $\mu\text{g/l}$ to 30,000 $\mu\text{g/l}$ to show all data points.

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-51

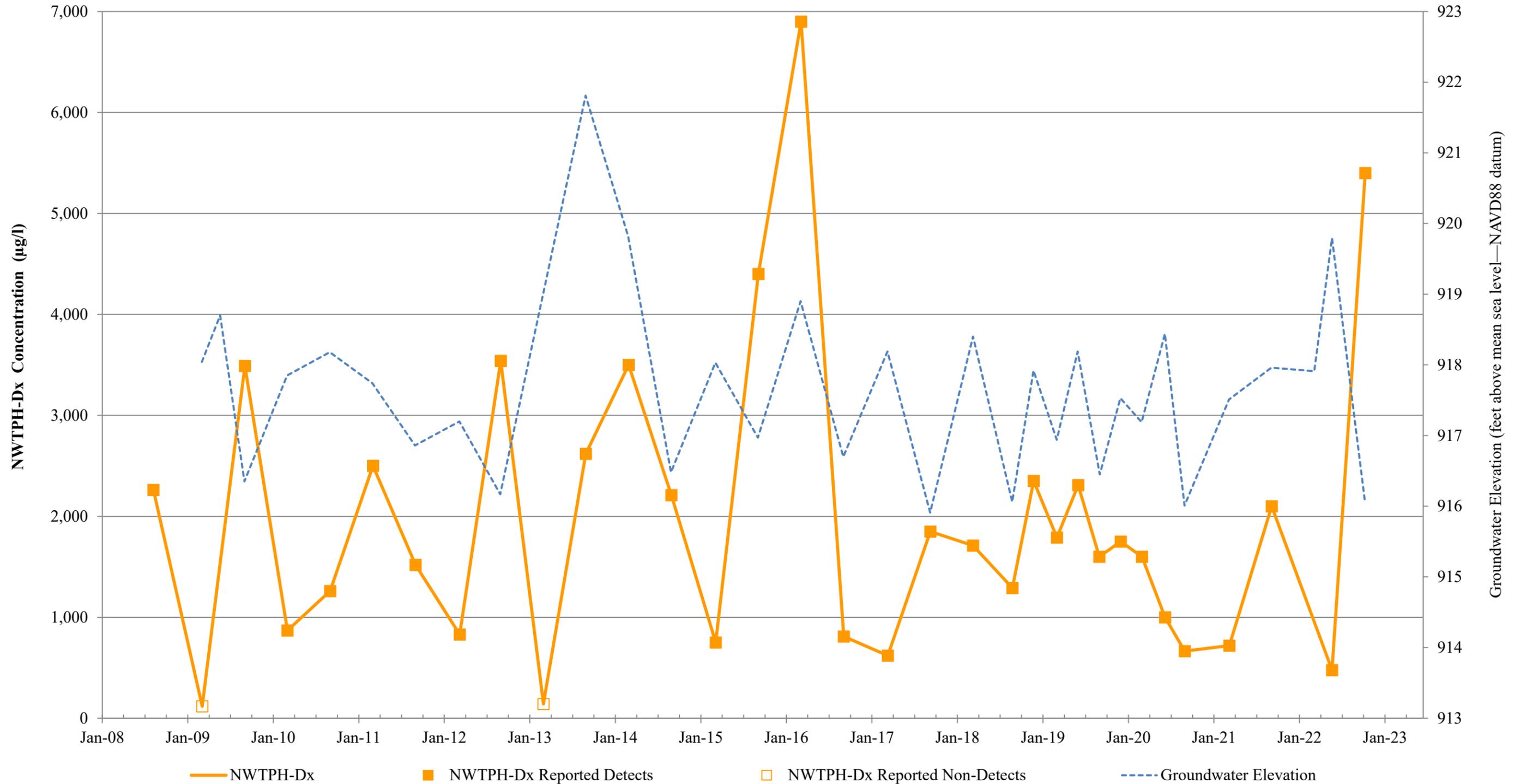


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-55

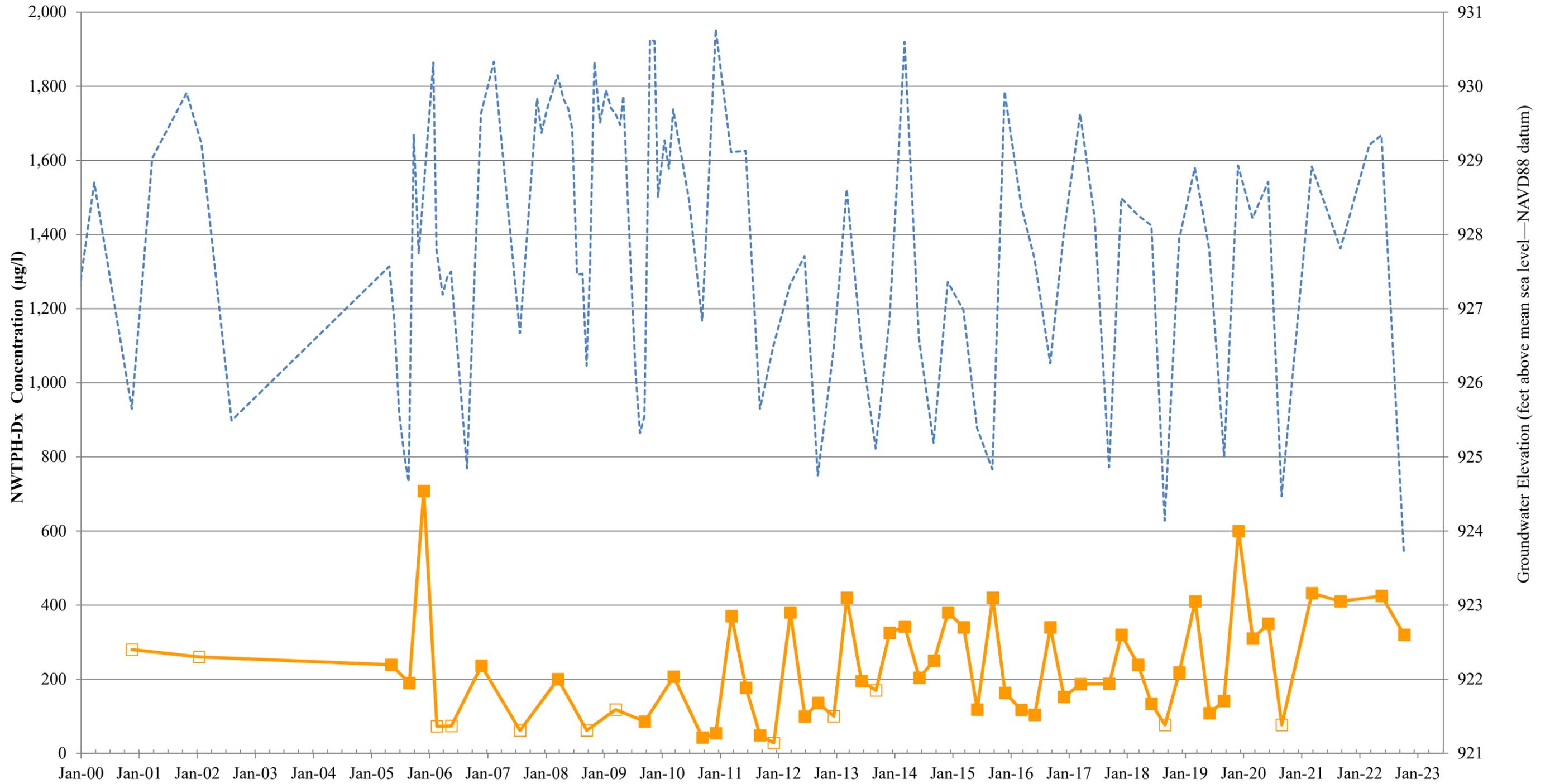


NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 5-W-56

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.



