FINAL MEMORANDUM

DATE: May 27, 2026

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FROM:

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RE: **PRB Treatability Testing Memorandum**
Glacier Northwest, Inc. Site
Project No. 25006-03

Introduction

Black River Environmental, LLC (Black River) has prepared this Permeable Reactive Barrier (PRB) Treatability Testing Memorandum (Memo) on behalf of Glacier Northwest, Inc. (Glacier) to support cleanup alternative development for the Glacier Northwest, Inc. Site (Site). The Site is associated with King County Tax Parcel No. 1924049292, located at 5900 West Marginal Way SW in Seattle, Washington (the Property). This Memo was prepared to support the Feasibility Study (FS) for the Site, consistent with the Agreed Order No. DE 6000 (Agreed Order) entered with the Washington State Department of Ecology (Ecology).

A Treatability Testing Work Plan (TTWP; Aspect Consulting, 2024) defined the approach and methods to evaluate whether the PRB technology is a viable remedial technology for the Site and should be included in remedial alternative development as part of the FS. The goal of the treatability testing was to evaluate potential effectiveness of a zero-valent iron (ZVI)-based PRB and determine preliminary design parameters that can be used in the FS to evaluate practicable application of the technology for treating Site contaminants of potential concern (COPCs), particularly arsenic in groundwater. PRB treatability testing was

conducted on-Site in April and May of 2025 by Aspect Consulting. This Memo presents the results and evaluation of PRB treatability testing and establishes a preliminary basis of design for PRB width and composition.

Treatability Testing Scope and Objectives

The treatability testing was conducted to evaluate the potential for a ZVI-based PRB to reduce concentrations of arsenic in Site groundwater, with a secondary objective of evaluating the potential for a ZVI-based PRB to reduce copper and pentachlorophenol (PCP) concentrations. Potential PRB performance was tested by constructing columns filled with sand and differing doses of granular ZVI, pumping Site groundwater through the columns, and sampling the water at different distances along the column. The TTWP identified the following objectives for column testing:

1. Verify ZVI reactivity in the presence of Site groundwater.
2. Calculate basis-of-design parameters, including removal rates and kinetics, for determining potential PRB width and iron content.
3. Evaluate secondary water quality factors that may impact PRB performance e.g., mineral precipitation).

An additional objective identified in the TTWP was to evaluate the potential effect of salinity on ZVI treatment of Site groundwater by pumping saline groundwater through one of the columns. Conductivity measurements collected at all shoreline wells during the FS data gaps investigation, including those in the deep groundwater zone, indicated only slightly brackish salinity. Therefore, treatment of saline water using a PRB at the Site is unlikely, and treatment of saline groundwater water was not included in the PRB treatability testing.

Additionally, a minimum arsenic treatment capacity was estimated from the results of column testing. The column testing, as described in the TTWP, was not designed to quantify arsenic treatment capacity, and arsenic breakthrough was not observed. However, an estimated minimum arsenic treatment capacity was calculated to compare against literature values that will be used in PRB design as part of the FS.

In November 2024, an FS data gaps investigation was conducted to close data gaps identified during the FS. The FS data gaps investigation included collection and laboratory analysis of soil, groundwater, and porewater samples. Results of the FS data gaps investigation were used to identify the source of groundwater used in the PRB treatability column testing. Groundwater from MW-13S was selected because it contained

concentrations of arsenic (650 micrograms per liter [µg/L]) and PCP (68 µg/L) representative of groundwater that may be treated using a PRB.

Methods

Column testing was conducted at the Site using groundwater pumped at a low flowrate from a Site groundwater monitoring well, MW-13S, as the column influent. The testing was conducted on Site because groundwater at the Site is anaerobic and reducing; transporting water to a laboratory would risk changing the geochemical conditions of the water prior to testing. Flow-through columns were operated by routing groundwater directly from the well through the columns to minimize exposure to air and maintain the in-situ groundwater oxidation-reduction potential (ORP) to the extent practicable. Column testing field work was conducted by Aspect Consulting, and field records are included in Appendix A.

Column Construction

Three columns with variable ZVI percentages were operated. The TTWP specified 20 percent ZVI, 50 percent ZVI, and a control column with only sand. The sand/ZVI mixes used to fill the columns were created using volume measurements at the ratios specified in the TTWP. Mix percentages by mass were subsequently calculated to be 25 percent ZVI and 58 percent ZVI. The control column was filled with sand only. The ZVI used was Connelly-GPM, Inc -8/+50 ZVI CC-1004 (Appendix B). The sand mix was procured from local sources that could be utilized during PRB construction. The sand was observed to consist primarily of medium to coarse sand with little to no fines content and would be an appropriate sand for use in shallow Site soils.

The columns were 3 inches in diameter and 36 inches long and constructed of clear PVC. Each column was constructed with three sample ports, located approximately 6 inches (Port 1), 12 inches (Port 2), and 24 inches (Port 3) from the bottom of the column. The columns were mounted to a temporary structure in a vertical position, with the influent at the bottom and the effluent at the top to facilitate upwards flow, which mitigates formation of air bubbles and allows for consistent flow control. Aliquots of each dry ZVI/sand mix were funneled into the columns vertically to achieve a homogeneous mixture.

Table 1. Column Physical Properties

Nominal ZVI percent by volume	Percent by Mass	Sand Mass (pounds)	ZVI Mass (pounds)
0% ZVI (Control)	0% ZVI	16.5	--
20% ZVI	25% ZVI	13.0	4.4
50% ZVI	58% ZVI	8.10	11.0

Influent groundwater was introduced to each column using a multi-channel peristaltic pump to achieve low-flow pumping rates at each column. Construction materials, pumping method, and tubing were chosen to minimize the amount of oxygen entering the columns. The intake and delivery tubing were polyethylene, and peristaltic tubing was silicon.

Startup and Operation

On April 22, 2025, the columns were constructed, filled with media, and flushed with carbon dioxide (CO2) gas prior to Site groundwater being introduced so that any bubbles remaining after filling the columns with water would quickly dissolve into the water and ensure full water saturation of the pore spaces in each column. A CO2 gas cylinder was connected to the bottom of each column, and the valve was opened for approximately 30 minutes to allow ambient air contained in the pore spaces of the ZVI/sand mix to be replaced by CO2.

After the CO2 flush, the column was filled with deionized water until 1 liter of effluent was collected. The flow was then reduced to the desired flow rate, 14.5 milliliters per minute [mL/min], and deionized water flowed through the column for at least 4 hours prior to the introduction of Site groundwater. The target flow rate was selected based on the estimated residence time required to treat influent arsenic concentrations to the proposed cleanup level. This flow rate was also consistent with estimated groundwater flow velocities at the Site. Upon the introduction of Site groundwater, flow rates were set at the target flow rate of 14.5 mL/min and remained unchanged throughout the duration of the test. Increases in pH and dissolved iron, and decreases in ORP and arsenic concentrations, were observed in treated columns in Days 1 and 2, which indicated that iron corrosion and associated treatment had begun and indicated the high-flowrate flush described in the TTWP was not needed.

Column operation and sampling began on April 23, 2025, and continued for a total of 10 days until May 2, 2025. The control column and 25% ZVI column were sampled according to the monitoring plan starting on April 23, 2025. Upon arrival to the Site on April 23, 2025, staff found that the 58% ZVI column had leaked and emptied after becoming disconnected from the influent tubing. The 58% ZVI column was re-flushed with CO2 and deionized water, and sampling of this column began on April 24, 2025. Each tubing connection at the three columns was reinforced with zip ties to prevent leaks after the 58% ZVI column was reset. All references in this memo to day numbers (e.g., Day 8, Day 9, and Day 10) are relative to starting operation on April 23, and do not reflect the delayed start of the 58% ZVI column.

The TTWP stated that the column test would be maintained until steady state was achieved as indicated by arsenic concentrations at each distance along the column not changing by more than a 20 percent relative percent difference (RPD) between sampling events. While this RPD target was not achieved, the test was determined to have reasonably achieved steady state and was stopped after the planned maximum of 10 days. The analysis to support the conclusion that the columns had achieved steady state is provided in the Results section.

Upon completion of column testing, geochemical data indicated results that were consistent with expectations, and the contingent geochemical evaluation described in the TTWP was determined not to be needed. The column media and spent deionized water and groundwater used for testing were placed into sealed drums on Site pending off-Site disposal.

Monitoring

The TTWP prescribed daily sampling of the influent of each of the three columns. Because the influent source for all three columns was the same (MW-13S) and would therefore be redundant, a modified sampling approach was proposed: sampling of each column influent would be conducted to verify the influent sources were geochemically similar and subsequently sampling would be reduced to only one influent stream. The approach was presented to Ecology in a meeting and subsequent email, and Ecology approved the approach in an email on February 25, 2025.

Two rounds of influent verification sampling were conducted on Day 1 and Day 2 of the column testing, as described in the next paragraph. The RPD of influent metals concentrations after two rounds were calculated to confirm that the redundant sampling could be reduced. RPDs are shown in the attached Table 2.

Three intake tubing lines were set up to deliver influent groundwater from MW-13S to each of the three columns. A fourth tubing line, (identified as "INFLUENT" in Table 2), was set up as a dedicated influent sampling port, purging groundwater directly from MW-13S without being connected to a column. Samples from each of the intake locations were collected starting on April 23, 2025, in accordance with the monitoring plan in the TTWP. The RPD was calculated to confirm the redundancy of the influent flowing into each column. The RPDs were calculated for each of the total and dissolved metals submitted for analysis and were based on the maximum and minimum results from the four influent locations. The average RPDs of Day 1 and Day 2 dissolved and total arsenic concentrations were 6 percent and 4 percent, respectively. The average RPDs for dissolved and total copper were 58 percent and 95 percent, which was a result of copper concentrations frequently being below the reporting limit. The maximums of the average of Day 1 and Day 2 RPDs among iron, manganese, calcium, magnesium, potassium, and sodium (which, with arsenic and copper are collectively referred to as 'metals') were 18 percent for dissolved analytes and 23 percent for total analytes. These calculated RPDs were determined to be acceptable for verifying that redundant influent sampling could be removed at each of the columns. Starting on April 25, 2025, influent groundwater samples were only collected from the dedicated Influent tubing.

Each column was sampled daily according to the monitoring plan in the TTWP. The influent and effluent samples from each column were analyzed for total metals, dissolved metals, anions (bromide, chloride, fluoride, nitrate, nitrite, orthophosphate, and sulfate), alkalinity, salinity, total dissolved solids (TDS), and total organic carbon (TOC). Ferrous iron testing by the analytical laboratory was included in the TTWP but was later determined to be redundant with dissolved iron analyses. Ecology agreed with the decision to remove ferrous iron laboratory testing in an email on February 25, 2025.

The three sample ports on each column were sampled daily and only analyzed for total and dissolved arsenic and copper. Only influent and effluent of the 58% ZVI column was analyzed for PCP, which was conducted once every three days. Measurements of field parameters (pH, ORP, dissolved oxygen, and electrical conductivity) were collected at influent, effluent, and sample ports using an Aqua TROLL 500 multiparameter meter. Field parameters were measured and recorded in a spreadsheet on each day of the test. However, the field computer used to record field parameters was stolen during testing, so only field parameter data from April 23 through April 28 are available. The available field parameter data in combination with lab analytical results were determined to adequately meet the objectives of the treatability test. As described in the Startup and Operation

section, column operation and sampling began on April 23, 2025, and continued for a total of 10 days, ending on May 2, 2025.

Results

Field parameters and analytical results for samples collected during column testing are summarized in Table 3, and analytical lab reports are provided in Appendix C.

Arsenic data was plotted on graphs with sampling port position on the X-axis and concentration on the Y-axis. These "column profiles" represent the decrease in arsenic concentrations as groundwater flows through the simulated PRB. Column profiles for total and dissolved arsenic on each day of operation are shown on Figures 1a and 1b. Column profiles for total and dissolved arsenic in each column (25% ZVI column, 58% ZVI column, and control) are shown on Figure 2. Results for total and dissolved arsenic at each port for the duration of testing are shown for each column on Figure 3.

As shown on Figure 3, arsenic concentrations at Ports 1, 2, and 3 of the treatment columns increased during the first four days of the test, then decreased. Arsenic concentrations were continuing to decrease in both treated columns when the test ended on Day 10 and had not reached steady state. While steady state may not have been achieved, the data collected during final three days of the test (Day 8 through Day 10) were analyzed collectively to evaluate treatment capacity and kinetics. This analysis is conservative because the decreasing trend suggests that a longer test duration would have resulted in lower concentrations throughout the treated columns, translating to faster reaction rates and higher arsenic removal percentages than are calculated in this memorandum by analyzing the final three days' data.

Treatment performance was evaluated based on dissolved arsenic because arsenic is primarily treated by ZVI through precipitation, which reduces dissolved metals concentrations, but potential for entrainment of fine particles during sampling can result in higher measured concentrations of total metals.

Influent dissolved copper concentrations were at or below analytical reporting limits (2.5 to 2.6 µg/L) on 8 of 10 days. As a result, dissolved copper results were insufficient to evaluate treatment performance. All copper analytical results are provided in Table 3. The TTWP identified evaluation of copper and PCP treatment as secondary objectives of column testing based on anticipated drivers for PRB usage, therefore the insufficient copper data is not considered a significant gap in treatability testing data. Additionally, the use of ZVI PRBs to treat dissolved copper is well established in the scientific literature (Tratnyek et al.,

2003), therefore it is reasonable to assume that the technology can be designed to effectively treat the relatively low concentrations of copper observed in shallow groundwater.

Arsenic concentrations decreased between the influent and Port 1 of the control column. Sorption of arsenic onto sand is a possible cause of arsenic losses in the control column, especially if sand was procured from a local source containing iron minerals. However, if losses were due to sorption onto sand, we would expect losses to occur throughout the column. Because losses were primarily observed between influent and Port 1, we attribute the losses to the higher dissolved oxygen concentrations and higher ORP observed in the control column (Table 3). Arsenic losses in the control column were considered in evaluation of arsenic removal kinetics described further below.

Arsenic Removal Rates

Table 4 below summarizes the influent and effluent arsenic concentrations on Days 8 through 10 of testing and shows the arsenic removal rates calculated for each column. Removal rates are the change in concentration between influent and effluent, expressed as a percentage of the influent concentration. In both the 25% and 58% ZVI columns, arsenic removal rates over Days 8 through 10 ranged from 99.4 percent to 99.9 percent.

Table 4. Steady-State Influent and Effluent Dissolved Arsenic Concentrations

Source	Sample Location	Dissolved Arsenic (ug/L)	Removal Rate (%)
4/30/2025 – Day 8			
Influent	MW-13S	670	0.0
Effluent	Control	290	56.7
Effluent	25% ZVI column	3.2	99.5
Effluent	58% ZVI column	1 U	99.9
5/1/2025 – Day 9			
Influent	MW-13S	660	0.0
Effluent	Control	350	47.0
Effluent	25% ZVI column	3.9	99.4
Effluent	58% ZVI column	3.1	99.5
5/2/2025 – Day 10			
Influent	MW-13S	680	0.0
Effluent	Control	360	47.1
Effluent	25% ZVI column	4.2	99.4
Effluent	58% ZVI column	1.2	99.8

Arsenic Removal Kinetics

Arsenic data was analyzed to estimate reaction rate constants that could be used to evaluate PRB design scenarios at the Site. Rate constants were calculated by first:

- evaluating only dissolved arsenic;
- using the reporting limit value for nondetect results[1];
- assuming the reaction behaved according to first-order kinetics;
- calculating a residence time of water within the column associated with each sampling port based on column dimensions and an estimated porosity of 0.4; and then
- combining Day 8 through Day 10 results for each column into a single dataset representative of approximate steady state.

The dataset was then normalized to influent arsenic concentrations and corrected for control column losses following the principles described in Lien and Wilkin (2003). These methods included:

- dividing each port and effluent concentration by the influent concentration;
- calculating the average loss ratio (effluent divided by influent) observed across the control column on Days 8, 9 and 10 (calculated to be 0.50);
- adjusting the influent concentration of influent-normalized dataset to 0.50 based on the control column loss ratio[2]; and
- fitting the data to an exponential decay curve.

Graphs containing the unadjusted, influent-normalized, and influent-normalized/control-corrected data are provided in Figure 4. First order decay constants and curve fit R^2 values were then calculated for each treated column. The first-order reaction rate constants based

[1] Only one result out of the fifteen results in the Day 8 through Day 10 dataset for the 58% ZVI column was nondetect. Calculating rate constants using ½ of the reporting limit for the nondetect value results in a 4 percent increase in the rate constant for all normalization scenarios. Therefore, using the reporting limit is conservative. The 25% ZVI column Day 8 through Day 10 dataset did not contain any nondetect results.

[2] Lien and Wilkin (2005) considered the effects of control losses by setting the y-intercept of the treated columns' fitted curves to the loss ratio to represent an influent concentration reflecting control losses. Using this approach caused the magnitude of the rate constant to increase, contrary to the expectation that the magnitude of the rate constant should decrease when accounting for control losses. Instead, we replaced the influent-normalized influent concentration (1) with the control loss ratio (0.5), which resulted in a decrease in the magnitude of the rate constant and therefore more reasonably reflected the losses observed in the control column.

on raw data, data normalized to influent concentrations, and data normalized to influent and control concentrations, are summarized in Table 5.

Table 5. Summary of Calculated Rate Constant

Column	Normalization Method	Rate Constant (day^{-1})	Curve fit R^2
25% ZVI column	None	-63	0.91
	Influent	-63	0.91
	Influent and Control	-57	0.95
58% ZVI column	None	-67	0.87
	Influent	-67	0.88
	Influent and Control	-61	0.88

The estimated rate constants show that variation in influent concentrations and control column losses do not substantially affect the calculated rate constants.

Ranges of first order rate constants calculated from column testing data in the scientific literature include -0.21 day^{-1} to -1.15 day^{-1} (Lien and Wilkin, 2005) and -6.4 day^{-1} to -12 day^{-1} (Pepler, 2009). Other recent column testing conducted for cleanup sites in Washington have yielded higher rate constants in a similar order of magnitude, ranging from -3.9 to -25 day^{-1} for ZVI dosing ranging up to 20 percent. Assuming rate constants scale linearly with ZVI dosing (Lien and Wilkin, 2005), these rate constants from literature review and other cleanup sites in Washington are comparable to the constants calculated for the on Site PRB column testing in this memorandum. Rate constants vary based on the available surface area of iron and the geochemical conditions, including whether arsenic is present as As(III) or As(V) (Pepler, 2009). While the results from this test are higher than the literature range, multiple scenarios were evaluated for the purpose of developing a conservative estimate and evaluating uncertainty in test results, and the most conservative results are presented in this report. Pilot testing could be conducted as part of PRB design if a PRB is selected in the FS to verify the results of the column testing.

Inspecting the data points plotted in Figure 4, one can see that the fitted curve lies above the data in the higher-concentration part of the dataset, and below the curve in the lower concentration part of the dataset, particularly for the 58% ZVI column data. This may

indicate that different treatment mechanisms or rate-limiting factors may dominate at different arsenic concentrations or at different distances along the simulated PRB. Lien and Wilkin made a similar observation of their dataset, which was also proposed by Farrell et al. (2001). Treatment kinetics could be higher at higher arsenic concentrations, and lower at lower concentrations, which is an important consideration when evaluating potential PRB applications.

Estimated Minimum Arsenic Treatment Capacity

As water flows through ZVI and arsenic precipitates accumulate, the ZVI treatment capacity is depleted. By estimating treatment capacity, the longevity of ZVI and a PRB lifespan based on a given design can be estimated. The treatment capacity of ZVI in a column is estimated based on when arsenic concentrations increase within the column (also known as arsenic breakthrough). Arsenic breakthrough was not observed during this column test, so a treatment capacity could not be estimated, but the data were used to estimate a lower bound on the range of treatment capacities.

This column test was not designed to quantify arsenic treatment capacity; testing arsenic treatment capacity would have required either an impractically long test duration or a flow velocity that is much higher than groundwater velocities observed at the Site. However, verifying that arsenic breakthrough did not occur during the relatively short test allows for the estimation of a *minimum* treatment capacity. The actual treatment capacity is expected to be larger than the estimated minimum. The estimated value is therefore not meant to be used as a design parameter, but to be compared against literature values to confirm that the column test ZVI was not consumed at a rate far above the literature values. Had breakthrough been observed, a treatment capacity could be estimated and would have been substantially lower than literature values. As expected based on the test's design, breakthrough was not observed, and a minimum capacity was estimated. This estimate is summarized in the attached Table 6.

The estimate assumes that breakthrough would have occurred had the test run any longer, which is a conservative assumption given the sustained and improving treatment observed in the final days of the test. Multiplying the average arsenic removal rate observed over the 10-day test by the duration of the test and dividing by the mass of iron between the influent and Port 1, we calculate a minimum treatment capacity of 0.36 milligrams arsenic per gram of ZVI for the 25% ZVI column, and a minimum of 0.16 milligrams arsenic per gram ZVI for the 58% ZVI column. When accounting for losses observed in the control column, those rates decrease to 0.13 and 0.07 milligrams arsenic per gram of ZVI, respectively. Other studies have reported higher treatment capacities ranging from 0.77 to

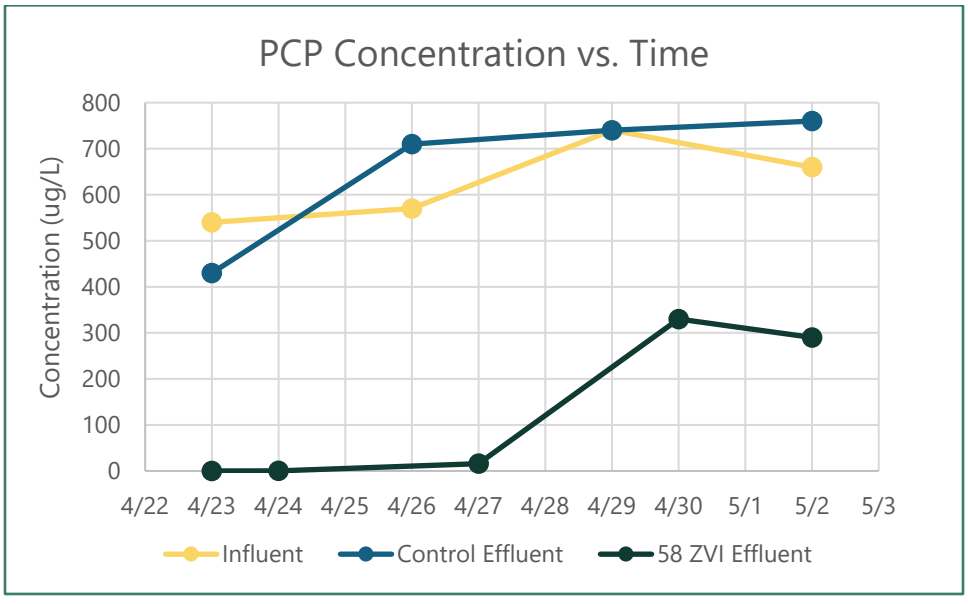
7.5 milligrams arsenic per gram ZVI (Abedin et al., 2010; Eljamal et al., 2013; Lien and Wilkin, 2005; Nikolaidis et al., 2003).

Because we did not observe breakthrough of ZVI (which would indicate an unexpectedly low treatment capacity), the minimum treatment capacity provides only a lower bound, and not a design value for the PRB. We recommend that literature values for treatment capacity be used for evaluating PRBs in the FS. The need for longer-term testing during design to estimate a Site-specific treatment capacity will depend on whether a PRB is selected, and application within the selected alternative.

PCP Treatment

Figure 5 (below) presents PCP data collected during column testing plotted over time. Those data are summarized in Table 3. Influent PCP concentrations increased over the duration of the test. Influent and control effluent concentrations were similar, indicating no notable treatment in the control column. The 58% ZVI column appeared to show strong treatment initially, reducing concentrations by over 98 percent during the first five days of the test before appearing to equilibrate at a removal rate averaging 56 percent. There is low certainty that steady state was achieved because only two samples were analyzed for PCP during the final half of the test.

Figure 5. PCP Concentration vs. Time



Effluent pH

Table 3 contains all analytical and field parameter data including pH data. pH data is also presented in Table 7, including calculated average pH values and changes in pH. As described in Monitoring section, the computer used to record field data was stolen, so pH data collected after Day 6 are not available. pH data collected during Days 1 through 6 were consistent, remaining circumneutral in all three columns through Day 6 and showing no apparent trend; therefore, the lack of pH data on Days 7 through 10 is not considered a significant data gap.

The average change in pH between influent and effluent was 0.44 in the 25% ZVI column and 0.40 in the 58% ZVI column, and -0.09 in the control column. While the ZVI appeared to consistently increase effluent pH, which is expected from iron corrosion, the magnitude of the increase was lower than expected. ZVI PRB effluent often ranges from 9.2 to 10.5 (Li et al., 2005; Wilkin et al., 2014), while the 25% ZVI column averaged an effluent pH of 6.96, and the 58% ZVI column averaged an effluent pH of 6.91.

The low increase in pH may have been due to a strong buffering capacity in ambient groundwater or hydroxide molecules being consumed by metal hydroxide complexes or other reactions. Regardless, the data do not indicate the potential for negative secondary effects associated with excessively high pH effluent such as mobilization of non-target metals downgradient of a ZVI PRB or permeability reduction associated with excessive dissolved metals precipitation. Further testing assessing changes in pH may be considered as part of design.

Potential for Permeability Reduction

Precipitation of dissolved metals can occur within a ZVI PRB, and if excessive, can reduce the permeability of the PRB enough to cause groundwater to flow around it and render it ineffective.

The following factors were evaluated for precipitation potential:

- **pH.** ZVI corrosion increases the pH of water by producing hydroxide. Hydroxide molecules can react with dissolved metals to form metal hydroxides that precipitate. While this reaction is one intended effect of the PRB and a treatment mechanism for arsenic, very high pH can drive excessive precipitation. As shown in Table 7, the maximum pH value recorded in either treated column effluent was 7.25, which is below the typical pH range for PRB effluent and indicates a low potential for pH-driven precipitation.

- **Dissolved metals and TDS.** Precipitation is indicated by a decrease in dissolved metals. No notable decreases were observed among dissolved metals concentrations except for arsenic. TDS concentrations decreased an average of 43 mg/L and 44 mg/L between influent and effluent of the 25% ZVI and 58% ZVI columns, respectively, which represents a 15% decrease in TDS. Given the moderately low TDS influent concentration, which averaged 257 mg/L during the study, and relatively minor change, these data do not to indicate a high potential for permeability reduction.
- **Sulfate.** High sulfate concentrations in the presence of dissolved metals in ZVI PRB influent can result in reduction of the sulfate into insoluble metal sulfides that precipitate. The maximum sulfate concentration detected during the test was 5.05 mg/L. This concentration is lower than the upgradient concentrations in nine of ten ZVI PRBs studies in Johnson et al., 2008, which studied metal sulfide precipitation in installed PRBs. This concentration is consistent with the sulfate concentrations observed within and downgradient of the studied PRBs, indicating a low potential to cause precipitation.
- **TOC.** TOC can form a complex with metals to form precipitates, or it can fuel microbial growth and cause excessive buildup of biomass referred to as biofouling. While sometimes evaluated as a potential failure mechanism, biofouling has not been observed to be an issue in most ZVI PRBs (ITRC, 2011). Elevated sulfate concentrations often drive microbial growth in ZVI PRBs, and the low sulfate concentrations observed at the Site indicate a low potential for biofouling. Additionally, the maximum TOC concentration measured during the test was an effluent concentration of 7.16 mg/L, also indicating a low potential for permeability reduction.
- **Alkalinity.** Carbonate, often a primary component of alkalinity, can precipitate with cations and cause permeability reduction in PRBs. Alkalinities measured in column influents ranged from 129 mg/L to 257 mg/L, which is within the range of values typically observed upgradient of PRBs (Johnson et al., 2008). The control column effluent averaged 33% higher alkalinity than the influent during the final three days of the test and was consistently higher throughout the test, suggesting that the sand used in treatability testing contributed alkalinity, potentially in the form of carbonate minerals. This added carbonate may also have contributed buffering capacity, providing a possible explanation for why pH remained circumneutral in the presence of ZVI corrosion.

Secondary Water Quality Effects

ZVI PRBs can elevate concentrations of dissolved iron and manganese in groundwater, although these effects typically attenuate moving downgradient of the PRB. Figure 6 contains graphs showing dissolved iron and dissolved manganese concentrations,

respectively, in column influent and effluents plotted against time. Treated column effluents contained higher concentrations of dissolved iron and manganese than influent and control effluent, indicating the potential for elevated dissolved iron and manganese in PRB effluent.

Groundwater at the Site is considered to be non-potable[3], and there is no applicable surface water quality standard for marine water for iron. Therefore, elevated iron concentrations may not be a concern for PRB design. However, the Surface Water Quality Standard for manganese is 100 µg/L, and average manganese concentrations in the column effluents in Days 8 through 10 averaged 530 µg/L higher than the average influent concentration of 170 µg/L. While it's not clear whether the manganese was introduced via the sand or ZVI, elevated manganese concentrations may be an important consideration for installing a PRB near the shoreline at the Site, and additional analysis of the effect of a PRB on manganese concentrations downgradient of the PRB may be appropriate.

[3] Potability of Site groundwater is evaluated in the PFAS Sampling Work Plan (Black River, 2025)

Conclusions and Recommendations

The following conclusions and recommendations are made:

- Column testing verified the reactivity of ZVI in the presence of Site groundwater, and the effective removal of arsenic from groundwater.
- Both treated columns resulted in removal of over 99% of dissolved arsenic from column effluents.
- Estimated rate constants for arsenic removal were higher than the typical range of literature values.
- A lack of arsenic breakthrough was consistent with the results expected based on test design, and literature values should be used to estimate longevity during PRB design.
- PCP results indicated that some treatment of PCP can be expected, but that the removal rate was limited to 56 percent for the 58% ZVI column, and treatment capacity or longevity of PCP treatment would require further evaluation if a PRB is designed to treat PCP.
- Influent copper concentrations were too low to evaluate copper treatment in this test. Copper concentrations in historical groundwater data had a median concentration of 2.0 µg/L and average concentration of 7.5 µg/L in samples from wells across the Site. Based on the relatively low copper concentrations at the Site (compared to the Remedial Investigation screening level of 3.1 µg/L) and well-established treatability of copper using ZVI, the lack of sufficient data to evaluate copper treatment in this test was not identified as a data gap from this study.
- Effluent pH remained circumneutral throughout the study, indicating a low potential for secondary effects or permeability reduction due to elevated pH.
- Geochemical factors including TDS, sulfate, TOC, and alkalinity were evaluated for their potential to reduce PRB permeability. Geochemical data analytical data from the test did not indicate a high potential for permeability reductions.
- Potential sand sources for full-scale implementation should be evaluated for mineral content including alkalinity.
- Manganese concentrations in both treated column effluents were substantially higher than the surface water quality standard for dissolved manganese, indicating dissolved manganese should be considered in evaluating surface water-adjacent PRB alignments.

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Limitations

Work on this project was performed for CalPortland Company (Client), and this letter has been prepared in accordance with generally accepted professional practices for work of this nature and under comparable local conditions at the time services were provided. This memorandum is not intended to serve as a legal opinion, and no warranties, expressed or implied, are provided.

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Table 2 - RPDs of Redundant Influent Analytes

Project No: 25006-03
Glacier Northwest Inc. Site

4/23 Influent Samples

Analytical Results

Dissolved Metals

Column	Arsenic (ug/L)	Copper (ug/L)	Iron (ug/L)	Manganese (ug/L)	Calcium (ug/L)	Magnesium (ug/L)	Potassium (ug/L)	Sodium (ug/L)
Control	850	2.5	15,000	150	91,100	4,670	4,090	15,600
25 ZVI	910	8.5	18,000	180	89,600	4,490	3,990	15,500
58 ZVI	850	2.8	16,000	160	90,800	4,390	3,890	15,500
Dedicated Influent	870	2.5	15,000	150	97,000	4,280	3,580	14,000
Method Blank	<0.2	<0.5	<50	<1	<250	<50	<50	<250

Total Metals

Column	Arsenic (ug/L)	Copper (ug/L)	Iron (ug/L)	Manganese (ug/L)	Calcium (ug/L)	Magnesium (ug/L)	Potassium (ug/L)	Sodium (ug/L)
Control	860	4.2	16,000	160	89,000	4,720	4,190	15,800
25 ZVI	840	11	20,000	180	96,100	4,440	3,920	15,100
58 ZVI	830	4.8	17,000	170	95,300	4,500	3,960	15,900
Dedicated Influent	840	4.5	15,000	150	102,000	4,440	3,700	14,400
Method Blank	<0.2	<0.5	<50	<1	<250	<50	<50	<250

Influent Statistics

Dissolved Metals

	Arsenic	Copper	Iron	Manganese	Calcium	Magnesium	Potassium	Sodium
Mean	870	4.075	16,000	160	92125	4457.5	3,888	15150
Standard Deviation	28	3	1,414	14	3314	166	221	768
Standard Deviation (%)	3%	72%	9%	9%	4%	4%	6%	5%
RPD	**7%**	**109%**	**18%**	**18%**	**8%**	**9%**	**13%**	**11%**

Total Metals

	Arsenic	Copper	Iron	Manganese	Calcium	Magnesium	Potassium	Sodium
Mean	842.5	6.125	17,000	165	95600	4525	3,943	15300
Standard Deviation	13	3	2,160	13	5319	133	201	698
Standard Deviation (%)	1%	53%	13%	8%	6%	3%	5%	5%
RPD	**4%**	**89%**	**29%**	**18%**	**14%**	**6%**	**12%**	**10%**

4/24 Influent Samples

Analytical Results

Dissolved Metals

Column	Arsenic (ug/L)	Copper (ug/L)	Iron (ug/L)	Manganese (ug/L)	Calcium (ug/L)	Magnesium (ug/L)	Potassium (ug/L)	Sodium (ug/L)
Control	720	2.5	14,000	170	78,800	4,930	4,290	15,800
25 ZVI	690	2.5	15,000	180	77,600	4,770	4,220	16,000
58 ZVI	680	2.7	13,000	160	80,500	4,620	4,090	16,900
Dedicated Influent	690	2.5	13,000	150	84,800	4,410	3,650	13,800
Method Blank	<0.2	<0.5	<50	<1	<250	<50	<50	<250

Total Metals

Column	Arsenic (ug/L)	Copper (ug/L)	Iron (ug/L)	Manganese (ug/L)	Calcium (ug/L)	Magnesium (ug/L)	Potassium (ug/L)	Sodium (ug/L)
Control	750	3.3	17,000	190	80,300	5,030	4,340	16,200
25 ZVI	740	10	18,000	190	74,500	4,510	3,960	15,100
58 ZVI	730	6.2	17,000	180	80,700	4,720	4,080	16,300
Dedicated Influent	720	3.6	15,000	150	86,600	4,410	3,580	13,800
Method Blank	<0.2	<0.5	<50	<1	<250	<50	<50	<250

Influent Statistics

Dissolved Metals

	Arsenic	Copper	Iron	Manganese	Calcium	Magnesium	Potassium	Sodium
Mean	695	2.55	13,750	165	80425	4682.5	4,063	15625
Standard Deviation	17	0	957	13	3150	221	287	1307
Standard Deviation (%)	2%	4%	7%	8%	4%	5%	7%	8%
RPD	**6%**	**8%**	**14%**	**18%**	**9%**	**11%**	**16%**	**20%**

Total Metals

	Arsenic	Copper	Iron	Manganese	Calcium	Magnesium	Potassium	Sodium
Mean	735	5.775	16,750	177.5	80525	4667.5	3,990	15350
Standard Deviation	13	3	1,258	19	4943	274	316	1168
Standard Deviation (%)	2%	54%	8%	11%	6%	6%	8%	8%
RPD	**4%**	**101%**	**18%**	**24%**	**15%**	**13%**	**19%**	**17%**

Average of Day 1 and Day 2 RPDs

	Arsenic	Copper	Iron	Manganese	Calcium	Magnesium	Potassium	Sodium
Dissolved	6%	58%	16%	18%	8%	10%	15%	16%
Total	4%	95%	23%	21%	14%	10%	16%	13%

Notes:

ug/L = micrograms per liter
PRD = Relative percent difference between minimum and maximum values
Red font indicates the reporting limit of a nondetect result
Green highlight indicates the result exceeds an RPD of 30%

Table 3 - Analytical Results

		Day 1											
		Influent - Day 1	***Control - Day 1***					***25% ZVI - Day 1***					***58% ZVI - Day 1***
Date		04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25
Port		Influent	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent	Influent
Dissolved Metals													
Arsenic	ug/L	**870**	**850**	**770**	**650**	**620**	**660**	**910**	**38**	**2.6**	**1.1**	1 U	**850**
Calcium	ug/L	**97000**	**91100**	--	--	--	**76700**	**89600**	--	--	--	**83300**	**90800**
Copper	ug/L	**2.5**	2.5 U	2.5 U	**2.7**	**5.4**	**6**	**8.5**	2.5 U	**5**	**12**	2.5 U	**2.8**
Iron	ug/L	**15000**	**15000**	--	--	--	**650**	**18000**	--	--	--	**23000**	**16000**
Magnesium	ug/L	**4280**	**4670**	--	--	--	**14500**	**4490**	--	--	--	**9520**	**4390**
Manganese	ug/L	**150**	**150**	--	--	--	**260**	**180**	--	--	--	**880**	**160**
Potassium	ug/L	**3580**	**4090**	--	--	--	**3280**	**3990**	--	--	--	**3830**	**3890**
Sodium	ug/L	**14000**	**15600**	--	--	--	**16000**	**15500**	--	--	--	**15700**	**15500**
Total Metals													
Arsenic	ug/L	**840**	**860**	**720**	**660**	**650**	**690**	**840**	**47**	**7.1**	**6.6**	**1.3**	**830**
Calcium	ug/L	**102000**	**89000**	--	--	--	**76700**	**96100**	--	--	--	**81200**	**95300**
Copper	ug/L	**4.5**	**4.2**	**4.5**	**5.2**	**9**	**4.7**	**11**	**250**	**400**	**870**	**23**	**4.8**
Iron	ug/L	**15000**	**16000**	--	--	--	**200**	**20000**	--	--	--	**54000**	**17000**
Magnesium	ug/L	**4440**	**4720**	--	--	--	**14900**	**4440**	--	--	--	**9730**	**4500**
Manganese	ug/L	**150**	**160**	--	--	--	**240**	**180**	--	--	--	**1000**	**170**
Potassium	ug/L	**3700**	**4190**	--	--	--	**3370**	**3920**	--	--	--	**3920**	**3960**
Sodium	ug/L	**14400**	**15800**	--	--	--	**16400**	**15100**	--	--	--	**16300**	**15900**
Semivolatile Organic Compounds													
Pentachlorophenol	ug/L	**540 J**	**530 J**	--	--	--	**430**	--	--	--	--	--	**500 J**
Conventionals													
Alkalinity, Total	mg/L	**236**	**167**	--	--	--	**258**	**233**	--	--	--	**135**	**192**
Bromide	mg/L	0.600 U	0.600 U	--	--	--	0.600 U	0.600 U	--	--	--	0.600 U	0.600 U
Chloride	mg/L	**4.10**	**4.60**	--	--	--	**4.70**	**4.85**	--	--	--	**5.00**	**4.69**
Fluoride	mg/L	**0.168**	**0.181**	--	--	--	**0.797**	**0.179**	--	--	--	**0.145**	**0.171**
Nitrate as Nitrogen	mg/L	**0.791**	0.200 U	--	--	--	0.200 U	0.200 U	--	--	--	0.200 U	0.200 U
Nitrite as Nitrogen	mg/L	0.200 U	0.200 U	--	--	--	0.200 U	0.200 U	--	--	--	0.200 U	0.200 U
Orthophosphate	mg/L	0.400 U	0.400 U	--	--	--	**0.983 J**	0.400 U	--	--	--	0.400 UJ	0.400 U
Salinity	%	**0.0100**	**0.0100**	--	--	--	0.000100 U	**0.0100**	--	--	--	0.000100 U	**0.0100**
Sulfate	mg/L	**3.00**	**3.76**	--	--	--	**2.92**	**2.09**	--	--	--	**2.78**	**1.95**
Total Dissolved Solids	mg/L	**140**	**310**	--	--	--	**210**	**210**	--	--	--	**250**	**230**
Total Organic Carbon	mg/L	**5.05**	**4.74**	--	--	--	**4.04**	**4.88**	--	--	--	**0.861**	**4.84**
Field Parameters													
Specific Conductance	uS/cm	**456.04**	**434.69**	**420.15**	**415.33**	**408.53**	**503.08**	**445.72**	**653.99**	**634.62**	**532.75**	**525.04**	**430.34**
Dissolved Oxygen	mg/L	**3.69**	**4.18**	**3.08**	**2.76**	**2.77**	**5.76**	**3.55**	**0.26**	**1**	**0.8**	**1.37**	**3.86**
pH	pH units	**6.54**	**6.55**	**6.45**	**6.45**	**6.45**	**6.4**	**6.56**	**7.33**	**7.56**	**7.46**	**7.61**	**6.61**
Oxidation Reduction Potential	mV	**-69**	**-73.8**	**16.4**	**89.9**	**58.7**	**203.9**	**-82.1**	**-519.4**	**-573.5**	**-495**	**-347**	**-78.1**

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 2															
		Influent - Day 2	*Control - Day 2*					*25% ZVI - Day 2*					*58% ZVI - Day 2*				
Date		04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25
Port		Influent	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals																	
Arsenic	ug/L	**690**	**720**	**360**	**320**	**380**	**460**	**690**	**42**	**7.8**	1 U	1 U	**680**	**10**	1 U	1 U	1 U
Calcium	ug/L	**84800**	**78800**	--	--	--	**76400**	**77600**	--	--	--	**77100**	**80500**	--	--	--	**61000**
Copper	ug/L	2.5 U	2.5 U	2.6 U	2.6 U	**4**	**2.5**	2.5 U	2.6 U	**3.1**	2.6 U	2.5 U	**2.7**	2.6 U	2.6 U	2.6 U	2.5 U
Iron	ug/L	**13000**	**14000**	--	--	--	**250**	**15000**	--	--	--	**63000**	**13000**	--	--	--	**27000**
Magnesium	ug/L	**4410**	**4930**	--	--	--	**7860**	**4770**	--	--	--	**6580**	**4620**	--	--	--	**6460**
Manganese	ug/L	**150**	**170**	--	--	--	**490**	**180**	--	--	--	**870**	**160**	--	--	--	**450**
Potassium	ug/L	**3650**	**4290**	--	--	--	**3710**	**4220**	--	--	--	**3880**	**4090**	--	--	--	**4120**
Sodium	ug/L	**13800**	**15800**	--	--	--	**16100**	**16000**	--	--	--	**16100**	**16900**	--	--	--	**16300**
Total Metals																	
Arsenic	ug/L	**720**	**750**	**360**	**320**	**380**	**480**	**740**	**47**	**16**	**5.8**	**1.7**	**730**	**17**	1 U	**3.1**	**1**
Calcium	ug/L	**86600**	**80300**	--	--	--	**73600**	**74500**	--	--	--	**80700**	**80700**	--	--	--	**65800**
Copper	ug/L	**3.6**	**3.3**	**3.2**	**4.5**	**22**	**5.1**	**10**	**11**	**88**	**260**	**6.8**	**6.2**	2.5 U	2.5 U	**90**	2.5 U
Iron	ug/L	**15000 J**	**17000 J**	--	--	--	**450**	**18000 J**	--	--	--	**85000**	**17000 J**	--	--	--	**43000 J**
Magnesium	ug/L	**4410**	**5030**	--	--	--	**7760**	**4510**	--	--	--	**6780**	**4720**	--	--	--	**6930**
Manganese	ug/L	**150**	**190**	--	--	--	**510**	**190**	--	--	--	**900**	**180**	--	--	--	**480**
Potassium	ug/L	**3580**	**4340**	--	--	--	**3580**	**3960**	--	--	--	**3960**	**4080**	--	--	--	**4170**
Sodium	ug/L	**13800**	**16200**	--	--	--	**15700**	**15100**	--	--	--	**16300**	**16300**	--	--	--	**17100**
Semivolatile Organic Compounds																	
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.2 U
Conventionals																	
Alkalinity, Total	mg/L	**198**	**204**	--	--	--	**246**	**197**	--	--	--	**183**	**204**	--	--	--	**109**
Bromide	mg/L	0.600 U	0.600 U	--	--	--	0.600 U	0.600 U	--	--	--	0.600 U	0.600 U	--	--	--	0.600 U
Chloride	mg/L	**3.68**	**4.48**	--	--	--	**4.48**	**4.50**	--	--	--	**4.63**	**4.55**	--	--	--	**4.97**
Fluoride	mg/L	**0.165**	**0.178**	--	--	--	**0.104**	**0.176**	--	--	--	**0.120**	**0.171**	--	--	--	**0.109**
Nitrate as Nitrogen	mg/L	0.200 U	0.200 U	--	--	--	0.200 U	0.200 U	--	--	--	0.200 U	0.200 U	--	--	--	0.200 U
Nitrite as Nitrogen	mg/L	0.200 U	0.200 U	--	--	--	0.200 U	0.200 U	--	--	--	0.200 U	0.200 U	--	--	--	0.200 U
Orthophosphate	mg/L	0.400 U	0.400 U	--	--	--	**0.901**	0.400 U	--	--	--	0.400 U	0.400 U	--	--	--	0.400 U
Salinity	%	0.000100 U	**0.0100**	--	--	--	**0.0100**	**0.0100**	--	--	--	0.000100 U	0.000100 U	--	--	--	0.000100 U
Sulfate	mg/L	**3.36**	**2.53**	--	--	--	**2.60**	**2.51**	--	--	--	**2.93**	**2.10**	--	--	--	**2.96**
Total Dissolved Solids	mg/L	**180**	**210**	--	--	--	**330 J**	**110**	--	--	--	**150**	**110**	--	--	--	**214 J**
Total Organic Carbon	mg/L	**4.84**	**4.53**	--	--	--	**4.46**	**4.59**	--	--	--	**1.58**	**4.57**	--	--	--	**0.925**
Field Parameters																	
Specific Conductance	uS/cm	**359.24**	**346.35**	**315.93**	**321.26**	**352.19**	**427.78**	**337.13**	**363.86**	**305.37**	**381.68**	**518.58**	**334.01**	**455.16**	**439.45**	**370.96**	**198.2**
Dissolved Oxygen	mg/L	**3.02**	**4.18**	**3.87**	**3.7**	**5.46**	**5.02**	**4.47**	**4.86**	**5.34**	**6.26**	**3.53**	**4.13**	**0.88**	**1.44**	**1.16**	**4.09**
pH	pH units	**6.26**	**6.13**	**6.45**	**6.4**	**6.43**	**6.24**	**6.14**	**6.9**	**6.94**	**6.95**	**7.13**	**6.18**	**7.03**	**7.25**	**7.2**	**6.98**
Oxidation Reduction Potential	mV	**-73.9**	**-84.1**	**-31.8**	**-3.4**	**123.9**	**210.8**	**-84.7**	**-122.1**	**-24.1**	**-157**	**-257.9**	**-82.2**	**-213.5**	**-319.2**	**-351.1**	**-215.7**

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 3															
		Influent - Day 3	*Control - Day 3*					*25% ZVI - Day 3*						*58% ZVI - Day 3*			
Date		04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25
Port		Influent	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals																	
Arsenic	ug/L	**740**	--	**300**	**310**	**330**	**380**	--	**160**	**25**	**2.2**	1 U	--	**9.7**	**2.3**	1 U	1 U
Calcium	ug/L	**71400**	--	--	--	--	**64000**	--	--	--	--	**62600**	--	--	--	--	**59200**
Copper	ug/L	**3.3**	--	**3.1**	2.5 U	**4.4**	**3.7**	--	**8.6**	**2.7**	**8.4**	2.5 U	--	2.5 U	2.5 U	**5.5**	2.5 U
Iron	ug/L	**14000**	--	--	--	--	**340**	--	--	--	--	**86000**	--	--	--	--	**36000**
Magnesium	ug/L	**4330**	--	--	--	--	**6320**	--	--	--	--	**5530**	--	--	--	--	**5930**
Manganese	ug/L	**170**	--	--	--	--	**520**	--	--	--	--	**900**	--	--	--	--	**340**
Potassium	ug/L	**3520**	--	--	--	--	**3960**	--	--	--	--	**3740**	--	--	--	--	**3950**
Sodium	ug/L	**13300**	--	--	--	--	**15100**	--	--	--	--	**15500**	--	--	--	--	**15700**
Total Metals																	
Arsenic	ug/L	**730**	--	**330**	**320**	**350**	**380**	--	**190**	**110**	**20**	1 U	--	**23**	**3.8**	**3.6**	1 U
Calcium	ug/L	**75400 J**	--	--	--	--	**66600**	--	--	--	--	**70600**	--	--	--	--	**64000**
Copper	ug/L	**3.3**	--	**2.6**	**3.7**	**4.4**	**4.4**	--	**4.8**	**9.1**	**1000**	**6.7**	--	**150**	2.5 U	**550**	2.5 U
Iron	ug/L	**15000**	--	--	--	--	**280**	--	--	--	--	**98000**	--	--	--	--	**44000**
Magnesium	ug/L	**4250**	--	--	--	--	**6300**	--	--	--	--	**5420**	--	--	--	--	**5690**
Manganese	ug/L	**160**	--	--	--	--	**550**	--	--	--	--	**860**	--	--	--	--	**360**
Potassium	ug/L	**3540**	--	--	--	--	**3960**	--	--	--	--	**3680**	--	--	--	--	**3880**
Sodium	ug/L	**12900**	--	--	--	--	**15000**	--	--	--	--	**15000**	--	--	--	--	**15300**
Semivolatile Organic Compounds																	
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Conventionals																	
Alkalinity, Total	mg/L	**219**	--	--	--	--	**231**	--	--	--	--	**225**	--	--	--	--	**185**
Bromide	mg/L	0.600 U	--	--	--	--	0.600 U	--	--	--	--	0.600 U	--	--	--	--	0.600 U
Chloride	mg/L	**3.67**	--	--	--	--	**4.44**	--	--	--	--	**4.58**	--	--	--	--	**4.85**
Fluoride	mg/L	**0.166**	--	--	--	--	**0.124**	--	--	--	--	**0.129**	--	--	--	--	**0.104**
Nitrate as Nitrogen	mg/L	0.200 UJ	--	--	--	--	0.200 UJ	--	--	--	--	0.200 UJ	--	--	--	--	0.200 UJ
Nitrite as Nitrogen	mg/L	0.200 UJ	--	--	--	--	0.200 UJ	--	--	--	--	0.200 UJ	--	--	--	--	0.200 UJ
Orthophosphate	mg/L	0.400 UJ	--	--	--	--	**0.501 J**	--	--	--	--	0.400 UJ	--	--	--	--	0.400 UJ
Salinity	%	**0.0100**	--	--	--	--	**0.0100**	--	--	--	--	**0.0100**	--	--	--	--	**0.0100**
Sulfate	mg/L	**3.64**	--	--	--	--	**3.00**	--	--	--	--	**3.34**	--	--	--	--	**2.88**
Total Dissolved Solids	mg/L	**278**	--	--	--	--	**278**	--	--	--	--	**236**	--	--	--	--	**234**
Total Organic Carbon	mg/L	**5.24**	--	--	--	--	**4.09**	--	--	--	--	**2.43**	--	--	--	--	**1.35**
Field Parameters																	
Specific Conductance	uS/cm	**303.54**	**313.96**	**302.44**	**294.45**	**305.03**	**455.23**	**308.41**	**446.94**	**393.55**	**439.27**	**461.77**	**312.47**	**395.94**	**442.15**	**447.89**	**351.39**
Dissolved Oxygen	mg/L	**5.98**	**5.76**	**7.14**	**6.73**	**7.47**	**7.57**	**6.73**	**3.88**	**4.7**	**6.16**	**4.42**	**6.53**	**3.45**	**3.51**	**7.71**	**3.64**
pH	pH units	**6.64**	**6.61**	**6.55**	**6.15**	**6.61**	**6.5**	**6.76**	**6.86**	**6.83**	**6.78**	**6.78**	**6.65**	**6.93**	**7.02**	**7.07**	**7.18**
Oxidation Reduction Potential	mV	**-69.3**	**-94.2**	**27.19**	**45.7**	**102**	**212.3**	**-89**	**-181.2**	**-136.5**	**-109**	**-149.1**	**-79.7**	**-142.8**	**-172.9**	**-37.2**	**-276.6**

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 4											
		Influent - Day 4	*Control - Day 4*				*25% ZVI - Day 4*				*58% ZVI - Day 4*			
Date		04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25
Port		Influent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals														
Arsenic	ug/L	**700**	**340**	**350**	**310**	**340**	**210**	**42**	**9.6**	**1.1**	**61**	**19**	1 U	1 U
Calcium	ug/L	**68600**	--	--	--	**63700**	--	--	--	**61800**	--	--	--	**61700**
Copper	ug/L	2.6 U	2.5 U	2.5 U	**4.8**	**3.5**	**4.8**	2.5 U	2.5 U	2.6 U	2.5 U	2.5 U	2.5 U	2.6 U
Iron	ug/L	**13000**	--	--	--	**300**	--	--	--	**88000**	--	--	--	**49000**
Magnesium	ug/L	**4310**	--	--	--	**5900**	--	--	--	**5230**	--	--	--	**5510**
Manganese	ug/L	**130**	--	--	--	**530**	--	--	--	**740**	--	--	--	**350**
Potassium	ug/L	**3590**	--	--	--	**3950**	--	--	--	**3720**	--	--	--	**3930**
Sodium	ug/L	**13300**	--	--	--	**15300**	--	--	--	**15200**	--	--	--	**15700**
Total Metals														
Arsenic	ug/L	**690**	**370**	**330**	**320**	**340**	**310**	**180**	**28**	**1.8**	**88**	**77**	1 U	1 U
Calcium	ug/L	**70800**	--	--	--	**70100**	--	--	--	**70400**	--	--	--	**68500**
Copper	ug/L	**2.6**	**3.1**	**5**	**6.5**	**3.3**	**76**	**34**	**37**	**5.6**	**7.8**	**1100**	2.5 U	2.5 U
Iron	ug/L	**15000**	--	--	--	**310**	--	--	--	**110000**	--	--	--	**56000**
Magnesium	ug/L	**4160**	--	--	--	**5730**	--	--	--	**5180**	--	--	--	**5310**
Manganese	ug/L	**150**	--	--	--	**570**	--	--	--	**790**	--	--	--	**330**
Potassium	ug/L	**3530**	--	--	--	**3940**	--	--	--	**3720**	--	--	--	**3880**
Sodium	ug/L	**12800**	--	--	--	**14900**	--	--	--	**14800**	--	--	--	**15200**
Semivolatile Organic Compounds														
Pentachlorophenol	ug/L	**570 J**	--	--	--	**710 J**	--	--	--	--	--	--	--	--
Conventionals														
Alkalinity, Total	mg/L	**185**	--	--	--	**209**	--	--	--	**109**	--	--	--	**94.8**
Bromide	mg/L	0.600 U	--	--	--	0.600 U	--	--	--	0.600 U	--	--	--	0.600 U
Chloride	mg/L	**3.66**	--	--	--	**4.37**	--	--	--	**4.54**	--	--	--	**4.68**
Fluoride	mg/L	**0.171**	--	--	--	**0.136**	--	--	--	**0.137**	--	--	--	**0.114**
Nitrate as Nitrogen	mg/L	0.200 UJ	--	--	--	0.200 UJ	--	--	--	0.200 UJ	--	--	--	0.200 UJ
Nitrite as Nitrogen	mg/L	0.200 UJ	--	--	--	0.200 UJ	--	--	--	0.200 UJ	--	--	--	0.200 UJ
Orthophosphate	mg/L	0.400 UJ	--	--	--	**0.718 J**	--	--	--	0.400 UJ	--	--	--	0.400 UJ
Salinity	%	**0.0100**	--	--	--	**0.0100**	--	--	--	**0.0100**	--	--	--	**0.0100**
Sulfate	mg/L	**3.92**	--	--	--	**3.37**	--	--	--	**3.69**	--	--	--	**3.12**
Total Dissolved Solids	mg/L	**286**	--	--	--	**215**	--	--	--	**254**	--	--	--	**216**
Total Organic Carbon	mg/L	**4.98**	--	--	--	**4.05**	--	--	--	**3.11**	--	--	--	**1.89 J**
Field Parameters														
Specific Conductance	uS/cm	**359.31**	**351.14**	**343.66**	**333**	**392.74**	**447.14**	**396.94**	**494.23**	**545.54**	**483.73**	**446.39**	**476.2**	**368.66**
Dissolved Oxygen	mg/L	**6.75**	**5.57**	**6.94**	**5.96**	**6.84**	**5.28**	**7.29**	**5.45**	**6.25**	**4.7**	**5.9**	**5.44**	**7.65**
pH	pH units	**6.75**	**6.51**	**6.6**	**6.8**	**6.45**	**6.76**	**6.77**	**7.01**	**6.83**	**6.95**	**6.87**	**7.06**	**6.9**
Oxidation Reduction Potential	mV	**-73.2**	**-29.6**	**-12.2**	**-75.1**	**208.3**	**-99.4**	**-70.2**	**-124.3**	**-93.8**	**-129.6**	**-127.7**	**-144.7**	**-100.8**

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 5											
		Influent - Day 5	*Control - Day 5*				*25% ZVI - Day 5*				*58% ZVI - Day 5*			
Date		04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25
Port		Influent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals														
Arsenic	ug/L	**800**	**490**	**460**	**420**	**470**	**220**	**79**	**61**	**8.1**	**76**	**5.4**	**1.3**	1 U
Calcium	ug/L	**67500**	--	--	--	**64800**	--	--	--	**62300**	--	--	--	--
Copper	ug/L	2.6 U	2.5 U	2.5 U	**3.4**	**3.7**	2.5 U	2.5 U	**3.5**	**3.4**	2.5 U	2.5 U	2.5 U	2.6 U
Iron	ug/L	**14000**	--	--	--	**270**	--	--	--	**120000**	--	--	--	**77000**
Magnesium	ug/L	**4450**	--	--	--	**5740**	--	--	--	**5260**	--	--	--	--
Manganese	ug/L	**140**	--	--	--	**560**	--	--	--	**1100**	--	--	--	**440**
Potassium	ug/L	**3660**	--	--	--	**3830**	--	--	--	**3740**	--	--	--	--
Sodium	ug/L	**13300**	--	--	--	**14900**	--	--	--	**15200**	--	--	--	--
Total Metals														
Arsenic	ug/L	**740**	**460**	**470**	**370**	**460**	**320**	**250**	**73**	**9.2**	**220**	**90**	**9.3**	1 U
Calcium	ug/L	**73800**	--	--	--	**70600**	--	--	--	**70300**	--	--	--	--
Copper	ug/L	**2.5**	**3.4**	**3.8**	**4.4**	**3.5**	**19**	**22**	**21**	**2.8**	**3.7**	**170**	**180**	2.5 U
Iron	ug/L	**14000**	--	--	--	**270**	--	--	--	**120000**	--	--	--	**80000**
Magnesium	ug/L	**4180**	--	--	--	**5890**	--	--	--	**5210**	--	--	--	--
Manganese	ug/L	**150**	--	--	--	**600**	--	--	--	**740**	--	--	--	**460**
Potassium	ug/L	**3500**	--	--	--	**4070**	--	--	--	**3710**	--	--	--	--
Sodium	ug/L	**12500**	--	--	--	**15300**	--	--	--	**15000**	--	--	--	--
Semivolatile Organic Compounds														
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	**16**
Conventionals														
Alkalinity, Total	mg/L	**235**	--	--	--	**250**	--	--	--	**199**	--	--	--	--
Bromide	mg/L	0.600 U	--	--	--	0.600 U	--	--	--	0.600 U	--	--	--	--
Chloride	mg/L	**3.86**	--	--	--	**4.51**	--	--	--	**4.74**	--	--	--	--
Fluoride	mg/L	**0.168**	--	--	--	**0.142**	--	--	--	**0.141**	--	--	--	--
Nitrate as Nitrogen	mg/L	0.200 UJ	--	--	--	0.200 UJ	--	--	--	0.200 UJ	--	--	--	--
Nitrite as Nitrogen	mg/L	0.200 UJ	--	--	--	0.200 UJ	--	--	--	--	--	--	--	--
Orthophosphate	mg/L	0.400 UJ	--	--	--	**0.641 J**	--	--	--	0.400 UJ	--	--	--	--
Salinity	%	**0.0100**	--	--	--	**0.0100**	--	--	--	**0.0100**	--	--	--	--
Sulfate	mg/L	**3.91**	--	--	--	**3.53**	--	--	--	**3.87**	--	--	--	--
Total Dissolved Solids	mg/L	**278**	--	--	--	**276**	--	--	--	**286**	--	--	--	--
Total Organic Carbon	mg/L	**5.24**	--	--	--	**4.27**	--	--	--	**3.86**	--	--	--	--
Field Parameters														
Specific Conductance	uS/cm	**370.18**	**346.11**	**324.58**	**326.75**	**471.97**	**412.3**	**486.65**	**383.78**	**557.78**	**500.67**	**449.2**	**369.07**	**491.91**
Dissolved Oxygen	mg/L	**3.33**	**6.79**	**6.67**	**7.27**	**7.29**	**5.85**	**5.87**	**6.95**	**6.55**	**5.08**	**5.88**	**8.61**	**7.61**
pH	pH units	**6.41**	**6.38**	**6.51**	**6.63**	**6.45**	**6.54**	**6.75**	**6.62**	**6.71**	**6.78**	**6.94**	**6.83**	**6.7**
Oxidation Reduction Potential	mV	**-55.6**	**9.6**	**-24.6**	**5.3**	**219**	**-71.5**	**-102.9**	**-102.3**	**-59.9**	**-118.5**	**-126.9**	**-81.2**	**-80.7**

Notes

ZVI = zero valent iron	**Bold - detected**
ug/L = micrograms per liter	"--" - indicates results not available
mV = millivolts	U - Analyte not detected at or above Reporting Limit shown
mg/L = milligrams per liter	J - Result value estimated
uS/cm = microSiemens per centimeter	UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 6											
		Influent - Day 6	***Control - Day 6***				***25% ZVI - Day 6***				***58% ZVI - Day 6***			
Date		04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25
Port		Influent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals														
Arsenic	ug/L	**670**	**400**	**410**	**390**	**400**	**170**	**170**	**14**	**4.8**	**190**	**40**	**1.9**	1 U
Calcium	ug/L	**68100**	--	--	--	**62500**	--	--	--	**59200**	--	--	--	**60800**
Copper	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Iron	ug/L	**14000**	--	--	--	**330**	--	--	--	**110000**	--	--	--	**86000**
Magnesium	ug/L	**4300**	--	--	--	**5560**	--	--	--	**5180**	--	--	--	**5190**
Manganese	ug/L	**150**	--	--	--	**680**	--	--	--	**1000**	--	--	--	**660**
Potassium	ug/L	**3510**	--	--	--	**3890**	--	--	--	**3830**	--	--	--	**3890**
Sodium	ug/L	**12800**	--	--	--	**15200**	--	--	--	**15100**	--	--	--	**15700**
Total Metals														
Arsenic	ug/L	**640**	**420**	**440**	**380**	**440**	**250**	**200**	**91**	**22**	**150**	**57**	**13**	1 U
Calcium	ug/L	**73400**	--	--	--	**66700**	--	--	--	**65000**	--	--	--	**65700**
Copper	ug/L	2.5 U	2.5 U	2.5 U	**2.6**	**2.6**	**22**	**8.8**	2.5 U	**5.2**	2.5 U	2.5 U	**11**	2.5 U
Iron	ug/L	**15000**	--	--	--	**610**	--	--	--	**130000**	--	--	--	**95000**
Magnesium	ug/L	**4270**	--	--	--	**5450**	--	--	--	**5250**	--	--	--	**5130**
Manganese	ug/L	**140**	--	--	--	**830**	--	--	--	**730**	--	--	--	**540**
Potassium	ug/L	**3610**	--	--	--	**3870**	--	--	--	**3880**	--	--	--	**3930**
Sodium	ug/L	**13000**	--	--	--	**14900**	--	--	--	**15100**	--	--	--	**15600**
Semivolatile Organic Compounds														
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Conventionals														
Alkalinity, Total	mg/L	**257**	--	--	--	**250**	--	--	--	**193**	--	--	--	**186**
Bromide	mg/L	0.600 U	--	--	--	0.600 U	--	--	--	0.600 U	--	--	--	0.600 U
Chloride	mg/L	**3.50**	--	--	--	**4.30**	--	--	--	**4.35**	--	--	--	**4.56**
Fluoride	mg/L	**0.171**	--	--	--	**0.157**	--	--	--	**0.167**	--	--	--	**0.140**
Nitrate as Nitrogen	mg/L	0.200 U	--	--	--	0.200 U	--	--	--	0.200 U	--	--	--	0.200 U
Nitrite as Nitrogen	mg/L	0.200 U	--	--	--	0.200 U	--	--	--	0.200 U	--	--	--	0.200 U
Orthophosphate	mg/L	0.400 UJ	--	--	--	**0.766 J**	--	--	--	0.400 UJ	--	--	--	0.400 UJ
Salinity	%	**0.0100**	--	--	--	**0.0100**	--	--	--	**0.0100**	--	--	--	**0.0100**
Sulfate	mg/L	**4.06**	--	--	--	**3.94**	--	--	--	**4.29**	--	--	--	**3.33**
Total Dissolved Solids	mg/L	**272**	--	--	--	**238**	--	--	--	**228**	--	--	--	**316**
Total Organic Carbon	mg/L	**4.81**	--	--	--	**3.95**	--	--	--	**3.64**	--	--	--	**2.99**
Field Parameters														
Specific Conductance	uS/cm	--	--	**358.12**	**358.92**	**445.42**	--	**425.44**	**486.68**	**551.84**	--	**485.95**	**527.5**	**407.93**
Dissolved Oxygen	mg/L	--	--	**7**	**6.73**	**7.58**	--	**6.32**	**5.33**	**6.68**	--	**7.01**	**5.88**	**8.23**
pH	pH units	--	--	**6.67**	**6.64**	**6.53**	--	**6.81**	**6.93**	**6.68**	--	**6.94**	**7.07**	**6.8**
Oxidation Reduction Potential	mV	--	--	**-27.2**	**2**	**217.3**	--	**-75.4**	**-116.5**	**-43**	--	**-94.3**	**-128.4**	**-79.6**

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 7											
		Influent - Day 7	*Control - Day 7*				*25% ZVI - Day 7*				*58% ZVI - Day 7*			
Date		04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25	04/29/25
Port		Influent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals														
Arsenic	ug/L	**820**	**440**	**430**	**390**	**380**	**150**	**100**	**42**	**5.7**	**14**	**21**	**2.9 J**	1 UJ
Calcium	ug/L	**67700**	--	--	--	**62700**	--	--	--	**61100**	--	--	--	**61500**
Copper	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	**3.7**	2.5 U	**2.6**	**3**	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Iron	ug/L	**17000**	--	--	--	**350**	--	--	--	**100000**	--	--	--	**89000**
Magnesium	ug/L	**4450**	--	--	--	**5570**	--	--	--	**5140**	--	--	--	**5030**
Manganese	ug/L	**190**	--	--	--	**770**	--	--	--	**730**	--	--	--	**640**
Potassium	ug/L	**3700**	--	--	--	**4240**	--	--	--	**4080**	--	--	--	**4080**
Sodium	ug/L	**13300**	--	--	--	**15200**	--	--	--	**15000**	--	--	--	**15500**
Total Metals														
Arsenic	ug/L	**830**	**460**	**460**	**380**	**350**	**230**	**130**	**50**	**29**	**77**	**29**	**9.8**	**1.7**
Calcium	ug/L	**66300**	--	--	--	**61900**	--	--	--	**61900**	--	--	--	**62400**
Copper	ug/L	2.5 U	**6.4**	**3.9**	**6.3**	**2.9**	**29**	**13**	**3.4**	**20**	2.5 U	2.5 U	**5.1**	**3.1**
Iron	ug/L	**17000**	--	--	--	**410**	--	--	--	**140000**	--	--	--	**120000**
Magnesium	ug/L	**4410**	--	--	--	**5550**	--	--	--	**5390**	--	--	--	**5130**
Manganese	ug/L	**180**	--	--	--	**710**	--	--	--	**800**	--	--	--	**680**
Potassium	ug/L	**3570**	--	--	--	**4110**	--	--	--	**4060**	--	--	--	**4070**
Sodium	ug/L	**13200**	--	--	--	**15300**	--	--	--	**15100**	--	--	--	**15800**
Semivolatile Organic Compounds														
Pentachlorophenol	ug/L	**740 J**	--	--	--	**740 J**	--	--	--	--	--	--	--	--
Conventionals														
Alkalinity, Total	mg/L	**219**	--	--	--	**254**	--	--	--	**210**	--	--	--	**225**
Bromide	mg/L	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U
Chloride	mg/L	**3.91**	--	--	--	**4.42**	--	--	--	**4.56**	--	--	--	**4.64**
Fluoride	mg/L	**0.17**	--	--	--	**0.163**	--	--	--	**0.166**	--	--	--	**0.147**
Nitrate as Nitrogen	mg/L	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U
Nitrite as Nitrogen	mg/L	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U
Orthophosphate	mg/L	0.4 UJ	--	--	--	**0.512 J**	--	--	--	0.4 UJ	--	--	--	0.4 UJ
Salinity	%	**0.01**	--	--	--	**0.01**	--	--	--	**0.01**	--	--	--	**0.01**
Sulfate	mg/L	**4**	--	--	--	**3.93**	--	--	--	**4.43**	--	--	--	**3.4**
Total Dissolved Solids	mg/L	**286**	--	--	--	**290**	--	--	--	**254**	--	--	--	**256**
Total Organic Carbon	mg/L	**5.03**	--	--	--	**4.34**	--	--	--	**3.9**	--	--	--	**3.17**
Field Parameters														
Specific Conductance	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	pH units	--	--	--	--	--	--	--	--	--	--	--	--	--
Oxidation Reduction Potential	mV	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 8											
		Influent - Day 8	*Control - Day 8*				*25% ZVI - Day 8*				*58% ZVI - Day 8*			
Date		04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25	04/30/25
Port		Influent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals														
Arsenic	ug/L	**670**	**340**	**360**	**360**	**290**	**130**	**57**	**9.1**	**3.2**	**24**	**7.7**	**6**	1 U
Calcium	ug/L	**68900**	--	--	--	**66900**	--	--	--	**62500**	--	--	--	**64000**
Copper	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	**3.7**	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Iron	ug/L	**15000**	--	--	--	**350**	--	--	--	**110000**	--	--	--	**88000**
Magnesium	ug/L	**4270**	--	--	--	**5420**	--	--	--	**5030**	--	--	--	**4970**
Manganese	ug/L	**180**	--	--	--	**750**	--	--	--	**780**	--	--	--	**710**
Potassium	ug/L	**3790**	--	--	--	**4210**	--	--	--	**3890**	--	--	--	**4020**
Sodium	ug/L	**12800**	--	--	--	**14600**	--	--	--	**14600**	--	--	--	**15100**
Total Metals														
Arsenic	ug/L	**690**	**390**	**380**	**340**	**280**	**140**	**63**	**50**	**26**	**64**	**24**	**7.1**	**1.8**
Calcium	ug/L	**65100**	--	--	--	**62300**	--	--	--	**59300**	--	--	--	**59500**
Copper	ug/L	**2.5**	**4.6**	**4.5**	**17**	**2.9**	**15**	**12**	**22**	**15**	**4.1**	**25**	2.5 U	2.5 U
Iron	ug/L	**16000**	--	--	--	**390**	--	--	--	**150000**	--	--	--	**130000**
Magnesium	ug/L	**4500**	--	--	--	**5550**	--	--	--	**5230**	--	--	--	**4970**
Manganese	ug/L	**180**	--	--	--	**730**	--	--	--	**970**	--	--	--	**670**
Potassium	ug/L	**3720**	--	--	--	**3970**	--	--	--	**3690**	--	--	--	**3750**
Sodium	ug/L	**13500**	--	--	--	**14900**	--	--	--	**14800**	--	--	--	**15200**
Semivolatile Organic Compounds														
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	**330 J**
Conventionals														
Alkalinity, Total	mg/L	**187**	--	--	--	**257**	--	--	--	**238**	--	--	--	**239**
Bromide	mg/L	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U
Chloride	mg/L	**3.79**	--	--	--	**4.5**	--	--	--	**4.6**	--	--	--	**4.66**
Fluoride	mg/L	**0.176**	--	--	--	**0.161**	--	--	--	**0.153**	--	--	--	**0.143**
Nitrate as Nitrogen	mg/L	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U
Nitrite as Nitrogen	mg/L	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U
Orthophosphate	mg/L	0.4 UJ	--	--	--	**0.443 J**	--	--	--	0.4 U	--	--	--	0.4 UJ
Salinity	%	**0.01**	--	--	--	**0.01**	--	--	--	**0.01**	--	--	--	**0.01**
Sulfate	mg/L	**4.36**	--	--	--	**4.22**	--	--	--	**4.56**	--	--	--	**3.55**
Total Dissolved Solids	mg/L	**278**	--	--	--	**286**	--	--	--	**242**	--	--	--	**244**
Total Organic Carbon	mg/L	**4.34**	--	--	--	**3.86**	--	--	--	**3.63**	--	--	--	**3.2**
Field Parameters														
Specific Conductance	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	pH units	--	--	--	--	--	--	--	--	--	--	--	--	--
Oxidation Reduction Potential	mV	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 9											
		Influent - Day 9	*Control - Day 9*				*25% ZVI - Day 9*				*58% ZVI - Day 9*			
Date		05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25	05/01/25
Port		Influent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals														
Arsenic	ug/L	**660**	**340**	**370**	**390**	**350**	**92**	**44**	**5.1**	**3.9**	**40**	**13**	**1.2**	**3.1**
Calcium	ug/L	**73100**	--	--	--	**65000**	--	--	--	**61200**	--	--	--	**63200**
Copper	ug/L	**4.8**	2.5 U	2.5 U	2.5 U	**2.6**	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	**4.3**	2.5 U
Iron	ug/L	**14000**	--	--	--	**710**	--	--	--	**84000**	--	--	--	**82000**
Magnesium	ug/L	**4360**	--	--	--	**5390**	--	--	--	**4990**	--	--	--	**5010**
Manganese	ug/L	**160**	--	--	--	**650**	--	--	--	**680**	--	--	--	**630**
Potassium	ug/L	**3800**	--	--	--	**4300**	--	--	--	**3990**	--	--	--	**4100**
Sodium	ug/L	**12600**	--	--	--	**14500**	--	--	--	**14800**	--	--	--	**15500**
Total Metals														
Arsenic	ug/L	**690**	**380**	**410**	**390**	**340**	**95**	**47**	**26**	**15**	**35**	**15**	**1.8**	**5.6**
Calcium	ug/L	**68900**	--	--	--	**59700**	--	--	--	**57000**	--	--	--	**58400**
Copper	ug/L	2.5 U	2.5 U	2.5 U	**4.1**	**2.9**	**11**	**10**	**13**	**12**	2.5 U	2.5 U	**5.5**	**3.1**
Iron	ug/L	**15000**	--	--	--	**1200**	--	--	--	**150000**	--	--	--	**110000**
Magnesium	ug/L	**4500**	--	--	--	**5450**	--	--	--	**5170**	--	--	--	**5030**
Manganese	ug/L	**170**	--	--	--	**690**	--	--	--	**1000**	--	--	--	**810**
Potassium	ug/L	**3630**	--	--	--	**4030**	--	--	--	**3750**	--	--	--	**3820**
Sodium	ug/L	**13100**	--	--	--	**14700**	--	--	--	**14800**	--	--	--	**15400**
Semivolatile Organic Compounds														
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Conventionals														
Alkalinity, Total	mg/L	**179**	--	--	--	**227**	--	--	--	**221**	--	--	--	**223**
Bromide	mg/L	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U
Chloride	mg/L	**3.63**	--	--	--	**4.31**	--	--	--	**4.38**	--	--	--	**4.54**
Fluoride	mg/L	**0.173**	--	--	--	**0.167**	--	--	--	**0.155**	--	--	--	**0.145**
Nitrate as Nitrogen	mg/L	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U
Nitrite as Nitrogen	mg/L	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U	--	--	--	0.2 U
Orthophosphate	mg/L	0.4 UJ	--	--	--	**0.44 J**	--	--	--	0.4 UJ	--	--	--	0.4 UJ
Salinity	%	**0.01**	--	--	--	**0.01**	--	--	--	**0.01**	--	--	--	**0.01**
Sulfate	mg/L	**3.83**	--	--	--	**4.48**	--	--	--	**4.98**	--	--	--	**3.83**
Total Dissolved Solids	mg/L	**278**	--	--	--	**268**	--	--	--	**234**	--	--	--	**234**
Total Organic Carbon	mg/L	**4.94**	--	--	--	**3.57**	--	--	--	**3.53**	--	--	--	**2.94 J**
Field Parameters														
Specific Conductance	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	pH units	--	--	--	--	--	--	--	--	--	--	--	--	--
Oxidation Reduction Potential	mV	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 3 - Analytical Results

		Day 10											
		Influent - Day 10	*Control - Day 10*				*25% ZVI - Day 10*				*58% ZVI - Day 10*			
Date		05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25	05/02/25
Port		Influent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent	Port 1	Port 2	Port 3	Effluent
Dissolved Metals														
Arsenic	ug/L	**680**	**240**	**310**	**390**	**360**	**57**	**21**	**3.8**	**4.2**	**15**	**7.2**	**1.9**	**1.2**
Calcium	ug/L	**72700**	--	--	--	**65200**	--	--	--	**61400**	--	--	--	**62900**
Copper	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	**3**	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Iron	ug/L	**15000**	--	--	--	**1300**	--	--	--	**98000**	--	--	--	**96000**
Magnesium	ug/L	**4470**	--	--	--	**5560**	--	--	--	**4970**	--	--	--	**4920**
Manganese	ug/L	**170**	--	--	--	**610**	--	--	--	**880**	--	--	--	**620**
Potassium	ug/L	**3920**	--	--	--	**4700**	--	--	--	**4090**	--	--	--	**4090**
Sodium	ug/L	**12900**	--	--	--	**14300**	--	--	--	**14600**	--	--	--	**15000**
Total Metals														
Arsenic	ug/L	**730**	**330**	**360**	**390**	**350**	**61**	**21**	**15**	**32**	**15**	**11**	**3.1**	**1.6**
Calcium	ug/L	**69000**	--	--	--	**62700**	--	--	--	**57000**	--	--	--	**61300**
Copper	ug/L	2.5 U	2.5 U	**2.8**	2.5 U	**3.1**	**8.5**	**3.9**	**7.9**	**38**	2.5 U	2.5 U	**4.7**	2.5 U
Iron	ug/L	**15000**	--	--	--	**1700**	--	--	--	**200000**	--	--	--	**110000**
Magnesium	ug/L	**4510**	--	--	--	**5790**	--	--	--	**5140**	--	--	--	**5140**
Manganese	ug/L	**180**	--	--	--	**650**	--	--	--	**1200**	--	--	--	**650**
Potassium	ug/L	**3640**	--	--	--	**4440**	--	--	--	**3750**	--	--	--	**4000**
Sodium	ug/L	**12900**	--	--	--	**14600**	--	--	--	**14200**	--	--	--	**15600**
Semivolatile Organic Compounds														
Pentachlorophenol	ug/L	**660 J**	--	--	--	**760 J**	--	--	--	--	--	--	--	**290 J**
Conventionals														
Alkalinity, Total	mg/L	**129**	--	--	--	**174**	--	--	--	**101**	--	--	--	**153**
Bromide	mg/L	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U	--	--	--	0.6 U
Chloride	mg/L	**3.83**	--	--	--	**4.42**	--	--	--	**4.53**	--	--	--	**4.68**
Fluoride	mg/L	**0.177**	--	--	--	0.1 U	--	--	--	**0.154**	--	--	--	**0.145**
Nitrate as Nitrogen	mg/L	**0.588 J**	--	--	--	0.2 UJ	--	--	--	0.2 UJ	--	--	--	0.2 UJ
Nitrite as Nitrogen	mg/L	0.2 UJ	--	--	--	0.2 UJ	--	--	--	0.2 UJ	--	--	--	0.2 UJ
Orthophosphate	mg/L	0.4 U	--	--	--	**0.625**	--	--	--	0.4 U	--	--	--	0.4 U
Salinity	%	**0.01**	--	--	--	**0.01**	--	--	--	0.0001 U	--	--	--	**0.01**
Sulfate	mg/L	**4.09**	--	--	--	**4.6**	--	--	--	**5.05**	--	--	--	**4.04**
Total Dissolved Solids	mg/L	**296**	--	--	--	**450**	--	--	--	**246**	--	--	--	**242**
Total Organic Carbon	mg/L	**4.88**	--	--	--	**7.16**	--	--	--	**4.83**	--	--	--	**3.44**
Field Parameters														
Specific Conductance	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	pH units	--	--	--	--	--	--	--	--	--	--	--	--	--
Oxidation Reduction Potential	mV	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes

ZVI = zero valent iron
ug/L = micrograms per liter
mV = millivolts
mg/L = milligrams per liter
uS/cm = microSiemens per centimeter

Bold - detected
"--" - indicates results not available
U - Analyte not detected at or above Reporting Limit shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit is an estimate

Table 6 - ZVI Treatment Capacity Calculation

Parameter \ Column	25% ZVI	58% ZVI	Units
ZVI Bulk Density[1]	150	150	pounds per cubic foot
Column Diameter	3	3	inches
Column Length to Port 1	0.5	0.5	feet
Column Volume to Port 1	0.025	0.025	cubic feet
Column Volume to Port 1	695	695	milliliters
ZVI %	20%	50%	by volume
ZVI mass	0.74	1.8	pounds
ZVI mass	334	836	grams
Pumping Rate	14.5	14.5	milliliters per minute
Pumping Duration	10	10	days
Pumping Duration	14400	14400	minutes
Volume pumped	209	209	liters
Conc. Decrease of Arsenic[2]	577	644	micrograms per liter
Conc. Decrease of Arsenic - Control-adjusted	214	280	micrograms per liter
Mass of Arsenic Removed	120	134	milligrams
Mass of Arsenic Removed - Control-adjusted	45	58	milligrams
Min. Removal Efficiency	**0.36**	**0.16**	**milligrams Arsenic per gram ZVI**
Min. Removal Efficiency (Control-adjusted)	**0.13**	**0.07**	**milligrams Arsenic per gram ZVI**

Notes:

1. Based on manufacturer specifications for the Connelly CC-1004 ZVI that was used in testing.
2. Decreases in arsenic were calculated by subtracting the average Port 1 concentration from the average influent concentration over Days 8 through 10.