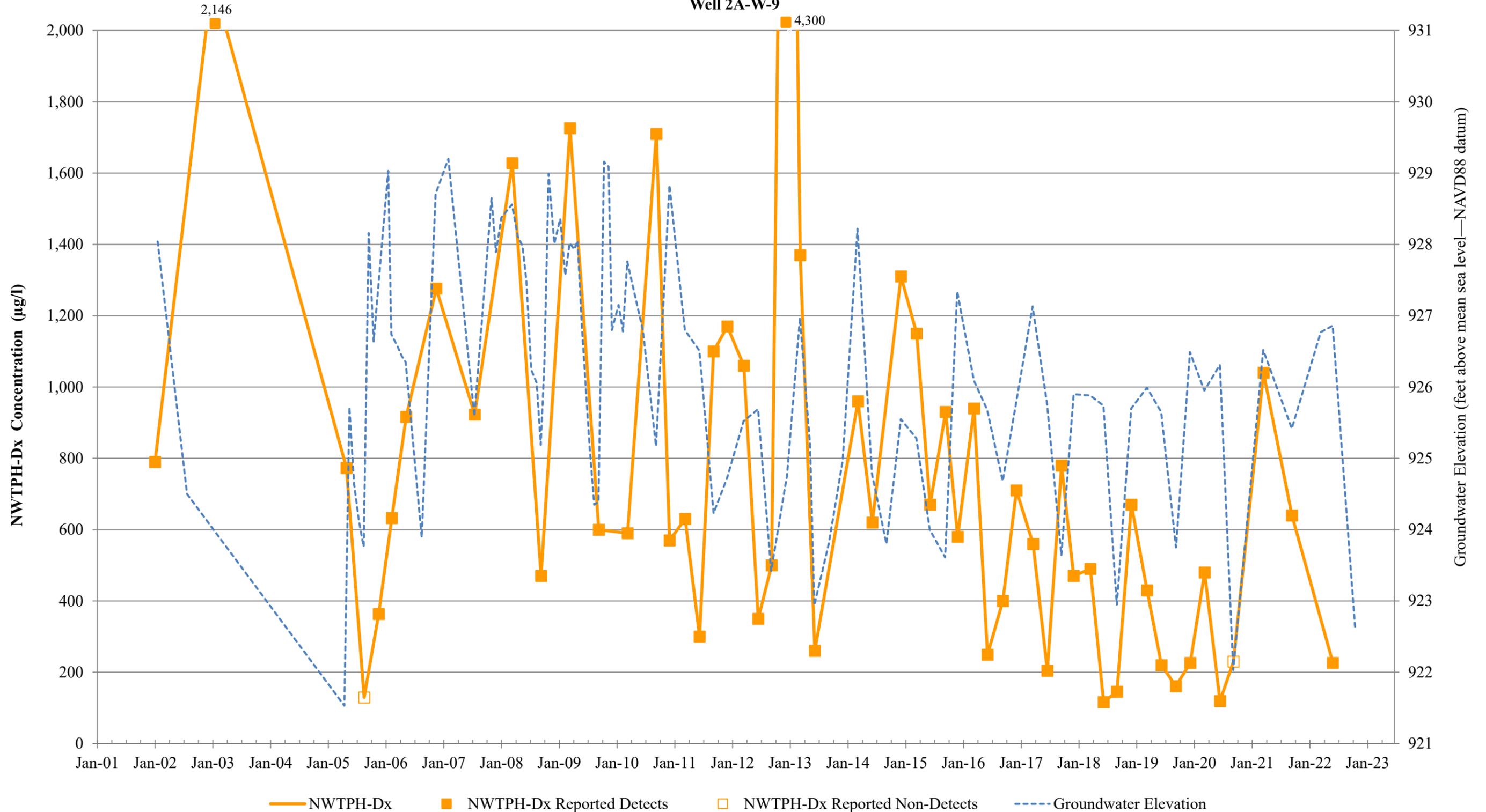
NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well MW-4



—■ NWTPH-Dx
 —■ NWTPH-Dx Reported Detects
 —□ NWTPH-Dx Reported Non-Detects
 - - - Groundwater Elevation

NWTPH-Dx Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071
Well 2A-W-9

NWTPH-Dx concentrations exceeding the plot scale are shown above the plot area with the associated reported concentration value.