ZVI = zero-valent iron

Table 7 - pH Data Summary

Control Column						
	Influent	**Port 1**	**Port 2**	**Port 3**	**Effluent**	**Effluent - Influent**
4/23/2025	6.54	6.45	6.45	6.45	6.4	-0.14
4/24/2025	6.26	6.45	6.4	6.43	6.24	-0.02
4/25/2025	6.64	6.55	6.15	6.61	6.5	-0.14
4/26/2025	6.75	6.51	6.6	6.8	6.45	-0.3
4/27/2025	6.41	6.38	6.51	6.63	6.45	0.04
4/28/2025	--	--	6.67	6.64	6.53	--
Average	**6.52**	**6.47**	**6.46**	**6.59**	**6.43**	**-0.11**
Minimum of All Influent, Port, and Effluent Measurements						**6.15**
Maximum of All Influent, Port, and Effluent Measurements						**6.8**

25% ZVI Column						
	Influent	**Port 1**	**Port 2**	**Port 3**	**Effluent**	**Effluent - Influent**
4/23/2025	6.54	7.33	7.56	7.46	7.61	1.07
4/24/2025	6.26	6.9	6.94	6.95	7.13	0.87
4/25/2025	6.64	6.86	6.83	6.78	6.78	0.14
4/26/2025	6.75	6.76	6.77	7.01	6.83	0.08
4/27/2025	6.41	6.54	6.75	6.62	6.71	0.3
4/28/2025	--	--	6.81	6.93	6.68	--
Average	**6.52**	**6.88**	**6.94**	**6.96**	**6.96**	**0.49**
Minimum of All Influent, Port, and Effluent Measurements						**6.26**
Maximum of All Influent, Port, and Effluent Measurements						**7.13**

58% ZVI Column						
	Influent	**Port 1**	**Port 2**	**Port 3**	**Effluent**	**Effluent - Influent**
4/24/2025	6.26	7.03	7.25	7.2	6.98	0.72
4/25/2025	6.64	6.93	7.02	7.07	7.18	0.54
4/26/2025	6.75	6.95	6.87	7.06	6.9	0.15
4/27/2025	6.41	6.78	6.94	6.83	6.7	0.29
4/28/2025	--	--	6.94	7.07	6.8	--
Average	**6.52**	**6.92**	**7.00**	**7.05**	**6.91**	**0.43**
Minimum of All Influent, Port, and Effluent Measurements						**6.26**
Maximum of All Influent, Port, and Effluent Measurements						**7.25**

Notes:

-- = no data available

All values are in pH standard units

FIGURES

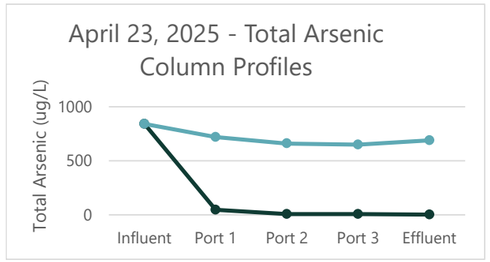
Figure 1a - Total Arsenic Column Profiles - By Date

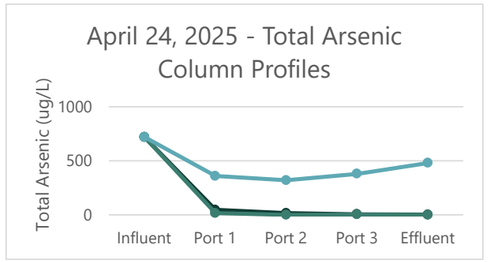
	TOTAL ARSENIC IN MICROGRAMS PER LITER														
	25% ZVI					58% ZVI					Control				
Date	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent
04/23/25	840	47	7.1	6.6	1.3	840	--	--	--	--	840	720	660	650	690
04/24/25	720	47	16	5.8	1.7	720	17	1.0	3.1	1.0	720	360	320	380	480
04/25/25	730	190	110	20	1	730	23	3.8	3.6	1	730	330	320	350	380
04/26/25	690	310	180	28	1.8	690	88	77	1	1	690	370	330	320	340
04/27/25	740	320	250	73	9.2	740	220	90	9.3	1	740	460	470	370	460
04/28/25	640	250	200	91	22	640	150	57	13	1	640	420	440	380	440
04/29/25	830	230	130	50	29	830	77	29	9.8	1.7	830	460	460	380	350
04/30/25	690	140	63	50	26	690	64	24	7.1	1.8	690	390	380	340	280
05/01/25	690	95	47	26	15	690	35	15	1.8	5.6	690	380	410	390	340
05/02/25	730	61	21	15	32	730	15	11	3.1	1.6	730	330	360	390	350

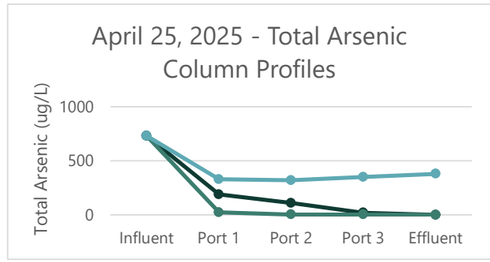
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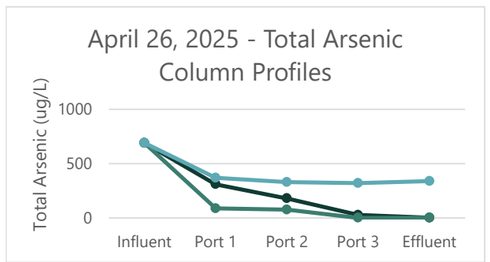
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2) Red text indicates nondetect result
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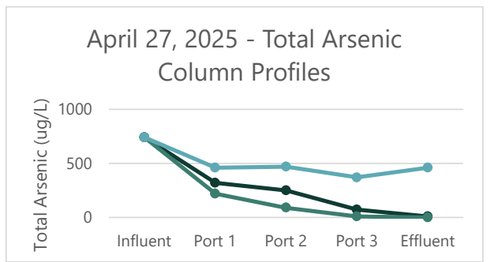
25% ZVI
58% ZVI
Control

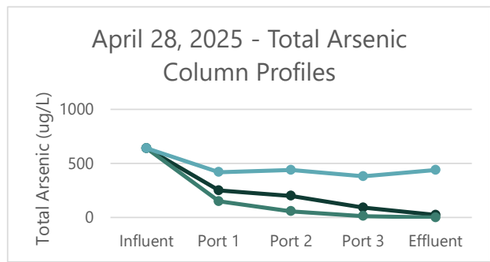


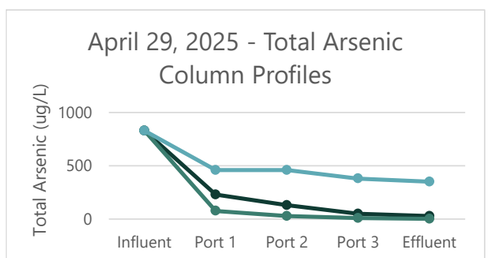


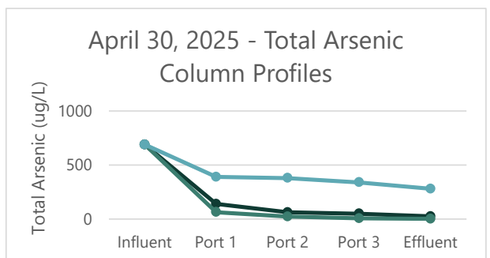


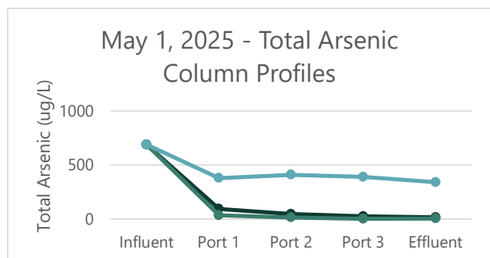












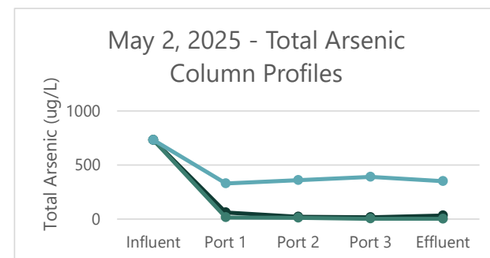
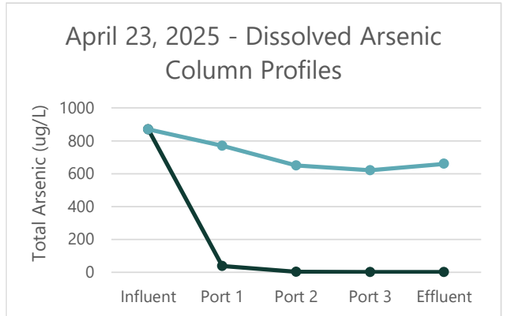


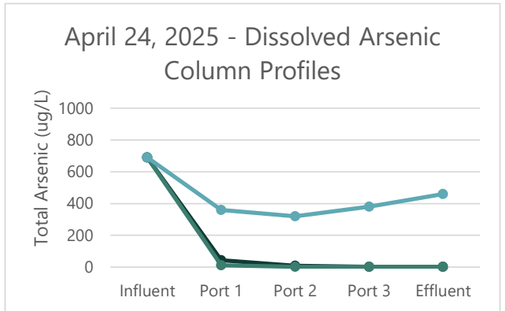
Figure 1b - Dissolved Arsenic Column Profiles - By Date

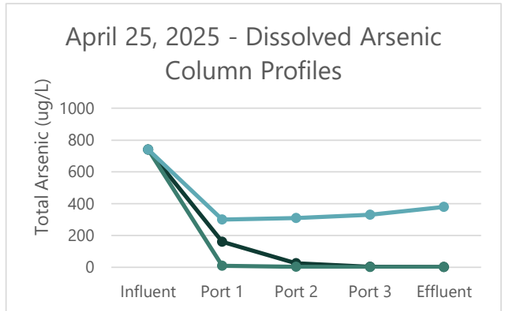
	DISSOLVED ARSENIC IN MICROGRAMS PER LITER														
	25% ZVI					58% ZVI					Control				
Date	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent	Influent	Port 1	Port 2	Port 3	Effluent
04/23/25	870	38	2.6	1.1	1	870	--	--	--	--	870	770	650	620	660
04/24/25	690	42	7.8	1	1	690	10	1	1	1	690	360	320	380	460
04/25/25	740	160	25	2.2	1	740	9.7	2.3	1	1	740	300	310	330	380
04/26/25	700	210	42	9.6	1.1	700	61	19	1	1	700	340	350	310	340
04/27/25	800	220	79	61	8.1	800	76	5.4	1.3	1	800	490	460	420	470
04/28/25	670	170	170	14	4.8	670	190	40	1.9	1	670	400	410	390	400
04/29/25	820	150	100	42	5.7	820	14	21	2.9	1	820	440	430	390	380
04/30/25	670	130	57	9.1	3.2	670	24	7.7	6	1	670	340	360	360	290
05/01/25	660	92	44	5.1	3.9	660	40	13	1.2	3.1	660	340	370	390	350
05/02/25	680	57	21	3.8	4.2	680	15	7.2	1.9	1.2	680	240	310	390	360

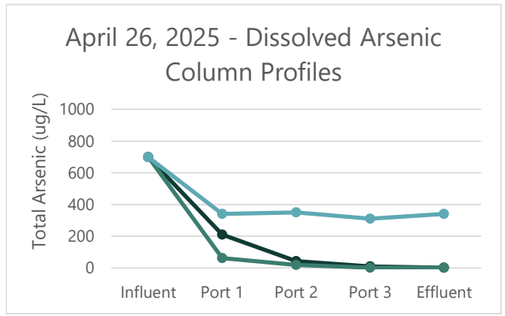
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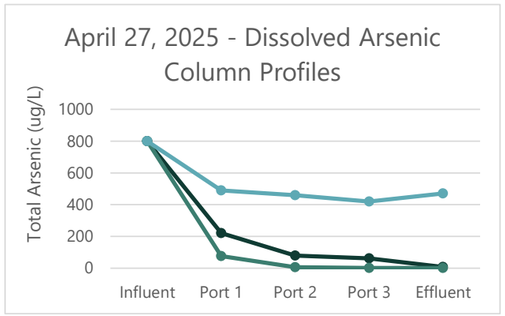
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2) Red text indicates nondetect result
3) -- indicates no data is available for this date

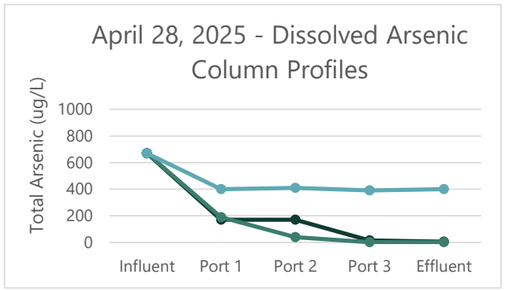


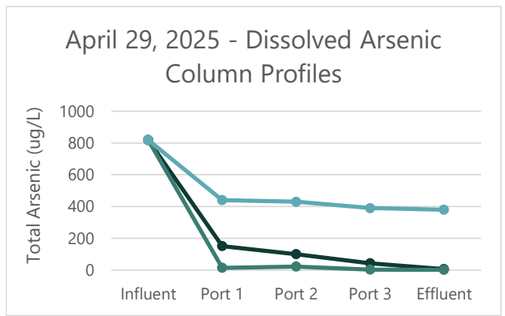


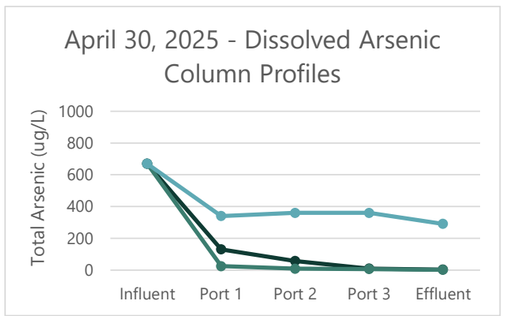


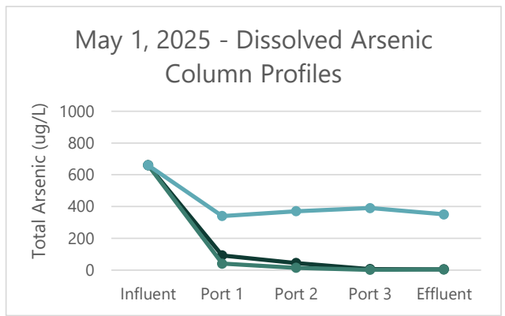












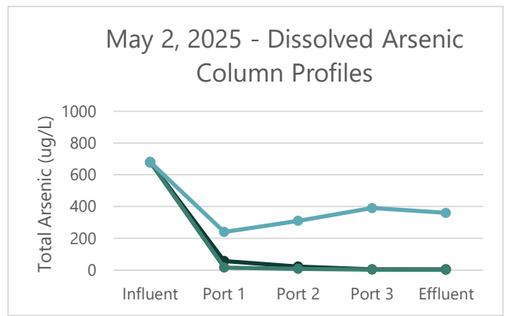
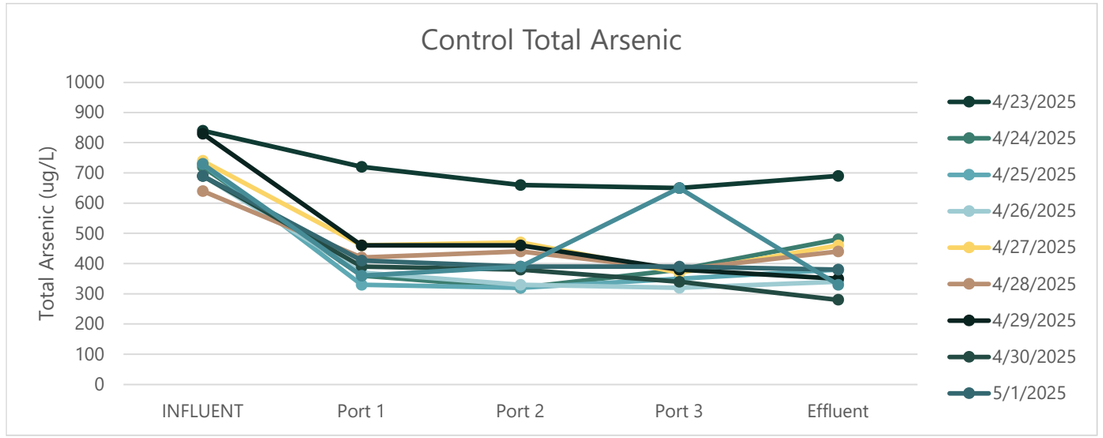
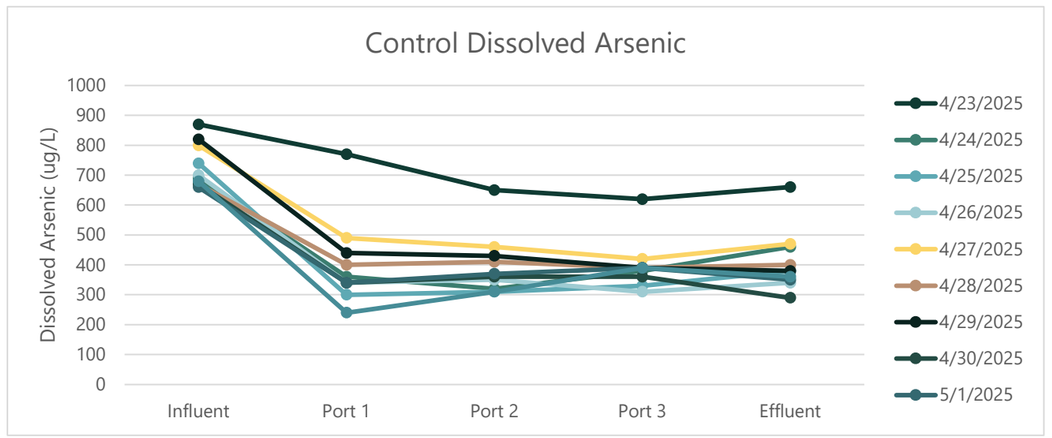
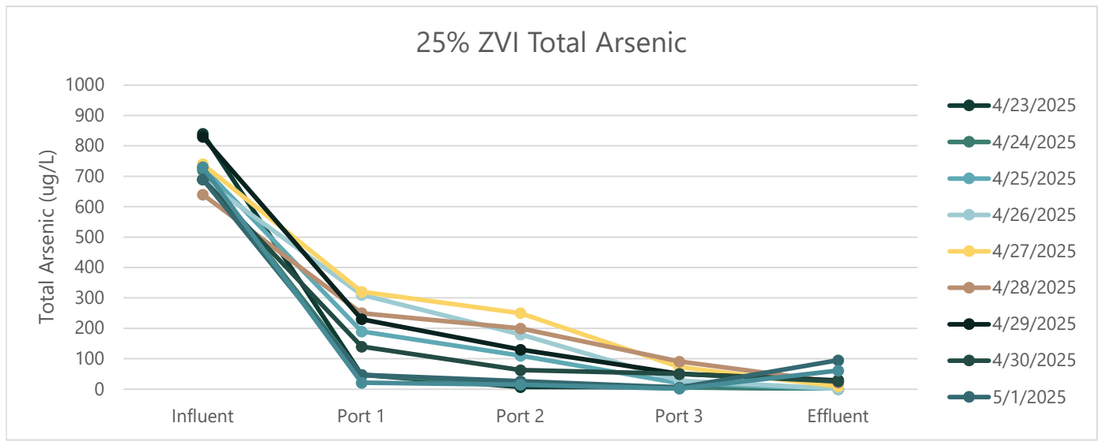
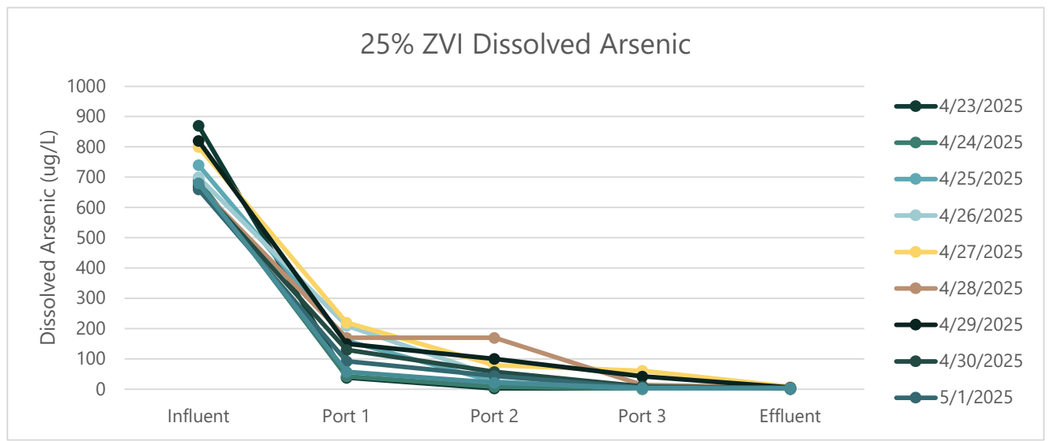


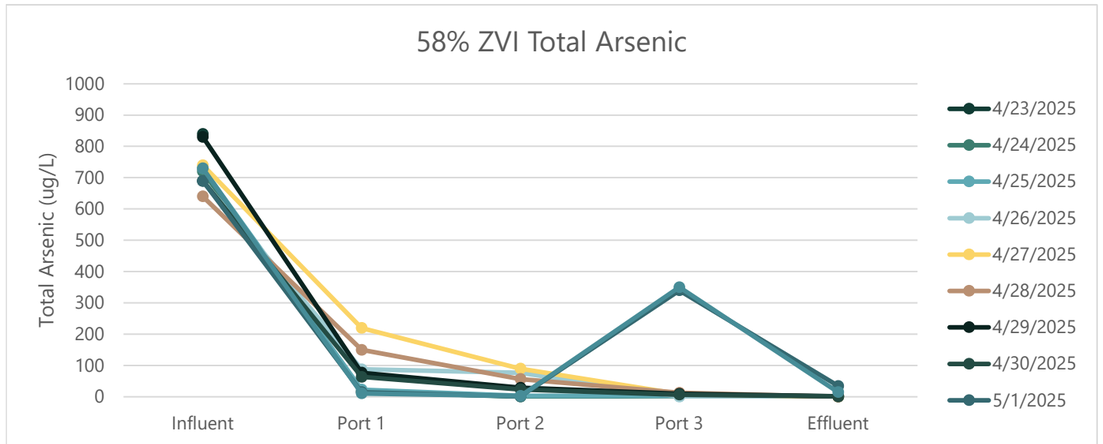
Figure 2 - Total and Dissolved Arsenic Column Profiles - By Column











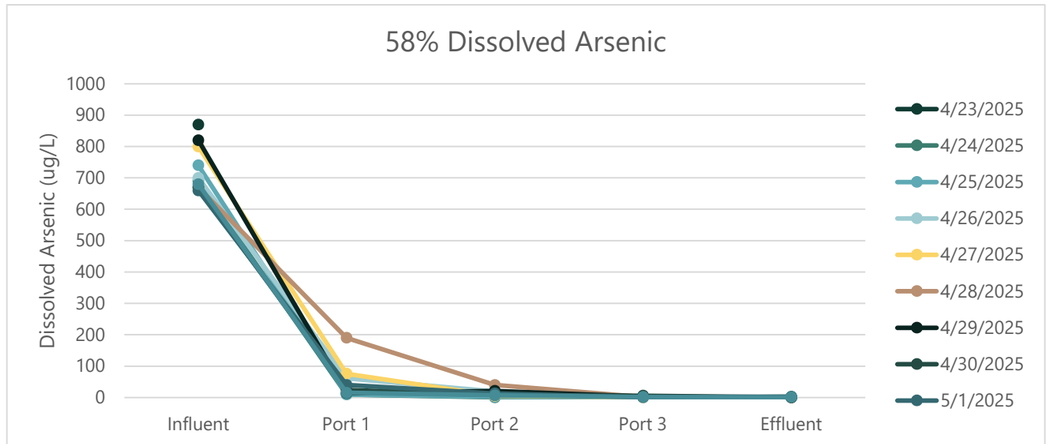
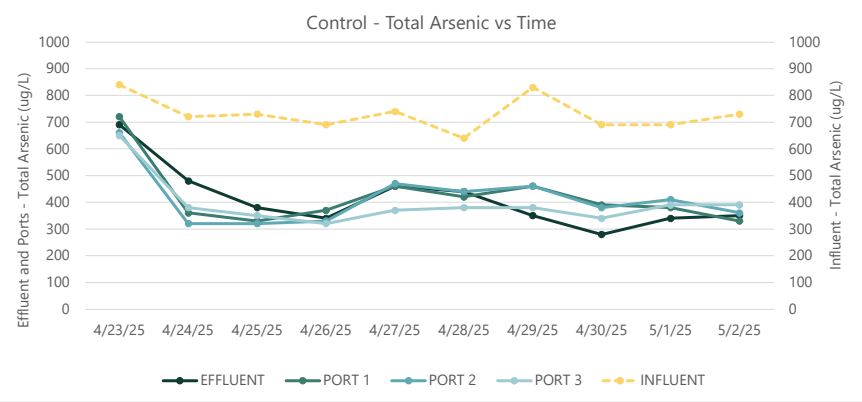
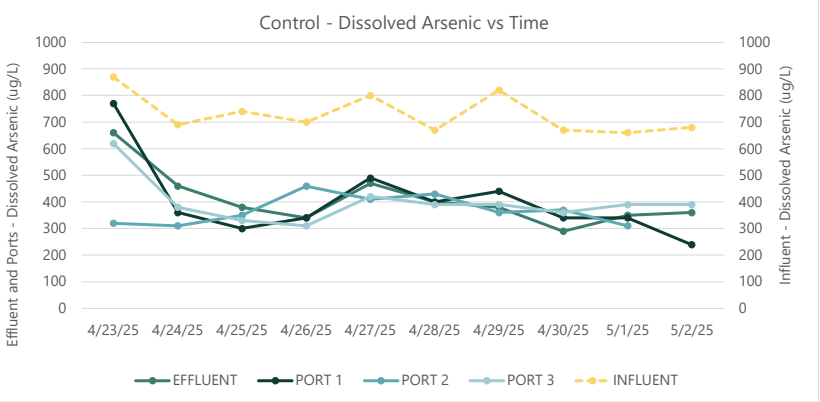
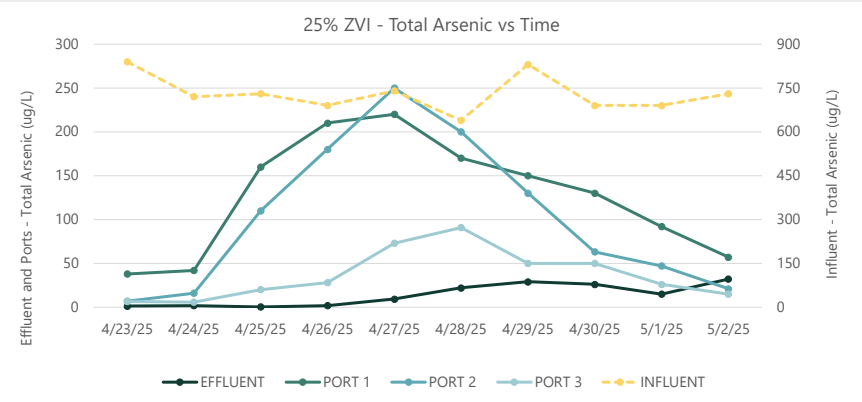
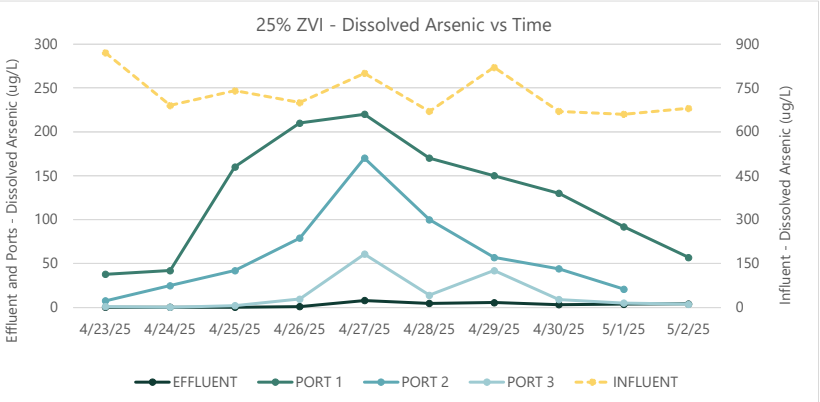


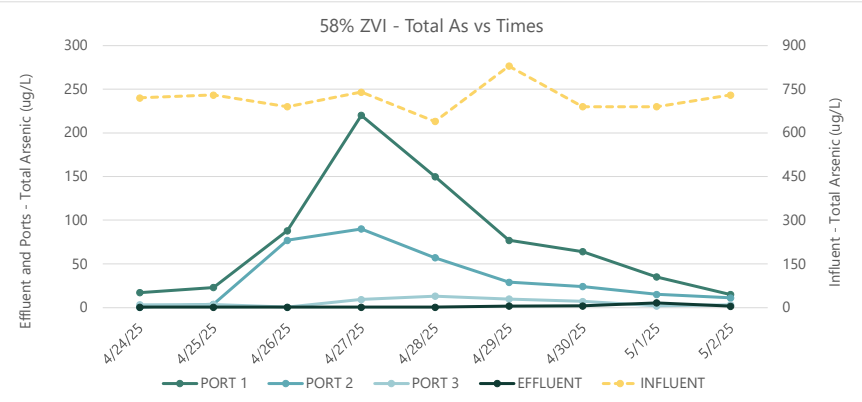
Figure 3 - Total and Dissolved Arsenic vs. Time - By Column











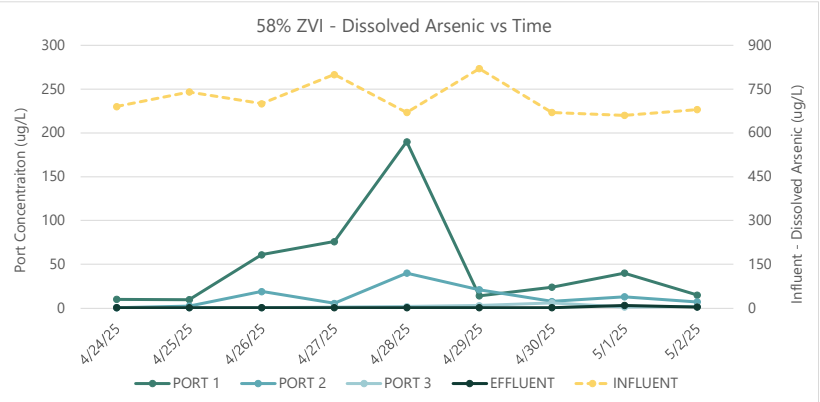
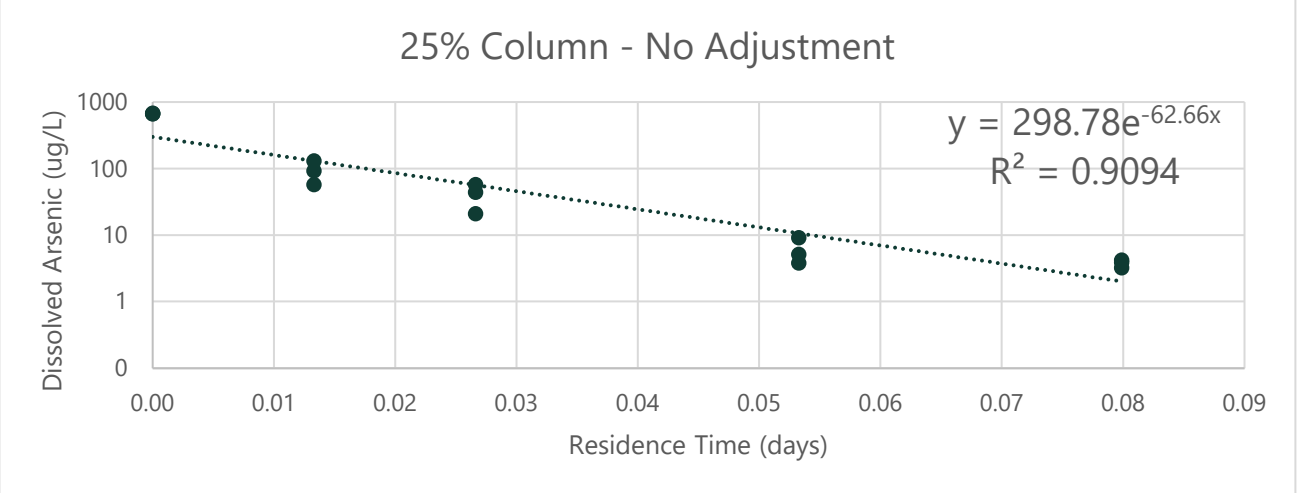
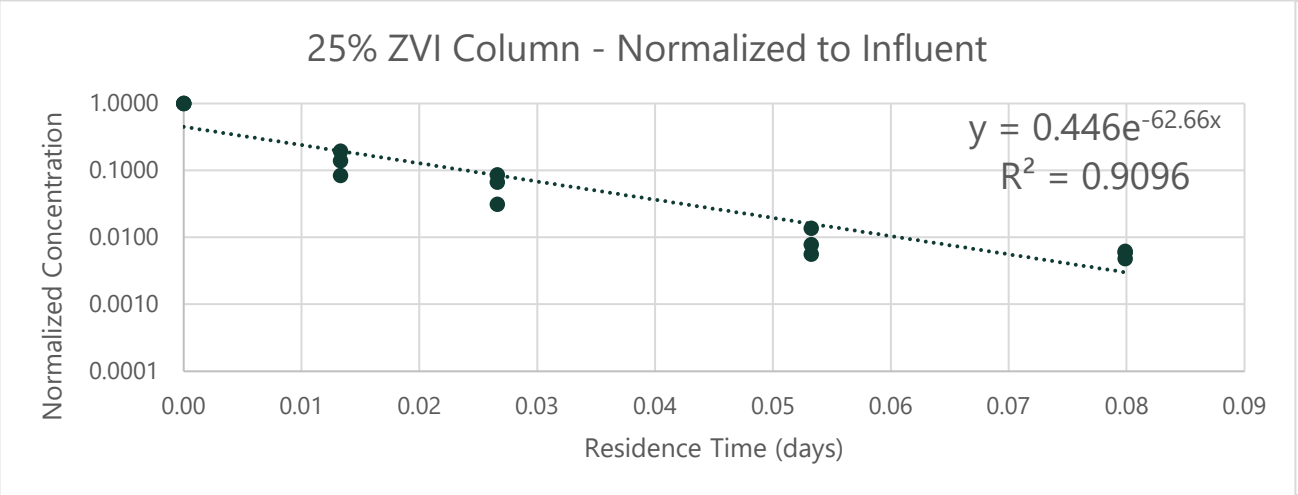


Figure 4 - Arsenic vs. Residence Time Plots





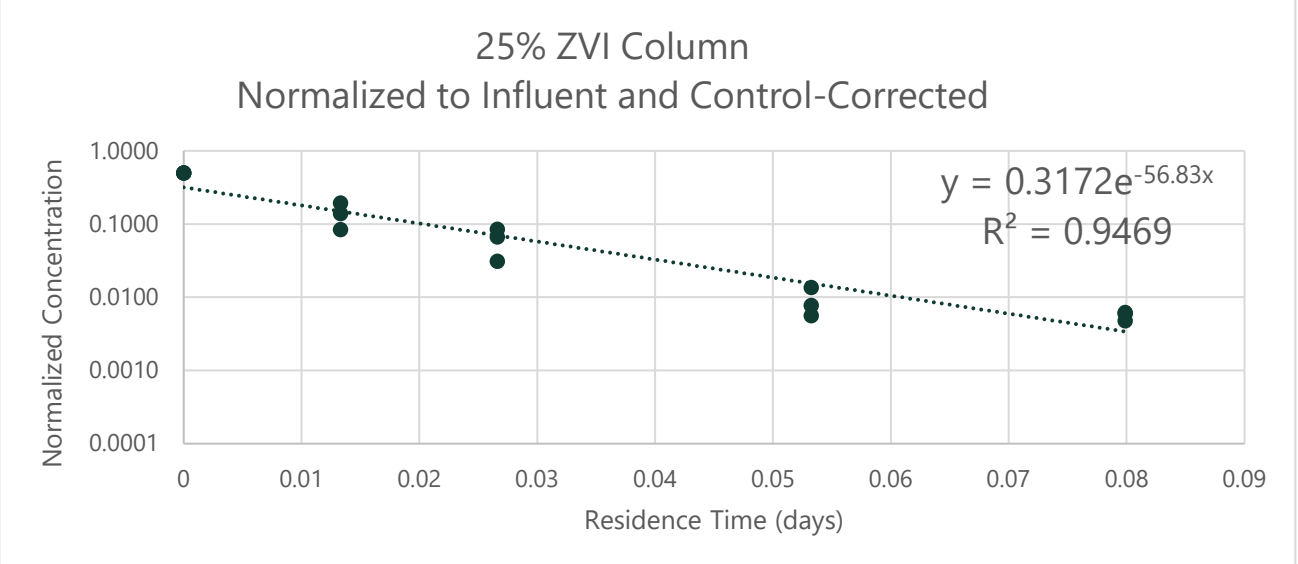
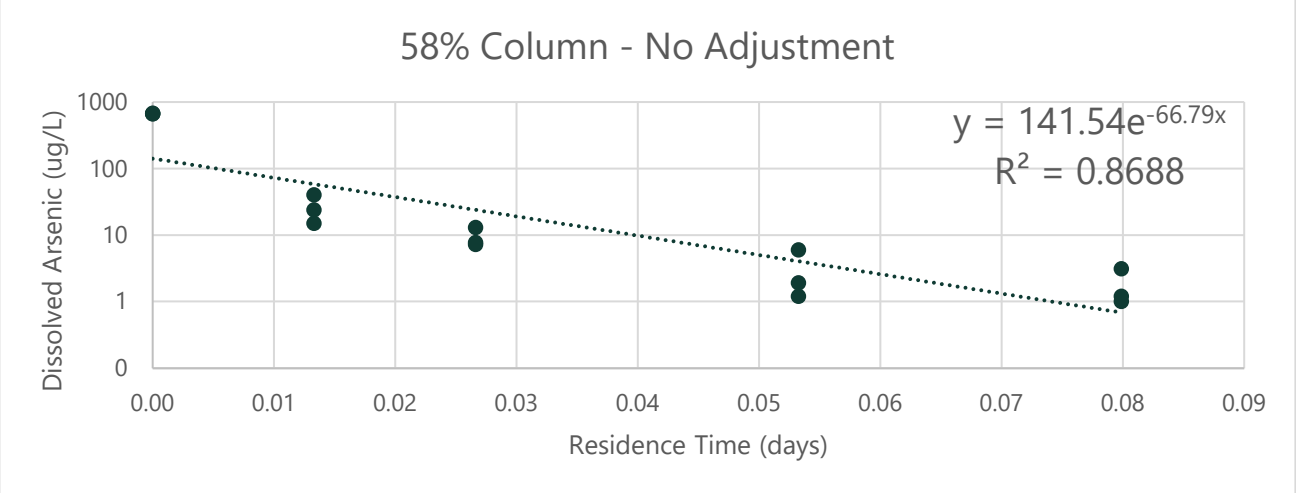
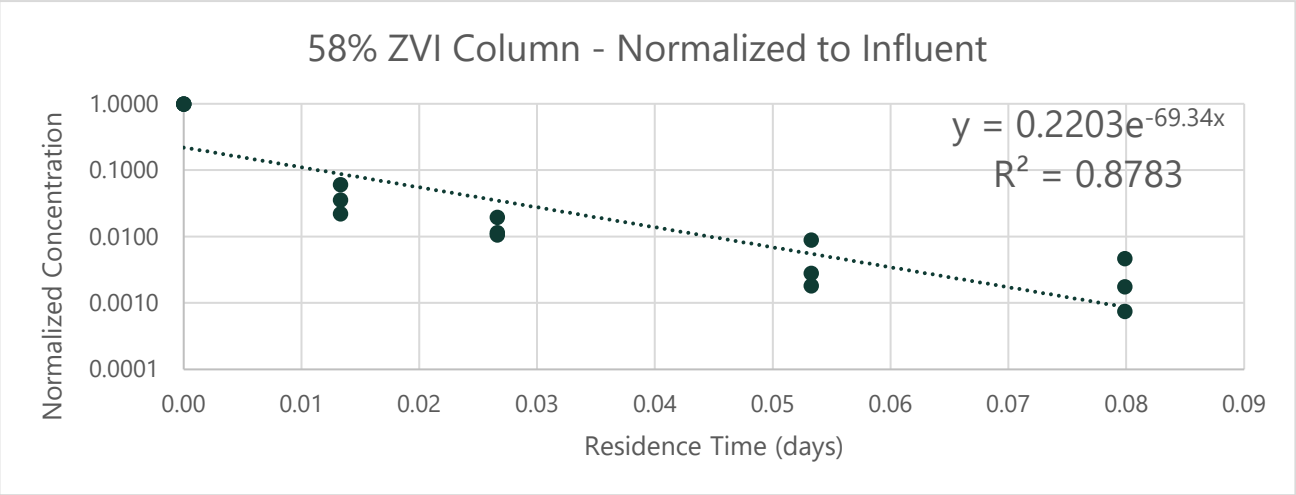


Figure 4 - Arsenic vs. Residence Time Plots





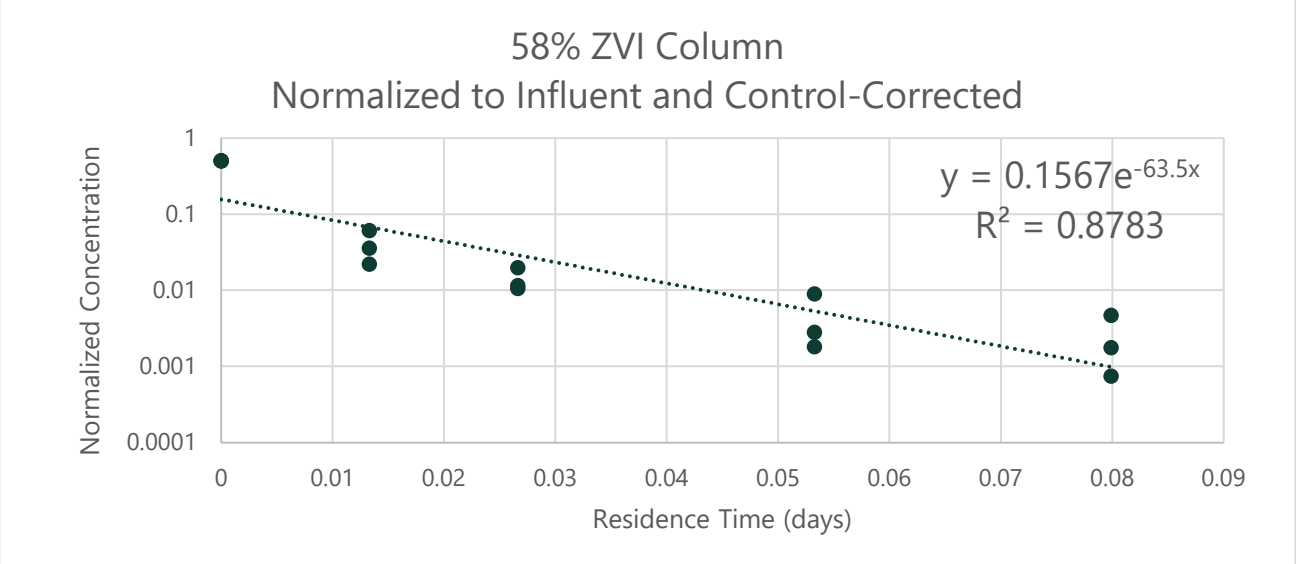
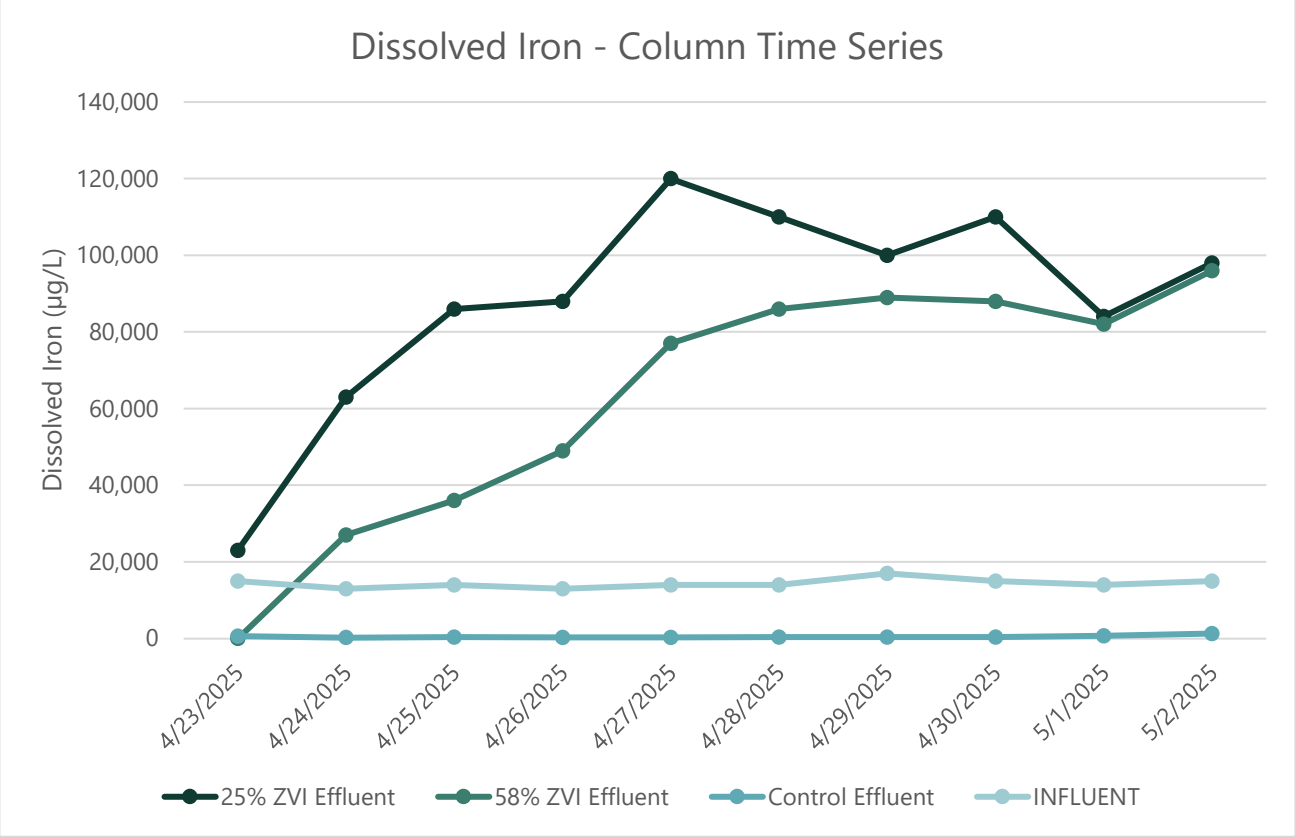
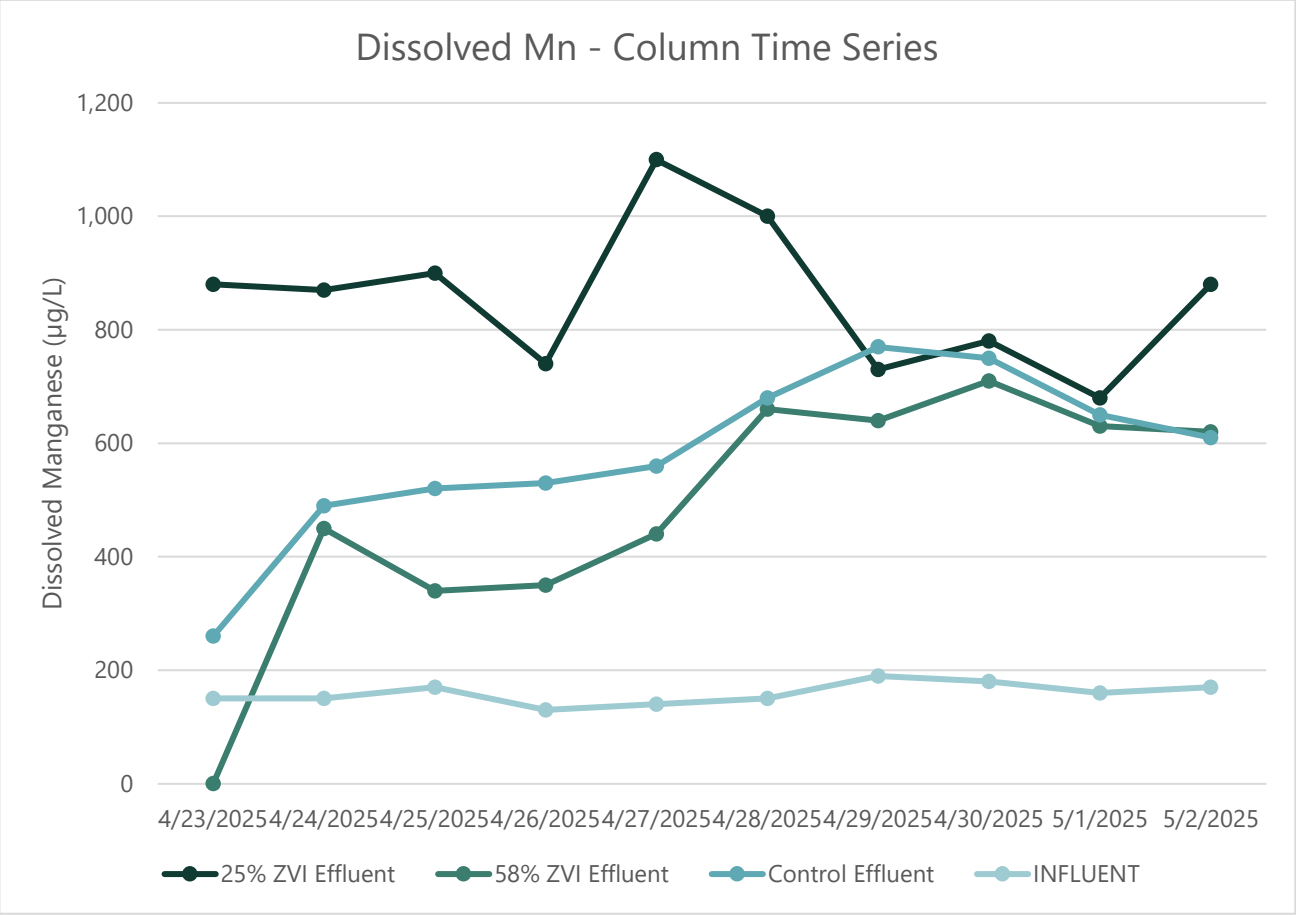


Figure 6 - Dissolved Iron and Manganese vs. Time

Project No. 25006-03
Glacier Northwest Inc. Site





APPENDIX A
COLUMN TESTING FIELD RECORDS

Appendix A - Field Measurements

Project No. 230067, West Marginal Way Cleanup Site, Seattle, WA

	Date	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/23/25	04/24/25	04/24/25
	Sample ID	20ZVI-EFF-042325	20ZVI-INF-042335	20ZVI-Port1-042335	20ZVI-Port2-042335	20ZVI-Port3-042335	50ZVI-INF-042325	Control-EFF-042325	Control-INF-042325	Control-Port1-042325	Control-Port2-042325	Control-Port3-042325	INFLUENT-042325	20ZVI-EFF-042425	20ZVI-INF-042425
Field Parameters															
Dissolved Oxygen	mg/L	1.37	3.55	0.26	1.00	0.80	3.86	5.76	4.18	3.08	2.76	2.77	3.69	3.53	4.47
Oxidation Reduction Potential	mV	-347.0	-82.1	-519.4	-573.5	-495.0	-78.1	203.9	-73.8	16.4	89.9	58.7	-69.0	-257.9	-84.7
pH	pH units	7.61	6.56	7.33	7.56	7.46	6.61	6.40	6.55	6.45	6.45	6.45	6.54	7.13	6.14
Specific Conductivitiy	uS/cm	525	446	654	635	533	430	503	435	420	415	409	456	519	337

Notes:

mg/L = milligrams per liter

mV = milivolts

uS/cm = microseimens per centimeter

Appendix A - Field Measurements

Project No. 230067, West Marginal Way Cleanup Site, Seattle, WA

		Date	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25	04/24/25
		Sample ID	20ZVI-Port1-042425	20ZVI-Port2-042425	20ZVI-Port3-042425	50ZVI-EFF-042425	50ZVI-INF-042425	50ZVI-Port1-042425	50ZVI-Port2-042425	50ZVI-Port3-042425	Control-EFF-042425	Control-INF-042425	Control-Port1-042425	Control-Port2-042425	Control-Port3-042425	INFLUENT-042425
Field Parameters																
Dissolved Oxygen	mg/L		4.86	5.34	6.26	4.09	4.13	0.88	1.44	1.16	5.02	4.18	3.87	3.70	5.46	3.02
Oxidation Reduction Potential	mV		-122.1	-24.1	-157.0	-215.7	-82.2	-213.5	-319.2	-351.1	210.8	-84.1	-31.8	-3.4	123.9	-73.9
pH	pH units		6.90	6.94	6.95	6.98	6.18	7.03	7.25	7.20	6.24	6.13	6.45	6.40	6.43	6.26
Specific Conductivitiy	uS/cm		364	305	382	198	334	455	439	371	428	346	316	321	352	359

Notes:

mg/L = milligrams per liter

mV = milivolts

uS/cm = microseimens per centimeter

Appendix A - Field Measurements

Project No. 230067, West Marginal Way Cleanup Site, Seattle, WA

		Date	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25	04/25/25
		Sample ID	20ZVI-EFF-042525	20ZVI-INF-042525	20ZVI-Port1-042525	20ZVI-Port2-042525	20ZVI-Port3-042525	50ZVI-EFF-042525	50ZVI-INF-042525	50ZVI-Port1-042525	50ZVI-Port2-042525	50ZVI-Port3-042525	Control-EFF-042525	Control-INF-042525	Control-Port1-042525	Control-Port2-042525
Field Parameters																
Dissolved Oxygen	mg/L		4.42	6.73	3.88	4.70	6.16	3.64	6.53	3.45	3.51	7.71	7.57	5.76	7.14	6.73
Oxidation Reduction Potential	mV		-149.1	-89.0	-181.2	-136.5	-109.0	-276.6	-79.7	-142.8	-172.9	-37.2	212.3	-94.2	27.2	45.7
pH	pH units		6.78	6.76	6.86	6.83	6.78	7.18	6.65	6.93	7.02	7.07	6.50	6.61	6.55	6.15
Specific Conductivitiy	uS/cm		462	308	447	394	439	351	312	396	442	448	455	314	302	294

Notes:

mg/L = milligrams per liter

mV = milivolts

uS/cm = microseimens per centimeter

Appendix A - Field Measurements

Project No. 230067, West Marginal Way Cleanup Site, Seattle, WA

		Date	04/25/25	04/25/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25	04/26/25
		Sample ID	Control-Port3-042525	INFLUENT-042525	20ZVI-EFF-042625	20ZVI-Port1-042625	20ZVI-Port2-042625	20ZVI-Port3-042625	50ZVI-EFF-042625	50ZVI-Port1-042625	50ZVI-Port2-042625	50ZVI-Port3-042625	Control-EFF-042625	Control-Port1-042625	Control-Port2-042625	Control-Port3-042625
Field Parameters																
Dissolved Oxygen	mg/L		7.47	5.98	6.25	5.28	7.29	5.45	7.65	4.70	5.90	5.44	6.84	5.57	6.94	5.96
Oxidation Reduction Potential	mV		102.0	-69.3	-93.8	-99.4	-70.2	-124.3	-100.8	-129.6	-127.7	-144.7	208.3	-29.6	-12.2	-75.1
pH	pH units		6.61	6.64	6.83	6.76	6.77	7.01	6.90	6.95	6.87	7.06	6.45	6.51	6.60	6.80
Specific Conductivitiy	uS/cm		305	304	546	447	397	494	369	484	446	476	393	351	344	333

Notes:

mg/L = milligrams per liter

mV = milivolts

uS/cm = microseimens per centimeter

Appendix A - Field Measurements

Project No. 230067, West Marginal Way Cleanup Site, Seattle, WA

	Date	04/26/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25	04/27/25
	Sample ID	INFLUENT-042625	20ZVI-EFF-042725	20ZVI-Port1-042725	20ZVI-Port2-042725	20ZVI-Port3-042725	50ZVI-EFF-042725	50ZVI-Port1-042725	50ZVI-Port2-042725	50ZVI-Port3-042725	Control-EFF-042725	Control-Port1-042725	Control-Port2-042725	Control-Port3-042725	INFLUENT-042725
Field Parameters															
Dissolved Oxygen	mg/L	6.75	6.55	5.85	5.87	6.95	7.61	5.08	5.88	8.61	7.29	6.79	6.67	7.27	3.33
Oxidation Reduction Potential	mV	-73.2	-59.9	-71.5	-102.9	-102.3	-80.7	-118.5	-126.9	-81.2	219.0	9.6	-24.6	5.3	-55.6
pH	pH units	6.75	6.71	6.54	6.75	6.62	6.70	6.78	6.94	6.83	6.45	6.38	6.51	6.63	6.41
Specific Conductivitiy	uS/cm	359	558	412	487	384	492	501	449	369	472	346	325	327	370

Notes:

mg/L = milligrams per liter

mV = milivolts

uS/cm = microseimens per centimeter

Appendix A - Field Measurements

Project No. 230067, West Marginal Way Cleanup Site, Seattle, WA

		Date	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25	04/28/25
		Sample ID	20ZVI-EFF-042825	20ZVI-Port2-042825	20ZVI-Port3-042825	50ZVI-EFF-042825	50ZVI-Port2-042825	50ZVI-Port3-042825	Control-EFF-042825	Control-Port2-042825	Control-Port3-042825
Field Parameters											
Dissolved Oxygen	mg/L		6.68	6.32	5.33	8.23	7.01	5.88	7.58	7.00	6.73
Oxidation Reduction Potential	mV		-43.0	-75.4	-116.5	-79.6	-94.3	-128.4	217.3	-27.2	2.0
pH	pH units		6.68	6.81	6.93	6.80	6.94	7.07	6.53	6.67	6.64
Specific Conductivitiy	uS/cm		552	425	487	408	486	528	445	358	359

Notes:

mg/L = milligrams per liter

mV = milivolts

uS/cm = microseimens per centimeter

APPENDIX B
ZVI MATERIAL SPECIFICATIONS

Screen Specification CC-1004 (-8+50 Mesh)



U.S. Screen Size

Number	Opening	% Passing	Micron Range
4	4.750 mm	100	4750
8	2.360 mm	95 - 100	2360
16	1.180 mm	75 - 90	1180
30	0.600 mm	25 - 45	600
50	0300 mm	0 - 10	300
100	0.150 mm	0 - 5	150

Iron Aggregate Analysis

Iron/Iron Oxide	Balance
Total Carbon	2.48
Manganese	0.93
Sulphur	0.12
Phosphorous	ND
Silicon	0.35
Nickel	>0.01
Chromium	>0.01
Vanadium	ND
Molybdenum	0.33
Copper	0.10
Aluminum	>0.01
Magnesium	0.01
Boron	0.01
Zinc	0.01
Zirconium	0.01

CONNELLY – GPM, INC.

ESTABLISHED 1875

3154 South California Avenue, Chicago, Illinois, 60608-5176

(773) 247-7231 | info@connellygpm.com | www.ConnellyGPM.com

APPENDIX C
LABORATORY ANALYTICAL REPORTS

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

April 25, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the results from the testing of material submitted on April 23, 2025 from the Glacier Northwest AS230067, F&BI 504386 project. There are 31 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkofski, Marc Chalfant
ASP0425R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 23, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504386 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504386 -01	Control-EFF-042325
504386 -02	20ZVI-EFF-042325
504386 -03	Control-Port 3-042325
504386 -04	20ZVI-Port 3-042325
504386 -05	Control- Port 2-042325
504386 -06	20ZVI-Port 2-042325
504386 -07	Control-Port 1-042325
504386 -08	20ZVI-Port 1-042325
504386 -09	Control-INF-042325
504386 -10	20ZVI-INF-042325
504386 -11	50ZVI-INF-042325
504386 -12	INFLUENT-042325

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report will be forwarded upon receipt.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-01 x2
Date Analyzed:	04/24/25	Data File:	504386-01 x2.154
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	200

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-01 x5
Date Analyzed:	04/24/25	Data File:	504386-01 x5.131
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	690
Copper	4.7

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-01 x50
Date Analyzed:	04/24/25	Data File:	504386-01 x50.147
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	240

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-02 x5
Date Analyzed:	04/24/25	Data File:	504386-02 x5.132
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.3
Copper	23

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-02 x200
Date Analyzed:	04/24/25	Data File:	504386-02 x200.149
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	54,000
Manganese	1,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-09 x5
Date Analyzed:	04/24/25	Data File:	504386-09 x5.133
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	860
Copper	4.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-09 x100
Date Analyzed:	04/24/25	Data File:	504386-09 x100.160
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	16,000
Manganese	160

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-10 x5
Date Analyzed:	04/24/25	Data File:	504386-10 x5.134
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	840
Copper	11

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-10 x100
Date Analyzed:	04/24/25	Data File:	504386-10 x100.162
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	20,000
Manganese	180

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-11 x5
Date Analyzed:	04/24/25	Data File:	504386-11 x5.135
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	830
Copper	4.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-11 x100
Date Analyzed:	04/24/25	Data File:	504386-11 x100.163
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	17,000
Manganese	170

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-12 x5
Date Analyzed:	04/24/25	Data File:	504386-12 x5.136
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	840
Copper	4.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-12 x100
Date Analyzed:	04/24/25	Data File:	504386-12 x100.164
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	150

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	I5-346 mb
Date Analyzed:	04/24/25	Data File:	I5-346 mb.116
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-01 x5
Date Analyzed:	04/24/25	Data File:	504386-01 x5.122
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	660
Copper	6.0
Iron	650

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-01 x20
Date Analyzed:	04/24/25	Data File:	504386-01 x20.140
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	260

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-02 x5
Date Analyzed:	04/24/25	Data File:	504386-02 x5.123
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-02 x200
Date Analyzed:	04/24/25	Data File:	504386-02 x200.141
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	23,000
Manganese	880

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-09 x5
Date Analyzed:	04/24/25	Data File:	504386-09 x5.124
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	850
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-09 x100
Date Analyzed:	04/24/25	Data File:	504386-09 x100.142
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	150

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-10 x5
Date Analyzed:	04/24/25	Data File:	504386-10 x5.125
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	910
Copper	8.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-10 x100
Date Analyzed:	04/24/25	Data File:	504386-10 x100.144
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	18,000
Manganese	180

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-11 x5
Date Analyzed:	04/24/25	Data File:	504386-11 x5.126
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	850
Copper	2.8

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-11 x100
Date Analyzed:	04/24/25	Data File:	504386-11 x100.145
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	16,000
Manganese	160

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-12 x5
Date Analyzed:	04/24/25	Data File:	504386-12 x5.127
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	870
Copper	2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	504386-12 x100
Date Analyzed:	04/24/25	Data File:	504386-12 x100.146
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	150

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/24/25	Lab ID:	I5-345 mb
Date Analyzed:	04/24/25	Data File:	I5-345 mb.112
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5
Iron	<50
Manganese	<1

Date of Report: 04/25/25
Date Received: 04/23/25
Project: Glacier Northwest AS230067, F&BI 504386

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	98	97	80-120	1
Copper	ug/L (ppb)	20	99	97	80-120	2
Iron	ug/L (ppb)	100	96	96	80-120	0
Manganese	ug/L (ppb)	20	98	97	80-120	1

Date of Report: 04/25/25
Date Received: 04/23/25
Project: Glacier Northwest AS230067, F&BI 504386

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	99	98	80-120	1
Copper	ug/L (ppb)	20	99	99	80-120	0
Iron	ug/L (ppb)	200	97	97	80-120	0
Manganese	ug/L (ppb)	20	99	98	80-120	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Note: Rush TAT applies to marked samples for Total and Dissolved All metals (6020B)

504386

SAMPLE CHAIN OF CUSTODY

04/23/25 C2/J4

Page # 1 of 2

Report To Delia Massey, Marc Chaltame, Andrew Yonkofski
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-5407 Email Delia.Massey@geosyntec.com

SAMPLERS (signature): Emily Rusen
PROJECT NAME: Glacier Northwest
PO #: AS230067
REMARKS: Field filtered for dissolved metals. Project specific RLs? - Yes / No
INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr TAT
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	Alkalinity (SM2320B)	NWTPH-Gx	Total Organic Carbon (SM5310C)	NWTPH-HCID	Salinity (SM2520B) VOCs EPA 8260	PCP (SW8270E-SIM) PAHs EPA 8270	Total Dissolved Solids (SM2540C) PCBs EPA 8082	Total Metals (As, Cu, Ca, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Cu, Ca, Fe, Mg, Mn, K, Na) (6020B)	Total As + Cu (6020B)	Dissolved As + Cu (6020B)	Br, Cl, F, SO4 EPA 300.0	Notes	NO3 as N, NO2 as N, Orthophosphate as PO4 (EPA 300.0)
Control-EFF-042325	01 A-I	4/23/25	1330	W	9	X		X		X	X	X	X	X			X	RUSH TAT	X
202VI-EFF-042325	02 A-H		1335		8	X		X		X		X	X	X			X	RUSH TAT	X
Control-Port 3-042325	03 A-B		1525		2										X	X			
202VI-Port 3-042325	04		1435		2										X	X			
Control-Port 2-042325	05		1545		2										X	X			
202VI-Port 2-042325	06		1455		2										X	X			
Control-Port 1-042325	07		1555		2										X	X			
202VI-Port 1-042325	08		~~1615~~ 1510 ER		2										X	X			
Control-INF-042325	09 A-I		1615		9	X		X		X	X	X	X	X			X	RUSH TAT	X
202VI-INF-042325	10 A-H	↓	1625	↓	8	X		X		X		X	X	X			X	RUSH TAT	X

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/23/25	18:30
Received by:	JOE MOHAMMED	FBI	04/23/25	18:30
Relinquished by:		Samples received at 3 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504386 Andrew Yonkofski, Marc Chalfant, and

SAMPLE CHAIN OF CUSTODY

04/23/25 C2/J4

Report To Delia Massey,
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-3107 Email Delia.Massey@Geosyntec.com

SAMPLERS (signature) Emily Rusen
PROJECT NAME Glacier Northwest
PO # AS230067
REMARKS Field Filtered for dissolved metals. Project specific RLs? - Yes / No
INVOICE TO Please Invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr TAT
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Alkalinity (SM 2320B)	NWTPH-Dx	Total Organic Carbon (SM 5310B)	Salinity (SM 2520B)	BTEX EPA 8021	PCBs NS2706-SIM NWTPH-HCID	Bz Cl Ester by GC/MS EPA 8260	PAHs EPA 8270	Total Organic Carbon PCBs EPA 8082	Total Dissolved Solids (SM 2540 C)	Total Metals (K, Ca, Cu, Fe, Mg, Mn, Na) (EPA 200.8)	Dissolved metals (Ins, Ca, Cu, Mg, Mn, K, Na, Fe) (EPA 200.8)	NO2as N, NO2as N Orthophosphate as P by EPA 300.0	Notes
SOZVI-INF-042325	11 A-I	4/23/25	1620	W	9	X		X	X	X	X	X		X	X	X	X	X	RUSH TAT
INFLUENT-042325	12 ↓	↓	1610	↓	9	X		X	X	X	X	X		X	X	X	X	X	RUSH TAT

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/23/25	18:30
Received by:	JOE MOHAMMED	FDL	04/23/25	18:30
Relinquished by:		Samples received at 3 oC		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504386 CLIENT ASP INITIALS/ DATE: 04/23/25

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 3 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP
*or other representative documents, letters, and/or shipping memos Date: 4/24/25

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☒ Yes ☐ No	☐ Not on COC/label
Date Sampled	☒ Yes ☐ No	☐ Not on COC/label
Time Sampled	☒ Yes ☐ No	☐ Not on COC/label
# of Containers	☒ Yes ☐ No	
Relinquished	☒ Yes ☐ No	
Requested analysis	☒ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
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office@friedmanandbruya.com
www.friedmanandbruya.com

April 28, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the additional results from the testing of material submitted on April 23, 2025 from the Glacier Northwest AS230067, F&BI 504386 project. There are 21 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkofski, Marc Chalfant
ASP0428R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 23, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504386 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504386 -01	Control-EFF-042325
504386 -02	20ZVI-EFF-042325
504386 -03	Control-Port 3-042325
504386 -04	20ZVI-Port 3-042325
504386 -05	Control- Port 2-042325
504386 -06	20ZVI-Port 2-042325
504386 -07	Control-Port 1-042325
504386 -08	20ZVI-Port 1-042325
504386 -09	Control-INF-042325
504386 -10	20ZVI-INF-042325
504386 -11	50ZVI-INF-042325
504386 -12	INFLUENT-042325

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port 3-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-03 x5
Date Analyzed:	04/25/25	Data File:	504386-03 x5.173
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	650
Copper	9.0

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 3-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-04 x5
Date Analyzed:	04/25/25	Data File:	504386-04 x5.174
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.6

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 3-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-04 x50
Date Analyzed:	04/28/25	Data File:	504386-04 x50.046
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	870

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control- Port 2-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-05 x5
Date Analyzed:	04/25/25	Data File:	504386-05 x5.175
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	660
Copper	5.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 2-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-06 x5
Date Analyzed:	04/25/25	Data File:	504386-06 x5.176
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	7.1

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 2-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-06 x20
Date Analyzed:	04/28/25	Data File:	504386-06 x20.048
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	400

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port 1-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-07 x5
Date Analyzed:	04/25/25	Data File:	504386-07 x5.177
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	720
Copper	4.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 1-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-08 x5
Date Analyzed:	04/25/25	Data File:	504386-08 x5.178
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	47

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 1-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	504386-08 x20
Date Analyzed:	04/28/25	Data File:	504386-08 x20.049
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	250

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/25/25	Lab ID:	I5-346 mb2
Date Analyzed:	04/25/25	Data File:	I5-346 mb2.047
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port 3-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/24/25	Lab ID:	504386-03 x5
Date Analyzed:	04/24/25	Data File:	504386-03 x5.181
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	620
Copper	5.4

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 3-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/24/25	Lab ID:	504386-04 x5
Date Analyzed:	04/24/25	Data File:	504386-04 x5.182
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.1
Copper	12

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control- Port 2-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/24/25	Lab ID:	504386-05 x5
Date Analyzed:	04/24/25	Data File:	504386-05 x5.183
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	650
Copper	2.7

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 2-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/24/25	Lab ID:	504386-06 x5
Date Analyzed:	04/24/25	Data File:	504386-06 x5.184
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.6
Copper	5.0

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port 1-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/24/25	Lab ID:	504386-07 x5
Date Analyzed:	04/24/25	Data File:	504386-07 x5.185
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	770
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 1-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/24/25	Lab ID:	504386-08 x5
Date Analyzed:	04/24/25	Data File:	504386-08 x5.186
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	38
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067, F&BI 504386
Date Extracted:	04/24/25	Lab ID:	I5-345 mb
Date Analyzed:	04/24/25	Data File:	I5-345 mb.112
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<0.5

Date of Report: 04/28/25
Date Received: 04/23/25
Project: Glacier Northwest AS230067, F&BI 504386

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	98	97	80-120	1
Copper	ug/L (ppb)	20	99	97	80-120	2

Date of Report: 04/28/25
Date Received: 04/23/25
Project: Glacier Northwest AS230067, F&BI 504386

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	99	98	80-120	1
Copper	ug/L (ppb)	20	99	99	80-120	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Note: Rush TAT applies to marked samples for Total and Dissolved All metals (6020B)

504386

SAMPLE CHAIN OF CUSTODY

04/23/25 C2/J4

Page # 1 of 2

Report To Delia Massey, Marc Chaltame, Andrew Yonkofski
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-5407 Email Delia.Massey@geosyntec.com

SAMPLERS (signature): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field filtered for dissolved metals.
Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr TAT
Rush charges authorized by: As and Cu rushed 04/28/25 ME/MC

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	Alkalinity (SM2320B) (NWTPH-Dx)	NWTPH-Gx	Total Organic Carbon (SM5310C)	NWTPH-HCID	Salinity (SM2520) VOCs EPA 8260	PCP (SW8270E-SIM) PAHs EPA 8270	Total Dissolved Solids (SM2540C) PCBs EPA 8082	Total Metals (As, Cu, Ca, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Cu, Ca, Fe, Mg, Mn, K, Na) (6020B)	Total As + Cu (6020B)	Dissolved As + Cu (6020B)	Br, Cl, F, SO4 EPA 300.0	Notes	NO_3 as N, NO_2 as N, Ortho-phosphate as PO_4 (EPA 300.0)
Control-EFF-042325	01 A-I	4/23/25	1330	W	9	X		X		X	X	X	X	X			X	RUSH TAT	X
202VI-EFF-042325	02 A-H		1335		8	X		X		X		X	X	X			X	RUSH TAT	X
Control-Port 3-042325	03 A-B		1525		2										X	X			
202VI-Port 3-042325	04		1435		2										X	X			
Control-Port 2-042325	05		1545		2										X	X			
202VI-Port 2-042325	06		1455		2										X	X			
Control-Port 1-042325	07		1555		2										X	X			
202VI-Port 1-042325	08		~~1615~~ 1510 ER		2										X	X			
Control-INF-042325	09 A-I		1615		9	X		X		X	X	X	X	X			X	RUSH TAT	X
202VI-INF-042325	10 A-H	↓	1625	↓	8	X		X		X		X	X	X			X	RUSH TAT	X

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/23/25	18:30
Received by:	JOE MOHAMMED	FBI	04/23/25	18:30
Relinquished by:		Samples received at 3 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504386 Andrew Yonkofski, Marc Chalfant, and

SAMPLE CHAIN OF CUSTODY

04/23/25 C2/J4

Report To Delia Massey,
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-3107 Email Delia.Massey@Geosyntec.com

SAMPLERS (signature) Emily Rusen
PROJECT NAME Glacier Northwest
PO # AS230067
REMARKS Field Filtered for dissolved metals. Project specific RLs? - Yes / No
INVOICE TO Please Invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr TAT
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Alkalinity (SM 2320B)	NWTPH-Dx	Total Organic Carbon (SM 5310B)	Salinity (SM 2520B)	BTEX EPA 8021	PCBs NS2706-SIM NWTPH-HCID	Bz Cl Ester by GC/MS EPA 8260	PAHs EPA 8270	Total Organic Carbon PCBs EPA 8082	Total Dissolved Solids (SM 2540 C)	Total Metals (K, Ca, Cu, Fe, Mg, Mn, Na) (EPA 200.8)	Dissolved metals (Ins, Ca, Cu, Mg, Mn, K, Na, Fe) (EPA 200.8)	NO2as N, NO2as N Orthophosphate as P by EPA 300.0	Notes
SOZVI-INF-042325	11 A-I	4/23/25	1620	W	9	X		X	X	X	X	X		X	X	X	X	X	RUSH TAT
INFLUENT-042325	12 ↓	↓	1610	↓	9	X		X	X	X	X	X		X	X	X	X	X	RUSH TAT

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/23/25	18:30
Received by:	JOE MOHAMMED	FDL	04/23/25	18:30
Relinquished by:		Samples received at 3 oC		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504386 CLIENT ASP INITIALS/ DATE: 04/23/25

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 3 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP
*or other representative documents, letters, and/or shipping memos Date: 4/24/25

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☒ Yes ☐ No	☐ Not on COC/label
Date Sampled	☒ Yes ☐ No	☐ Not on COC/label
Time Sampled	☒ Yes ☐ No	☐ Not on COC/label
# of Containers	☒ Yes ☐ No	
Relinquished	☒ Yes ☐ No	
Requested analysis	☒ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 7, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the additional results from the testing of material submitted on April 23, 2025 from the Glacier Northwest AS230067, F&BI 504386 project. There are 8 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkofski, Marc Chalfant
ASP0507R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 23, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504386 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504386 -01	Control-EFF-042325
504386 -02	20ZVI-EFF-042325
504386 -03	Control-Port 3-042325
504386 -04	20ZVI-Port 3-042325
504386 -05	Control- Port 2-042325
504386 -06	20ZVI-Port 2-042325
504386 -07	Control-Port 1-042325
504386 -08	20ZVI-Port 1-042325
504386 -09	Control-INF-042325
504386 -10	20ZVI-INF-042325
504386 -11	50ZVI-INF-042325
504386 -12	INFLUENT-042325

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) sent to Alliance Technical Group for testing. The report is enclosed.

All quality control requirements were acceptable.

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Control-EFF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504386-01 1/5
Date Analyzed:	04/29/25	Data File:	042910.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	85 d	10	140

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	430

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Control-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504386-09 1/25
Date Analyzed:	04/30/25	Data File:	043004.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	174 d	22	158

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	530

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	50ZVI-INF-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504386-11 1/25
Date Analyzed:	04/30/25	Data File:	043005.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	164 d	22	158

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	500

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	INFLUENT-042325	Client:	Aspect Consulting
Date Received:	04/23/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504386-12 1/25
Date Analyzed:	04/30/25	Data File:	043006.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	180 d	22	158

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	540

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	05-1021 mb 1/0.5
Date Analyzed:	04/28/25	Data File:	042808.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	75	10	140

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	<0.2

Date of Report: 05/07/25
Date Received: 04/23/25
Project: Glacier Northwest AS230067, F&BI 504386

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Pentachlorophenol	ug/L (ppb)	10	86	100	10-144	15

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Note: Rush TAT applies to marked samples for Total and Dissolved All metals (6020B)

504386

SAMPLE CHAIN OF CUSTODY

04/23/25 C2/J4

Page # 1 of 2

Report To Delia Massey, Marc Chaltame, Andrew Yonkofski
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-5407 Email Delia.Massey@geosyntec.com

SAMPLERS (signature): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field filtered for dissolved metals.
Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr TAT
Rush charges authorized by: As and Cu rushed 04/28/25 ME/MC

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	Alkalinity (SM2320B) (NWTPH-Dx)	NWTPH-Gx	Total Organic Carbon (SM5310C)	NWTPH-HCID	Salinity (SM2520) VOCs EPA 8260	PCP (SW8270E-SIM) PAHs EPA 8270	Total Dissolved Solids (SM2540C) PCBs EPA 8082	Total Metals (As, Cu, Ca, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Cu, Ca, Fe, Mg, Mn, K, Na) (6020B)	Total As + Cu (6020B)	Dissolved As + Cu (6020B)	Br, Cl, F, SO4 EPA 300.0	Notes	NO_3 as N, NO_2 as N, Ortho-phosphate as PO_4 (EPA 300.0)
Control-EFF-042325	01 A-I	4/23/25	1330	W	9	X		X		X	X	X	X	X			X	RUSH TAT	X
202VI-EFF-042325	02 A-H		1335		8	X		X		X		X	X	X			X	RUSH TAT	X
Control-Port 3-042325	03 A-B		1525		2										X	X			
202VI-Port 3-042325	04		1435		2										X	X			
Control-Port 2-042325	05		1545		2										X	X			
202VI-Port 2-042325	06		1455		2										X	X			
Control-Port 1-042325	07		1555		2										X	X			
202VI-Port 1-042325	08		~~1615~~ 1510 ER		2										X	X			
Control-INF-042325	09 A-I		1615		9	X		X		X	X	X	X	X			X	RUSH TAT	X
202VI-INF-042325	10 A-H	↓	1625	↓	8	X		X		X		X	X	X			X	RUSH TAT	X

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/23/25	18:30
Received by:	JOE MOHAMMED	FBI	04/23/25	18:30
Relinquished by:		Samples received at 3 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504386 Andrew Yonkofski, Marc Chalfant, and

SAMPLE CHAIN OF CUSTODY

04/23/25 C2/J4

Report To Delia Massey,
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-3107 Email Delia.Massey@Geosyntec.com

SAMPLERS (signature) Emily Rusen
PROJECT NAME Glacier Northwest
PO # AS230067
REMARKS Field Filtered for dissolved metals. Project specific RLs? - Yes / No
INVOICE TO Please Invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr TAT
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Alkalinity (SM 2320B)	NWTPH-Dx	Total Organic Carbon (SM 5310B)	Salinity (SM 2520B)	BTEX EPA 8021	PCBs NS2706-SIM NWTPH-HCID	Bz Cl Ester by GC/MS EPA 8260	PAHs EPA 8270	Total Organic Carbon PCBs EPA 8082	Total Dissolved Solids (SM 2540 C)	Total Metals (K, Ca, Cu, Fe, Mg, Mn, Na) (EPA 200.8)	Dissolved metals (Ins, Ca, Cu, Mg, Mn, K, Na, Fe) (EPA 200.8)	NO2as N, NO2as N Orthophosphate as P by EPA 300.0	Notes
SOZVI-INF-042325	11 A-I	4/23/25	1620	W	9	X		X	X	X	X	X		X	X	X	X	X	RUSH TAT
INFLUENT-042325	12 ↓	↓	1610	↓	9	X		X	X	X	X	X		X	X	X	X	X	RUSH TAT

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/23/25	18:30
Received by:	JOE MOHAMMED	FDL	04/23/25	18:30
Relinquished by:		Samples received at 3 oC		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504386 CLIENT ASP INITIALS/ DATE: 04/23/25

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 3 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP
*or other representative documents, letters, and/or shipping memos Date: 4/24/25

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☒ Yes ☐ No	☐ Not on COC/label
Date Sampled	☒ Yes ☐ No	☐ Not on COC/label
Time Sampled	☒ Yes ☐ No	☐ Not on COC/label
# of Containers	☒ Yes ☐ No	
Relinquished	☒ Yes ☐ No	
Requested analysis	☒ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 504386,
Work Order Number: 2504593

May 02, 2025

Attention Michael Erdahl:

Alliance Technical Group, LLC - Seattle received 6 sample(s) on 4/24/2025 for the analyses presented in the following report.

Dissolved Metals by EPA 6020B
Ion Chromatography by EPA 300.0
Salinity by SM 2520B
Total Alkalinity by EPA 310.2
Total Dissolved Solids by SM 2540C
Total Metals by EPA 6020B
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Alliance Technical Group is committed to accuracy, speed, and customer service. Thank you for choosing Alliance Technical Group's Seattle laboratory team for your analytical needs. We appreciate this opportunity to serve you!

Sincerely,



DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Brianna Barnes
Project Manager

Date: *05/02/2025*

CLIENT: Friedman & Bruya
Project: 504386
Work Order: 2504593

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2504593-001	Control-EFF-042325	04/23/2025 1:30 PM	04/24/2025 10:47 AM
2504593-002	20ZVI-EFF-042325	04/23/2025 1:35 PM	04/24/2025 10:47 AM
2504593-003	Control-INF-042325	04/23/2025 4:15 PM	04/24/2025 10:47 AM
2504593-004	20ZVI-INF-042325	04/23/2025 4:25 PM	04/24/2025 10:47 AM
2504593-005	50ZVI-INF-042325	04/23/2025 4:20 PM	04/24/2025 10:47 AM
2504593-006	Influent-042325	04/23/2025 4:10 PM	04/24/2025 10:47 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2504593**

Date: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2504593**
Date Reported: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-001 **Collection Date:** 4/23/2025 1:30:00 PM
Client Sample ID: **Control-EFF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.797	0.100		mg/L	1	4/24/2025 6:48:00 PM
Chloride	4.70	0.200		mg/L	1	4/24/2025 6:48:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 6:48:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 6:48:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 6:48:00 PM
Ortho-Phosphate (as P)	0.983	0.400	H	mg/L	1	4/26/2025 12:51:00 AM
Sulfate	2.92	1.00		mg/L	1	4/24/2025 6:48:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	76,700	25,000	D	µg/L	100	4/25/2025 1:03:00 PM
Magnesium	14,500	50.0		µg/L	1	4/24/2025 5:47:00 PM
Potassium	3,280	50.0		µg/L	1	4/24/2025 5:47:00 PM
Sodium	16,000	250		µg/L	1	4/24/2025 5:47:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	76,700	25,000	D	µg/L	100	4/25/2025 10:32:00 AM
Magnesium	14,900	50.0		µg/L	1	4/24/2025 7:22:00 PM
Potassium	3,370	50.0		µg/L	1	4/24/2025 7:22:00 PM
Sodium	16,400	250		µg/L	1	4/24/2025 7:22:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.04	0.700		mg/L	1	4/29/2024 7:14:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	258	25.0	D	mg/L	10	5/1/2025 12:41:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	ND	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	210	5.00		mg/L	1	4/29/2025 9:16:11 AM

Analytical Report

Work Order: **2504593**
Date Reported: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-002 **Collection Date:** 4/23/2025 1:35:00 PM
Client Sample ID: **20ZVI-EFF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.145	0.100		mg/L	1	4/24/2025 7:11:00 PM
Chloride	5.00	0.200		mg/L	1	4/24/2025 7:11:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 7:11:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 7:11:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 7:11:00 PM
Ortho-Phosphate (as P)	ND	0.400	H	mg/L	1	4/26/2025 1:15:00 AM
Sulfate	2.78	1.00		mg/L	1	4/24/2025 7:11:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	83,300	25,000	D	µg/L	100	4/25/2025 1:06:00 PM
Magnesium	9,520	50.0		µg/L	1	4/24/2025 6:00:00 PM
Potassium	3,830	50.0		µg/L	1	4/24/2025 6:00:00 PM
Sodium	15,700	250		µg/L	1	4/24/2025 6:00:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	81,200	1,200	D	µg/L	10	4/25/2025 10:35:00 AM
Magnesium	9,730	100		µg/L	1	4/24/2025 7:51:00 PM
Potassium	3,920	100		µg/L	1	4/24/2025 7:51:00 PM
Sodium	16,300	2,000	D	µg/L	10	4/25/2025 10:35:00 AM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	0.861	0.700		mg/L	1	4/29/2024 7:35:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	135	25.0	D	mg/L	10	5/1/2025 12:43:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	ND	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	250	5.00		mg/L	1	4/29/2025 9:16:11 AM

Analytical Report

Work Order: **2504593**
Date Reported: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-003 **Collection Date:** 4/23/2025 4:15:00 PM
Client Sample ID: **Control-INF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.181	0.100		mg/L	1	4/24/2025 7:34:00 PM
Chloride	4.60	0.200		mg/L	1	4/24/2025 7:34:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 7:34:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 7:34:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 7:34:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 7:34:00 PM
Sulfate	3.76	1.00		mg/L	1	4/24/2025 7:34:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	91,100	25,000	D	µg/L	100	4/25/2025 1:09:00 PM
Magnesium	4,670	50.0		µg/L	1	4/24/2025 6:03:00 PM
Potassium	4,090	50.0		µg/L	1	4/24/2025 6:03:00 PM
Sodium	15,600	250		µg/L	1	4/24/2025 6:03:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	89,000	25,000	D	µg/L	100	4/25/2025 10:44:00 AM
Magnesium	4,720	50.0		µg/L	1	4/24/2025 7:54:00 PM
Potassium	4,190	50.0		µg/L	1	4/24/2025 7:54:00 PM
Sodium	15,800	250		µg/L	1	4/24/2025 7:54:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.74	0.700		mg/L	1	4/29/2024 7:56:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	167	25.0	D	mg/L	10	5/1/2025 12:49:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	310	5.00		mg/L	1	4/29/2025 9:16:11 AM

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-004 **Collection Date:** 4/23/2025 4:25:00 PM
Client Sample ID: **20ZVI-INF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.179	0.100		mg/L	1	4/24/2025 7:57:00 PM
Chloride	4.85	0.200		mg/L	1	4/24/2025 7:57:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 7:57:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 7:57:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 7:57:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 7:57:00 PM
Sulfate	2.09	1.00		mg/L	1	4/24/2025 7:57:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	89,600	25,000	D	µg/L	100	4/25/2025 1:12:00 PM
Magnesium	4,490	50.0		µg/L	1	4/24/2025 6:06:00 PM
Potassium	3,990	50.0		µg/L	1	4/24/2025 6:06:00 PM
Sodium	15,500	250		µg/L	1	4/24/2025 6:06:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	96,100	25,000	D	µg/L	100	4/25/2025 10:50:00 AM
Magnesium	4,440	50.0		µg/L	1	4/24/2025 7:57:00 PM
Potassium	3,920	50.0		µg/L	1	4/24/2025 7:57:00 PM
Sodium	15,100	250		µg/L	1	4/24/2025 7:57:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.88	0.700		mg/L	1	4/29/2024 8:18:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	233	25.0	D	mg/L	10	5/1/2025 12:50:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	210	5.00		mg/L	1	4/29/2025 9:16:11 AM

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-005 **Collection Date:** 4/23/2025 4:20:00 PM
Client Sample ID: **50ZVI-INF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.171	0.100		mg/L	1	4/24/2025 8:20:00 PM
Chloride	4.69	0.200		mg/L	1	4/24/2025 8:20:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 8:20:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 8:20:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 8:20:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 8:20:00 PM
Sulfate	1.95	1.00		mg/L	1	4/24/2025 8:20:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	90,800	25,000	D	µg/L	100	4/25/2025 1:15:00 PM
Magnesium	4,390	50.0		µg/L	1	4/24/2025 6:16:00 PM
Potassium	3,890	50.0		µg/L	1	4/24/2025 6:16:00 PM
Sodium	15,500	250		µg/L	1	4/24/2025 6:16:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	95,300	25,000	D	µg/L	100	4/25/2025 11:03:00 AM
Magnesium	4,500	50.0		µg/L	1	4/24/2025 8:00:00 PM
Potassium	3,960	50.0		µg/L	1	4/24/2025 8:00:00 PM
Sodium	15,900	250		µg/L	1	4/24/2025 8:00:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.84	0.700		mg/L	1	4/29/2024 8:39:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	192	25.0	D	mg/L	10	5/1/2025 12:52:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	230	5.00		mg/L	1	4/29/2025 9:16:11 AM