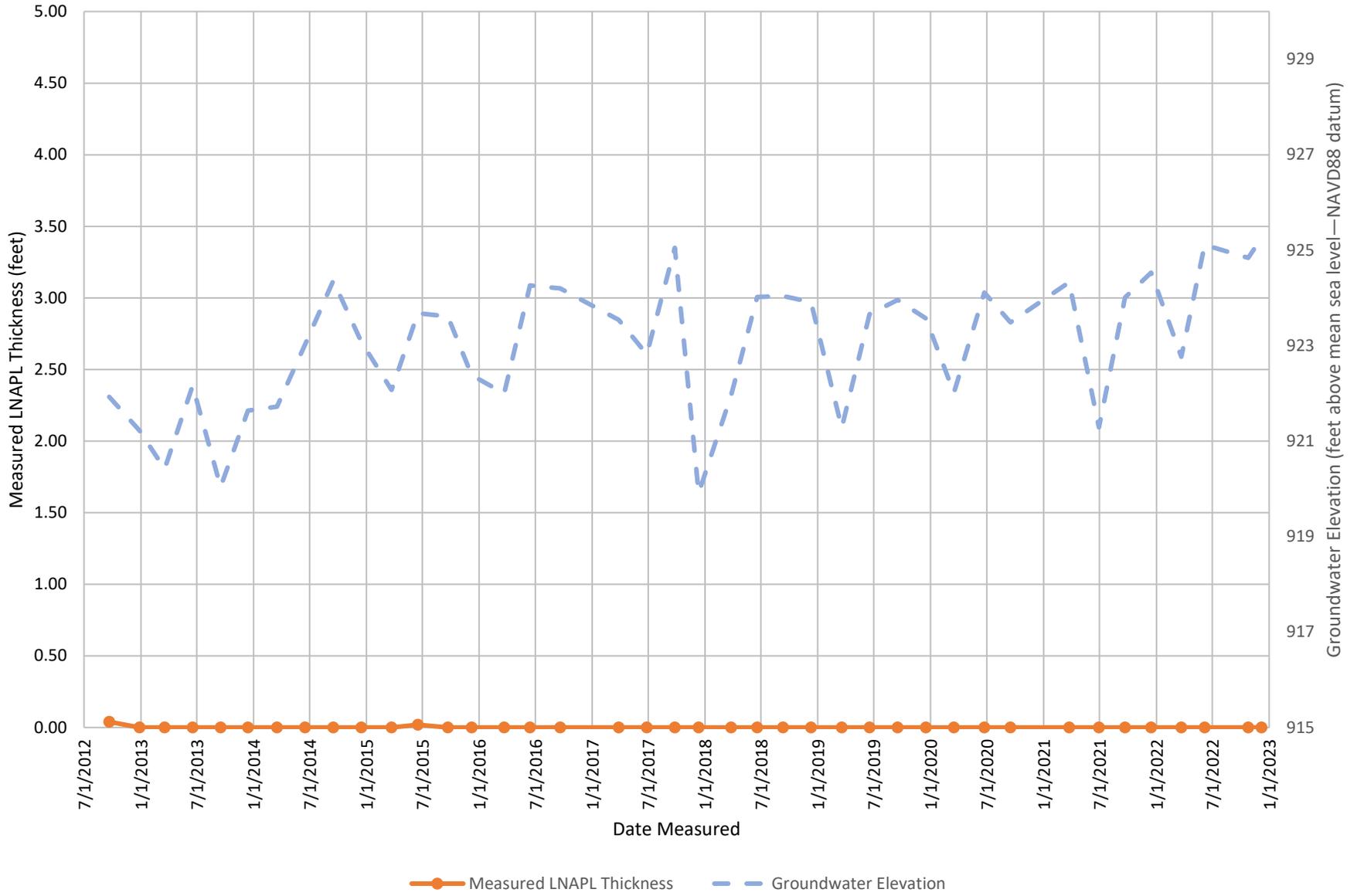
APPENDIX D
LNAPL TREND PLOTS

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

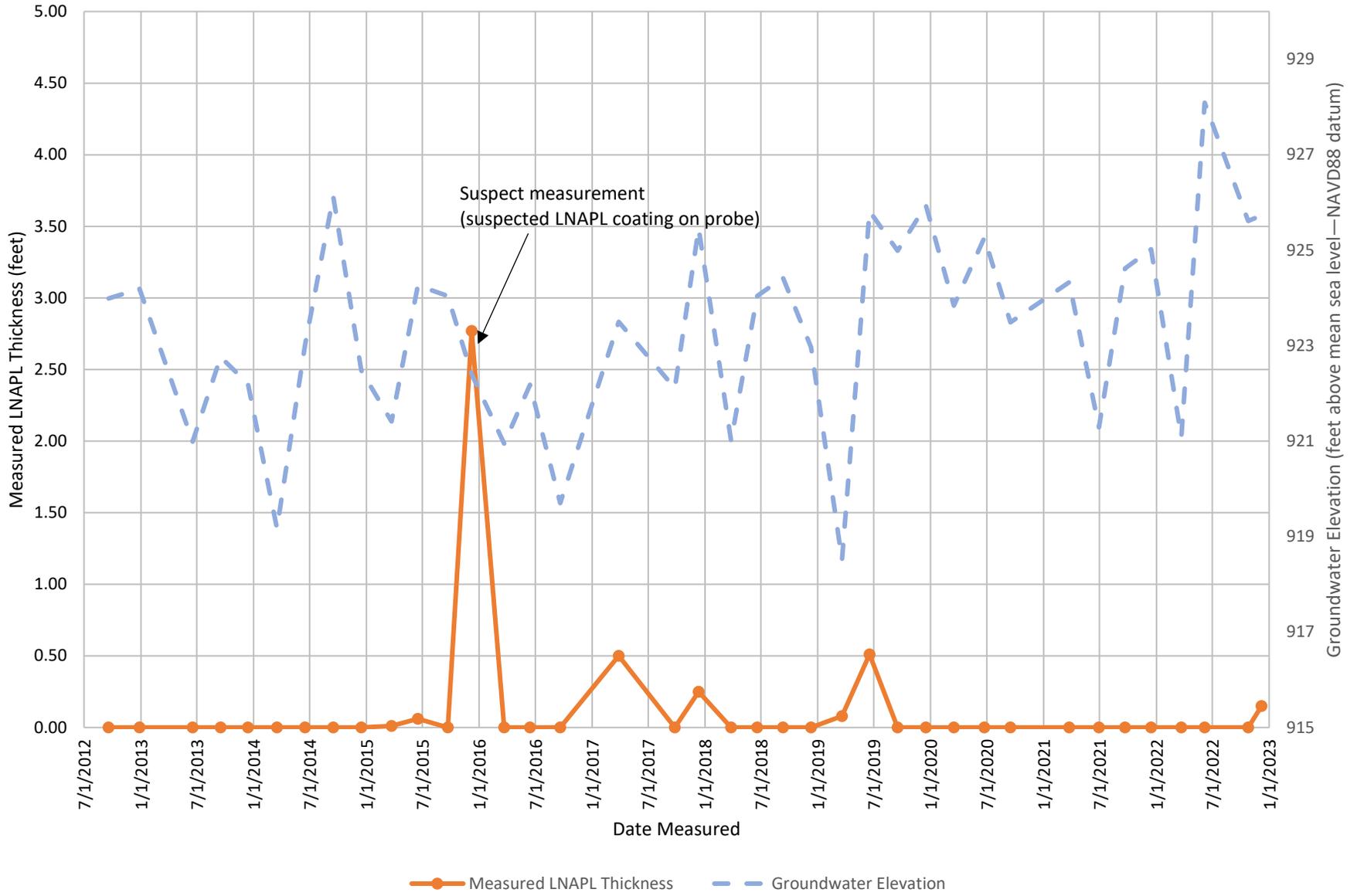
Farallon PN: 683-071

Well RW-03