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-006 **Collection Date:** 4/23/2025 4:10:00 PM
Client Sample ID: **Influent-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.168	0.100		mg/L	1	4/24/2025 8:43:00 PM
Chloride	4.10	0.200		mg/L	1	4/24/2025 8:43:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 8:43:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 8:43:00 PM
Nitrate (as N)	0.791	0.200		mg/L	1	4/24/2025 8:43:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 8:43:00 PM
Sulfate	3.00	1.00		mg/L	1	4/24/2025 8:43:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	97,000	25,000	D	µg/L	100	4/25/2025 1:18:00 PM
Magnesium	4,280	50.0		µg/L	1	4/24/2025 6:19:00 PM
Potassium	3,580	50.0		µg/L	1	4/24/2025 6:19:00 PM
Sodium	14,000	250		µg/L	1	4/24/2025 6:19:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	102,000	25,000	D	µg/L	100	4/25/2025 11:09:00 AM
Magnesium	4,440	50.0		µg/L	1	4/24/2025 8:04:00 PM
Potassium	3,700	50.0		µg/L	1	4/24/2025 8:04:00 PM
Sodium	14,400	250		µg/L	1	4/24/2025 8:04:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	5.05	0.700		mg/L	1	4/29/2024 9:00:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	236	25.0	D	mg/L	10	5/1/2025 12:54:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	140	5.00		mg/L	1	4/29/2025 9:16:11 AM

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **MB-99418**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **MBLKW**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070709**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-99418**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **LCSW**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070710**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	30.3	2.50	25.00	0	121	79.4	136				

Sample ID: **2504661-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **BATCH**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070909**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	244	25.0						250.1	2.59	20	D

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-47493** SampType: **MBLK** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **MBLKW** Batch ID: **47493** Analysis Date: **4/24/2025** SeqNo: **2067476**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	ND	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	ND	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	ND	1.00									

Sample ID: **LCS-47493** SampType: **LCS** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **LCSW** Batch ID: **47493** Analysis Date: **4/24/2025** SeqNo: **2067477**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.515	0.100	0.5000	0	103	90	110				
Chloride	0.742	0.200	0.7500	0	98.9	90	110				
Nitrite (as N)	0.718	0.200	0.7500	0	95.7	90	110				
Bromide	2.47	0.600	2.500	0	98.8	90	110				
Nitrate (as N)	0.750	0.200	0.7500	0	100	90	110				
Ortho-Phosphate (as P)	1.30	0.400	1.250	0	104	90	110				
Sulfate	3.68	1.00	3.750	0	98.3	90	110				

Sample ID: **2504577-016BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067490**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	18.9	0.200									E
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	0.347	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	2.63	1.00									

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504577-016BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067490**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2504577-016BMS** SampType: **MS** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067491**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.559	0.100	0.5000	0	112	80	120				
Chloride	19.3	0.200	0.7500	0	2,570	80	120				ES
Nitrite (as N)	0.728	0.200	0.7500	0	97.1	80	120				
Bromide	2.51	0.600	2.500	0	100	80	120				
Nitrate (as N)	1.13	0.200	0.7500	0	150	80	120				S
Ortho-Phosphate (as P)	1.05	0.400	1.250	0	83.8	80	120				
Sulfate	6.63	1.00	3.750	0	177	80	120				S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2504577-016BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067510**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.574	0.100	0.5000	0	115	80	120	0.5590	2.65	20	
Chloride	19.3	0.200	0.7500	0	2,570	80	120	19.31	0.119	20	ES
Nitrite (as N)	0.754	0.200	0.7500	0	101	80	120	0.7280	3.51	20	
Bromide	2.59	0.600	2.500	0	104	80	120	2.509	3.10	20	
Nitrate (as N)	1.15	0.200	0.7500	0	153	80	120	1.128	2.02	20	S
Ortho-Phosphate (as P)	1.05	0.400	1.250	0	83.8	80	120	1.048	0	20	
Sulfate	6.72	1.00	3.750	0	179	80	120	6.630	1.27	20	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504577-017BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067511**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	4.31	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	0.526	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	3.62	1.00									

Sample ID: **2504577-017BMS** SampType: **MS** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067512**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.519	0.100	0.5000	0	104	80	120				
Chloride	5.06	0.200	0.7500	0	675	80	120				S
Nitrite (as N)	0.737	0.200	0.7500	0	98.3	80	120				
Bromide	2.51	0.600	2.500	0	101	80	120				
Nitrate (as N)	1.34	0.200	0.7500	0	178	80	120				S
Ortho-Phosphate (as P)	1.10	0.400	1.250	0	88.2	80	120				
Sulfate	7.69	1.00	3.750	0	205	80	120				S

NOTES:
S - Spike recovery indicates a possible matrix effect.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Salinity by SM 2520B

Sample ID: **MB-R99311**	SampType: **MBLK**	Units: **%**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **MBLKW**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068530**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100									

Sample ID: **LCS-R99311**	SampType: **LCS**	Units: **µS/cm**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **LCSW**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068531**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	992	0.000100	1,000	0	99.2	79.1	119.1				

Sample ID: **2504593-001CDUP**	SampType: **DUP**	Units: **%**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **Control-EFF-042325**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068533**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100						0		30	

Sample ID: **2504593-006CDUP**	SampType: **DUP**	Units: **%**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **Influent-042325**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068539**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99309**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **MBLKW**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068483**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99309**	SampType: **LCS**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **LCSW**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068484**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	296	5.00	300.0	0	98.7	65	135				

Sample ID: **2504593-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **Control-EFF-042325**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068486**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	240	5.00						210.0	13.3	30	

Sample ID: **2504605-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **BATCH**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068493**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	8,850	5.00						8,320	6.17	30	

Sample ID: **2504618-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99309**
Client ID: **BATCH**	Batch ID: **R99309**		Analysis Date: **5/1/2025**	SeqNo: **2071394**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	80.0	5.00						330.0	122	30	R

NOTES:
R - High RPD observed.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB** SampType: **MBLK** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **MBLKW** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069423**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS** SampType: **LCS** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **LCSW** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069424**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	21.5	0.700	25.00	0	85.9	79.6	120				

Sample ID: **2504605-001DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069434**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	60.8	0.700						60.00	1.27	15	

Sample ID: **2504605-001DMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069435**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	81.2	0.700	25.00	60.00	85.0	85	115				S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2504605-001DMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069436**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	79.9	0.700	25.00	60.00	79.6	85	115	81.24	1.66	15	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2504620-001DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/30/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/30/2024** SeqNo: **2069447**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	9.25	0.700						9.301	0.604	15	

Sample ID: **2504620-001DMS** SampType: **MS** Units: **mg/L** Prep Date: **4/30/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/30/2024** SeqNo: **2069448**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	28.9	0.700	25.00	9.301	78.6	85	115				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **MB-47485** SampType: **MBLK** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **MBLKW** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066859**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	250									

Sample ID: **LCS-47485** SampType: **LCS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **LCSW** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066860**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	999	250	1,000	0	99.9	80	120				
Magnesium	999	50.0	1,000	0	99.9	80	120				
Potassium	1,030	50.0	1,000	0	103	80	120				
Sodium	1,050	250	1,000	0	105	80	120				

Sample ID: **2504593-001BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066862**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	62,800	250						62,870	0.0524	20	E
Magnesium	14,500	50.0						14,530	0.0584	20	
Potassium	3,280	50.0						3,284	0.103	20	
Sodium	15,900	250						16,040	0.573	20	

Sample ID: **2504593-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066863**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	61,900	250	1,000	62,870	-99.4	75	125				ES
Magnesium	15,000	50.0	1,000	14,530	49.0	75	125				S
Potassium	4,180	50.0	1,000	3,284	89.3	75	125				

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **2504593-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066863**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	16,500	250	1,000	16,040	44.8	75	125				S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504593-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066864**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	61,900	250	1,000	62,870	-101	75	125	61,880	0.0220	20	ES
Magnesium	15,100	50.0	1,000	14,530	53.0	75	125	15,020	0.265	20	S
Potassium	4,170	50.0	1,000	3,284	88.8	75	125	4,177	0.116	20	
Sodium	16,500	250	1,000	16,040	42.2	75	125	16,490	0.157	20	S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **MB-47489** SampType: **MBLK** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **MBLKW** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067004**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	250									

Sample ID: **LCS-47489** SampType: **LCS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **LCSW** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067005**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,010	250	1,000	0	101	80	120				
Magnesium	998	50.0	1,000	0	99.8	80	120				
Potassium	1,040	50.0	1,000	0	104	80	120				
Sodium	1,020	250	1,000	0	102	80	120				

Sample ID: **2504593-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **Control-EFF-042325** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067007**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	65,100	250	1,000	64,400	72.7	75	125				ES
Magnesium	15,900	50.0	1,000	14,940	92.3	75	125				
Potassium	4,350	50.0	1,000	3,371	98.3	75	125				
Sodium	17,400	250	1,000	16,420	99.6	75	125				

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504593-001AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **Control-EFF-042325** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067009**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	65,400	250	1,000	64,400	100	75	125	65,130	0.422	20	E
Magnesium	15,900	50.0	1,000	14,940	91.5	75	125	15,870	0.0528	20	

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **2504593-001AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **Control-EFF-042325** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067009**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	4,330	50.0	1,000	3,371	95.7	75	125	4,354	0.597	20	
Sodium	17,500	250	1,000	16,420	112	75	125	17,420	0.691	20	

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2504593
Logged by:	Morgan Wilson	Date Received:	4/24/2025 10:47:00 AM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp ºC
Sample	6.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2504593

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 5500 4th Ave S
City, State, ZIP Seattle, WA 98108
Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
ATG

PROJECT NAME/NO.	PO #
504386	F-196

REMARKS
Aspect EDD See RL table.

TURNAROUND TIME
☒ Standard TAT
☒ RUSH Total Mass Metals -24h mc
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: anions	TDS	TOC	Alkalinity	Salinity	Total Ca, Mg, K, Na + Dissolved Ca + Mg, K, Na					Notes
Control-EFF-042325		4/23/2025	1330	water	8	x	x	x	x	x	x	x				anions= Br, Cl, F,
202V1-EFF-042325		4/23/2025	1335	water	8	x	x	x	x	x	x	x				SO4, NO2, NO3,
Control-INF-042325		4/23/2025	1615	water	8	x	x	x	x	x	x	x				o-phosphate
202V1-INF-042325		4/23/2025	1625	water	8	x	x	x	x	x	x	x				
502V1-INF-042325		4/23/2025	1620	water	8	x	x	x	x	x	x	x				
Influent-042325		4/23/2025	1610	water	8	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	4/24/25	0746.
Received by:		Briana Ballard	ATG	4/24	10:47AM
Relinquished by:					
Received by:					

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2504593

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 5500 4th Ave S
City, State, ZIP Seattle, WA 98108
Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
ATG

PROJECT NAME/NO.: 504386
PO #: F-196

REMARKS: Update per ME -mw 4/25/25
Aspect EDD SeeRL table.

TURNAROUND TIME
☒ Standard TAT
☒ RUSH Total Mass Metals -24h mc
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID "2V1=ZVI" ID Update	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: anions	TDS	TOC	Alkalinity	Salinity	Total Ca, Mg, K, Na (+ dup)	Dissolved Ca, Mg, K, Na (+ dup)				Notes
Control-EFF-042325		4/23/2025	1330	water	8	x	x	x	x	x	x	x				anions= Br, Cl, F,
202V1-EFF-042325		4/23/2025	1335	water	8	x	x	x	x	x	x	x				SO4, NO2, NO3,
Control-INF-042325		4/23/2025	1615	water	8	x	x	x	x	x	x	x				o-phosphate
202V1-INF-042325		4/23/2025	1625	water	8	x	x	x	x	x	x	x				
502V1-INF-042325		4/23/2025	1620	water	8	x	x	x	x	x	x	x				
Influent-042325		4/23/2025	1610	water	8	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	4/24/25	0746.
Received by:		Briana Ballard	ATG	4/24	10:47AM
Relinquished by:					
Received by:					

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 504386,
Work Order Number: 2504593

May 02, 2025

Attention Michael Erdahl:

Alliance Technical Group, LLC - Seattle received 6 sample(s) on 4/24/2025 for the analyses presented in the following report.

Dissolved Metals by EPA 6020B
Ion Chromatography by EPA 300.0
Salinity by SM 2520B
Total Alkalinity by EPA 310.2
Total Dissolved Solids by SM 2540C
Total Metals by EPA 6020B
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Alliance Technical Group is committed to accuracy, speed, and customer service. Thank you for choosing Alliance Technical Group's Seattle laboratory team for your analytical needs. We appreciate this opportunity to serve you!

Sincerely,



DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Brianna Barnes
Project Manager

Date: *05/02/2025*

CLIENT: Friedman & Bruya
Project: 504386
Work Order: 2504593

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2504593-001	Control-EFF-042325	04/23/2025 1:30 PM	04/24/2025 10:47 AM
2504593-002	20ZVI-EFF-042325	04/23/2025 1:35 PM	04/24/2025 10:47 AM
2504593-003	Control-INF-042325	04/23/2025 4:15 PM	04/24/2025 10:47 AM
2504593-004	20ZVI-INF-042325	04/23/2025 4:25 PM	04/24/2025 10:47 AM
2504593-005	50ZVI-INF-042325	04/23/2025 4:20 PM	04/24/2025 10:47 AM
2504593-006	Influent-042325	04/23/2025 4:10 PM	04/24/2025 10:47 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2504593**

Date: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2504593**
Date Reported: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-001 **Collection Date:** 4/23/2025 1:30:00 PM
Client Sample ID: **Control-EFF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.797	0.100		mg/L	1	4/24/2025 6:48:00 PM
Chloride	4.70	0.200		mg/L	1	4/24/2025 6:48:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 6:48:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 6:48:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 6:48:00 PM
Ortho-Phosphate (as P)	0.983	0.400	H	mg/L	1	4/26/2025 12:51:00 AM
Sulfate	2.92	1.00		mg/L	1	4/24/2025 6:48:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	76,700	25,000	D	µg/L	100	4/25/2025 1:03:00 PM
Magnesium	14,500	50.0		µg/L	1	4/24/2025 5:47:00 PM
Potassium	3,280	50.0		µg/L	1	4/24/2025 5:47:00 PM
Sodium	16,000	250		µg/L	1	4/24/2025 5:47:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	76,700	25,000	D	µg/L	100	4/25/2025 10:32:00 AM
Magnesium	14,900	50.0		µg/L	1	4/24/2025 7:22:00 PM
Potassium	3,370	50.0		µg/L	1	4/24/2025 7:22:00 PM
Sodium	16,400	250		µg/L	1	4/24/2025 7:22:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.04	0.700		mg/L	1	4/29/2024 7:14:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	258	25.0	D	mg/L	10	5/1/2025 12:41:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	ND	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	210	5.00		mg/L	1	4/29/2025 9:16:11 AM

Analytical Report

Work Order: **2504593**
Date Reported: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-002 **Collection Date:** 4/23/2025 1:35:00 PM
Client Sample ID: **20ZVI-EFF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.145	0.100		mg/L	1	4/24/2025 7:11:00 PM
Chloride	5.00	0.200		mg/L	1	4/24/2025 7:11:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 7:11:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 7:11:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 7:11:00 PM
Ortho-Phosphate (as P)	ND	0.400	H	mg/L	1	4/26/2025 1:15:00 AM
Sulfate	2.78	1.00		mg/L	1	4/24/2025 7:11:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	83,300	25,000	D	µg/L	100	4/25/2025 1:06:00 PM
Magnesium	9,520	50.0		µg/L	1	4/24/2025 6:00:00 PM
Potassium	3,830	50.0		µg/L	1	4/24/2025 6:00:00 PM
Sodium	15,700	250		µg/L	1	4/24/2025 6:00:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	81,200	1,200	D	µg/L	10	4/25/2025 10:35:00 AM
Magnesium	9,730	100		µg/L	1	4/24/2025 7:51:00 PM
Potassium	3,920	100		µg/L	1	4/24/2025 7:51:00 PM
Sodium	16,300	2,000	D	µg/L	10	4/25/2025 10:35:00 AM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	0.861	0.700		mg/L	1	4/29/2024 7:35:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	135	25.0	D	mg/L	10	5/1/2025 12:43:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	ND	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	250	5.00		mg/L	1	4/29/2025 9:16:11 AM

Analytical Report

Work Order: **2504593**
Date Reported: **5/2/2025**

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-003 **Collection Date:** 4/23/2025 4:15:00 PM
Client Sample ID: **Control-INF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.181	0.100		mg/L	1	4/24/2025 7:34:00 PM
Chloride	4.60	0.200		mg/L	1	4/24/2025 7:34:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 7:34:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 7:34:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 7:34:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 7:34:00 PM
Sulfate	3.76	1.00		mg/L	1	4/24/2025 7:34:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	91,100	25,000	D	µg/L	100	4/25/2025 1:09:00 PM
Magnesium	4,670	50.0		µg/L	1	4/24/2025 6:03:00 PM
Potassium	4,090	50.0		µg/L	1	4/24/2025 6:03:00 PM
Sodium	15,600	250		µg/L	1	4/24/2025 6:03:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	89,000	25,000	D	µg/L	100	4/25/2025 10:44:00 AM
Magnesium	4,720	50.0		µg/L	1	4/24/2025 7:54:00 PM
Potassium	4,190	50.0		µg/L	1	4/24/2025 7:54:00 PM
Sodium	15,800	250		µg/L	1	4/24/2025 7:54:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.74	0.700		mg/L	1	4/29/2024 7:56:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	167	25.0	D	mg/L	10	5/1/2025 12:49:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	310	5.00		mg/L	1	4/29/2025 9:16:11 AM

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-004 **Collection Date:** 4/23/2025 4:25:00 PM
Client Sample ID: **20ZVI-INF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.179	0.100		mg/L	1	4/24/2025 7:57:00 PM
Chloride	4.85	0.200		mg/L	1	4/24/2025 7:57:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 7:57:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 7:57:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 7:57:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 7:57:00 PM
Sulfate	2.09	1.00		mg/L	1	4/24/2025 7:57:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	89,600	25,000	D	µg/L	100	4/25/2025 1:12:00 PM
Magnesium	4,490	50.0		µg/L	1	4/24/2025 6:06:00 PM
Potassium	3,990	50.0		µg/L	1	4/24/2025 6:06:00 PM
Sodium	15,500	250		µg/L	1	4/24/2025 6:06:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	96,100	25,000	D	µg/L	100	4/25/2025 10:50:00 AM
Magnesium	4,440	50.0		µg/L	1	4/24/2025 7:57:00 PM
Potassium	3,920	50.0		µg/L	1	4/24/2025 7:57:00 PM
Sodium	15,100	250		µg/L	1	4/24/2025 7:57:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.88	0.700		mg/L	1	4/29/2024 8:18:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	233	25.0	D	mg/L	10	5/1/2025 12:50:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	210	5.00		mg/L	1	4/29/2025 9:16:11 AM

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-005 **Collection Date:** 4/23/2025 4:20:00 PM
Client Sample ID: **50ZVI-INF-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.171	0.100		mg/L	1	4/24/2025 8:20:00 PM
Chloride	4.69	0.200		mg/L	1	4/24/2025 8:20:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 8:20:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 8:20:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/24/2025 8:20:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 8:20:00 PM
Sulfate	1.95	1.00		mg/L	1	4/24/2025 8:20:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	90,800	25,000	D	µg/L	100	4/25/2025 1:15:00 PM
Magnesium	4,390	50.0		µg/L	1	4/24/2025 6:16:00 PM
Potassium	3,890	50.0		µg/L	1	4/24/2025 6:16:00 PM
Sodium	15,500	250		µg/L	1	4/24/2025 6:16:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	95,300	25,000	D	µg/L	100	4/25/2025 11:03:00 AM
Magnesium	4,500	50.0		µg/L	1	4/24/2025 8:00:00 PM
Potassium	3,960	50.0		µg/L	1	4/24/2025 8:00:00 PM
Sodium	15,900	250		µg/L	1	4/24/2025 8:00:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	4.84	0.700		mg/L	1	4/29/2024 8:39:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	192	25.0	D	mg/L	10	5/1/2025 12:52:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	230	5.00		mg/L	1	4/29/2025 9:16:11 AM

CLIENT: Friedman & Bruya
Project: 504386

Lab ID: 2504593-006 **Collection Date:** 4/23/2025 4:10:00 PM
Client Sample ID: **Influent-042325** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47493		Analyst: OP
Fluoride	0.168	0.100		mg/L	1	4/24/2025 8:43:00 PM
Chloride	4.10	0.200		mg/L	1	4/24/2025 8:43:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/24/2025 8:43:00 PM
Bromide	ND	0.600		mg/L	1	4/24/2025 8:43:00 PM
Nitrate (as N)	0.791	0.200		mg/L	1	4/24/2025 8:43:00 PM
Ortho-Phosphate (as P)	ND	0.400		mg/L	1	4/24/2025 8:43:00 PM
Sulfate	3.00	1.00		mg/L	1	4/24/2025 8:43:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47485		Analyst: SS
Calcium	97,000	25,000	D	µg/L	100	4/25/2025 1:18:00 PM
Magnesium	4,280	50.0		µg/L	1	4/24/2025 6:19:00 PM
Potassium	3,580	50.0		µg/L	1	4/24/2025 6:19:00 PM
Sodium	14,000	250		µg/L	1	4/24/2025 6:19:00 PM
Total Metals by EPA 6020B				Batch ID: 47489		Analyst: SS
Calcium	102,000	25,000	D	µg/L	100	4/25/2025 11:09:00 AM
Magnesium	4,440	50.0		µg/L	1	4/24/2025 8:04:00 PM
Potassium	3,700	50.0		µg/L	1	4/24/2025 8:04:00 PM
Sodium	14,400	250		µg/L	1	4/24/2025 8:04:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99356		Analyst: SS
Total Organic Carbon	5.05	0.700		mg/L	1	4/29/2024 9:00:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	236	25.0	D	mg/L	10	5/1/2025 12:54:00 PM
Salinity by SM 2520B				Batch ID: R99311		Analyst: BB
Salinity	0.0100	0.000100		%	1	4/29/2025 9:19:42 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	140	5.00		mg/L	1	4/29/2025 9:16:11 AM

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **MB-99418**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **MBLKW**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070709**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-99418**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **LCSW**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070710**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	30.3	2.50	25.00	0	121	79.4	136				

Sample ID: **2504661-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **BATCH**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070909**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	244	25.0						250.1	2.59	20	D

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-47493** SampType: **MBLK** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **MBLKW** Batch ID: **47493** Analysis Date: **4/24/2025** SeqNo: **2067476**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	ND	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	ND	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	ND	1.00									

Sample ID: **LCS-47493** SampType: **LCS** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **LCSW** Batch ID: **47493** Analysis Date: **4/24/2025** SeqNo: **2067477**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.515	0.100	0.5000	0	103	90	110				
Chloride	0.742	0.200	0.7500	0	98.9	90	110				
Nitrite (as N)	0.718	0.200	0.7500	0	95.7	90	110				
Bromide	2.47	0.600	2.500	0	98.8	90	110				
Nitrate (as N)	0.750	0.200	0.7500	0	100	90	110				
Ortho-Phosphate (as P)	1.30	0.400	1.250	0	104	90	110				
Sulfate	3.68	1.00	3.750	0	98.3	90	110				

Sample ID: **2504577-016BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067490**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	18.9	0.200									E
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	0.347	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	2.63	1.00									

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504577-016BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067490**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2504577-016BMS** SampType: **MS** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067491**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.559	0.100	0.5000	0	112	80	120				
Chloride	19.3	0.200	0.7500	0	2,570	80	120				ES
Nitrite (as N)	0.728	0.200	0.7500	0	97.1	80	120				
Bromide	2.51	0.600	2.500	0	100	80	120				
Nitrate (as N)	1.13	0.200	0.7500	0	150	80	120				S
Ortho-Phosphate (as P)	1.05	0.400	1.250	0	83.8	80	120				
Sulfate	6.63	1.00	3.750	0	177	80	120				S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2504577-016BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067510**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.574	0.100	0.5000	0	115	80	120	0.5590	2.65	20	
Chloride	19.3	0.200	0.7500	0	2,570	80	120	19.31	0.119	20	ES
Nitrite (as N)	0.754	0.200	0.7500	0	101	80	120	0.7280	3.51	20	
Bromide	2.59	0.600	2.500	0	104	80	120	2.509	3.10	20	
Nitrate (as N)	1.15	0.200	0.7500	0	153	80	120	1.128	2.02	20	S
Ortho-Phosphate (as P)	1.05	0.400	1.250	0	83.8	80	120	1.048	0	20	
Sulfate	6.72	1.00	3.750	0	179	80	120	6.630	1.27	20	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504577-017BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067511**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	4.31	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	0.526	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	3.62	1.00									

Sample ID: **2504577-017BMS** SampType: **MS** Units: **mg/L** Prep Date: **4/24/2025** RunNo: **99268**
Client ID: **BATCH** Batch ID: **47493** Analysis Date: **4/25/2025** SeqNo: **2067512**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.519	0.100	0.5000	0	104	80	120				
Chloride	5.06	0.200	0.7500	0	675	80	120				S
Nitrite (as N)	0.737	0.200	0.7500	0	98.3	80	120				
Bromide	2.51	0.600	2.500	0	101	80	120				
Nitrate (as N)	1.34	0.200	0.7500	0	178	80	120				S
Ortho-Phosphate (as P)	1.10	0.400	1.250	0	88.2	80	120				
Sulfate	7.69	1.00	3.750	0	205	80	120				S

NOTES:
S - Spike recovery indicates a possible matrix effect.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Salinity by SM 2520B

Sample ID: **MB-R99311**	SampType: **MBLK**	Units: **%**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **MBLKW**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068530**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100									

Sample ID: **LCS-R99311**	SampType: **LCS**	Units: **µS/cm**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **LCSW**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068531**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	992	0.000100	1,000	0	99.2	79.1	119.1				

Sample ID: **2504593-001CDUP**	SampType: **DUP**	Units: **%**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **Control-EFF-042325**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068533**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100						0		30	

Sample ID: **2504593-006CDUP**	SampType: **DUP**	Units: **%**	Prep Date: **4/29/2025**	RunNo: **99311**
Client ID: **Influent-042325**	Batch ID: **R99311**		Analysis Date: **4/29/2025**	SeqNo: **2068539**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99309**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **MBLKW**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068483**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99309**	SampType: **LCS**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **LCSW**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068484**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	296	5.00	300.0	0	98.7	65	135				

Sample ID: **2504593-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **Control-EFF-042325**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068486**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	240	5.00						210.0	13.3	30	

Sample ID: **2504605-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **BATCH**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068493**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	8,850	5.00						8,320	6.17	30	

Sample ID: **2504618-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99309**
Client ID: **BATCH**	Batch ID: **R99309**		Analysis Date: **5/1/2025**	SeqNo: **2071394**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	80.0	5.00						330.0	122	30	R

NOTES:
R - High RPD observed.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB** SampType: **MBLK** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **MBLKW** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069423**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS** SampType: **LCS** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **LCSW** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069424**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	21.5	0.700	25.00	0	85.9	79.6	120				

Sample ID: **2504605-001DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069434**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	60.8	0.700						60.00	1.27	15	

Sample ID: **2504605-001DMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069435**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	81.2	0.700	25.00	60.00	85.0	85	115				S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2504605-001DMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/29/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/29/2024** SeqNo: **2069436**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	79.9	0.700	25.00	60.00	79.6	85	115	81.24	1.66	15	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2504620-001DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/30/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/30/2024** SeqNo: **2069447**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	9.25	0.700						9.301	0.604	15	

Sample ID: **2504620-001DMS** SampType: **MS** Units: **mg/L** Prep Date: **4/30/2024** RunNo: **99356**
Client ID: **BATCH** Batch ID: **R99356** Analysis Date: **4/30/2024** SeqNo: **2069448**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	28.9	0.700	25.00	9.301	78.6	85	115				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **MB-47485** SampType: **MBLK** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **MBLKW** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066859**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	250									

Sample ID: **LCS-47485** SampType: **LCS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **LCSW** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066860**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	999	250	1,000	0	99.9	80	120				
Magnesium	999	50.0	1,000	0	99.9	80	120				
Potassium	1,030	50.0	1,000	0	103	80	120				
Sodium	1,050	250	1,000	0	105	80	120				

Sample ID: **2504593-001BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066862**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	62,800	250						62,870	0.0524	20	E
Magnesium	14,500	50.0						14,530	0.0584	20	
Potassium	3,280	50.0						3,284	0.103	20	
Sodium	15,900	250						16,040	0.573	20	

Sample ID: **2504593-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066863**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	61,900	250	1,000	62,870	-99.4	75	125				ES
Magnesium	15,000	50.0	1,000	14,530	49.0	75	125				S
Potassium	4,180	50.0	1,000	3,284	89.3	75	125				

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **2504593-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066863**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	16,500	250	1,000	16,040	44.8	75	125				S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504593-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99245**
Client ID: **Control-EFF-042325** Batch ID: **47485** Analysis Date: **4/24/2025** SeqNo: **2066864**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	61,900	250	1,000	62,870	-101	75	125	61,880	0.0220	20	ES
Magnesium	15,100	50.0	1,000	14,530	53.0	75	125	15,020	0.265	20	S
Potassium	4,170	50.0	1,000	3,284	88.8	75	125	4,177	0.116	20	
Sodium	16,500	250	1,000	16,040	42.2	75	125	16,490	0.157	20	S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **MB-47489** SampType: **MBLK** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **MBLKW** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067004**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	250									

Sample ID: **LCS-47489** SampType: **LCS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **LCSW** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067005**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,010	250	1,000	0	101	80	120				
Magnesium	998	50.0	1,000	0	99.8	80	120				
Potassium	1,040	50.0	1,000	0	104	80	120				
Sodium	1,020	250	1,000	0	102	80	120				

Sample ID: **2504593-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **Control-EFF-042325** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067007**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	65,100	250	1,000	64,400	72.7	75	125				ES
Magnesium	15,900	50.0	1,000	14,940	92.3	75	125				
Potassium	4,350	50.0	1,000	3,371	98.3	75	125				
Sodium	17,400	250	1,000	16,420	99.6	75	125				

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504593-001AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **Control-EFF-042325** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067009**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	65,400	250	1,000	64,400	100	75	125	65,130	0.422	20	E
Magnesium	15,900	50.0	1,000	14,940	91.5	75	125	15,870	0.0528	20	

Work Order: 2504593
CLIENT: Friedman & Bruya
Project: 504386

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **2504593-001AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/24/2025** RunNo: **99248**
Client ID: **Control-EFF-042325** Batch ID: **47489** Analysis Date: **4/24/2025** SeqNo: **2067009**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	4,330	50.0	1,000	3,371	95.7	75	125	4,354	0.597	20	
Sodium	17,500	250	1,000	16,420	112	75	125	17,420	0.691	20	

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2504593
Logged by:	Morgan Wilson	Date Received:	4/24/2025 10:47:00 AM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp ºC
Sample	6.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2504593

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 5500 4th Ave S
City, State, ZIP Seattle, WA 98108
Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
ATG

PROJECT NAME/NO.	PO #
504386	F-196

REMARKS
Aspect EDD See RL table.

TURNAROUND TIME
☒ Standard TAT
☒ RUSH Total Mass Metals -24h mc
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: anions	TDS	TOC	Alkalinity	Salinity	Total Ca, Mg, K, Na + dust	Dissolved Ca, Mg, K, Na + dust				Notes
Control-EFF-042325		4/23/2025	1330	water	8	x	x	x	x	x	x	x				anions= Br, Cl, F,
202V1-EFF-042325		4/23/2025	1335	water	8	x	x	x	x	x	x	x				SO4, NO2, NO3,
Control-INF-042325		4/23/2025	1615	water	8	x	x	x	x	x	x	x				o-phosphate
202V1-INF-042325		4/23/2025	1625	water	8	x	x	x	x	x	x	x				
502V1-INF-042325		4/23/2025	1620	water	8	x	x	x	x	x	x	x				
Influent-042325		4/23/2025	1610	water	8	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	4/24/25	0746.
Received by:		Briana Ballard	ATG	4/24	10:47AM
Relinquished by:					
Received by:					

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2504593

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 5500 4th Ave S
City, State, ZIP Seattle, WA 98108
Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
ATG

PROJECT NAME/NO.: 504386
PO #: F-196

REMARKS: Update per ME -mw 4/25/25
Aspect EDD SeeRL table.

TURNAROUND TIME
☒ Standard TAT
☒ RUSH Total Mass Metals -24h mc
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID "2V1=ZVI" ID Update	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: anions	TDS	TOC	Alkalinity	Salinity	Total Ca, Mg, K, Na (+ dup)	Dissolved Ca, Mg, K, Na (+ dup)				Notes
Control-EFF-042325		4/23/2025	1330	water	8	x	x	x	x	x	x	x				anions= Br, Cl, F,
202V1-EFF-042325		4/23/2025	1335	water	8	x	x	x	x	x	x	x				SO4, NO2, NO3,
Control-INF-042325		4/23/2025	1615	water	8	x	x	x	x	x	x	x				o-phosphate
202V1-INF-042325		4/23/2025	1625	water	8	x	x	x	x	x	x	x				
502V1-INF-042325		4/23/2025	1620	water	8	x	x	x	x	x	x	x				
Influent-042325		4/23/2025	1610	water	8	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	4/24/25	0746.
Received by:		Briana Ballard	ATG	4/24	10:47AM
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 1, 2025

Andrew Yonkofski, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Yonkofski:

Included are the additional results from the testing of material submitted on April 24, 2025 from the Glacier NW AS230067, F&BI 504411 project. There are 26 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Deli Massey, Marc Chalfant
ASP0501R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 24, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier NW AS230067, F&BI 504411 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504411 -01	Control-EFF-042425
504411 -02	20ZVI-Port3-042425
504411 -03	20ZVI-Port2-042425
504411 -04	20ZVI-Port1-042425
504411 -05	20ZVI-EFF-042425
504411 -06	20ZVI-INF-042425
504411 -07	Control-Port3-042425
504411 -08	Control-Port2-042425
504411 -09	Control-Port1-042425
504411 -10	Control-INF-042425
504411 -11	50ZVI-EFF-042425
504411 -12	50ZVI-Port3-042425
504411 -13	50ZVI-Port2-042425
504411 -14	50ZVI-Port1-042425
504411 -15	50ZVI-INF-042425
504411 -16	Influent-042425

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report will be forwarded upon receipt.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-02 x5
Date Analyzed:	04/29/25	Data File:	504411-02 x5.288
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-02 x100
Date Analyzed:	04/30/25	Data File:	504411-02 x100.161
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	260

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-03 x5
Date Analyzed:	04/29/25	Data File:	504411-03 x5.289
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	16

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-03 x20
Date Analyzed:	04/30/25	Data File:	504411-03 x20.162
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	88

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-04 x5
Date Analyzed:	04/29/25	Data File:	504411-04 x5.290
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	47
Copper	11

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-07 x5
Date Analyzed:	04/29/25	Data File:	504411-07 x5.291
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380
Copper	22

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-08 x5
Date Analyzed:	04/29/25	Data File:	504411-08 x5.292
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	320
Copper	4.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-09 x5
Date Analyzed:	04/29/25	Data File:	504411-09 x5.293
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	360
Copper	3.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port3-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-12 x5
Date Analyzed:	04/29/25	Data File:	504411-12 x5.294
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.1
Copper	90

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port2-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-13 x5
Date Analyzed:	04/29/25	Data File:	504411-13 x5.295
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port1-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-14 x5
Date Analyzed:	04/29/25	Data File:	504411-14 x5.299
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	17
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	I5-351 mb
Date Analyzed:	04/28/25	Data File:	I5-351 mb.055
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-02 x5
Date Analyzed:	04/29/25	Data File:	504411-02 x5.300
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-03 x5
Date Analyzed:	04/29/25	Data File:	504411-03 x5.302
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	7.8
Copper	3.1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-04 x5
Date Analyzed:	04/29/25	Data File:	504411-04 x5.303
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	42
Copper	<2.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-07 x5
Date Analyzed:	04/29/25	Data File:	504411-07 x5.304
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380
Copper	4.0

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-08 x5
Date Analyzed:	04/29/25	Data File:	504411-08 x5.305
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	320
Copper	<2.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-09 x5
Date Analyzed:	04/29/25	Data File:	504411-09 x5.306
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	360
Copper	<2.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port3-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-12 x5
Date Analyzed:	04/29/25	Data File:	504411-12 x5.308
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port2-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-13 x5
Date Analyzed:	04/29/25	Data File:	504411-13 x5.311
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port1-042425	Client:	Aspect Consulting
Date Received:	04/24/25	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	504411-14 x5
Date Analyzed:	04/30/25	Data File:	504411-14 x5.312
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	10
Copper	<2.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier NW AS230067
Date Extracted:	04/28/25	Lab ID:	I5-352 mb
Date Analyzed:	04/28/25	Data File:	I5-352 mb.057
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.52

Date of Report: 05/01/25
Date Received: 04/24/25
Project: Glacier NW AS230067, F&BI 504411

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 504402-01 x20 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	4.92	115 b	105 b	75-125	9 b
Copper	ug/L (ppb)	20	115	143 b	78 b	75-125	59 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	102	80-120
Copper	ug/L (ppb)	20	103	80-120

Date of Report: 05/01/25
Date Received: 04/24/25
Project: Glacier NW AS230067, F&BI 504411

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 504405-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	13.4	94 b	98 b	75-125	4 b
Copper	ug/L (ppb)	20	<0.52	91	92	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	100	80-120
Copper	ug/L (ppb)	20	102	80-120

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504411

SAMPLE CHAIN OF CUSTODY

04/24/25 C2/J4

Page # 1 of 2

Andrew Yonkofski

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone 206-413-5407 Email delia.massey@geosyntec.com

SAMPLERS (*signature*): Emily Reuser

PROJECT NAME: Glacier NW

PO #: AS230067

REMARKS: Field filtered for dissolved/total metals. TDS= total Dissolved solids

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Capa !

TURNAROUND TIME

☐ Standard turnaround

☒ RUSH 24-hr; Only T/D metals @ marked samples

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Archive samples

☐ Other

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	TDS (Sm 2540C(E)) NWTPH-HCID	Salinity (Sm 1520B) VOCs EPA 8260	Total Organic Carbon (Sm 5310B) PAHs EPA 8270	Alkalinity (Sm 2320B) PCBs EPA 8082	Total metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	Total As and Cr (6020B)	Dissolved As and Cr (6020B)	Br, Cl, F, SO4 (EPA 300.0)	Notes	NO3 as N, NO2 as N, Ortho phosphate as PO4 3- (EPA 300.0)
Control - EFF - 042425	01A-D	4/24/25	10:35	W	4				X	X	X	X	X	X			X	RUSH TAT for T/D metals	X
20 ZVI - Port 3 - 042425	02A-B	↓	1225	↓	2										X	X			
20 ZVI - Port 2 - 042425	03		1340		2										X	X			
20 ZVI - Port 1 - 042425	04		1415		2										X	X			
20 ZVI - EFF - 042425	05A-D		1040		4				X	X	X	X	X	X			X	RUSH T/D metals	X
20 ZVI - INF - 042425	06		~~1515~~ ER		~~4~~ 2 ER				X	X	X	X	X	X	~~X~~	~~X~~ ER	X	*1510 RUSH T/D metals	X
Control - Port 3 - 042425	07AB		1220		2										X	X			
Control - Port 2 - 042425	08		1335		2										X	X			
Control - Port 1 - 042425	09		1410		2										X	X			
Control - INF - 042425	10A-D	↓	1505	↓	4				X	X	X	X	X	X			X	RUSH T/D metals	X

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Reuser	Emily Reuser	ASPECT	4/24/25	17:57
Received by:	JOE MARANTO	FEDEX	04/24/25	17:57
Relinquished by:		Samples received at 3 °C		
Received by:				

Friedman & Bruya, Inc.
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office@friedmanandbruya.com

504411 Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY

04/24/25

C2/J4

Page # 2 of 2

Report To Delia Massey, Marc Cnalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone 206-413-5407 Email delia.massey@geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
- ☐ Standard turnaround
- ☒ RUSH 24-hr; Emily T/D metals @ marked samples

Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TDS (SM 2540 C/E) NWTPH-Dx	Salinity (SM 2520 B) NWTPH-Gx	Total Organic Carbon (SM5310) BTEX EPA 8021	Alkalinity (SM 2320B) NWTPH-HCID	Br, Cl, F, SO4 (E EPA 300) VOCs EPA 8260	PAHs EPA 8270	PCP (SW 8270 E-SIM) PCBs EPA 8082	Total Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	Total As and Cu (6020B)	Dissolved As and Cu (6020B)	NO_3 as N, NO_2 as N Ortho phosphate as PO_4^{3-} (EPA 300.0)	Notes
50ZVI-EFF-042425	11 A-E	4/24/25	1045	W	5	X	X	X	X	X		X	X	X			X	RUSH T/D metals
50ZVI-Port3-042425	12 A B		1325		2										X	X		
50ZVI-Port2-042425	13		1355		2										X	X		
50ZVI-Port1-042425	14		1430		2										X	X		
50ZVI-INF-042425	15 A-D		1515		4	X	X	X	X	X			X	X			X	RUSH T/D metals
INFLUENT-042425	16 1	↓	1520	↓	4	X	X	X	X	X			X	X			X	RUSH T/D metals

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	ASPECT	4/24/25	17:57
Received by:	DE MOHAMMED	FBI	04/24/25	17:57
Relinquished by:		Samples received at 3 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504411 CLIENT ASP INITIALS/ DATE: 04/24/25

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 3 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ Date: 4/25 JB
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☐ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 7, 2025

Andrew Yonkofski, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Yonkofski:

Included are the additional results from the testing of material submitted on April 25, 2025 from the Glacier Northwest AS230067, F&BI 504435 project. There are 17 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Delia Massey, Marc Chalfant
ASP0507R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 25, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504435 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504435 -01	Control-EFF-042525
504435 -02	Control-PORT3-042525
504435 -03	Control-PORT2-042525
504435 -04	Control-PORT1-042525
504435 -05	Control-INF-042525
504435 -06	20ZVI-EFF-042525
504435 -07	20ZVI-PORT3-042525
504435 -08	20ZVI-PORT2-042525
504435 -09	20ZVI-PORT1-042525
504435 -10	20ZVI-INF-042525
504435 -11	50ZVI-EFF-042525
504435 -12	50ZVI-PORT3-042525
504435 -13	50ZVI-PORT2-042525
504435 -14	50ZVI-PORT1-042525
504435 -15	50ZVI-INF-042525
504435 -16	INFLUENT-042525

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report will be forwarded upon receipt.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-01 x5
Date Analyzed:	05/05/25	Data File:	504435-01 x5.142
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	280

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-01 x100
Date Analyzed:	04/30/25	Data File:	504435-01 x100.313
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	550

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-06 x100
Date Analyzed:	05/06/25	Data File:	504435-06 x100.102
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	860

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-06 x500
Date Analyzed:	04/30/25	Data File:	504435-06 x500.317
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	98,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-11 x200
Date Analyzed:	05/05/25	Data File:	504435-11 x200.144
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	44,000
Manganese	360

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-16 x100
Date Analyzed:	05/05/25	Data File:	504435-16 x100.145
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	160

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-351 mb
Date Analyzed:	04/28/25	Data File:	I5-351 mb.055
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-01 x2
Date Analyzed:	05/02/25	Data File:	504435-01 x2.178
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	340

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-01 x100
Date Analyzed:	05/02/25	Data File:	504435-01 x100.177
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	520

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-06 x500
Date Analyzed:	05/02/25	Data File:	504435-06 x500.179
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	86,000
Manganese	900

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-11 x200
Date Analyzed:	05/05/25	Data File:	504435-11 x200.146
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	36,000
Manganese	340

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-16 x100
Date Analyzed:	05/02/25	Data File:	504435-16 x100.201
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	14,000
Manganese	170

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-359 mb
Date Analyzed:	04/28/25	Data File:	I5-359 mb.254
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Date of Report: 05/07/25
Date Received: 04/25/25
Project: Glacier Northwest AS230067, F&BI 504435

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 504402-01 x20 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	24,100	3440 b	1340 b	75-125	88 b
Manganese	ug/L (ppb)	20	327	334 b	186 b	75-125	57 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	96	80-120
Manganese	ug/L (ppb)	20	104	80-120

Date of Report: 05/07/25
Date Received: 04/25/25
Project: Glacier Northwest AS230067, F&BI 504435

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	96	94	80-120	2
Manganese	ug/L (ppb)	20	99	98	80-120	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY

04-25-25 J4

Page # 1 of 2

504435 Andrew Yonkofski

Report To Delia massey; marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-9407 Email delia.massey@geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME

☒ Standard turnaround

~~☒ RUSH 24 hr - Only T/D metals for marked samples~~ ER

Rush charges authorized by:

As and Cu 24 hr TAT per MC 04/28/25 ME

SAMPLE DISPOSAL

☐ Archive samples

☐ Other

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: ~~T/D dissolved solids (Sm 2540C/E) NWTPH-Dx~~	~~Salinity (Sm 2520 B) NWTPH-Dx~~	~~Alkalinity (Sm 2320B) BTEX EPA 8021~~	~~Total Organic Carbon (Sm 5310C) NWTPH-HCID~~	Total As + Cu (6020 B) VOCs EPA 8260	Dissolved As + Cu (6020B) PAHs EPA 8270	Br, Cl, F, SO4 (EPA 300) PCBs EPA 8082	Total metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (6020B)	Dissolved metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (6020B)	NO3 as N, NO2 as N, Orthophosphate as P (EPA 300.0)		Notes
Control-EFF-042525	01 A-D	4/25/25	0925	W	4	X	X	X	X			X	X	X	X		~~RUSH TAT for T/D metals~~ ER
Control-Port3-042525	02 A B		1030		2					X	X						
Control-Port2-042525	03		1115		2					X	X						
Control-Port1-042525	04		1215		2					X	X						
Control-INF-042525	05 A-D		1325		4	X	X	X	X			X	X	X	X		HOLD
20ZVI-EFF-042525	06 A-D		0930		4	X	X	X	X			X	X	X	X		~~RUSH TAT for T/D metals~~ ER
20ZVI-Port3-042525	07 A-B		1035		2					X	X						
20ZVI-Port2-042525	08		1120		2					X	X						
20ZVI-PORT1-042525	09		1220		2					X	X						
20ZVI-INF-042525	10 A-D	↓	1330	↓	4	X	X	X	X			X	X	X	X	ER	HOLD

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/25/25	1608
Received by:	Eric Young	T+B	4/25/25	1608
Relinquished by:				
Received by:				

Samples received at 4 °C

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504435

Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 04-25-25 J4

Page # 2 of 2

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-5407 Email Delia.massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME

X Standard turnaround

~~X RUSH 24-hr - only T/D metals were marked~~ ER

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Archive samples

☐ Other

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM2540C) NWTPH-Dx	Salinity (SM2520B) NWTPH-Gx	Alkalinity (SM2320B) BTEX EPA 8021	Phal Organic Carbon (SM5310C) NWTPH-HCID	Total As rcul (6020B) VOCs EPA 8260	Dissolved As rcul (6020B) PAHs EPA 8270	Br, Cl, F SO4 (EPA 300.0) PCBs EPA 8082	Total Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	NO3 as N, NO2 as N, ortho-phosphate as PO4 (EPA 300.0)		Notes
50ZVI-EFF-042525	11A-D	4/25/25	0935	W	4	X	X	X	X			X	X	X	X		~~RUSH TAT FOR T/D METALS~~ ER
50ZVI-PORT3-042525	12AB	4/25/25	1040	W	2					X	X						
~~50ZVI PORT~~ ER																	
50ZVI-PORT2-042525	13AB	4/25/25	1125	W	2					X	X						
50ZVI-PORT1-042525	14AB	↓	1225	↓	2					X	X						
50ZVI-INF-042525	15A-D		1335		4	X	X	X	X	~~X~~ ER		X	X	X	X		HOLD
INFLUENT-042525	16A-D	↓	1340	↓	4	X	X	X	X			X	X	X	X		
																	Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	ASPECT	4/25/25	1608
Received by:	Eric Young	F+B	4/25/25	1608
Relinquished by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504435 CLIENT Aspect INITIALS/DATE: C 4/25

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/Date: NP 4/28
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes	☐ No	☐ Not on COC/label
Date Sampled	☑ Yes	☐ No	☐ Not on COC/label
Time Sampled	☑ Yes	☐ No	☐ Not on COC/label
# of Containers	☑ Yes	☐ No	
Relinquished	☑ Yes	☐ No	
Requested analysis	☑ Yes	☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 504435,
Work Order Number: 2504663

May 05, 2025

Attention Michael Erdahl:

Alliance Technical Group, LLC - Seattle received 7 sample(s) on 4/28/2025 for the analyses presented in the following report.

Dissolved Metals by EPA 6020B
Ion Chromatography by EPA 300.0
Salinity by SM 2520B
Total Alkalinity by EPA 310.2
Total Dissolved Solids by SM 2540C
Total Metals by EPA 6020B
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Alliance Technical Group is committed to accuracy, speed, and customer service. Thank you for choosing Alliance Technical Group's Seattle laboratory team for your analytical needs. We appreciate this opportunity to serve you!

Sincerely,



Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Date: *05/05/2025*

CLIENT: Friedman & Bruya
Project: 504435
Work Order: 2504663

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2504663-001	Control-Eff-042525	04/25/2025 9:25 AM	04/28/2025 2:36 PM
2504663-002	Control-INF-042525	04/25/2025 1:25 PM	04/28/2025 2:36 PM
2504663-003	20ZVI-EFF-042525	04/25/2025 9:30 AM	04/28/2025 2:36 PM
2504663-004	20ZVI-INF-042525	04/25/2025 1:30 PM	04/28/2025 2:36 PM
2504663-005	50ZVI-EFF-042525	04/25/2025 9:35 AM	04/28/2025 2:36 PM
2504663-006	50ZVI-INF-042525	04/25/2025 1:35 PM	04/28/2025 2:36 PM
2504663-007	INFLUENT-042525	04/25/2025 1:40 PM	04/28/2025 2:36 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2504663**

Date: **5/5/2025**

CLIENT: Friedman & Bruya

Project: 504435

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2504663**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504435

Lab ID: 2504663-001 **Collection Date:** 4/25/2025 9:25:00 AM
Client Sample ID: **Control-Eff-042525** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.124	0.100		mg/L	1	4/29/2025 8:10:00 PM
Chloride	4.44	0.200		mg/L	1	4/29/2025 8:10:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 8:10:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 8:10:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 8:10:00 PM
Ortho-Phosphate (as P)	0.501	0.400	QH	mg/L	1	4/29/2025 8:10:00 PM
Sulfate	3.00	1.00		mg/L	1	4/29/2025 8:10:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	64,000	250		µg/L	1	5/5/2025 1:17:00 PM
Magnesium	6,320	50.0		µg/L	1	5/5/2025 1:17:00 PM
Potassium	3,960	50.0		µg/L	1	5/5/2025 1:17:00 PM
Sodium	15,100	100		µg/L	1	5/5/2025 1:17:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	66,600	120		µg/L	1	4/29/2025 5:15:00 PM
Magnesium	6,300	100		µg/L	1	4/29/2025 5:15:00 PM
Potassium	3,960	100		µg/L	1	4/29/2025 5:15:00 PM
Sodium	15,000	200		µg/L	1	4/29/2025 5:15:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	4.09	0.700		mg/L	1	5/2/2024 2:00:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	231	25.0	D	mg/L	10	5/2/2025 1:35:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	278	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504435

Analytical Report

Work Order: **2504663**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504435

Lab ID: 2504663-003 **Collection Date:** 4/25/2025 9:30:00 AM
Client Sample ID: **20ZVI-EFF-042525** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.129	0.100		mg/L	1	4/29/2025 8:33:00 PM
Chloride	4.58	0.200		mg/L	1	4/29/2025 8:33:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 8:33:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 8:33:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 8:33:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 8:33:00 PM
Sulfate	3.34	1.00		mg/L	1	4/29/2025 8:33:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	62,600	250		µg/L	1	5/5/2025 1:20:00 PM
Magnesium	5,530	50.0		µg/L	1	5/5/2025 1:20:00 PM
Potassium	3,740	50.0		µg/L	1	5/5/2025 1:20:00 PM
Sodium	15,500	100		µg/L	1	5/5/2025 1:20:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	70,600	1,200	D	µg/L	20	5/2/2025 11:33:00 AM
Magnesium	5,420	50.0		µg/L	1	4/29/2025 5:18:00 PM
Potassium	3,680	50.0		µg/L	1	4/29/2025 5:18:00 PM
Sodium	15,000	100		µg/L	1	4/29/2025 5:18:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	2.43	0.700		mg/L	1	5/2/2024 2:31:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	225	25.0	D	mg/L	10	5/2/2025 1:39:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	236	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504435

Analytical Report

Work Order: **2504663**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504435

Lab ID: 2504663-005 **Collection Date:** 4/25/2025 9:35:00 AM
Client Sample ID: **50ZVI-EFF-042525** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.104	0.100		mg/L	1	4/29/2025 8:56:00 PM
Chloride	4.85	0.200		mg/L	1	4/29/2025 8:56:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 8:56:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 8:56:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 8:56:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 8:56:00 PM
Sulfate	2.88	1.00		mg/L	1	4/29/2025 8:56:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	59,200	250		µg/L	1	5/5/2025 1:23:00 PM
Magnesium	5,930	50.0		µg/L	1	5/5/2025 1:23:00 PM
Potassium	3,950	50.0		µg/L	1	5/5/2025 1:23:00 PM
Sodium	15,700	100		µg/L	1	5/5/2025 1:23:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	64,000	1,200	D	µg/L	20	5/2/2025 11:36:00 AM
Magnesium	5,690	50.0		µg/L	1	4/29/2025 5:21:00 PM
Potassium	3,880	50.0		µg/L	1	4/29/2025 5:21:00 PM
Sodium	15,300	100		µg/L	1	4/29/2025 5:21:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	1.35	0.700		mg/L	1	5/2/2024 4:24:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	185	25.0	D	mg/L	10	5/2/2025 1:41:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	234	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504435

Analytical Report

Work Order: **2504663**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504435

Lab ID: 2504663-007 **Collection Date:** 4/25/2025 1:40:00 PM
Client Sample ID: **INFLUENT-042525** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.166	0.100		mg/L	1	4/29/2025 9:19:00 PM
Chloride	3.67	0.200		mg/L	1	4/29/2025 9:19:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 9:19:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 9:19:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 9:19:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 9:19:00 PM
Sulfate	3.64	1.00		mg/L	1	4/29/2025 9:19:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	71,400	250		µg/L	1	5/5/2025 1:32:00 PM
Magnesium	4,330	50.0		µg/L	1	5/5/2025 1:32:00 PM
Potassium	3,520	50.0		µg/L	1	5/5/2025 1:32:00 PM
Sodium	13,300	100		µg/L	1	5/5/2025 1:32:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	75,400	60.0	E	µg/L	1	4/29/2025 5:25:00 PM
Magnesium	4,250	50.0		µg/L	1	4/29/2025 5:25:00 PM
Potassium	3,540	50.0		µg/L	1	4/29/2025 5:25:00 PM
Sodium	12,900	100		µg/L	1	4/29/2025 5:25:00 PM

NOTES:
E - value is slightly beyond the calibration range of the instrument and may be estimated. Insufficient volume remains for reanalysis.

Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	5.24	0.700		mg/L	1	5/2/2024 4:43:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	219	25.0	D	mg/L	10	5/2/2025 1:43:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM

Analytical Report

Work Order: **2504663**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504435

Total Dissolved Solids by SM 2540C

Batch ID: R99442 Analyst: BB

Total Dissolved Solids	278	5.00	mg/L	1	5/2/2025 12:27:54 PM

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **MB-99477**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **MBLKW**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2071986**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-99477**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **LCSW**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2071987**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	25.7	2.50	25.00	0	103	79.4	136				

Sample ID: **2504662-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **BATCH**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2071991**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	217	25.0						209.0	3.86	20	D

Sample ID: **2504663-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **Control-Eff-042525**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2072002**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	231	25.0						231.0	0	20	D

Alliance TECHNICAL GROUP

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-47545** SampType: **MBLK** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **MBLKW** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071891**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	ND	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	ND	0.200									
Ortho-Phosphate (as P)	ND	0.400									Q
Sulfate	ND	1.00									

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **LCS-47545** SampType: **LCS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **LCSW** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071892**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.481	0.100	0.5000	0	96.2	90	110				
Chloride	0.751	0.200	0.7500	0	100	90	110				
Nitrite (as N)	0.706	0.200	0.7500	0	94.1	90	110				
Bromide	2.47	0.600	2.500	0	98.6	90	110				
Nitrate (as N)	0.749	0.200	0.7500	0	99.9	90	110				
Ortho-Phosphate (as P)	1.14	0.400	1.250	0	91.5	90	110				
Sulfate	3.59	1.00	3.750	0	95.7	90	110				

Sample ID: **2504657-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100						0		20	
Chloride	4.60	0.200						4.604	0.174	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	ND	0.200						0		20	
Ortho-Phosphate (as P)	ND	0.400						0		20	Q

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504657-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	18.5	1.00						18.56	0.0701	20	

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **2504657-001CMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071895**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.563	0.100	0.5000	0.07900	96.8	80	120				
Chloride	5.34	0.200	0.7500	4.604	98.5	80	120				
Nitrite (as N)	0.735	0.200	0.7500	0	98.0	80	120				
Bromide	2.52	0.600	2.500	0	101	80	120				
Nitrate (as N)	0.791	0.200	0.7500	0	105	80	120				
Ortho-Phosphate (as P)	0.952	0.400	1.250	0	76.2	80	120				S
Sulfate	22.3	1.00	3.750	18.56	100	80	120				

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed and recovered within range.

Sample ID: **2504657-001CMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071896**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.568	0.100	0.5000	0.07900	97.8	80	120	0.5630	0.884	20	
Chloride	5.35	0.200	0.7500	4.604	99.1	80	120	5.343	0.0748	20	
Nitrite (as N)	0.738	0.200	0.7500	0	98.4	80	120	0.7350	0.407	20	
Bromide	2.54	0.600	2.500	0	102	80	120	2.515	1.07	20	
Nitrate (as N)	0.799	0.200	0.7500	0	107	80	120	0.7910	1.01	20	
Ortho-Phosphate (as P)	1.08	0.400	1.250	0	86.8	80	120	0.9520	13.1	20	
Sulfate	22.3	1.00	3.750	18.56	101	80	120	22.30	0.179	20	

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504658-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071898**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100						0		20	
Chloride	3.57	0.200						3.568	0.140	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	1.11	0.200						1.111	0.0900	20	
Ortho-Phosphate (as P)	ND	0.400						0		20	Q
Sulfate	9.44	1.00						9.438	0.0741	20	

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **2504658-001CMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071899**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.426	0.100	0.5000	0.05200	74.8	80	120				S
Chloride	3.57	0.200	0.7500	3.568	0.800	80	120				S
Nitrite (as N)	0.594	0.200	0.7500	0	79.2	80	120				S
Bromide	2.03	0.600	2.500	0	81.3	80	120				
Nitrate (as N)	1.57	0.200	0.7500	1.111	60.8	80	120				S
Ortho-Phosphate (as P)	0.676	0.400	1.250	0	54.1	80	120				S
Sulfate	10.7	1.00	3.750	9.438	34.1	80	120				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Salinity by SM 2520B

Sample ID: **MB-R99486**	SampType: **MBLK**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **MBLKW**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072324**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100									

Sample ID: **LCS-R99486**	SampType: **LCS**	Units: **µS/cm**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **LCSW**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072325**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	986	0.00100	1,000	0	98.6	79.1	119.1				

Sample ID: **2504661-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **BATCH**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072327**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Sample ID: **2504662-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **BATCH**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072332**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99442**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **MBLKW**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071396**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99442**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **LCSW**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071397**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	304	5.00	300.0	0	101	65	135				

Sample ID: **2504658-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **BATCH**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071399**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	97.0	5.00						89.00	8.60	30	

Sample ID: **2504662-003ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **BATCH**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071406**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	232	5.00						216.0	7.14	30	

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/1/2024**	RunNo: **99428**
Client ID: **MBLKW**	Batch ID: **R99428**		Analysis Date: **5/1/2024**	SeqNo: **2071074**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/1/2024**	RunNo: **99428**
Client ID: **LCSW**	Batch ID: **R99428**		Analysis Date: **5/1/2024**	SeqNo: **2071075**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	21.7	0.700	25.00	0	86.6	79.6	120				

Sample ID: **2504661-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/1/2024**	RunNo: **99428**
Client ID: **BATCH**	Batch ID: **R99428**		Analysis Date: **5/1/2024**	SeqNo: **2071077**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.93	0.700						3.953	0.533	15	

Sample ID: **2504662-003BMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **5/1/2024**	RunNo: **99428**
Client ID: **BATCH**	Batch ID: **R99428**		Analysis Date: **5/1/2024**	SeqNo: **2071086**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.0	0.700	25.00	1.890	84.5	85	115				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Sample ID: **2504663-003BMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **5/2/2024**	RunNo: **99428**
Client ID: **20ZVI-EFF-042525**	Batch ID: **R99428**		Analysis Date: **5/2/2024**	SeqNo: **2071094**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.7	0.700	25.00	2.430	85.0	85	115				

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2504663-003BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/2/2024** RunNo: **99428**
Client ID: **20ZVI-EFF-042525** Batch ID: **R99428** Analysis Date: **5/2/2024** SeqNo: **2071097**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.6	0.700	25.00	2.430	84.5	85	115	23.68	0.525	15	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed and recovered within range.

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **MB-47613** SampType: **MBLK** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **MBLKW** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072269**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47613** SampType: **LCS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **LCSW** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072270**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	936	250	1,000	0	93.6	80	120				
Magnesium	1,000	50.0	1,000	0	100	80	120				
Potassium	981	50.0	1,000	0	98.1	80	120				
Sodium	1,010	100	1,000	0	101	80	120				

Sample ID: **2504661-001DMS** SampType: **MS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **BATCH** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072272**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	61,100	250	1,000	62,530	-145	75	125				S
Magnesium	6,310	50.0	1,000	5,559	75.1	75	125				
Potassium	4,670	50.0	1,000	3,892	77.8	75	125				
Sodium	15,600	100	1,000	15,220	43.0	75	125				S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504661-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **BATCH** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072274**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	60,500	250	1,000	62,530	-205	75	125	61,080	0.984	20	S
Magnesium	6,280	50.0	1,000	5,559	72.1	75	125	6,310	0.478	20	S

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **2504661-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **BATCH** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072274**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	4,670	50.0	1,000	3,892	77.6	75	125	4,669	0.0338	20	
Sodium	15,400	100	1,000	15,220	13.7	75	125	15,650	1.88	20	S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **MB-47533** SampType: **MBLK** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **MBLKW** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069259**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	60.0									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47533** SampType: **LCS** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **LCSW** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069260**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,020	60.0	1,000	0	102	80	120				
Magnesium	1,020	50.0	1,000	0	102	80	120				
Potassium	1,010	50.0	1,000	0	101	80	120				
Sodium	1,020	100	1,000	0	102	80	120				

Sample ID: **2504624-003DMS** SampType: **MS** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **BATCH** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069262**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	19,300	60.0	1,000	18,050	126	75	125				ES
Magnesium	2,550	50.0	1,000	1,522	103	75	125				
Potassium	7,130	50.0	1,000	6,038	109	75	125				E
Sodium	13,000	100	1,000	11,820	121	75	125				E

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504624-003DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **BATCH** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069264**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	19,400	60.0	1,000	18,050	139	75	125	19,310	0.669	20	ES
Magnesium	2,560	50.0	1,000	1,522	104	75	125	2,550	0.477	20	

Work Order: 2504663
CLIENT: Friedman & Bruya
Project: 504435

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **2504624-003DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **BATCH** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069264**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	7,170	50.0	1,000	6,038	113	75	125	7,132	0.482	20	E
Sodium	13,000	100	1,000	11,820	123	75	125	13,030	0.129	20	E

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2504663
Logged by:	Morgan Wilson	Date Received:	4/28/2025 2:36:00 PM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☐	No ☑	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified:	Michael Erdahl	Date:	4/28/2025
By Whom:	Morgan Wilson	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Anions Hold Time		
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp °C
Sample	4.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER: ATG

PROJECT NAME/NO.: 504435

PO #: F-198

REMARKS
Aspect EDD
Limited Volume—Use project RLS
25041663

TURNAROUND TIME
☒ Standard TAT All Std TAT MEPH
~~☒ RUSH—T/D Cations 24 hr TAT~~ 4/28/25
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Anions	Alkalinity	TOC	TDS	Salinity	Total Cations (Mg, K, Na, Ca)	Dissolved Cations (Mg, K, Na, Ca)				Notes
Control-Eff-042525		4/25/2025	925	water	4	x	x	x	x	x	x	x				
Control-INF-042525		4/25/2025	1325	water												Hold
20ZVI-EFF-042525		4/25/2025	930	water		x	x	x	x	x	x	x				
20ZVI-INF-042525		4/25/2025	1330	water												Hold
50ZVI-EFF-042525		4/25/2025	935	water		x	x	x	x	x	x	x				
50ZVI-INF-042525		4/25/2025	1335	water												Hold
INFLUENT-042525		4/25/2025	1340	water		x	x	x	x	x	x	x				
																anions=Br, Cl, F,
																SO4, NO2, NO3,
																PO4

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	4/28/25	0845
Received by:		Jacob Hawthorne		4/28/25	1436
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

April 30, 2025

Andrew Yonkofski, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Yonkofski:

Included are the results from the testing of material submitted on April 25, 2025 from the Glacier Northwest AS230067, F&BI 504435 project. There are 41 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Marc Chalfant, Andrew Yonkofski
ASP0430R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 25, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504435 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504435 -01	Control-EFF-042525
504435 -02	Control-PORT3-042525
504435 -03	Control-PORT2-042525
504435 -04	Control-PORT1-042525
504435 -05	Control-INF-042525
504435 -06	20ZVI-EFF-042525
504435 -07	20ZVI-PORT3-042525
504435 -08	20ZVI-PORT2-042525
504435 -09	20ZVI-PORT1-042525
504435 -10	20ZVI-INF-042525
504435 -11	50ZVI-EFF-042525
504435 -12	50ZVI-PORT3-042525
504435 -13	50ZVI-PORT2-042525
504435 -14	50ZVI-PORT1-042525
504435 -15	50ZVI-INF-042525
504435 -16	INFLUENT-042525

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report will be forwarded upon receipt.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-01 x5
Date Analyzed:	04/29/25	Data File:	504435-01 x5.383
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380
Copper	4.4

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-02 x5
Date Analyzed:	04/29/25	Data File:	504435-02 x5.440
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	4.4

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-02 x5
Date Analyzed:	04/30/25	Data File:	504435-02 x5.313
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	350

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-03 x5
Date Analyzed:	04/29/25	Data File:	504435-03 x5.443
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	3.7

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-03 x5
Date Analyzed:	04/30/25	Data File:	504435-03 x5.314
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	320

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT1-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-04 x5
Date Analyzed:	04/29/25	Data File:	504435-04 x5.444
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	2.6

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT1-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-04 x5
Date Analyzed:	04/30/25	Data File:	504435-04 x5.315
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	330

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-06 x5
Date Analyzed:	04/29/25	Data File:	504435-06 x5.384
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	6.7

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-07 x50
Date Analyzed:	04/30/25	Data File:	504435-07 x50.316
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	20
Copper	1,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-08 x5
Date Analyzed:	04/29/25	Data File:	504435-08 x5.446
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	9.1

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-08 x5
Date Analyzed:	04/30/25	Data File:	504435-08 x5.318
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	110

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT1-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-09 x5
Date Analyzed:	04/30/25	Data File:	504435-09 x5.320
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	190
Copper	4.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-11 x5
Date Analyzed:	04/29/25	Data File:	504435-11 x5.385
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-12 x5
Date Analyzed:	04/30/25	Data File:	504435-12 x5.324
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.6

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-12 x50
Date Analyzed:	04/30/25	Data File:	504435-12 x50.323
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	550

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-13 x5
Date Analyzed:	04/30/25	Data File:	504435-13 x5.325
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.8
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT1-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-14 x10
Date Analyzed:	04/30/25	Data File:	504435-14 x10.326
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	23
Copper	150

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-16 x5
Date Analyzed:	04/29/25	Data File:	504435-16 x5.386
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	730
Copper	3.3

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-353 mb
Date Analyzed:	04/28/25	Data File:	I5-353 mb.156
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-351 mb
Date Analyzed:	04/28/25	Data File:	I5-351 mb.055
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-01 x5
Date Analyzed:	04/29/25	Data File:	504435-01 x5.367
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380
Copper	3.7

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-02 x5
Date Analyzed:	04/29/25	Data File:	504435-02 x5.409
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	330
Copper	4.4

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-03 x5
Date Analyzed:	04/29/25	Data File:	504435-03 x5.410
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	310
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT1-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-04 x5
Date Analyzed:	04/29/25	Data File:	504435-04 x5.411
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	300
Copper	3.1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-06 x5
Date Analyzed:	04/29/25	Data File:	504435-06 x5.368
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-07 x5
Date Analyzed:	04/29/25	Data File:	504435-07 x5.412
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.2
Copper	8.4

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-08 x5
Date Analyzed:	04/29/25	Data File:	504435-08 x5.413
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	25
Copper	2.7

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT1-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-09 x5
Date Analyzed:	04/29/25	Data File:	504435-09 x5.414
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	160
Copper	8.6

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-11 x5
Date Analyzed:	04/29/25	Data File:	504435-11 x5.371
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT3-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-12 x5
Date Analyzed:	04/29/25	Data File:	504435-12 x5.415
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	5.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT2-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-13 x5
Date Analyzed:	04/29/25	Data File:	504435-13 x5.416
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.3
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT1-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-14 x5
Date Analyzed:	04/30/25	Data File:	504435-14 x5.327
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	9.7
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042525	Client:	Aspect Consulting
Date Received:	04/25/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504435-16 x5
Date Analyzed:	04/29/25	Data File:	504435-16 x5.372
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	740
Copper	3.3

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-357 mb
Date Analyzed:	04/28/25	Data File:	I5-357 mb.167
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-359 mb
Date Analyzed:	04/28/25	Data File:	I5-359 mb.254
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5
Iron	<50
Manganese	<1

Date of Report: 04/30/25
Date Received: 04/25/25
Project: Glacier Northwest AS230067, F&BI 504435

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 504410-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	15.4	98 b	95 b	75-125	3 b
Copper	ug/L (ppb)	20	0.932	86	85	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	95	80-120
Copper	ug/L (ppb)	20	97	80-120

Date of Report: 04/30/25
Date Received: 04/25/25
Project: Glacier Northwest AS230067, F&BI 504435

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 504402-01 x20 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	4.92	115 b	105 b	75-125	9 b
Copper	ug/L (ppb)	20	115	143 b	78 b	75-125	59 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	102	80-120
Copper	ug/L (ppb)	20	103	80-120

Date of Report: 04/30/25
Date Received: 04/25/25
Project: Glacier Northwest AS230067, F&BI 504435

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	94	92	80-120	2
Copper	ug/L (ppb)	20	96	94	80-120	2

Date of Report: 04/30/25
Date Received: 04/25/25
Project: Glacier Northwest AS230067, F&BI 504435

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	90	89	80-120	1
Copper	ug/L (ppb)	20	99	98	80-120	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY

04-25-25 J4

Page # 1 of 2

504435 Andrew Yonkofski

Report To Delia massey; marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-9407 Email delia.massey@geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME

☒ Standard turnaround

~~☒ RUSH 24 hr - Only T/D metals for marked samples~~ ER

Rush charges authorized by:

As and Cu 24 hr TAT per MC 04/28/25 ME

SAMPLE DISPOSAL

☐ Archive samples

☐ Other

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: ~~T/D dissolved solids (Sm 2540C/E) NWTPH-Dx~~	~~Salinity (Sm 2520 B) NWTPH-Dx~~	~~Alkalinity (Sm 2320B) BTEX EPA 8021~~	~~Total Organic Carbon (Sm 5310C) NWTPH-HCID~~	Total As + Cu (6020 B) VOCs EPA 8260	Dissolved As + Cu (6020B) PAHs EPA 8270	Br, Cl, F, SO4 (EPA 300) PCBs EPA 8082	Total metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (6020B)	Dissolved metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (6020B)	NO3 as N, NO2 as N, Orthophosphate as P (EPA 300.0)		Notes
Control-EFF-042525	01 A-D	4/25/25	0925	W	4	X	X	X	X			X	X	X	X		~~RUSH TAT for T/D metals~~ ER
Control-Port3-042525	02 A B		1030		2					X	X						
Control-Port2-042525	03		1115		2					X	X						
Control-Port1-042525	04		1215		2					X	X						
Control-INF-042525	05 A-D		1325		4	X	X	X	X			X	X	X	X		HOLD
20ZVI-EFF-042525	06 A-D		0930		4	X	X	X	X			X	X	X	X		~~RUSH TAT for T/D metals~~ ER
20ZVI-Port3-042525	07 A-B		1035		2					X	X						
20ZVI-Port2-042525	08		1120		2					X	X						
20ZVI-PORT1-042525	09		1220		2					X	X						
20ZVI-INF-042525	10 A-D	↓	1330	↓	4	X	X	X	X			X	X	X	X	ER	HOLD

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/25/25	1608
Received by:	Eric Young	T+B	4/25/25	1608
Relinquished by:				
Received by:				

Samples received at 4 °C

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504435

Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 04-25-25 J4

Page # 2 of 2

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-5407 Email Delia.massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME

X Standard turnaround

~~X RUSH 24-hr - only T/D metals were marked~~ ER

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Archive samples

☐ Other

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM2540C) NWTPH-Dx	Salinity (SM2520B) NWTPH-Gx	Alkalinity (SM2320B) BTEX EPA 8021	Phal Organic Carbon (SM5310C) NWTPH-HCID	Total As rcul (6020B) VOCs EPA 8260	Dissolved As rcul (6020B) PAHs EPA 8270	Br, Cl, F SO4 (EPA 300.0) PCBs EPA 8082	Total Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (6020B)	NO3 as N, NO2 as N, ortho-phosphate as PO4 (EPA 300.0)		Notes
50ZVI-EFF-042525	11A-D	4/25/25	0935	W	4	X	X	X	X			X	X	X	X		~~RUSH TAT FOR T/D METALS~~ ER
50ZVI-PORT3-042525	12AB	4/25/25	1040	W	2					X	X						
~~50ZVI PORT~~ ER																	
50ZVI-PORT2-042525	13AB	4/25/25	1125	W	2					X	X						
50ZVI-PORT1-042525	14AB	↓	1225	↓	2					X	X						
50ZVI-INF-042525	15A-D		1335		4	X	X	X	X	~~X~~ ER		X	X	X	X		HOLD
INFLUENT-042525	16A-D	↓	1340	↓	4	X	X	X	X			X	X	X	X		
																	Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	ASPECT	4/25/25	1608
Received by:	Eric Young	F+B	4/25/25	1608
Relinquished by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504435 CLIENT Aspect INITIALS/DATE: C 4/25

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/Date: NP 4/28
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes	☐ No	☐ Not on COC/label
Date Sampled	☑ Yes	☐ No	☐ Not on COC/label
Time Sampled	☑ Yes	☐ No	☐ Not on COC/label
# of Containers	☑ Yes	☐ No	
Relinquished	☑ Yes	☐ No	
Requested analysis	☑ Yes	☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 6, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the additional results from the testing of material submitted on April 28, 2025 from the Glacier Northwest AS230067, F&BI 504443 project. There are 37 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Marc Chalfant, Andrew Yonkofski
ASP0506R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 28, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504443 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504443 -01	Control-EFF-042625
504443 -02	Control-PORT3-042625
504443 -03	Control-PORT2-042625
504443 -04	Control-PORT1-042625
504443 -05	20ZVI-EFF-042625
504443 -06	20ZVI-PORT3-042625
504443 -07	20ZVI-PORT2-042625
504443 -08	20ZVI-PORT1-042625
504443 -09	50ZVI-EFF-042625
504443 -10	50ZVI-PORT3-042625
504443 -11	50ZVI-PORT2-042625
504443 -12	50ZVI-PORT1-042625
504443 -13	INFLUENT-042625
504443 -14	Control-EFF-042725
504443 -15	Control-PORT3-042725
504443 -16	Control-PORT2-042725
504443 -17	Control-PORT1-042725
504443 -18	20ZVI-EFF-042725
504443 -19	20ZVI-PORT3-042725
504443 -20	20ZVI-PORT2-042725
504443 -21	20ZVI-PORT1-042725
504443 -22	50ZVI-EFF-042725
504443 -23	50ZVI-PORT3-042725
504443 -24	50ZVI-PORT2-042725
504443 -25	50ZVI-PORT1-042725
504443 -26	INFLUENT-042725

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were PRINTINGHEREsent to Alliance Technical Group for testing. The report is enclosed.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-01 x5
Date Analyzed:	05/01/25	Data File:	504443-01 x5.246
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	310

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-01 x100
Date Analyzed:	05/02/25	Data File:	504443-01 x100.161
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	570

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-05 x100
Date Analyzed:	05/02/25	Data File:	504443-05 x100.162
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	790

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-05 x500
Date Analyzed:	05/01/25	Data File:	504443-05 x500.247
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	110,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-09 x100
Date Analyzed:	05/02/25	Data File:	504443-09 x100.163
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	330

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-09 x250
Date Analyzed:	05/01/25	Data File:	504443-09 x250.248
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	56,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-13 x100
Date Analyzed:	05/02/25	Data File:	504443-13 x100.164
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	150

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-14 x5
Date Analyzed:	05/01/25	Data File:	504443-14 x5.259
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	270

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-14 x100
Date Analyzed:	05/02/25	Data File:	504443-14 x100.173
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	600

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-18 x100
Date Analyzed:	05/02/25	Data File:	504443-18 x100.174
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	740

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-18 x500
Date Analyzed:	05/01/25	Data File:	504443-18 x500.260
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	120,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-22 x100
Date Analyzed:	05/02/25	Data File:	504443-22 x100.175
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	460

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-22 x500
Date Analyzed:	05/01/25	Data File:	504443-22 x500.261
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	80,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-26 x100
Date Analyzed:	05/02/25	Data File:	504443-26 x100.176
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	14,000
Manganese	150

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-358 mb
Date Analyzed:	04/28/25	Data File:	I5-358 mb.170
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-01 x2
Date Analyzed:	04/30/25	Data File:	504443-01 x2.320
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	300

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-01 x50
Date Analyzed:	04/30/25	Data File:	504443-01 x50.321
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	530

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-05 x400
Date Analyzed:	04/30/25	Data File:	504443-05 x400.322
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	88,000
Manganese	740

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-09 x100
Date Analyzed:	04/30/25	Data File:	504443-09 x100.324
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	350

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-09 x400
Date Analyzed:	04/30/25	Data File:	504443-09 x400.323
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	49,000

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-13 x100
Date Analyzed:	04/30/25	Data File:	504443-13 x100.325
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	13,000
Manganese	130

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-14 x2
Date Analyzed:	05/01/25	Data File:	504443-14 x2.330
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	270

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-14 x100
Date Analyzed:	04/30/25	Data File:	504443-14 x100.326
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	560

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-18 x500
Date Analyzed:	05/01/25	Data File:	504443-18 x500.331
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	120,000
Manganese	1,100

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-22 x100
Date Analyzed:	05/01/25	Data File:	504443-22 x100.333
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	440

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-22 x500
Date Analyzed:	05/01/25	Data File:	504443-22 x500.332
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	77,000

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	504443-26 x100
Date Analyzed:	05/01/25	Data File:	504443-26 x100.334
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	14,000
Manganese	140

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/28/25	Lab ID:	I5-352 mb
Date Analyzed:	04/28/25	Data File:	I5-352 mb.057
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Control-EFF-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504443-01 1/25
Date Analyzed:	04/30/25	Data File:	043007.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	174 d	22	158

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	710

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	INFLUENT-042625	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504443-13 1/25
Date Analyzed:	04/30/25	Data File:	043008.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	170 d	22	158

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	570

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	50ZVI-EFF-042725	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504443-22 1/0.5
Date Analyzed:	04/30/25	Data File:	043010.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	84	22	158

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	16

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/05	Lab ID:	05-1021 mb2 1/0.5
Date Analyzed:	04/29/25	Data File:	042909.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	61	22	158

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	<0.2

Date of Report: 05/06/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504443

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	84	88	80-120	5
Manganese	ug/L (ppb)	20	90	91	80-120	1

Date of Report: 05/06/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504443

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 504405-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	280	119 b	140 b	75-125	16 b
Manganese	ug/L (ppb)	20	169	52 b	59 b	75-125	13 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	88	80-120
Manganese	ug/L (ppb)	20	101	80-120

Date of Report: 05/06/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504443

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Pentachlorophenol	ug/L (ppb)	10	86	100	10-144	15

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504443 Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 04/28/25 C2/J4

Page # 1 of 3

Report To Delia Massey ; Marc Chalfant
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA, 98104
Phone 206-413-5407 Email delia.massey@aspectconsulting.com

SAMPLERS (signature): Emily Rusen
PROJECT NAME: Glacier Northwest
PO #: AS230667
REMARKS: Field filtered for T/D metals
Project specific RLs? - Yes / No
INVOICE TO: Please Invoice Through Coupa

TURNAROUND TIME
☐ Standard turnaround All metals
☒ RUSH 24hr-TAT - Analyses
Rush charges authorized by: See Email From Marc C.
As+Cu only rush per MC 04/28/25 ME

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM 2540C)	Salinity (SM 2520B)	Alkalinity (SM 2320B)	BTEX EPA 8021	Total Inorganic Carbon (SM 5310D)	Total Organic Carbon	Total As, Cu (6020B)	VOCs EPA 8260	Dissolved As+Cu (6020B)	PAHs EPA 8270	Brom. F, SO4 (EPA 300.0)	PCBs EPA 8082	Total Metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (6020B)	Dissolved Metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (6020B)	NO3 as N, NO2 as N, Orthophosphate as PO4 (EPA 300.0)	PCP (SM 6270E-SIM)	Notes
Control - EFF - 042625	01 A-E	4/26/25	0930	W	ER 5	X	X	X		X							X	X	X	X	X	RUSH TAT - All Samples for All metals Analyses
Control - PORT3 - 042625	02 A-B	↓	1135	↓	2							X	X									
Control - PORT2 - 042625	03 ↓		1155		2							X	X									
Control - PORT1 - 042625	04 ↓		1230		2							X	X									
202VI - EFF - 042625	05 A-D		0935		4	X	X	X	X							X	X	X	X			
202VI - ~~PORT3~~ - 042625	06 A-B		1055		2							X	X									
202VI - PORT2 - 042625	07 ↓		1200		2							X	X									
202VI - PORT1 - 042625	08 ↓		1235		2							X	X									labeled AP 4/28 202VI - PORT2 - 042625
502VI - EFF ~~- 02 ER~~ - 042625	09 A-D		0940		4	X	X	X	X							X	X	X	X			
502VI - PORT3 - 042625	10 A-B	↓	1100	↓	2							X	X									↓

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	Aspect	4/28/25	8:11
~~Received by:~~	Michael Erdahl	F&B m	4/28/25	8:11
Relinquished by:		Samples received at 2 oC		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504443

SAMPLE CHAIN OF CUSTODY

04/28/25 CR/JY

Andrew Yonkofski

Report To Delia Massey, Marc Crailsfort

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-5407 Email Delia.massey@aecosystems.com

SAMPLERS (*signature*): Emily Rosen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice using Coupa

Page # 1 of 3

TURNAROUND TIME

☐ Standard turnaround

☒ RUSH 24 hr - All samples for All Rush charges authorized by: metals analyses See Email from marc C.

SAMPLE DISPOSAL

☐ Archive samples

☐ Other

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM2540C(E)) NWTPH-Dx	Salinity (SM2690B) NWTPH-Gx	Alkalinity (SM2320B) BTEX EPA 8021	Total Organic Carbon (Lloyd Kahn) NWTPH-HCID	Total As+Cu 6020B VOCs EPA 8260	Dissolved As+Cu 6020B PAHs EPA 8270	Br, NO_3, PO_4, SO_4 (E300.0) PCBs EPA 8082	Total Metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) 6020B	Dissolved Metals (As, Ca, Fe, Mn, Mg, K, Na) (6020B)	NO_3 as N, NO_2 as N, Orthophosphate as PO_4 (SM4500)	pCP (SM8270E-SIM)	Notes
50ZVI-PORT2-042625	11 A-B	4/26/25	1205	W	2					X	X						RUSH TAT - FOR ALL SAMPLES ALL metal Analyses
50ZVI-PORT1-042625	12		1240		2					X	X						
INFLUENT-042625	13 A-E		1310		5	X	X	X	X			X	X	X	X	X	
Control-EFF-042725	14 A-D	4/27/25	0915		4	X	X	X	X			X	X	X	X		
Control-PORT3-042725	15 A-B		1145		2					X	X						
Control-PORT2-042725	16		1240		2					X	X						
Control-PORT1-042725	17		1325		2					X	X						
20ZVI-EFF-042725	18 A-D		0920		4	X	X	X	X			X	X	X	X		
20ZVI-PORT3-042725	19 A-B		1150		2					X	X						
20ZVI-PORT2-042725	20		1245		2					X	X						

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rosen	Emily Rosen	ASPECT	4/28/25	8:12
Received by	Michael Erdahl	F&B Inc	4/28/25	812.
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504443 Andrew Jenkofski

SAMPLE CHAIN OF CUSTODY

04/28/25 C2/J4

Page # 3 of 3

Report To Delia Massey Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone 206-413-5407 Email Delia.massey@Geosyntec.com

SAMPLERS (*signature*) Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME

☐ Standard turnaround

☒ RUSH 24hr - All Samples All Metals Analyses

Rush charges authorized by: See Email from Marc C.

SAMPLE DISPOSAL

☐ Archive samples

☐ Other _____

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM2540C) NWTPH-Dx (Diesel and Motor Oil)	Salinity (SM2520B) NWTPH-Gx	Alkalinity (SM2320B) BTEX EPA 8021	Total Organic Carbon (Combustion) NWTPH-HCID	Total Petroleum Hydrocarbons (Gravimetric)	Total As+Cu (6020B) VOCs EPA 8260	Dissolved As+Cu (6020B) PAHs EPA 8270	Br, Cl, F, SO4 (Ion Chromatography) PCBs EPA 8082	Total Metals: As, Ca, Fe, Mg, Mn, K, Na (6020B)	Dissolved Metals: As, Ca, Cu, Fe, Mg, Mn, K, Na (6020B)	NO3 as N, NO2 as N, Orthophosphate as PO4 (EPA 300.0)	PCP (SM 6420 B-2011)	Notes
20ZVI-PORT 1-042725	21 A-B	4/27/25	1330	W	2						X	X						RUSH TAT; All metals All samples
50ZVI-EFF-042725	22 A-E	↓	0925	↓	5	X	X	X	X				X	X	X	X	X	↓
50ZVI-PORT 3-042725	23 A-B		1200		2						X	X						
50ZVI-PORT 2-042725	24		1250		2						X	X						
50ZVI-PORT 1-042725	25 ↓		1335		2						X	X						
INFLUENT-042725	26 A-D	↓	1345	↓	4	X	X	X	X				X	X	X	X		↓

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	ASPECT	4/28/25	8:13
Received by:	Michael Eddl	FG Bruya	4/28/25	613
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504443 CLIENT Aspect INITIALS/ DATE: AP 4/28/25

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 2 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP Date: 4/28/25
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 1-2 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 504443,
Work Order Number: 2504662

May 05, 2025

Attention Michael Erdahl:

Alliance Technical Group, LLC - Seattle received 8 sample(s) on 4/28/2025 for the analyses presented in the following report.