LNAPL Thickness Measurements

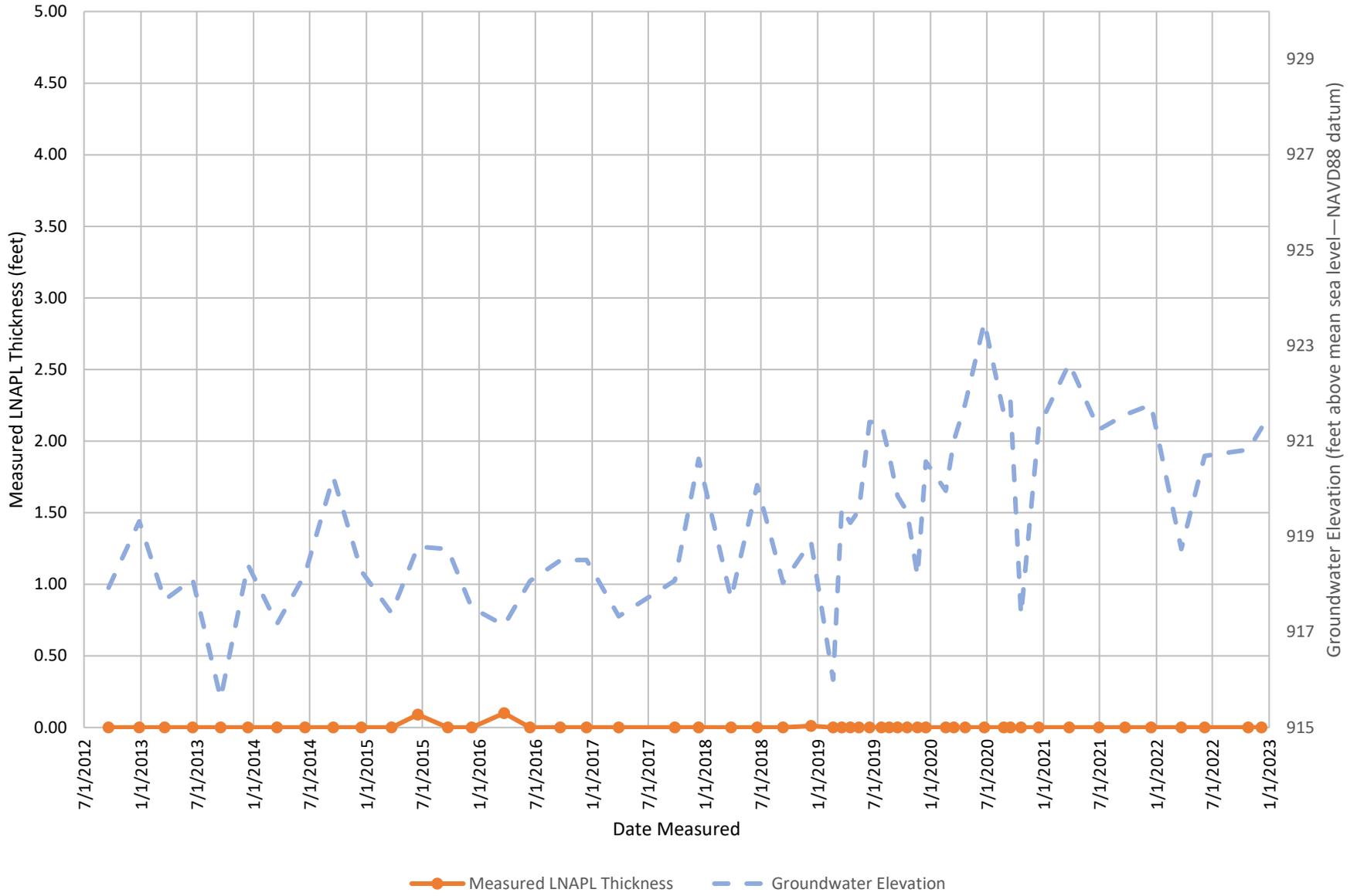


Well RW-04 LNAPL Thickness Measurements



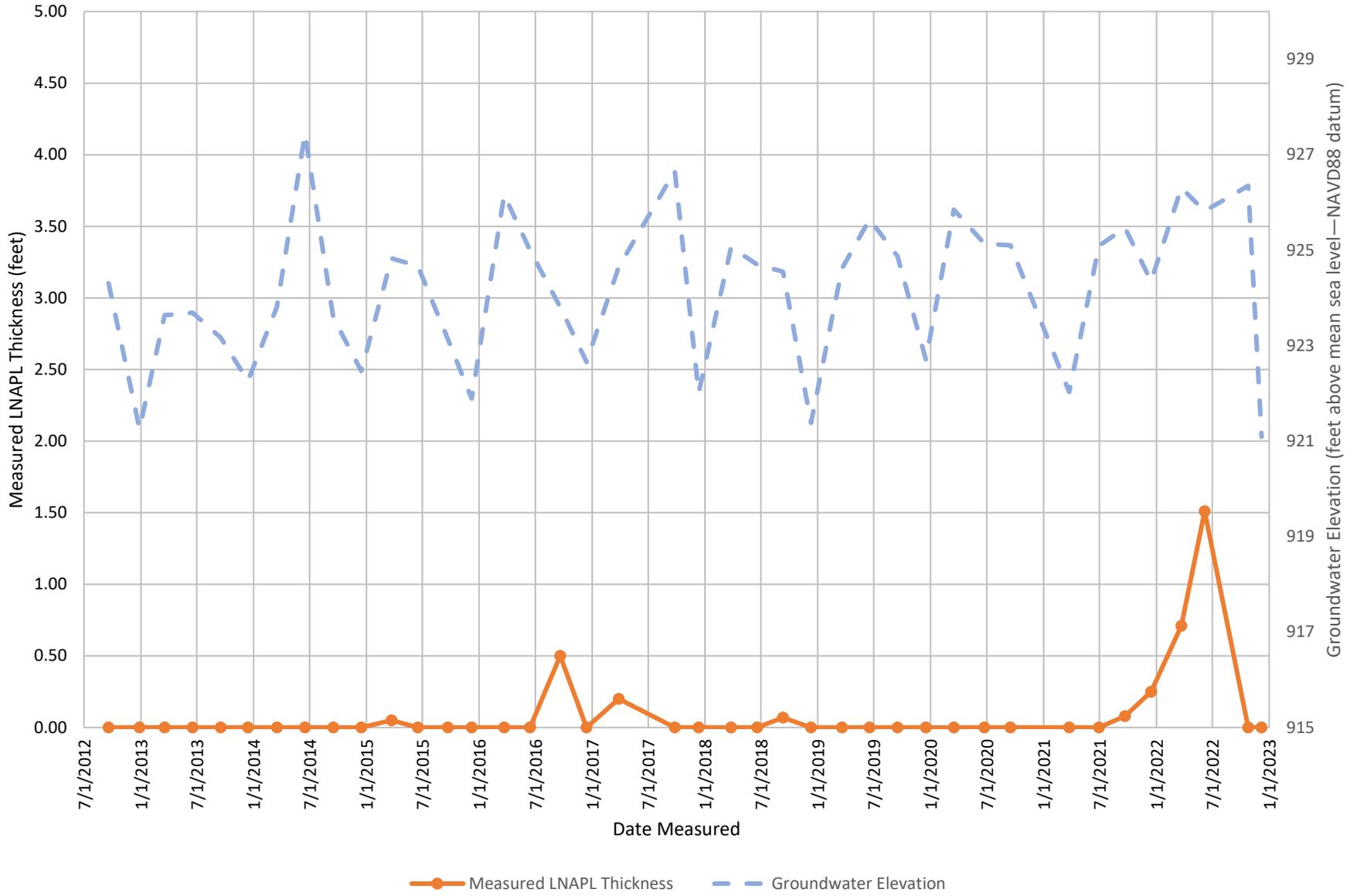
Well RW-05

LNAPL Thickness Measurements