Dissolved Metals by EPA 6020B
Ion Chromatography by EPA 300.0
Salinity by SM 2520B
Total Alkalinity by EPA 310.2
Total Dissolved Solids by SM 2540C
Total Metals by EPA 6020B
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Alliance Technical Group is committed to accuracy, speed, and customer service. Thank you for choosing Alliance Technical Group's Seattle laboratory team for your analytical needs. We appreciate this opportunity to serve you!

Sincerely,



Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Date: *05/05/2025*

CLIENT: Friedman & Bruya
Project: 504443
Work Order: 2504662

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2504662-001	Control-EFF-042625	04/26/2025 9:30 AM	04/28/2025 2:36 PM
2504662-002	20ZVI-EFF-042625	04/26/2025 9:35 AM	04/28/2025 2:36 PM
2504662-003	50ZVI-EFF-042625	04/26/2025 9:40 AM	04/28/2025 2:36 PM
2504662-004	INFLUENT-042625	04/26/2025 1:10 PM	04/28/2025 2:36 PM
2504662-005	Control-EFF-042725	04/27/2025 9:15 AM	04/28/2025 2:36 PM
2504662-006	20ZVI-EFF-042725	04/27/2025 9:20 AM	04/28/2025 2:36 PM
2504662-007	20ZVI-EFF-042725	04/27/2025 9:25 AM	04/28/2025 2:36 PM
2504662-008	INFLUENT-042725	04/27/2025 1:45 PM	04/28/2025 2:36 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2504662**

Date: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504443

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2504662**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-001 **Collection Date:** 4/26/2025 9:30:00 AM
Client Sample ID: **Control-EFF-042625** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.136	0.100		mg/L	1	4/29/2025 4:19:00 PM
Chloride	4.37	0.200		mg/L	1	4/29/2025 4:19:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 4:19:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 4:19:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 4:19:00 PM
Ortho-Phosphate (as P)	0.718	0.400	QH	mg/L	1	4/29/2025 4:19:00 PM
Sulfate	3.37	1.00		mg/L	1	4/29/2025 4:19:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (87%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	63,700	250		µg/L	1	5/5/2025 12:45:00 PM
Magnesium	5,900	50.0		µg/L	1	5/5/2025 12:45:00 PM
Potassium	3,950	50.0		µg/L	1	5/5/2025 12:45:00 PM
Sodium	15,300	100		µg/L	1	5/5/2025 12:45:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	70,100	1,200	D	µg/L	20	5/2/2025 11:14:00 AM
Magnesium	5,730	50.0		µg/L	1	4/29/2025 4:43:00 PM
Potassium	3,940	50.0		µg/L	1	4/29/2025 4:43:00 PM
Sodium	14,900	100		µg/L	1	4/29/2025 4:43:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	4.05	0.700		mg/L	1	5/1/2024 9:44:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	209	25.0	D	mg/L	10	5/2/2025 1:15:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99309		Analyst: BB
Total Dissolved Solids	215	5.00		mg/L	1	5/1/2025 8:31:00 AM

CLIENT: Friedman & Bruya
Project: 504443

Analytical Report

Work Order: **2504662**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-002 **Collection Date:** 4/26/2025 9:35:00 AM
Client Sample ID: **20ZVI-EFF-042625** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.137	0.100		mg/L	1	4/29/2025 4:42:00 PM
Chloride	4.54	0.200		mg/L	1	4/29/2025 4:42:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 4:42:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 4:42:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 4:42:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 4:42:00 PM
Sulfate	3.69	1.00		mg/L	1	4/29/2025 4:42:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (87%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	61,800	250		µg/L	1	5/5/2025 12:54:00 PM
Magnesium	5,230	50.0		µg/L	1	5/5/2025 12:54:00 PM
Potassium	3,720	50.0		µg/L	1	5/5/2025 12:54:00 PM
Sodium	15,200	100		µg/L	1	5/5/2025 12:54:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	70,400	1,200	D	µg/L	20	5/2/2025 11:17:00 AM
Magnesium	5,180	50.0		µg/L	1	4/29/2025 4:46:00 PM
Potassium	3,720	50.0		µg/L	1	4/29/2025 4:46:00 PM
Sodium	14,800	100		µg/L	1	4/29/2025 4:46:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	3.11	0.700		mg/L	1	5/1/2024 10:05:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	109	25.0	D	mg/L	10	5/2/2025 1:18:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	254	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504443

Analytical Report

Work Order: **2504662**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-003 **Collection Date:** 4/26/2025 9:40:00 AM
Client Sample ID: **50ZVI-EFF-042625** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.114	0.100		mg/L	1	4/29/2025 5:52:00 PM
Chloride	4.68	0.200		mg/L	1	4/29/2025 5:52:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 5:52:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 5:52:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 5:52:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 5:52:00 PM
Sulfate	3.12	1.00		mg/L	1	4/29/2025 5:52:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	61,700	250		µg/L	1	5/5/2025 12:58:00 PM
Magnesium	5,510	50.0		µg/L	1	5/5/2025 12:58:00 PM
Potassium	3,930	50.0		µg/L	1	5/5/2025 12:58:00 PM
Sodium	15,700	100		µg/L	1	5/5/2025 12:58:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	68,500	1,200	D	µg/L	20	5/2/2025 11:21:00 AM
Magnesium	5,310	50.0		µg/L	1	4/29/2025 4:50:00 PM
Potassium	3,880	50.0		µg/L	1	4/29/2025 4:50:00 PM
Sodium	15,200	100		µg/L	1	4/29/2025 4:50:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	1.89	0.700		mg/L	1	5/1/2024 11:26:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	94.8	25.0	D	mg/L	10	5/2/2025 1:20:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	216	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504443

Analytical Report

Work Order: **2504662**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-004 **Collection Date:** 4/26/2025 1:10:00 PM
Client Sample ID: **INFLUENT-042625** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.171	0.100		mg/L	1	4/29/2025 6:15:00 PM
Chloride	3.66	0.200		mg/L	1	4/29/2025 6:15:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 6:15:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 6:15:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 6:15:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 6:15:00 PM
Sulfate	3.92	1.00		mg/L	1	4/29/2025 6:15:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	68,600	250		µg/L	1	5/5/2025 1:01:00 PM
Magnesium	4,310	50.0		µg/L	1	5/5/2025 1:01:00 PM
Potassium	3,590	50.0		µg/L	1	5/5/2025 1:01:00 PM
Sodium	13,300	100		µg/L	1	5/5/2025 1:01:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	70,800	120		µg/L	1	4/29/2025 4:53:00 PM
Magnesium	4,160	100		µg/L	1	4/29/2025 4:53:00 PM
Potassium	3,530	100		µg/L	1	4/29/2025 4:53:00 PM
Sodium	12,800	200		µg/L	1	4/29/2025 4:53:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	4.98	0.700		mg/L	1	5/2/2024 12:06:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	185	25.0	D	mg/L	10	5/2/2025 1:22:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	286	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504443

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-005 **Collection Date:** 4/27/2025 9:15:00 AM
Client Sample ID: **Control-EFF-042725** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.142	0.100		mg/L	1	4/29/2025 6:38:00 PM
Chloride	4.51	0.200		mg/L	1	4/29/2025 6:38:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 6:38:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 6:38:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 6:38:00 PM
Ortho-Phosphate (as P)	0.641	0.400	QH	mg/L	1	4/29/2025 6:38:00 PM
Sulfate	3.53	1.00		mg/L	1	4/29/2025 6:38:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	64,800	250		µg/L	1	5/5/2025 1:04:00 PM
Magnesium	5,740	50.0		µg/L	1	5/5/2025 1:04:00 PM
Potassium	3,830	50.0		µg/L	1	5/5/2025 1:04:00 PM
Sodium	14,900	100		µg/L	1	5/5/2025 1:04:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	70,600	120		µg/L	1	4/29/2025 4:56:00 PM
Magnesium	5,890	100		µg/L	1	4/29/2025 4:56:00 PM
Potassium	4,070	100		µg/L	1	4/29/2025 4:56:00 PM
Sodium	15,300	200		µg/L	1	4/29/2025 4:56:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	4.27	0.700		mg/L	1	5/2/2024 12:28:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	250	25.0	D	mg/L	10	5/2/2025 1:24:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	276	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504443

Analytical Report

Work Order: **2504662**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-006 **Collection Date:** 4/27/2025 9:20:00 AM
Client Sample ID: **20ZVI-EFF-042725** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.141	0.100		mg/L	1	4/29/2025 7:01:00 PM
Chloride	4.65	0.200		mg/L	1	4/29/2025 7:01:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 7:01:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 7:01:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 7:01:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 7:01:00 PM
Sulfate	3.87	1.00		mg/L	1	4/29/2025 7:01:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	62,300	250		µg/L	1	5/5/2025 1:07:00 PM
Magnesium	5,260	50.0		µg/L	1	5/5/2025 1:07:00 PM
Potassium	3,600	50.0		µg/L	1	5/5/2025 1:07:00 PM
Sodium	15,100	100		µg/L	1	5/5/2025 1:07:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	70,000	1,200	D	µg/L	20	5/2/2025 11:24:00 AM
Magnesium	5,060	50.0		µg/L	1	4/29/2025 4:59:00 PM
Potassium	3,580	50.0		µg/L	1	4/29/2025 4:59:00 PM
Sodium	14,600	100		µg/L	1	4/29/2025 4:59:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	3.86	0.700		mg/L	1	5/2/2024 12:49:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	199	25.0	D	mg/L	10	5/2/2025 1:29:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	222	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504443

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-007 **Collection Date:** 4/27/2025 9:25:00 AM
Client Sample ID: **20ZVI-EFF-042725** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.127	0.100		mg/L	1	4/29/2025 7:24:00 PM
Chloride	4.74	0.200		mg/L	1	4/29/2025 7:24:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 7:24:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 7:24:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 7:24:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 7:24:00 PM
Sulfate	3.18	1.00		mg/L	1	4/29/2025 7:24:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	62,000	250		µg/L	1	5/5/2025 1:10:00 PM
Magnesium	5,240	50.0		µg/L	1	5/5/2025 1:10:00 PM
Potassium	3,740	50.0		µg/L	1	5/5/2025 1:10:00 PM
Sodium	15,200	100		µg/L	1	5/5/2025 1:10:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	70,300	1,200	D	µg/L	20	5/2/2025 11:27:00 AM
Magnesium	5,210	50.0		µg/L	1	4/29/2025 5:09:00 PM
Potassium	3,710	50.0		µg/L	1	4/29/2025 5:09:00 PM
Sodium	15,000	100		µg/L	1	4/29/2025 5:09:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	2.73	0.700		mg/L	1	5/2/2024 1:20:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	181	25.0	D	mg/L	10	5/2/2025 1:32:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	286	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504443

CLIENT: Friedman & Bruya
Project: 504443

Lab ID: 2504662-008 **Collection Date:** 4/27/2025 1:45:00 PM
Client Sample ID: **INFLUENT-042725** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.168	0.100		mg/L	1	4/29/2025 7:47:00 PM
Chloride	3.86	0.200		mg/L	1	4/29/2025 7:47:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	4/29/2025 7:47:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 7:47:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	4/29/2025 7:47:00 PM
Ortho-Phosphate (as P)	ND	0.400	QH	mg/L	1	4/29/2025 7:47:00 PM
Sulfate	3.91	1.00		mg/L	1	4/29/2025 7:47:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	67,500	250		µg/L	1	5/5/2025 1:13:00 PM
Magnesium	4,450	50.0		µg/L	1	5/5/2025 1:13:00 PM
Potassium	3,660	50.0		µg/L	1	5/5/2025 1:13:00 PM
Sodium	13,300	100		µg/L	1	5/5/2025 1:13:00 PM
Total Metals by EPA 6020B				Batch ID: 47533		Analyst: ME
Calcium	73,800	1,200	D	µg/L	20	5/2/2025 11:30:00 AM
Magnesium	4,180	50.0		µg/L	1	4/29/2025 5:12:00 PM
Potassium	3,500	50.0		µg/L	1	4/29/2025 5:12:00 PM
Sodium	12,500	100		µg/L	1	4/29/2025 5:12:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	5.24	0.700		mg/L	1	5/2/2024 1:39:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99477		Analyst: NR
Alkalinity, Total (As CaCO3)	235	25.0	D	mg/L	10	5/2/2025 1:34:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	278	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504443

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **MB-99477**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **MBLKW**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2071986**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-99477**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **LCSW**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2071987**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	25.7	2.50	25.00	0	103	79.4	136				

Sample ID: **2504662-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **Control-EFF-042625**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2071991**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	217	25.0						209.0	3.86	20	D

Sample ID: **2504663-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99477**
Client ID: **BATCH**	Batch ID: **R99477**		Analysis Date: **5/2/2025**	SeqNo: **2072002**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	231	25.0						231.0	0	20	D

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-47545** SampType: **MBLK** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **MBLKW** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071891**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	ND	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	ND	0.200									
Ortho-Phosphate (as P)	ND	0.400									Q
Sulfate	ND	1.00									

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **LCS-47545** SampType: **LCS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **LCSW** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071892**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.481	0.100	0.5000	0	96.2	90	110				
Chloride	0.751	0.200	0.7500	0	100	90	110				
Nitrite (as N)	0.706	0.200	0.7500	0	94.1	90	110				
Bromide	2.47	0.600	2.500	0	98.6	90	110				
Nitrate (as N)	0.749	0.200	0.7500	0	99.9	90	110				
Ortho-Phosphate (as P)	1.14	0.400	1.250	0	91.5	90	110				
Sulfate	3.59	1.00	3.750	0	95.7	90	110				

Sample ID: **2504657-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100						0		20	
Chloride	4.60	0.200						4.604	0.174	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	ND	0.200						0		20	
Ortho-Phosphate (as P)	ND	0.400						0		20	Q

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504657-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	18.5	1.00						18.56	0.0701	20	

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **2504657-001CMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071895**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.563	0.100	0.5000	0.07900	96.8	80	120				
Chloride	5.34	0.200	0.7500	4.604	98.5	80	120				
Nitrite (as N)	0.735	0.200	0.7500	0	98.0	80	120				
Bromide	2.52	0.600	2.500	0	101	80	120				
Nitrate (as N)	0.791	0.200	0.7500	0	105	80	120				
Ortho-Phosphate (as P)	0.952	0.400	1.250	0	76.2	80	120				S
Sulfate	22.3	1.00	3.750	18.56	100	80	120				

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed and recovered within range.

Sample ID: **2504657-001CMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071896**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.568	0.100	0.5000	0.07900	97.8	80	120	0.5630	0.884	20	
Chloride	5.35	0.200	0.7500	4.604	99.1	80	120	5.343	0.0748	20	
Nitrite (as N)	0.738	0.200	0.7500	0	98.4	80	120	0.7350	0.407	20	
Bromide	2.54	0.600	2.500	0	102	80	120	2.515	1.07	20	
Nitrate (as N)	0.799	0.200	0.7500	0	107	80	120	0.7910	1.01	20	
Ortho-Phosphate (as P)	1.08	0.400	1.250	0	86.8	80	120	0.9520	13.1	20	
Sulfate	22.3	1.00	3.750	18.56	101	80	120	22.30	0.179	20	

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504658-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071898**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100						0		20	
Chloride	3.57	0.200						3.568	0.140	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	1.11	0.200						1.111	0.0900	20	
Ortho-Phosphate (as P)	ND	0.400						0		20	Q
Sulfate	9.44	1.00						9.438	0.0741	20	

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **2504658-001CMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071899**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.426	0.100	0.5000	0.05200	74.8	80	120				S
Chloride	3.57	0.200	0.7500	3.568	0.800	80	120				S
Nitrite (as N)	0.594	0.200	0.7500	0	79.2	80	120				S
Bromide	2.03	0.600	2.500	0	81.3	80	120				
Nitrate (as N)	1.57	0.200	0.7500	1.111	60.8	80	120				S
Ortho-Phosphate (as P)	0.676	0.400	1.250	0	54.1	80	120				S
Sulfate	10.7	1.00	3.750	9.438	34.1	80	120				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Salinity by SM 2520B

Sample ID: **MB-R99486**	SampType: **MBLK**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **MBLKW**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072324**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100									

Sample ID: **LCS-R99486**	SampType: **LCS**	Units: **µS/cm**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **LCSW**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072325**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	986	0.00100	1,000	0	98.6	79.1	119.1				

Sample ID: **2504661-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **BATCH**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072327**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Sample ID: **2504662-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **Control-EFF-042625**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072332**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99309**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **MBLKW**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068483**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99309**	SampType: **LCS**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **LCSW**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068484**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	296	5.00	300.0	0	98.7	65	135				

Sample ID: **2504593-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **BATCH**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068486**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	240	5.00						210.0	13.3	30	

Sample ID: **2504605-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **4/29/2025**	RunNo: **99309**
Client ID: **BATCH**	Batch ID: **R99309**		Analysis Date: **4/29/2025**	SeqNo: **2068493**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	8,850	5.00						8,320	6.17	30	

Sample ID: **2504618-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99309**
Client ID: **BATCH**	Batch ID: **R99309**		Analysis Date: **5/1/2025**	SeqNo: **2071394**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	80.0	5.00						330.0	122	30	R

NOTES:
R - High RPD observed.

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99442**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **MBLKW**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071396**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99442**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **LCSW**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071397**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	304	5.00	300.0	0	101	65	135				

Sample ID: **2504658-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **BATCH**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071399**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	97.0	5.00						89.00	8.60	30	

Sample ID: **2504662-003ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **50ZVI-EFF-042625**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071406**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	232	5.00						216.0	7.14	30	

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB** SampType: **MBLK** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **MBLKW** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071074**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS** SampType: **LCS** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **LCSW** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071075**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	21.7	0.700	25.00	0	86.6	79.6	120				

Sample ID: **2504661-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **BATCH** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071077**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.93	0.700						3.953	0.533	15	

Sample ID: **2504662-003BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **50ZVI-EFF-042625** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071086**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.0	0.700	25.00	1.890	84.5	85	115				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Sample ID: **2504663-003BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/2/2024** RunNo: **99428**
Client ID: **BATCH** Batch ID: **R99428** Analysis Date: **5/2/2024** SeqNo: **2071094**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.7	0.700	25.00	2.430	85.0	85	115				

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2504663-003BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/2/2024** RunNo: **99428**
Client ID: **BATCH** Batch ID: **R99428** Analysis Date: **5/2/2024** SeqNo: **2071097**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.6	0.700	25.00	2.430	84.5	85	115	23.68	0.525	15	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed and recovered within range.

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **MB-47613** SampType: **MBLK** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **MBLKW** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072269**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47613** SampType: **LCS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **LCSW** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072270**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	936	250	1,000	0	93.6	80	120				
Magnesium	1,000	50.0	1,000	0	100	80	120				
Potassium	981	50.0	1,000	0	98.1	80	120				
Sodium	1,010	100	1,000	0	101	80	120				

Sample ID: **2504661-001DMS** SampType: **MS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **BATCH** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072272**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	61,100	250	1,000	62,530	-145	75	125				S
Magnesium	6,310	50.0	1,000	5,559	75.1	75	125				
Potassium	4,670	50.0	1,000	3,892	77.8	75	125				
Sodium	15,600	100	1,000	15,220	43.0	75	125				S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504661-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **BATCH** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072274**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	60,500	250	1,000	62,530	-205	75	125	61,080	0.984	20	S
Magnesium	6,280	50.0	1,000	5,559	72.1	75	125	6,310	0.478	20	S

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **2504661-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **BATCH** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072274**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	4,670	50.0	1,000	3,892	77.6	75	125	4,669	0.0338	20	
Sodium	15,400	100	1,000	15,220	13.7	75	125	15,650	1.88	20	S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **MB-47533** SampType: **MBLK** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **MBLKW** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069259**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	60.0									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47533** SampType: **LCS** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **LCSW** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069260**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,020	60.0	1,000	0	102	80	120				
Magnesium	1,020	50.0	1,000	0	102	80	120				
Potassium	1,010	50.0	1,000	0	101	80	120				
Sodium	1,020	100	1,000	0	102	80	120				

Sample ID: **2504624-003DMS** SampType: **MS** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **BATCH** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069262**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	19,300	60.0	1,000	18,050	126	75	125				SE
Magnesium	2,550	50.0	1,000	1,522	103	75	125				
Potassium	7,130	50.0	1,000	6,038	109	75	125				E
Sodium	13,000	100	1,000	11,820	121	75	125				E

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504624-003DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **BATCH** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069264**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	19,400	60.0	1,000	18,050	139	75	125	19,310	0.669	20	SE
Magnesium	2,560	50.0	1,000	1,522	104	75	125	2,550	0.477	20	

Work Order: 2504662
CLIENT: Friedman & Bruya
Project: 504443

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **2504624-003DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/29/2025** RunNo: **99350**
Client ID: **BATCH** Batch ID: **47533** Analysis Date: **4/29/2025** SeqNo: **2069264**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	7,170	50.0	1,000	6,038	113	75	125	7,132	0.482	20	E
Sodium	13,000	100	1,000	11,820	123	75	125	13,030	0.129	20	E

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2504662
Logged by:	Morgan Wilson	Date Received:	4/28/2025 2:36:00 PM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☐	No ☑	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified:	Michael Erdahl	Date:	4/28/2025
By Whom:	Morgan Wilson	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Anions Hold Time		
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp °C
Sample	4.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
ATG

PROJECT NAME/NO.	PO #
504443	F-202

REMARKS
Aspect EDD
Limited Volume—Use project
RLS
2504662

TURNAROUND TIME
☒ Standard TAT All Std TAT MS 4/28/25
☒ ~~RUSH T/D Cations 24 hr TAT~~
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Anions	Alkalinity	TOC	TDS	Salinity	Total Cations (Mg, K, Na, Ca)	Dissolved Cations (Mg, K, Na, Ca)				Notes
Control-EFF-042625		4/26/2025	930	water	4	x	x	x	x	x	x	x				anions=Br, Cl, F,
20ZVI-EFF-042625		4/26/2025	935	water	4	x	x	x	x	x	x	x				SO4, NO2, NO3,
50ZVI-EFF-042625		4/26/2025	940	water	4	x	x	x	x	x	x	x				PO4
INFLUENT-042625		4/26/2025	1310	water	4	x	x	x	x	x	x	x				
Control-EFF-042725		4/27/2025	915	water	4	x	x	x	x	x	x	x				
20ZVI-EFF-042725		4/27/2025	920	water	4	x	x	x	x	x	x	x				
20ZVI-EFF-042725		4/27/2025	925	water	4	x	x	x	x	x	x	x				
INFLUENT-042725		4/27/2025	1345	water	4	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	4/28/25	0926
Received by:		Jack Hawthorne		4/28/25	1436
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 7, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the additional results from the testing of material submitted on April 28, 2025 from the Glacier Northwest AS230067, F&BI 504455 project. There are 19 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkofski, Marc Chalfant
ASP0507R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 28, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504455 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504455 -01	Control-EFF-042825
504455 -02	Control-Port3-042825
504455 -03	Control-Port2-042825
504455 -04	Control-Port1-042825
504455 -05	20ZVI-EFF-042825
504455 -06	20ZVI-Port3-042825
504455 -07	20ZVI-Port2-042825
504455 -08	20ZVI-Port1-042825
504455 -09	50ZVI-EFF-042825
504455 -10	50ZVI-Port3-042825
504455 -11	50ZVI-Port2-042825
504455 -12	50ZVI-Port1-042825
504455 -13	Influent-042825

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report will be forwarded upon receipt.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-01 x5
Date Analyzed:	04/29/25	Data File:	504455-01 x5.149
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	610

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-01 x100
Date Analyzed:	04/30/25	Data File:	504455-01 x100.308
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	830

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-05 x100
Date Analyzed:	05/05/25	Data File:	504455-05 x100.149
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	730

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-05 x1000
Date Analyzed:	05/01/25	Data File:	504455-05 x1000.322
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	130,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-09 x500
Date Analyzed:	04/30/25	Data File:	504455-09 x500.310
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	540

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-09 x500
Date Analyzed:	05/01/25	Data File:	504455-09 x500.323
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	95,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Influent-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-13 x100
Date Analyzed:	04/30/25	Data File:	504455-13 x100.312
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	140

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Influent-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-13 x100
Date Analyzed:	05/01/25	Data File:	504455-13 x100.324
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	I5-351 mb2
Date Analyzed:	04/29/25	Data File:	I5-351 mb2.284
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-01 x2
Date Analyzed:	05/02/25	Data File:	504455-01 x2.203
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	330

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-01 x100
Date Analyzed:	05/02/25	Data File:	504455-01 x100.202
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	680

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-05 x500
Date Analyzed:	05/02/25	Data File:	504455-05 x500.204
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	110,000
Manganese	1,000

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-09 x500
Date Analyzed:	05/02/25	Data File:	504455-09 x500.205
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	86,000
Manganese	660

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Influent-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-13 x100
Date Analyzed:	05/02/25	Data File:	504455-13 x100.216
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	14,000
Manganese	150

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	I5-359 mb2
Date Analyzed:	04/29/25	Data File:	I5-359 mb2.260
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Date of Report: 05/07/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504455

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 504402-01 x20 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	24,100	3440 b	1340 b	75-125	88 b
Manganese	ug/L (ppb)	20	327	334 b	186 b	75-125	57 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	96	80-120
Manganese	ug/L (ppb)	20	104	80-120

Date of Report: 05/07/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504455

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	96	94	80-120	2
Manganese	ug/L (ppb)	20	99	98	80-120	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504455 Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 04/28/25 JJ

Page # 1 of 2

Report To Delia Massey, marchantant

Company ASpect Consulting

Address 710 2nd Ave Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-5407 Email Delia.Massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
- ☐ Standard turnaround
- ☒ RUSH 24-hr - only As and Cu results (All samples)

Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM 2540C)	Salinity (SM 2520B)	Alkalinity (SM 2320B)	BTEX EPA 8021	Methanol (SM 6200B)	Total Metals (EPA 6020B)	VOCs EPA 8260	Dissolved Metals (EPA 6020B)	PAHs EPA 8270	Br, Cl, F, SO4 (EPA 300.0)	PCBs EPA 8082	Total Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (SW 6020B)	Dissolved Metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (SW 6020B)	NO3 as N, NO2 as N, ortho-Phosphate as PO4 (EPA 300.0)		Notes
Control-EFF-042825	01 A-D	4/28/25	0930	W	4	X	X	X	X						X	X	X	X	X		RUSH TAT for As and Cu Results for All Samples
Control-PORT3-042825	02 A-B	↓	1040	↓	2						X	X									
Control-PORT2-042825	03 ↓		1140		2						X	X									
Control-PORT1-042825	04 ↓		1230		2						X	X									
20ZVI-EFF-042825	05 A-D		0935		4	X	X	X	X						X	X	X	X	X		
20ZVI-PORT3-042825	06 A-B		1045		2						X	X									
20ZVI-PORT2-042825	07 ↓		1145		2						X	X									
20ZVI-PORT1-042825	08 ↓		1235		2						X	X									
50ZVI-EFF-042825	09 A-D		0940		4	X	X	X	X						X	X	X	X	X		
50ZVI-PORT3-042825	10 A-B	↓	1050	↓	2						X	X									↓

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	4/28/25	14:50
Received by: Nhan Phan	Nhan Phan	FeBI	4/28/25	1452
Relinquished by:				
Received by:		Samples received at 4 °C		

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504455 Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 04/28/25 J3

Page # 2 of 2

Report To Delia Massey, Marc Chalfant
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-9407 Email Ent Delia.massey@Geosyntec.com

SAMPLERS (signature) Emily Rusen
PROJECT NAME Glacier Northwest
PO # AS230067
REMARKS Field Filtered for T/D metals
Project specific RLs? - Yes / No
INVOICE TO Please Invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr - Only As and Cu results (All Samples)
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	(SM2540C(E)) Total Dissolved Solids - NWTPH-Dx	Turbidity (SM2130B) NWTPH-Gx	Alkalinity (SM2320B) BTEX EPA 8021	Total Organic Carbon (SM5310B) NWTPH-HCID	Total As + Cu (1020B) VOCs EPA 8260	Dissolved As + Cu (1020B) PAHs EPA 8270	Br, Cl, F, SO4 (EPA 300.0) PCBs EPA 8082	Total Metals (As, Ca, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Cu, Fe, Mg, Mn, K, Na) (6020B)	NO3 as N, NO2 as N (EPA 300.0) Organophosphates Diss.:		Notes
SOZVI-PORT2-042825	11 A-B	4/28/25	1150	W	2					X	X						RUSH TAT for As and Cu results for ALL SAMPLES
SOZVI-PORT 1-042825	12	↓	1240	↓	2					X	X						↓
INFLUENT-042825	13 A-D	↓	1305	↓	4	X	X	X	X			X	X	X	X		↓

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	4/28/25	14:50
Received by: Nhan Phan	Nhan Phan	FEBI	4/28/25	1450
Relinquished by:				
Received by:		Samples received at 4 °C		

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504455 CLIENT Aspect INITIALS/DATE: NA 04/28/25

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP
*or other representative documents, letters, and/or shipping memos Date: 4/28/25

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 504455,
Work Order Number: 2504661

May 05, 2025

Attention Michael Erdahl:

Alliance Technical Group, LLC - Seattle received 4 sample(s) on 4/28/2025 for the analyses presented in the following report.

Dissolved Metals by EPA 6020B
Ion Chromatography by EPA 300.0
Salinity by SM 2520B
Total Alkalinity by EPA 310.2
Total Dissolved Solids by SM 2540C
Total Metals by EPA 6020B
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Alliance Technical Group is committed to accuracy, speed, and customer service. Thank you for choosing Alliance Technical Group's Seattle laboratory team for your analytical needs. We appreciate this opportunity to serve you!

Sincerely,

Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Date: *05/05/2025*

CLIENT: Friedman & Bruya
Project: 504455
Work Order: 2504661

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2504661-001	Control-EFF-042825	04/28/2025 9:30 AM	04/28/2025 3:39 PM
2504661-002	20ZVI-EFF-042825	04/28/2025 9:35 AM	04/28/2025 3:39 PM
2504661-003	50ZVI-EFF-042825	04/28/2025 9:40 AM	04/28/2025 3:39 PM
2504661-004	INFLUENT-042825	04/28/2025 1:05 PM	04/28/2025 3:39 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2504661**

Date: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504455

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2504661**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504455

Lab ID: 2504661-001 **Collection Date:** 4/28/2025 9:30:00 AM
Client Sample ID: **Control-EFF-042825** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.157	0.100		mg/L	1	4/29/2025 10:29:00 PM
Chloride	4.30	0.200		mg/L	1	4/29/2025 10:29:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/29/2025 10:29:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 10:29:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/29/2025 10:29:00 PM
Ortho-Phosphate (as P)	0.766	0.400	Q	mg/L	1	4/29/2025 10:29:00 PM
Sulfate	3.94	1.00		mg/L	1	4/29/2025 10:29:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	62,500	250		µg/L	1	5/5/2025 12:23:00 PM
Magnesium	5,560	50.0		µg/L	1	5/5/2025 12:23:00 PM
Potassium	3,890	50.0		µg/L	1	5/5/2025 12:23:00 PM
Sodium	15,200	100		µg/L	1	5/5/2025 12:23:00 PM
Total Metals by EPA 6020B				Batch ID: 47553		Analyst: ME
Calcium	66,700	2,500	D	µg/L	10	5/5/2025 11:23:00 AM
Magnesium	5,450	500	D	µg/L	10	5/5/2025 11:23:00 AM
Potassium	3,870	500	D	µg/L	10	5/5/2025 11:23:00 AM
Sodium	14,900	1,000	D	µg/L	10	5/5/2025 11:23:00 AM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	3.95	0.700		mg/L	1	5/1/2024 7:57:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	250	25.0	D	mg/L	10	5/1/2025 1:37:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	238	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504455

Analytical Report

Work Order: **2504661**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504455

Lab ID: 2504661-002 **Collection Date:** 4/28/2025 9:35:00 AM
Client Sample ID: **20ZVI-EFF-042825** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.167	0.100		mg/L	1	4/29/2025 10:52:00 PM
Chloride	4.35	0.200		mg/L	1	4/29/2025 10:52:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/29/2025 10:52:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 10:52:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/29/2025 10:52:00 PM
Ortho-Phosphate (as P)	ND	0.400	Q	mg/L	1	4/29/2025 10:52:00 PM
Sulfate	4.29	1.00		mg/L	1	4/29/2025 10:52:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	59,200	250		µg/L	1	5/5/2025 12:36:00 PM
Magnesium	5,180	50.0		µg/L	1	5/5/2025 12:36:00 PM
Potassium	3,830	50.0		µg/L	1	5/5/2025 12:36:00 PM
Sodium	15,100	100		µg/L	1	5/5/2025 12:36:00 PM
Total Metals by EPA 6020B				Batch ID: 47553		Analyst: ME
Calcium	65,000	2,500	D	µg/L	10	5/5/2025 11:26:00 AM
Magnesium	5,250	500	D	µg/L	10	5/5/2025 11:26:00 AM
Potassium	3,880	500	D	µg/L	10	5/5/2025 11:26:00 AM
Sodium	15,100	1,000	D	µg/L	10	5/5/2025 11:26:00 AM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	3.64	0.700		mg/L	1	5/1/2024 8:40:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	193	25.0	D	mg/L	10	5/1/2025 1:39:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	228	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504455

Analytical Report

Work Order: **2504661**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504455

Lab ID: 2504661-003 **Collection Date:** 4/28/2025 9:40:00 AM
Client Sample ID: **50ZVI-EFF-042825** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.140	0.100		mg/L	1	4/29/2025 11:15:00 PM
Chloride	4.56	0.200		mg/L	1	4/29/2025 11:15:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/29/2025 11:15:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 11:15:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/29/2025 11:15:00 PM
Ortho-Phosphate (as P)	ND	0.400	Q	mg/L	1	4/29/2025 11:15:00 PM
Sulfate	3.33	1.00		mg/L	1	4/29/2025 11:15:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	60,800	250		µg/L	1	5/5/2025 12:39:00 PM
Magnesium	5,190	50.0		µg/L	1	5/5/2025 12:39:00 PM
Potassium	3,890	50.0		µg/L	1	5/5/2025 12:39:00 PM
Sodium	15,700	100		µg/L	1	5/5/2025 12:39:00 PM
Total Metals by EPA 6020B				Batch ID: 47553		Analyst: ME
Calcium	65,700	2,500	D	µg/L	10	5/5/2025 11:29:00 AM
Magnesium	5,130	500	D	µg/L	10	5/5/2025 11:29:00 AM
Potassium	3,930	500	D	µg/L	10	5/5/2025 11:29:00 AM
Sodium	15,600	1,000	D	µg/L	10	5/5/2025 11:29:00 AM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	2.99	0.700		mg/L	1	5/1/2024 9:01:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	186	25.0	D	mg/L	10	5/1/2025 1:41:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	316	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504455

Analytical Report

Work Order: **2504661**
Date Reported: **5/5/2025**

CLIENT: Friedman & Bruya
Project: 504455

Lab ID: 2504661-004 **Collection Date:** 4/28/2025 1:05:00 PM
Client Sample ID: **INFLUENT-042825** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47545		Analyst: OP
Fluoride	0.171	0.100		mg/L	1	4/29/2025 11:38:00 PM
Chloride	3.50	0.200		mg/L	1	4/29/2025 11:38:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	4/29/2025 11:38:00 PM
Bromide	ND	0.600		mg/L	1	4/29/2025 11:38:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	4/29/2025 11:38:00 PM
Ortho-Phosphate (as P)	ND	0.400	Q	mg/L	1	4/29/2025 11:38:00 PM
Sulfate	4.06	1.00		mg/L	1	4/29/2025 11:38:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (81%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47613		Analyst: ME
Calcium	68,100	250		µg/L	1	5/5/2025 12:42:00 PM
Magnesium	4,300	50.0		µg/L	1	5/5/2025 12:42:00 PM
Potassium	3,510	50.0		µg/L	1	5/5/2025 12:42:00 PM
Sodium	12,800	100		µg/L	1	5/5/2025 12:42:00 PM
Total Metals by EPA 6020B				Batch ID: 47553		Analyst: ME
Calcium	73,400	2,500	D	µg/L	10	5/5/2025 11:32:00 AM
Magnesium	4,270	500	D	µg/L	10	5/5/2025 11:32:00 AM
Potassium	3,610	500	D	µg/L	10	5/5/2025 11:32:00 AM
Sodium	13,000	1,000	D	µg/L	10	5/5/2025 11:32:00 AM
Total Organic Carbon by SM 5310C				Batch ID: R99428		Analyst: SS
Total Organic Carbon	4.81	0.700		mg/L	1	5/1/2024 9:23:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99418		Analyst: NR
Alkalinity, Total (As CaCO3)	257	25.0	D	mg/L	10	5/1/2025 1:43:00 PM
Salinity by SM 2520B				Batch ID: R99486		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/5/2025 3:11:21 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99442		Analyst: BB
Total Dissolved Solids	272	5.00		mg/L	1	5/2/2025 12:27:54 PM

CLIENT: Friedman & Bruya
Project: 504455

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **MB-99418**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **MBLKW**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070709**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-99418**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **LCSW**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070710**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	30.3	2.50	25.00	0	121	79.4	136				

Sample ID: **2504661-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/1/2025**	RunNo: **99418**
Client ID: **Control-EFF-042825**	Batch ID: **R99418**		Analysis Date: **5/1/2025**	SeqNo: **2070909**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	244	25.0						250.1	2.59	20	D

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-47545** SampType: **MBLK** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **MBLKW** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071891**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	ND	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	ND	0.200									
Ortho-Phosphate (as P)	ND	0.400									Q
Sulfate	ND	1.00									

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **LCS-47545** SampType: **LCS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **LCSW** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071892**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.481	0.100	0.5000	0	96.2	90	110				
Chloride	0.751	0.200	0.7500	0	100	90	110				
Nitrite (as N)	0.706	0.200	0.7500	0	94.1	90	110				
Bromide	2.47	0.600	2.500	0	98.6	90	110				
Nitrate (as N)	0.749	0.200	0.7500	0	99.9	90	110				
Ortho-Phosphate (as P)	1.14	0.400	1.250	0	91.5	90	110				
Sulfate	3.59	1.00	3.750	0	95.7	90	110				

Sample ID: **2504657-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100						0		20	
Chloride	4.60	0.200						4.604	0.174	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	ND	0.200						0		20	
Ortho-Phosphate (as P)	ND	0.400						0		20	Q

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504657-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	18.5	1.00						18.56	0.0701	20	

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **2504657-001CMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071895**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.563	0.100	0.5000	0.07900	96.8	80	120				
Chloride	5.34	0.200	0.7500	4.604	98.5	80	120				
Nitrite (as N)	0.735	0.200	0.7500	0	98.0	80	120				
Bromide	2.52	0.600	2.500	0	101	80	120				
Nitrate (as N)	0.791	0.200	0.7500	0	105	80	120				
Ortho-Phosphate (as P)	0.952	0.400	1.250	0	76.2	80	120				S
Sulfate	22.3	1.00	3.750	18.56	100	80	120				

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed and recovered within range.

Sample ID: **2504657-001CMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071896**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.568	0.100	0.5000	0.07900	97.8	80	120	0.5630	0.884	20	
Chloride	5.35	0.200	0.7500	4.604	99.1	80	120	5.343	0.0748	20	
Nitrite (as N)	0.738	0.200	0.7500	0	98.4	80	120	0.7350	0.407	20	
Bromide	2.54	0.600	2.500	0	102	80	120	2.515	1.07	20	
Nitrate (as N)	0.799	0.200	0.7500	0	107	80	120	0.7910	1.01	20	
Ortho-Phosphate (as P)	1.08	0.400	1.250	0	86.8	80	120	0.9520	13.1	20	
Sulfate	22.3	1.00	3.750	18.56	101	80	120	22.30	0.179	20	

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504658-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071898**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100						0		20	
Chloride	3.57	0.200						3.568	0.140	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	1.11	0.200						1.111	0.0900	20	
Ortho-Phosphate (as P)	ND	0.400						0		20	Q
Sulfate	9.44	1.00						9.438	0.0741	20	

NOTES:
Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: **2504658-001CMS** SampType: **MS** Units: **mg/L** Prep Date: **4/29/2025** RunNo: **99463**
Client ID: **BATCH** Batch ID: **47545** Analysis Date: **4/29/2025** SeqNo: **2071899**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.426	0.100	0.5000	0.05200	74.8	80	120				S
Chloride	3.57	0.200	0.7500	3.568	0.800	80	120				S
Nitrite (as N)	0.594	0.200	0.7500	0	79.2	80	120				S
Bromide	2.03	0.600	2.500	0	81.3	80	120				
Nitrate (as N)	1.57	0.200	0.7500	1.111	60.8	80	120				S
Ortho-Phosphate (as P)	0.676	0.400	1.250	0	54.1	80	120				S
Sulfate	10.7	1.00	3.750	9.438	34.1	80	120				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Salinity by SM 2520B

Sample ID: **MB-R99486**	SampType: **MBLK**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **MBLKW**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072324**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100									

Sample ID: **LCS-R99486**	SampType: **LCS**	Units: **µS/cm**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **LCSW**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072325**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	986	0.00100	1,000	0	98.6	79.1	119.1				

Sample ID: **2504661-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **Control-EFF-042825**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072327**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Sample ID: **2504662-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/5/2025**	RunNo: **99486**
Client ID: **BATCH**	Batch ID: **R99486**		Analysis Date: **5/5/2025**	SeqNo: **2072332**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99442**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **MBLKW**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071396**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99442**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **LCSW**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071397**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	304	5.00	300.0	0	101	65	135				

Sample ID: **2504658-001CDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **BATCH**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071399**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	97.0	5.00						89.00	8.60	30	

Sample ID: **2504662-003ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/2/2025**	RunNo: **99442**
Client ID: **BATCH**	Batch ID: **R99442**		Analysis Date: **5/2/2025**	SeqNo: **2071406**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	232	5.00						216.0	7.14	30	

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB** SampType: **MBLK** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **MBLKW** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071074**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS** SampType: **LCS** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **LCSW** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071075**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	21.7	0.700	25.00	0	86.6	79.6	120				

Sample ID: **2504661-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **Control-EFF-042825** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071077**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.93	0.700						3.953	0.533	15	

Sample ID: **2504662-003BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/1/2024** RunNo: **99428**
Client ID: **BATCH** Batch ID: **R99428** Analysis Date: **5/1/2024** SeqNo: **2071086**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.0	0.700	25.00	1.890	84.5	85	115				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Sample ID: **2504663-003BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/2/2024** RunNo: **99428**
Client ID: **BATCH** Batch ID: **R99428** Analysis Date: **5/2/2024** SeqNo: **2071094**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.7	0.700	25.00	2.430	85.0	85	115				

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2504663-003BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/2/2024** RunNo: **99428**
Client ID: **BATCH** Batch ID: **R99428** Analysis Date: **5/2/2024** SeqNo: **2071097**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.6	0.700	25.00	2.430	84.5	85	115	23.68	0.525	15	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed and recovered within range.