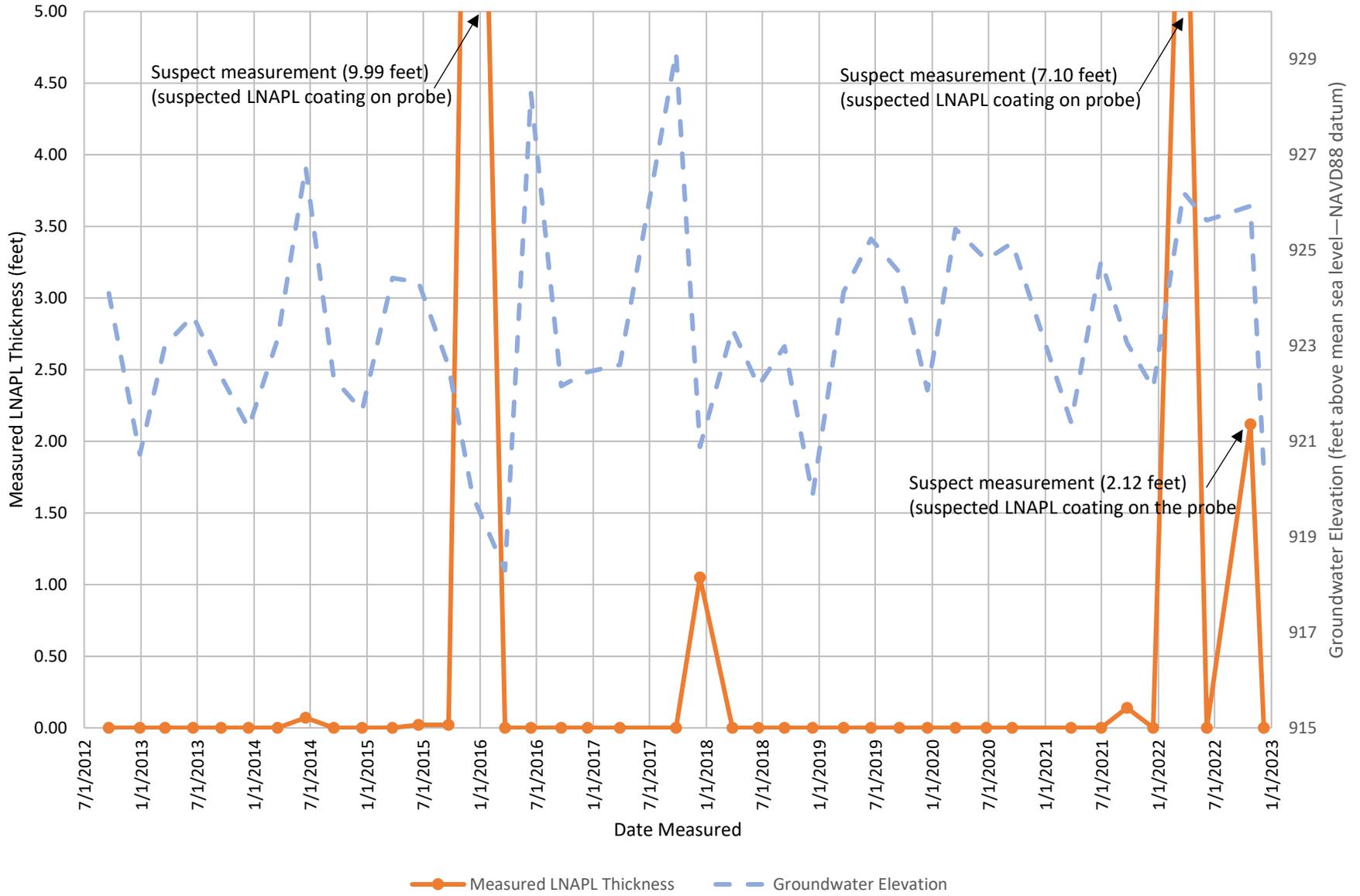


Well RW-07

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 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
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							

	A	B	C	D	E	F	G	H	I	J	K	L
911						KM Mean (logged)	3.957				KM Geo Mean	52.28
912						KM SD (logged)	0.716				95% Critical H Value (KM-Log)	2.357
913						KM Standard Error of Mean (logged)	0.234				95% H-UCL (KM -Log)	107.8
914						KM SD (logged)	0.716				95% Critical H Value (KM-Log)	2.357
915						KM Standard Error of Mean (logged)	0.234					
916												
917						DL/2 Statistics						
918						DL/2 Normal			DL/2 Log-Transformed			
919						Mean in Original Scale	75.71				Mean in Log Scale	3.94
920						SD in Original Scale	95.06				SD in Log Scale	0.776
921						95% t UCL (Assumes normality)	120.7				95% H-Stat UCL	117.6
922						DL/2 is not a recommended method, provided for comparisons and historical reasons						
923												
924						Nonparametric Distribution Free UCL Statistics						
925						Detected Data appear Normal Distributed at 1% Significance Level						
926												
927						Suggested UCL to Use						
928						95% KM (t) UCL	128.8					
929												
930						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
931						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.						
932						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
933												
934												
935						NWTPH-Dx (5-w-51)						
936												
937						General Statistics						
938						Total Number of Observations	10				Number of Distinct Observations	9
939											Number of Missing Observations	0
940						Minimum	201				Mean	774.8
941						Maximum	1530				Median	775
942						SD	379.8				Std. Error of Mean	120.1
943						Coefficient of Variation	0.49				Skewness	0.419
944												
945						Normal GOF Test						
946						Shapiro Wilk Test Statistic	0.951				Shapiro Wilk GOF Test	
947						1% Shapiro Wilk Critical Value	0.781				Data appear Normal at 1% Significance Level	
948						Lilliefors Test Statistic	0.174				Lilliefors GOF Test	
949						1% Lilliefors Critical Value	0.304				Data appear Normal at 1% Significance Level	
950						Data appear Normal at 1% Significance Level						
951												
952						Assuming Normal Distribution						
953						95% Normal UCL			95% UCLs (Adjusted for Skewness)			
954						95% Student's-t UCL	995				95% Adjusted-CLT UCL (Chen-1995)	989.4
955											95% Modified-t UCL (Johnson-1978)	997.6
956												
957						Gamma GOF Test						
958						A-D Test Statistic	0.433				Anderson-Darling Gamma GOF Test	
959						5% A-D Critical Value	0.73				Detected data appear Gamma Distributed at 5% Significance Level	
960						K-S Test Statistic	0.233				Kolmogorov-Smirnov Gamma GOF Test	
961						5% K-S Critical Value	0.268				Detected data appear Gamma Distributed at 5% Significance Level	
962						Detected data appear Gamma Distributed at 5% Significance Level						
963												
964						Gamma Statistics						
965						k hat (MLE)	3.806				k star (bias corrected MLE)	2.731
966						Theta hat (MLE)	203.6				Theta star (bias corrected MLE)	283.7
967						nu hat (MLE)	76.11				nu star (bias corrected)	54.61
968						MLE Mean (bias corrected)	774.8				MLE Sd (bias corrected)	468.9
969											Approximate Chi Square Value (0.05)	38.63
970						Adjusted Level of Significance	0.0267				Adjusted Chi Square Value	36.31
971												
972						Assuming Gamma Distribution						
973						95% Approximate Gamma UCL	1095				95% Adjusted Gamma UCL	1165
974												
975						Lognormal GOF Test						

	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
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						

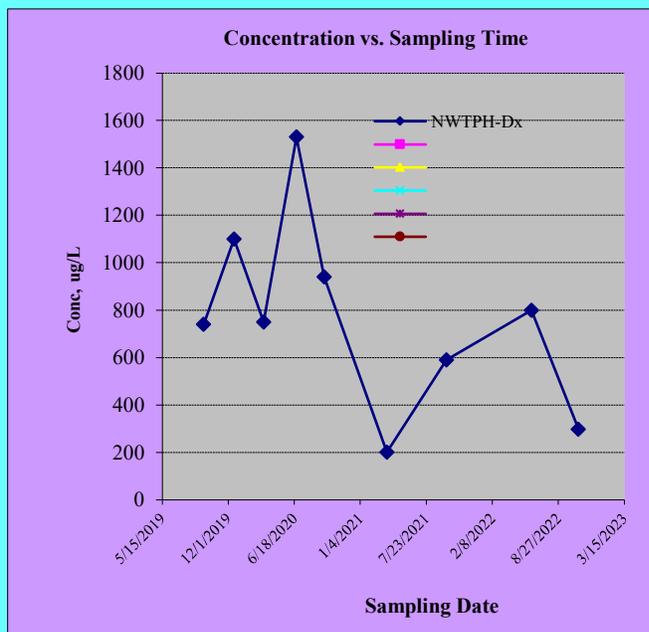
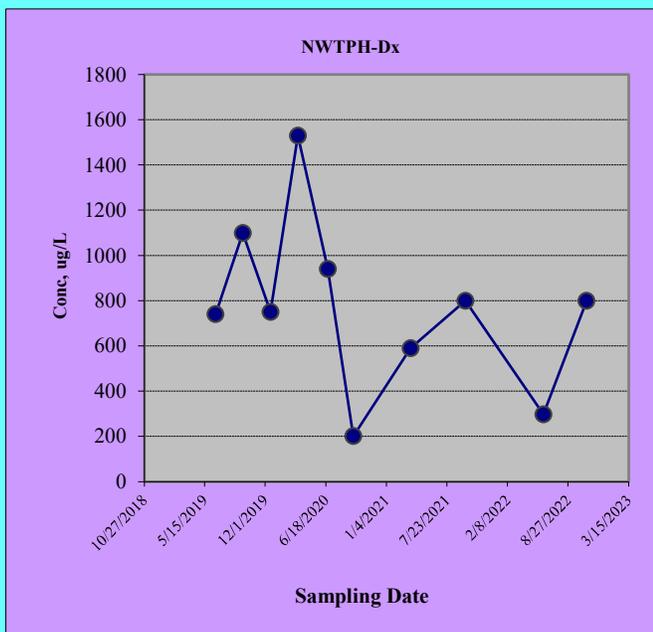
2. Mann-Kendall Non-parametric Statistical Test Results

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 Time

Hazardous 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.

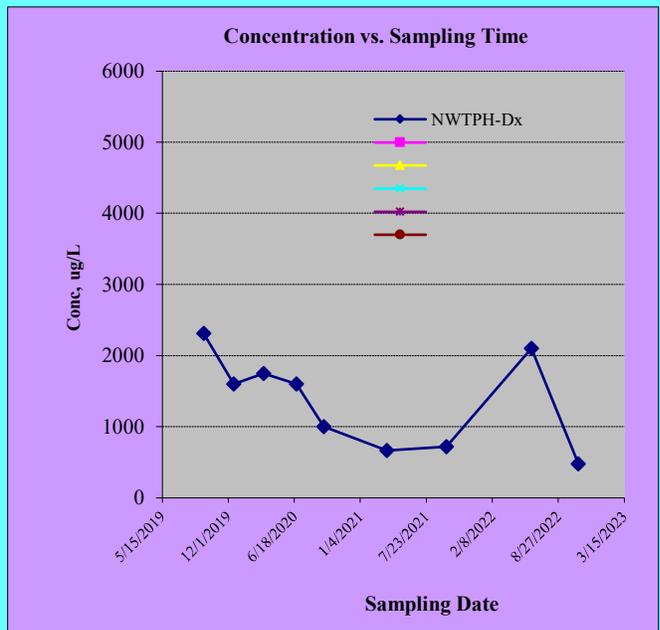
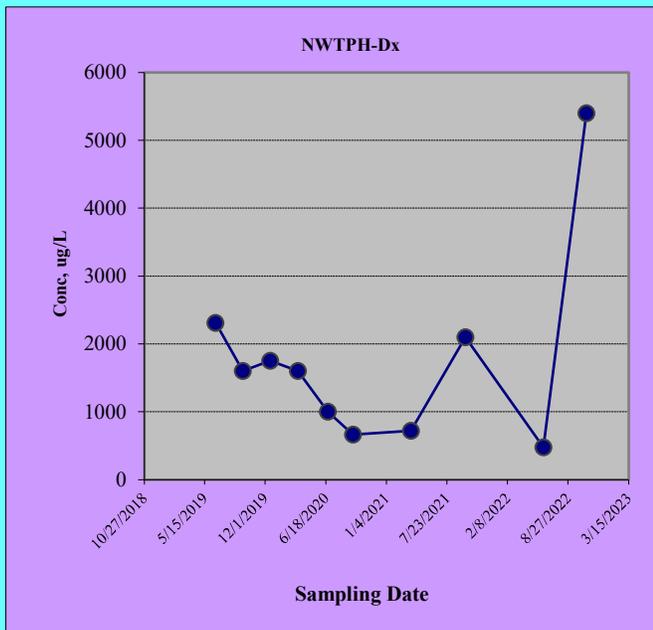
		Hazardous Substances (unit is ug/L)				
Sampling Event	Date Sampled	NWTPH-Dx				
#1	6/19/2019	2310				
#2	9/17/2019	1600				
#3	12/17/2019	1750				
#4	3/17/2020	1600				
#5	6/24/2020	1000				
#6	9/15/2020	665				
#7	3/25/2021	720				
#8	9/22/2021	2100				
#9	6/6/2022	477				
#10	10/26/2022	5400				
#11						
#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 Time

Hazardous 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						

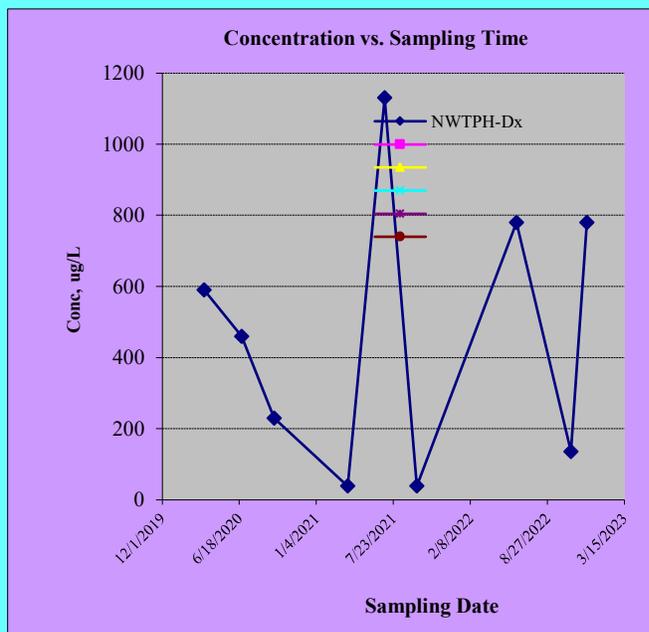
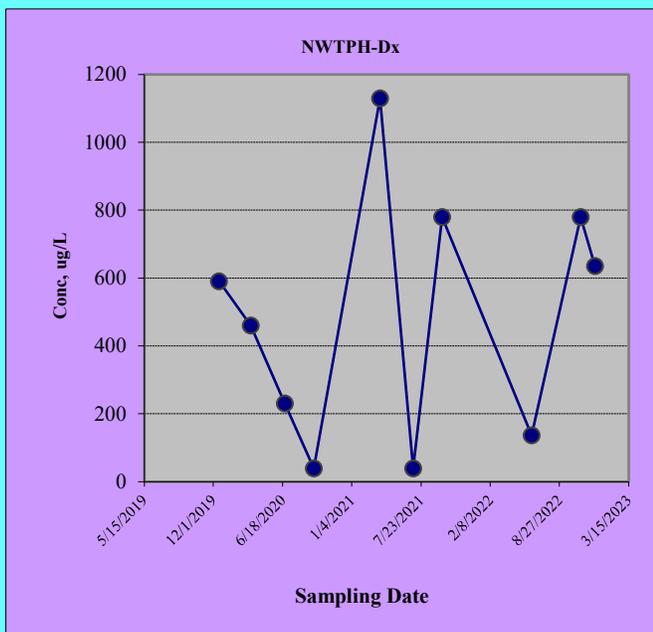
2. Mann-Kendall Non-parametric Statistical Test Results

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 Time

Hazardous 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.

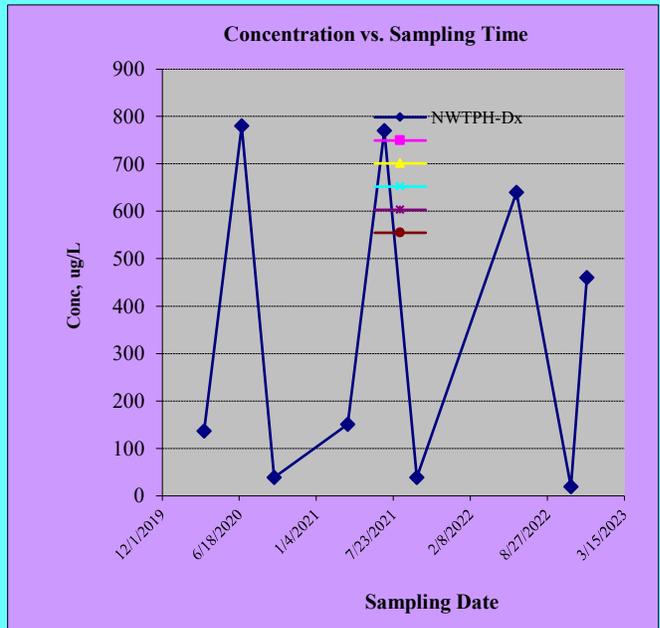
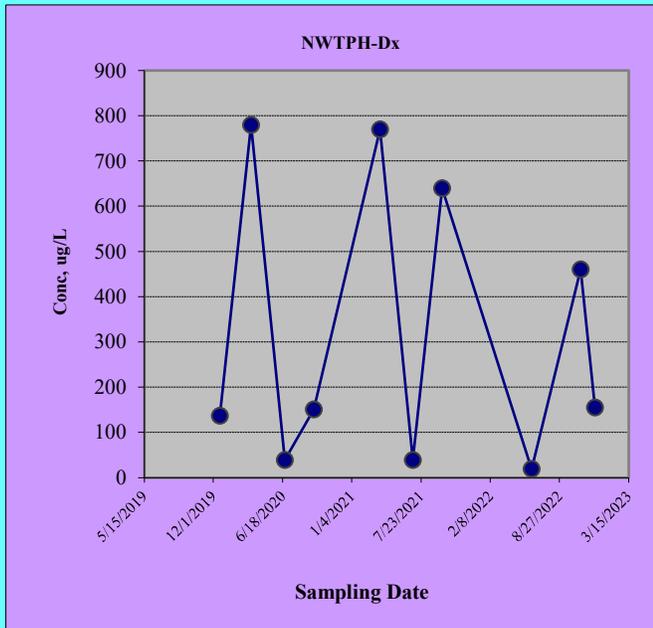
		Hazardous Substances (unit is ug/L)				
Sampling Event	Date Sampled	NWTPH-Dx				
#1	12/19/2019	137				
#2	3/18/2020	780				
#3	6/24/2020	39				
#4	9/16/2020	151				
#5	3/26/2021	770				
#6	6/29/2021	39				
#7	9/22/2021	640				
#8	6/7/2022	19				
#9	10/27/2022	460				
#10	12/7/2022	155				
#11						
#12						
#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 Time

Hazardous 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.

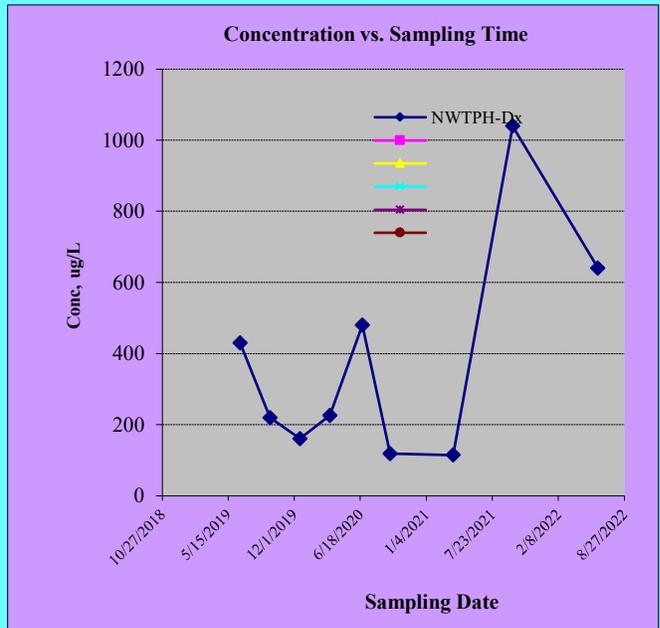
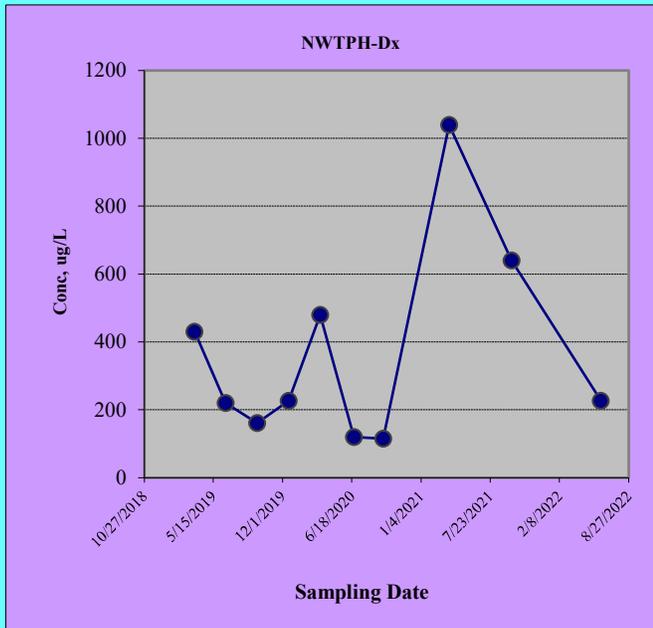
Sampling Event	Date Sampled	Hazardous Substances (unit is ug/L)				
		NWTPH-Dx				
#1	3/21/2019	430				
#2	6/19/2019	220				
#3	9/18/2019	161				
#4	12/18/2019	226				
#5	3/18/2020	480				
#6	6/24/2020	119				
#7	9/16/2020	115				
#8	3/26/2021	1040				
#9	9/22/2021	640				
#10	6/7/2022	226				
#11						
#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 Time

Hazardous 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 Time

Hazardous substance? NWTPH-Dx
 Plume Stability? Stable