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **MB-47613** SampType: **MBLK** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **MBLKW** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072269**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47613** SampType: **LCS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **LCSW** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072270**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	936	250	1,000	0	93.6	80	120				
Magnesium	1,000	50.0	1,000	0	100	80	120				
Potassium	981	50.0	1,000	0	98.1	80	120				
Sodium	1,010	100	1,000	0	101	80	120				

Sample ID: **2504661-001DMS** SampType: **MS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **Control-EFF-042825** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072272**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	61,100	250	1,000	62,530	-145	75	125				S
Magnesium	6,310	50.0	1,000	5,559	75.1	75	125				
Potassium	4,670	50.0	1,000	3,892	77.8	75	125				
Sodium	15,600	100	1,000	15,220	43.0	75	125				S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504661-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **Control-EFF-042825** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072274**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	60,500	250	1,000	62,530	-205	75	125	61,080	0.984	20	S
Magnesium	6,280	50.0	1,000	5,559	72.1	75	125	6,310	0.478	20	S

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **2504661-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99484**
Client ID: **Control-EFF-042825** Batch ID: **47613** Analysis Date: **5/5/2025** SeqNo: **2072274**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	4,670	50.0	1,000	3,892	77.6	75	125	4,669	0.0338	20	
Sodium	15,400	100	1,000	15,220	13.7	75	125	15,650	1.88	20	S

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **MB-47553** SampType: **MBLK** Units: **µg/L** Prep Date: **4/30/2025** RunNo: **99436**
Client ID: **MBLKW** Batch ID: **47553** Analysis Date: **4/30/2025** SeqNo: **2071226**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	10.0									
Potassium	ND	30.0									
Sodium	ND	100									

Sample ID: **2504589-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **4/30/2025** RunNo: **99436**
Client ID: **BATCH** Batch ID: **47553** Analysis Date: **4/30/2025** SeqNo: **2071239**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	2,160	250	1,000	1,259	90.6	75	125				
Magnesium	1,130	10.0	1,000	101.1	103	75	125				
Potassium	1,830	30.0	1,000	886.4	94.8	75	125				
Sodium	6,450	100	1,000	5,820	62.8	75	125				SE

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504589-001AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/30/2025** RunNo: **99436**
Client ID: **BATCH** Batch ID: **47553** Analysis Date: **4/30/2025** SeqNo: **2071241**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	2,200	250	1,000	1,259	94.2	75	125	2,165	1.67	20	
Magnesium	1,140	10.0	1,000	101.1	104	75	125	1,130	0.700	20	
Potassium	1,860	30.0	1,000	886.4	97.4	75	125	1,834	1.41	20	
Sodium	6,550	100	1,000	5,820	73.4	75	125	6,448	1.63	20	SE

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **LCS-47553** SampType: **LCS** Units: **µg/L** Prep Date: **4/30/2025** RunNo: **99436**
Client ID: **LCSW** Batch ID: **47553** Analysis Date: **4/30/2025** SeqNo: **2071267**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	949	250	1,000	0	94.9	80	120				

Work Order: 2504661
CLIENT: Friedman & Bruya
Project: 504455

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **LCS-47553** SampType: **LCS** Units: **µg/L** Prep Date: **4/30/2025** RunNo: **99436**
Client ID: **LCSW** Batch ID: **47553** Analysis Date: **4/30/2025** SeqNo: **2071267**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Magnesium	1,010	10.0	1,000	0	101	80	120				
Potassium	1,010	30.0	1,000	0	101	80	120				
Sodium	1,020	100	1,000	0	102	80	120				

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2504661
Logged by:	Morgan Wilson	Date Received:	4/28/2025 2:39:00 PM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp °C
Sample	6.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

25U-1491

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
Amtest

PROJECT NAME/NO.	PO #
504455	F-203

REMARKS
Aspect EDD
Limited Volume, use project RLs

TURNAROUND TIME
☒ Standard TAT
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Anions	Alkalinity	TOC	TDS	Salinity	Total Cations (Mg, K, Na, Ca)	Dissolved Cations (Mg, K, Na, Ca)				Notes
Control-EFF-042825		4/28/2025	930	water	4	x	x	x	x	x	x	x				anions=Br, Cl, F,
20ZVI-EFF-042825		4/28/2025	935	water	4	x	x	x	x	x	x	x				SO4, NO2, NO3,
50ZVI-EFF-042825		4/28/2025	940	water	4	x	x	x	x	x	x	x				PO4
INFLUENT-042825		4/28/2025	1305	water	4	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	4/28/25	1500
Received by:		Jack Hawthorne		4/28/25	1539
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

April 30, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the results from the testing of material submitted on April 28, 2025 from the Glacier Northwest AS230067, F&BI 504455 project. There are 39 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkofski, Marc Chalfant
ASP0430R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 28, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504455 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504455 -01	Control-EFF-042825
504455 -02	Control-Port3-042825
504455 -03	Control-Port2-042825
504455 -04	Control-Port1-042825
504455 -05	20ZVI-EFF-042825
504455 -06	20ZVI-Port3-042825
504455 -07	20ZVI-Port2-042825
504455 -08	20ZVI-Port1-042825
504455 -09	50ZVI-EFF-042825
504455 -10	50ZVI-Port3-042825
504455 -11	50ZVI-Port2-042825
504455 -12	50ZVI-Port1-042825
504455 -13	Influent-042825

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report will be forwarded upon receipt.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-01 x5
Date Analyzed:	04/29/25	Data File:	504455-01 x5.269
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	440
Copper	2.6

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-02 x5
Date Analyzed:	04/29/25	Data File:	504455-02 x5.276
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380
Copper	2.6

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-03 x5
Date Analyzed:	04/29/25	Data File:	504455-03 x5.277
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	440
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-04 x5
Date Analyzed:	04/29/25	Data File:	504455-04 x5.278
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	420
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-05 x5
Date Analyzed:	04/29/25	Data File:	504455-05 x5.150
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	5.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-05 x5
Date Analyzed:	04/29/25	Data File:	504455-05 x5.270
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	22

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-06 x5
Date Analyzed:	04/29/25	Data File:	504455-06 x5.279
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	91
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-07 x5
Date Analyzed:	04/29/25	Data File:	504455-07 x5.160
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	8.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-07 x5
Date Analyzed:	04/29/25	Data File:	504455-07 x5.280
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	200

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-08 x5
Date Analyzed:	04/29/25	Data File:	504455-08 x5.161
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	22

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-08 x5
Date Analyzed:	04/29/25	Data File:	504455-08 x5.281
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	250

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-09 x5
Date Analyzed:	04/29/25	Data File:	504455-09 x5.271
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port3-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-10 x5
Date Analyzed:	04/29/25	Data File:	504455-10 x5.282
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	13
Copper	11

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port2-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-11 x5
Date Analyzed:	04/29/25	Data File:	504455-11 x5.283
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	57
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port1-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-12 x5
Date Analyzed:	04/29/25	Data File:	504455-12 x5.287
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	150
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Influent-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-13 x5
Date Analyzed:	04/29/25	Data File:	504455-13 x5.275
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	640
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	I5-351 mb2
Date Analyzed:	04/29/25	Data File:	I5-351 mb2.284
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	I5-358 mb2
Date Analyzed:	04/29/25	Data File:	I5-358 mb2.296
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-01 x5
Date Analyzed:	04/29/25	Data File:	504455-01 x5.253
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	400
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-02 x5
Date Analyzed:	04/29/25	Data File:	504455-02 x5.257
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	390
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-03 x5
Date Analyzed:	04/29/25	Data File:	504455-03 x5.258
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	410
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-04 x5
Date Analyzed:	04/29/25	Data File:	504455-04 x5.259
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	400
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-05 x5
Date Analyzed:	04/29/25	Data File:	504455-05 x5.254
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	4.8
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-06 x5
Date Analyzed:	04/29/25	Data File:	504455-06 x5.263
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	14
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-07 x5
Date Analyzed:	04/29/25	Data File:	504455-07 x5.264
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	170
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-08 x5
Date Analyzed:	04/29/25	Data File:	504455-08 x5.265
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	170
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-09 x5
Date Analyzed:	04/29/25	Data File:	504455-09 x5.255
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port3-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-10 x5
Date Analyzed:	04/29/25	Data File:	504455-10 x5.266
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.9
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port2-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-11 x5
Date Analyzed:	04/29/25	Data File:	504455-11 x5.267
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	40
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port1-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-12 x5
Date Analyzed:	04/29/25	Data File:	504455-12 x5.268
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	190
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Influent-042825	Client:	Aspect Consulting
Date Received:	04/28/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	504455-13 x5
Date Analyzed:	04/29/25	Data File:	504455-13 x5.256
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	670
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	I5-359 mb2
Date Analyzed:	04/29/25	Data File:	I5-359 mb2.260
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<0.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/29/25	Lab ID:	I5-357 mb2
Date Analyzed:	04/29/25	Data File:	I5-357 mb2.272
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Copper	<2.5

Date of Report: 04/30/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504455

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 504402-01 x20 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	4.92	115 b	105 b	75-125	9 b
Copper	ug/L (ppb)	20	115	143 b	78 b	75-125	59 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	102	80-120
Copper	ug/L (ppb)	20	103	80-120

Date of Report: 04/30/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504455

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	91	90	80-120	1
Copper	ug/L (ppb)	20	94	94	80-120	0

Date of Report: 04/30/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504455

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	90	89	80-120	1
Copper	ug/L (ppb)	20	99	98	80-120	1

Date of Report: 04/30/25
Date Received: 04/28/25
Project: Glacier Northwest AS230067, F&BI 504455

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	94	92	80-120	2
Copper	ug/L (ppb)	20	96	94	80-120	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504455 Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 04/28/25 JJ

Page # 1 of 2

Report To Delia Massey, marchantant

Company ASpect Consulting

Address 710 2nd Ave Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-5407 Email Delia.Massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
- ☐ Standard turnaround
- ☒ RUSH 24-hr - only As and Cu results (All samples)

Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM 2540C)	Salinity (SM 2520B)	Alkalinity (SM 2320B)	BTEX EPA 8021	Methanol (SM 6200B)	Total Metals (EPA 6020B)	VOCs EPA 8260	Dissolved Metals (EPA 6020B)	PAHs EPA 8270	Br, Cl, F, SO4 (EPA 300.0)	PCBs EPA 8082	Total Metals (As, Ca, Cu, Fe, Mg, Mn, K, Na) (SW 6020B)	Dissolved Metals (As, Ca, Cu, Fe, Mn, Mg, K, Na) (SW 6020B)	NO3 as N, NO2 as N, ortho-Phosphate as PO4 (EPA 300.0)		Notes
Control-EFF-042825	01 A-D	4/28/25	0930	W	4	X	X	X	X						X	X	X	X	X		RUSH TAT for As and Cu Results for All Samples
Control-PORT3-042825	02 A-B	↓	1040	↓	2						X	X									
Control-PORT2-042825	03 ↓		1140		2						X	X									
Control-PORT1-042825	04 ↓		1230		2						X	X									
20ZVI-EFF-042825	05 A-D		0935		4	X	X	X	X						X	X	X	X	X		
20ZVI-PORT3-042825	06 A-B		1045		2						X	X									
20ZVI-PORT2-042825	07 ↓		1145		2						X	X									
20ZVI-PORT1-042825	08 ↓		1235		2						X	X									
50ZVI-EFF-042825	09 A-D		0940		4	X	X	X	X						X	X	X	X	X		
50ZVI-PORT3-042825	10 A-B	↓	1050	↓	2						X	X									↓

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	4/28/25	14:50
Received by: Nhan Phan	Nhan Phan	FeBI	4/28/25	1452
Relinquished by:				
Received by:		Samples received at 4 °C		

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

504455 Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 04/28/25 J3

Page # 2 of 2

Report To Delia Massey, Marc Chalfant
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-9407 Email Ent Delia.massey@Geosyntec.com

SAMPLERS (signature) Emily Rusen
PROJECT NAME Glacier Northwest
PO # AS230067
REMARKS Field Filtered for T/D metals
Project specific RLs? - Yes / No
INVOICE TO Please Invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr - Only As and Cu results (All Samples)
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	(SM2540C(E)) Total Dissolved Solids - NWTPH-Dx	Turbidity (SM2130B) NWTPH-Gx	Alkalinity (SM2320B) BTEX EPA 8021	Total Organic Carbon (SM5310B) NWTPH-HCID	Total As + Cu (1020B) VOCs EPA 8260	Dissolved As + Cu (1020B) PAHs EPA 8270	Br, Cl, F, SO4 (EPA 300.0) PCBs EPA 8082	Total Metals (As, Ca, Fe, Mg, Mn, K, Na) (6020B)	Dissolved Metals (As, Cu, Fe, Mg, Mn, K, Na) (6020B)	NO3 as N, NO2 as N (EPA 300.0) Organophosphates Diss.:		Notes
SOZVI-PORT2-042825	11 A-B	4/28/25	1150	W	2					X	X						RUSH TAT for As and Cu results for ALL SAMPLES
SOZVI-PORT 1-042825	12	↓	1240	↓	2					X	X						↓
INFLUENT-042825	13 A-D	↓	1305	↓	4	X	X	X	X			X	X	X	X		↓

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	4/28/25	14:50
Received by: Nhan Phan	Nhan Phan	FEBI	4/28/25	1450
Relinquished by:				
Received by:		Samples received at 4 °C		

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504455 CLIENT Aspect INITIALS/DATE: NA 04/28/25

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP
*or other representative documents, letters, and/or shipping memos Date: 4/28/25

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
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office@friedmanandbruya.com
www.friedmanandbruya.com

May 1, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the results from the testing of material submitted on April 29, 2025 from the Glacier Northwest AS230067, F&BI 504476 project. There are 36 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkofski, Marc Chalfant
ASP0501R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 29, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504476 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504476 -01	Control-EFF-042925
504476 -02	Control-Port 3-042925
504476 -03	Control-Port 2-042925
504476 -04	Control-Port 1-042925
504476 -05	20ZVI-EFF-042925
504476 -06	20ZVI-Port 3-042925
504476 -07	20ZVI-Port 2-042925
504476 -08	20ZVI-Port 1-042925
504476 -09	50ZVI-EFF-042925
504476 -10	50ZVI-Port 3-042925
504476 -11	50ZVI-Port 2-042925
504476 -12	50ZVI-Port 1-042925
504476 -13	INFLUENT-042925

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report is enclosed.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-01 x5
Date Analyzed:	04/30/25	Data File:	504476-01 x5.232
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	350

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port 3-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-02 x5
Date Analyzed:	04/30/25	Data File:	504476-02 x5.236
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port 2-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-03 x5
Date Analyzed:	04/30/25	Data File:	504476-03 x5.237
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	460

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port 1-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-04 x5
Date Analyzed:	04/30/25	Data File:	504476-04 x5.238
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	460

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-05 x5
Date Analyzed:	04/30/25	Data File:	504476-05 x5.233
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	29

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 3-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-06 x5
Date Analyzed:	04/30/25	Data File:	504476-06 x5.239
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	50

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 2-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-07 x5
Date Analyzed:	04/30/25	Data File:	504476-07 x5.240
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	130

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 1-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-08 x5
Date Analyzed:	04/30/25	Data File:	504476-08 x5.241
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	230

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-09 x5
Date Analyzed:	04/30/25	Data File:	504476-09 x5.234
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.7

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port 3-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-10 x5
Date Analyzed:	04/30/25	Data File:	504476-10 x5.244
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	9.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port 2-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-11 x5
Date Analyzed:	04/30/25	Data File:	504476-11 x5.245
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	29

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port 1-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-12 x5
Date Analyzed:	04/30/25	Data File:	504476-12 x5.246
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	77

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-13 x5
Date Analyzed:	04/30/25	Data File:	504476-13 x5.235
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	830

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	I5-365 mb
Date Analyzed:	04/30/25	Data File:	I5-365 mb.130
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	I5-365 mb
Date Analyzed:	04/30/25	Data File:	I5-365 mb.130
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-01 x5
Date Analyzed:	04/30/25	Data File:	504476-01 x5.169
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port 3-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-02 x5
Date Analyzed:	04/30/25	Data File:	504476-02 x5.173
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	390

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port 2-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-03 x5
Date Analyzed:	04/30/25	Data File:	504476-03 x5.174
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	430

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port 1-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-04 x5
Date Analyzed:	04/30/25	Data File:	504476-04 x5.175
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	440

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-05 x5
Date Analyzed:	04/30/25	Data File:	504476-05 x5.170
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.7

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 3-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-06 x5
Date Analyzed:	04/30/25	Data File:	504476-06 x5.176
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	42

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 2-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-07 x5
Date Analyzed:	04/30/25	Data File:	504476-07 x5.177
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	100

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port 1-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-08 x5
Date Analyzed:	04/30/25	Data File:	504476-08 x5.178
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	150

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-09 x5
Date Analyzed:	04/30/25	Data File:	504476-09 x5.171
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1 j

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port 3-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-10 x5
Date Analyzed:	04/30/25	Data File:	504476-10 x5.181
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.9 j

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port 2-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-11 x5
Date Analyzed:	04/30/25	Data File:	504476-11 x5.182
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	21

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-Port 1-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-12 x5
Date Analyzed:	04/30/25	Data File:	504476-12 x5.183
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	14

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-042925	Client:	Aspect Consulting
Date Received:	04/29/25	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	504476-13 x5
Date Analyzed:	04/30/25	Data File:	504476-13 x5.172
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	820

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	I5-366 mb
Date Analyzed:	04/30/25	Data File:	I5-366 mb.133
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2 j

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	04/30/25	Lab ID:	I5-366 mb
Date Analyzed:	04/30/25	Data File:	I5-366 mb.133
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2 j

Date of Report: 05/01/25
Date Received: 04/29/25
Project: Glacier Northwest AS230067, F&BI 504476

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	99	99	80-120	0

Date of Report: 05/01/25
Date Received: 04/29/25
Project: Glacier Northwest AS230067, F&BI 504476

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	99	99	80-120	0

Date of Report: 05/01/25
Date Received: 04/29/25
Project: Glacier Northwest AS230067, F&BI 504476

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	98	98	80-120	0

Date of Report: 05/01/25
Date Received: 04/29/25
Project: Glacier Northwest AS230067, F&BI 504476

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	98	98	80-120	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504476

Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY

04/29/25 J5/C2

Page # 1 of 2

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-5407 Email Delia.Massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusem

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals

Project Specific RLs - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME: Standard Turnaround; X RUSH 24-hr - Only As + Fe results for Rush charges authorized by:

SAMPLE DISPOSAL: Dispose after 30 days; Archive Samples; Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	Total Dissolved Solids (Sm2540C)	Turbidity (Sm2130B)	Alkalinity (Sm2320B) BTEX EPA 8021	Total Organic Halides (Sm5320B) VOCs EPA 8260	Dissolved Fe (6020B) PAHs EPA 8270	Dissolved As (6020B) PCBs EPA 8082	Total Mn (6020B)	Dissolved Mn (6020B)	NO3as N NO2as N (Sm4500-NO3F) (Sm4500-NO2B)	PCP (SM6270E-SIM)	Br, F, Cl, SO4 (EPA 300.0)	Notes
Control-EFF-042925	01 A-E	4/29/25	1010	W	5	X	X	X	X			X	X	X	X	X	RUSH TAT ONLY As + Fe results FOR ALL SAMPLES
Control-PORT3-042925	02 A-B		1205		2					X	X						
Control-PORT2-042925	03		1235		2					X	X						
Control-PORT1-042925	04		1315		2					X	X						
20ZVI-EFF-042925	05 A-D		1000		4	X	X	X	X			X	X	X		X	
20ZVI-PORT3-042925	06 A-B		1155		2					X	X						
20ZVI-PORT2-042925	07		1230		2					X	X						
20ZVI-PORT1-042925	08		1310		2					X	X						
50ZVI-EFF-042925	09 A-D		1005		4	X	X	X	X			X	X	X		X	
50ZVI-PORT3-042925	10 A-B		1200		2					X	X						

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusem	EMILY RUSEM	ASPECT	4/29/25	16:50
Received by:	Anh Phan	FBI	4/29/25	16:50
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Avenue S
Seattle, WA 98108
Ph. (206) 285-8282

504476

Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY

04/29/25 J5/C2

Page # 2 of 2

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 206-413-5407 Email Delia.Massey@Geosyntec.com

SAMPLERS (signature) Emily Rusen

PROJECT NAME Glacier Northwest

PO # AS230067

REMARKS Field Filtered for T/D Metals

Project Specific RLs - Yes / No

INVOICE TO Please Invoice Through Coupa

TURNAROUND TIME

Standard Turnaround

X RUSH 24-hr - only As & Cu results for ALL SAMPLES

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Archive Samples

Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Petroleum Hydrocarbons NWTPH-Dx	Extractable Petroleum Hydrocarbons NWTPH-Gx	Volatile Petroleum Hydrocarbons BTEX EPA 8021	Total Organic Carbon (SM5310B) VOCs EPA 8260	Total Metals As, Cu (6020B) PAHs EPA 8270	Dissolved Metals As, Cu (6020B) PCBs EPA 8082	Total Metals (As, Cd, Cu, Pb, Mn, Mg, Ni, Zn) (6020B)	Dissolved Metals (As, Cd, Cu, Fe, Mn, Mg, Ni, Zn) (6020B)	NO3as N, NO2as N, Orthophosphate as PO4 (EPA 300.0)	PCB (SM 8270E-SIM)	Br, Cl, F, SO4 (EPA 300.0)	Notes
SOZV1-PORT2-042925	11 A-B	4/29/25	1240	W	2					X	X						RUSH TAT only As and Cu Results
SOZV1-PORT 1-042925	12 ↓	↓	1320	↓	2					X	X						ALL SAMPLES
INFLUENT-04/925	13 A-E	↓	1330	↓	5	X	X	X	X			X	X	X	X	X	↓

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	Emily Rusen	ASPECT	4/29/25	1650
Received by:	Anh Phan	FBI	4/29/25	16:50
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.

5500 4th Avenue S

Seattle, WA 98108

Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504476 CLIENT Aspect INITIALS/ DATE: AP 4/29/25

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 2 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☒ YES ☐ NO Initials/ Date: AP 4/29/25
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☒ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☒ YES ☐ NO

Were appropriate sample containers used? ☒ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☒ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☒ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☒ Yes ☐ No	☐ Not on COC/label
Date Sampled	☒ Yes ☐ No	☐ Not on COC/label
Time Sampled	☒ Yes ☐ No	☐ Not on COC/label
# of Containers	☒ Yes ☐ No	
Relinquished	☒ Yes ☐ No	
Requested analysis	☒ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☒ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 6, 2025

Andrew Yonkofski, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Yonkofski:
PRINTINGHERE
Included are the results from the testing of material submitted on April 30, 2025 from the Glacier Northwest AS230067, F&BI 504506 project. There are 32 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Delia Massey, Marc Chalfant
ASP0506R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 30, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 504506 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
504506 -01	Control-EFF-043025
504506 -02	Control-Port3-043025
504506 -03	Control-Port2-043025
504506 -04	Control-Port1-043025
504506 -05	20ZV1-EFF-043025
504506 -06	20ZV1-Port3-043025
504506 -07	20ZV1-Port2-043025
504506 -08	20ZV1-Port1-043025
504506 -09	50ZV1-EFF-043025
504506 -10	50ZV1-Port3-043025
504506 -11	50ZV1-Port2-043025
504506 -12	50ZV1-Port1-043025
504506 -13	Influent-043025

All quality control requirements were acceptable.

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-01 x5
Date Analyzed:	05/01/25	Data File:	504506-01 x5.151
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	290

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-02 x5
Date Analyzed:	05/01/25	Data File:	504506-02 x5.152
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	360

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-03 x5
Date Analyzed:	05/01/25	Data File:	504506-03 x5.153
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	360

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-04 x5
Date Analyzed:	05/01/25	Data File:	504506-04 x5.154
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	340

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZV1-EFF-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-05 x5
Date Analyzed:	05/01/25	Data File:	504506-05 x5.155
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.2

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZV1-Port3-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-06 x5
Date Analyzed:	05/01/25	Data File:	504506-06 x5.156
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	9.1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZV1-Port2-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-07 x5
Date Analyzed:	05/01/25	Data File:	504506-07 x5.157
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	57

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZV1-Port1-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-08 x5
Date Analyzed:	05/01/25	Data File:	504506-08 x5.158
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	130

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-09 x5
Date Analyzed:	05/01/25	Data File:	504506-09 x5.162
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port3-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-10 x5
Date Analyzed:	05/01/25	Data File:	504506-10 x5.163
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.0

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port2-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-11 x5
Date Analyzed:	05/01/25	Data File:	504506-11 x5.168
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	7.7

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port1-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-12 x5
Date Analyzed:	05/01/25	Data File:	504506-12 x5.169
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	24

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Influent-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-13 x5
Date Analyzed:	05/01/25	Data File:	504506-13 x5.170
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	670

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	I5-370 mb
Date Analyzed:	05/01/25	Data File:	I5-370 mb.115
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-01 x5
Date Analyzed:	05/01/25	Data File:	504506-01 x5.171
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	280

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-02 x5
Date Analyzed:	05/01/25	Data File:	504506-02 x5.172
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	340

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-03 x5
Date Analyzed:	05/01/25	Data File:	504506-03 x5.173
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-04 x5
Date Analyzed:	05/01/25	Data File:	504506-04 x5.174
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	390

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZV1-EFF-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-05 x5
Date Analyzed:	05/01/25	Data File:	504506-05 x5.175
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	26

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZV1-Port3-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-06 x5
Date Analyzed:	05/01/25	Data File:	504506-06 x5.176
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	50

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZV1-Port2-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-07 x5
Date Analyzed:	05/01/25	Data File:	504506-07 x5.177
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	63

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZV1-Port1-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-08 x5
Date Analyzed:	05/01/25	Data File:	504506-08 x5.180
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	140

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-09 x5
Date Analyzed:	05/01/25	Data File:	504506-09 x5.181
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port3-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-10 x5
Date Analyzed:	05/01/25	Data File:	504506-10 x5.182
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	7.1

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port2-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-11 x5
Date Analyzed:	05/01/25	Data File:	504506-11 x5.183
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	24

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port1-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-12 x5
Date Analyzed:	05/01/25	Data File:	504506-12 x5.184
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	64

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Influent-043025	Client:	Aspect Consulting
Date Received:	04/30/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	504506-13 x5
Date Analyzed:	05/01/25	Data File:	504506-13 x5.185
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	690

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/01/25	Lab ID:	I5-369 mb
Date Analyzed:	05/01/25	Data File:	I5-369 mb.112
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Date of Report: 05/06/25
Date Received: 04/30/25
Project: Glacier Northwest AS230067, F&BI 504506

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	94	94	80-120	0

Date of Report: 05/06/25
Date Received: 04/30/25
Project: Glacier Northwest AS230067, F&BI 504506

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	95	96	80-120	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY

504506 — 04/30/25 — C2/J3

Page # 1 of 2

Report To: Andrew Yonkofski, Delia Massey, Marc Chalfant
Company: Aspect Consulting
Address: 710 2nd Ave, Suite 550
City, State, ZIP: Seattle, WA 98104
Phone: 206-413-5407 Email: Delia.massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered T/D Metals

Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
- ☐ Standard turnaround
- ☒ RUSH 24-hr
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total As (6020B)	Dissolved As (6020B)			Notes
Control-EFF-043025	01 A-D	4/30/25	0920	W	4								X	X			RUSH TAT FOR ALL SAMPLES FOR MARKED ANALYSES
Control-PORT3-043025	02 A-B		1125		2												
Control-PORT2-043025	03		1200		2												
Control-PORT1-043025	04		1245		2												
20ZVI-EFF-043025	05 A-D		0925		4												
20ZVI-PORT3-043025	06 A-B		1130		2												
20ZVI-PORT2-043025	07		1205		2												
20ZVI-PORT1-043025	08		1250		2												
50ZVI-EFF-043025	09 A-E		0930		5												
50ZVI-PORT3-043025	10 A-B		1135		2												

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	4/30/25	1602
Received by:	Khut Truong	F&B	4/30/25	16:02
Relinquished by:		Samples received at 1 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

Andrew Yonkofski 504506

SAMPLE CHAIN OF CUSTODY

04/30/25 C2/J3

Page # 2 of 2

Report To Delia Massey, Marc Chalfant
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-5407 Email Delia.Massey@Geosyntec.com

SAMPLERS (signature): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals
Project specific RLs? - Yes / No

INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME
- ☐ Standard turnaround
- ☒ RUSH 24-hr
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total As (6020B)	Dissolved As (6020B)			Notes
SOZVI-PORT2-043025	11 AB	4/30/25	1210	W	2								X	X			RUSH TAT FOR ALL SAMPLES FOR MARKED ANALYSES
SOZVI-PORT1-043025	12	↓	1255	↓	2								↓	↓			
INFLUENT-043025	13 A-D	↓	1300	↓	4								↓	↓			↓

Samples received at 1 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	4/30/25	1602
Received by:	Mint Truong	F&B	4/30/25	16:02
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 504506 CLIENT ASPECT INITIALS/ DATE: 4/30/25

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 1 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☒ YES ☐ NO Initials/ Date: (NP) 05/01
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 6, 2025

Andrew Yonkofski, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Yonkofski:
PRINTINGHERE
Included are the results from the testing of material submitted on May 1, 2025 from the Glacier Northwest AS230067, F&BI 505029 project. There are 32 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Delia Massey, Marc Chalfant
ASP0506R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 1, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 505029 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
505029 -01	Control-EFF-050125
505029 -02	Control-Port3-050125
505029 -03	Control-Port2-050125
505029 -04	Control-Port1-050125
505029 -05	20ZVI-EFF-050125
505029 -06	20ZVI-Port3-050125
505029 -07	20ZVI-Port2-050125
505029 -08	20ZVI-Port1-050125
505029 -09	50ZV1-Port3-050125
505029 -10	50ZV1-EFF-050125
505029 -11	50ZV1-Port2-050125
505029 -12	50ZV1-Port1-050125
505029 -13	Influent-050125

All quality control requirements were acceptable.

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-01 x5
Date Analyzed:	05/02/25	Data File:	505029-01 x5.091
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	350

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-02 x5
Date Analyzed:	05/02/25	Data File:	505029-02 x5.092
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	390

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-03 x5
Date Analyzed:	05/02/25	Data File:	505029-03 x5.093
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	370

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-04 x5
Date Analyzed:	05/02/25	Data File:	505029-04 x5.094
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	340

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-05 x5
Date Analyzed:	05/02/25	Data File:	505029-05 x5.156
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.9

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-06 x5
Date Analyzed:	05/02/25	Data File:	505029-06 x5.099
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-07 x5
Date Analyzed:	05/02/25	Data File:	505029-07 x5.157
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	44

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-08 x5
Date Analyzed:	05/02/25	Data File:	505029-08 x5.101
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	92

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-09 x5
Date Analyzed:	05/02/25	Data File:	505029-09 x5.158
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.2

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-10 x5
Date Analyzed:	05/02/25	Data File:	505029-10 x5.103
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-11 x5
Date Analyzed:	05/02/25	Data File:	505029-11 x5.104
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	13

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-12 x5
Date Analyzed:	05/05/25	Data File:	505029-12 x5.101
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	40

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Influent-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-13 x5
Date Analyzed:	05/02/25	Data File:	505029-13 x5.160
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	660

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	I5-377 mb
Date Analyzed:	05/02/25	Data File:	I5-377 mb.045
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-01 x5
Date Analyzed:	05/02/25	Data File:	505029-01 x5.075
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	340

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-02 x5
Date Analyzed:	05/02/25	Data File:	505029-02 x5.076
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	390

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-03 x5
Date Analyzed:	05/02/25	Data File:	505029-03 x5.077
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	410

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-04 x5
Date Analyzed:	05/02/25	Data File:	505029-04 x5.078
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	380

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-05 x5
Date Analyzed:	05/02/25	Data File:	505029-05 x5.079
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	15

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-06 x5
Date Analyzed:	05/02/25	Data File:	505029-06 x5.080
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	26

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-07 x5
Date Analyzed:	05/02/25	Data File:	505029-07 x5.081
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	47

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-08 x5
Date Analyzed:	05/02/25	Data File:	505029-08 x5.085
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	95

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-09 x5
Date Analyzed:	05/02/25	Data File:	505029-09 x5.086
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-10 x5
Date Analyzed:	05/02/25	Data File:	505029-10 x5.087
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.6

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-11 x5
Date Analyzed:	05/02/25	Data File:	505029-11 x5.088
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	15

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-12 x5
Date Analyzed:	05/02/25	Data File:	505029-12 x5.089
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	35

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Influent-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505029-13 x5
Date Analyzed:	05/02/25	Data File:	505029-13 x5.090
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	690

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	I5-376 mb
Date Analyzed:	05/02/25	Data File:	I5-376 mb.042
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Date of Report: 05/06/25
Date Received: 05/01/25
Project: Glacier Northwest AS230067, F&BI 505029

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	90	92	80-120	2

Date of Report: 05/06/25
Date Received: 05/01/25
Project: Glacier Northwest AS230067, F&BI 505029

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	92	92	80-120	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505029 Andrew Yonkotski

SAMPLE CHAIN OF CUSTODY

05/01/25 K3

Page # 1 of 2

Report To Delia Massey ; Marc Chalfant

Company Aspect Consulting

Address 7100 2nd Ave, Suite 550 ER

City, State, ZIP Seattle, WA 98104

Phone 206-413-5407 Email Delia.massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D Metals

Project Specific RLs - Yes / No

INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME

Standard Turnaround

X RUSH 24-hr

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Archive Samples

Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total As (1e0020B)	Dissolved As (1e0020B)				Notes
Control-EFF-050125	01 A-D	5/1/25	0930	W	4							X	X				RUSH TAT FOR ALL SAMPLES
Control-PORT3-050125	02 A-B		1050		2							X	X				FOR MARKED ANALYSES
Control-PORT2-050125	03		1145		2							X	X				
Control-PORT1-050125	04		1225		2							X	X				
202VI-EFF-050125	05 A-D		0935		4							X	X				
202VI-PORT3-050125	06 A-B		1055		2							X	X				
202VI-PORT2-050125	07		1150		2							X	X				
202VI-PORT1-050125	08		1230		2							X	X				
502VI-PORT3-050125	09		1100		2							X	X				
502VI-EFF-050125	10 A-D	↓	0940	↓	4							X	X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/1/25	1733
Received by:	JOE MOHARRED	FOR	05/01/25	1733
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Avenue S
Seattle, WA 98108
Ph. (206) 285-8282

505029

Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY

05/01/25 K3/

Page # 2 of 2

Report To Delia Massey; Marc Onalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone 206-413-5407 Email Delia.massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO # AS230067

REMARKS: Field Filtered for T/D metals

Project Specific RLs - Yes / No

INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME

Standard Turnaround

X RUSH 24-hr

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Archive Samples

Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total As (EPA 6020B)	Dissolved As (EPA 6020B)				Notes
502VI-PORT2-050125	11 A B	5/1/25	1155	W	2							X	X				RUSH TAT FOR ALL SAMPLES
502VI-PORT1-050125	12 |	↓	1235	|	2							X	X				FOR MARKED ANALYSES
INFLUENT-050125	13 A-D	↓	1245	↓	4							X	X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/1/25	1733
Received by:	JOE MOHAMMED	FBI	05/01/25	1733
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Avenue S
Seattle, WA 98108
Ph. (206) 285-8282

FORMS\COC\COC.DOC

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 505029 CLIENT ASP INITIALS/ DATE: 05/01/25 JM

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 2 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ Date: 5/2
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☐ YES ☑ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	(NP) ☒ Yes	☑ No	☐ Not on COC/label
Date Sampled	☑ Yes	☐ No	☐ Not on COC/label
Time Sampled	☑ Yes	☐ No	☐ Not on COC/label
# of Containers	☑ Yes	☐ No	
Relinquished	☑ Yes	☐ No	
Requested analysis	☑ Yes	☐ On Hold	

Other comments (use a separate page if needed)
SAMPLES IDENTICAL CONTAINERS TO THOSE IN COC 505030. 05/01 JM
SOZV1-Port1 @ 12:35 Field Filter container labeled Port 2 ID based on Time

Air Samples: Were any additional canisters/tubes received? ☐ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 13, 2025

Andrew Yonkofski, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Yonkofski:

Included are the results from the testing of material submitted on May 1, 2025 from the Glacier Northwest AS230067, F&BI 505030 project. There are 41 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Delia Massey, Marc Chalfant
ASP0513R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 1, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 505030 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
505030 -01	Control-EFF-050125
505030 -02	Control-Port3-050125
505030 -03	Control-Port2-050125
505030 -04	Control-Port1-050125
505030 -05	20ZVI-EFF-050125
505030 -06	20ZVI-Port3-050125
505030 -07	20ZVI-Port2-050125
505030 -08	20ZVI-Port1-050125
505030 -09	50ZV1-EFF-050125
505030 -10	50ZV1-Port3-050125
505030 -11	50ZV1-Port2-050125
505030 -12	50ZV1-Port1-050125
505030 -13	Influent-050125

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report is enclosed.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-01 x5
Date Analyzed:	05/02/25	Data File:	505030-01 x5.075
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	2.9

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-01 x10
Date Analyzed:	05/12/25	Data File:	505030-01 x10.084
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	1,200

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-01 x100
Date Analyzed:	05/02/25	Data File:	505030-01 x100.244
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	690

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-02 x5
Date Analyzed:	05/02/25	Data File:	505030-02 x5.076
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	4.1

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-03 x5
Date Analyzed:	05/02/25	Data File:	505030-03 x5.077
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-04 x5
Date Analyzed:	05/02/25	Data File:	505030-04 x5.078
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-05 x5
Date Analyzed:	05/02/25	Data File:	505030-05 x5.079
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	12

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-05 x1000
Date Analyzed:	05/12/25	Data File:	505030-05 x1000.095
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	150,000
Manganese	1,000

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-06 x5
Date Analyzed:	05/02/25	Data File:	505030-06 x5.080
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	13

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-07 x5
Date Analyzed:	05/02/25	Data File:	505030-07 x5.081
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	10

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-08 x5
Date Analyzed:	05/02/25	Data File:	505030-08 x5.085
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	11

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-09 x5
Date Analyzed:	05/02/25	Data File:	505030-09 x5.086
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	3.1

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-09 x500
Date Analyzed:	05/02/25	Data File:	505030-09 x500.254
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	110,000
Manganese	810

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-10 x5
Date Analyzed:	05/02/25	Data File:	505030-10 x5.087
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	5.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-11 x5
Date Analyzed:	05/02/25	Data File:	505030-11 x5.088
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-12 x5
Date Analyzed:	05/02/25	Data File:	505030-12 x5.089
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Influent-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-13 x5
Date Analyzed:	05/02/25	Data File:	505030-13 x5.090
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Influent-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-13 x100
Date Analyzed:	05/02/25	Data File:	505030-13 x100.256
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	170

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	I5-376 mb
Date Analyzed:	05/02/25	Data File:	I5-376 mb.042
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<0.5
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-01 x5
Date Analyzed:	05/02/25	Data File:	505030-01 x5.155
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	2.6
Iron	710

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-01 x100
Date Analyzed:	05/02/25	Data File:	505030-01 x100.231
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	650

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-02 x5
Date Analyzed:	05/02/25	Data File:	505030-02 x5.092
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-03 x5
Date Analyzed:	05/02/25	Data File:	505030-03 x5.093
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-04 x5
Date Analyzed:	05/02/25	Data File:	505030-04 x5.094
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-05 x5
Date Analyzed:	05/02/25	Data File:	505030-05 x5.098
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-05 x500
Date Analyzed:	05/02/25	Data File:	505030-05 x500.239
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	84,000
Manganese	680

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-06 x5
Date Analyzed:	05/02/25	Data File:	505030-06 x5.099
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-07 x5
Date Analyzed:	05/02/25	Data File:	505030-07 x5.100
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-08 x5
Date Analyzed:	05/02/25	Data File:	505030-08 x5.101
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-09 x5
Date Analyzed:	05/02/25	Data File:	505030-09 x5.102
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-EFF-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-09 x500
Date Analyzed:	05/02/25	Data File:	505030-09 x500.241
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	82,000
Manganese	630

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port3-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-10 x5
Date Analyzed:	05/02/25	Data File:	505030-10 x5.103
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	4.3

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port2-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-11 x5
Date Analyzed:	05/02/25	Data File:	505030-11 x5.104
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZV1-Port1-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-12 x5
Date Analyzed:	05/02/25	Data File:	505030-12 x5.105
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Influent-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-13 x5
Date Analyzed:	05/02/25	Data File:	505030-13 x5.106
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	4.8

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Influent-050125	Client:	Aspect Consulting
Date Received:	05/01/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	505030-13 x100
Date Analyzed:	05/02/25	Data File:	505030-13 x100.243
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	14,000
Manganese	160

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/02/25	Lab ID:	I5-377 mb
Date Analyzed:	05/02/25	Data File:	I5-377 mb.045
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<0.5
Iron	<50
Manganese	<1

Date of Report: 05/13/25
Date Received: 05/01/25
Project: Glacier Northwest AS230067, F&BI 505030

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Copper	ug/L (ppb)	20	96	96	80-120	0
Iron	ug/L (ppb)	100	92	92	80-120	0
Manganese	ug/L (ppb)	20	95	97	80-120	2

Date of Report: 05/13/25
Date Received: 05/01/25
Project: Glacier Northwest AS230067, F&BI 505030

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Copper	ug/L (ppb)	20	97	98	80-120	1
Iron	ug/L (ppb)	100	90	93	80-120	3
Manganese	ug/L (ppb)	20	97	98	80-120	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505030

SAMPLE CHAIN OF CUSTODY 05/01/25 K3

Page # 1 of 2

Report To Andrew Yonkofski, Delia Massey, Marc Chaitant
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-5407 Email Delia.Massey@GeosyntecConsultants.com

SAMPLERS (signature): Emily Rusen
PROJECT NAME: Glacier Northwest
PO #: AS230067
REMARKS: Field Filtered for T/D Metals
Project Specific RLs - Yes / No
INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
X Standard Turnaround
RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Archive Samples
Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids (SM2540C/E) NWTPH-Dx	Salinity (SM2510B) NWTPH-Dx	Alkalinity (EPA310.1) BTEX EPA 8021	Total Organic Carbon (SM5310B) VOCs EPA 8260	Total (w/ LL) PAHs EPA 8270	Dissolved (w/ LL) PCBs EPA 8082	Br, Cl, F, SO4 (EPA 300.0)	Total Metals (Ca, K, Mg, Na, Fe) EPA 6020	Dissolved Metals (Ca, K, Mg, Na, Fe) (EPA 6020B)	NO3as N, NO2as N, Orthophosphate as PO4 (EPA 300.0)		Notes
Control-EFF-050125	01 A-D	5/1/25	0930	W	4	X	X	X	X			X	X	X	X		
Control-PORT3-050125	02 A-B		1050		2					X	X						
Control-PORT2-050125	03		1145		2					X	X						
Control-PORT1-050125	04		1225		2					X	X						
20ZVI-EFF-050125	05 A-D		0935		4	X	X	X	X			X	X	X	X		
20ZVi-PORT3-050125	06 A B		1055		2					X	X						
20ZVi-PORT2-050125	07		1150		2					X	X						
20ZVi-PORT1-050125	08		1230		2					X	X						
50ZVI-EFF-050125	09 A-D		1100		4	X	X	X	X			X	X	X	X		
50ZVi-PORT3-050125	10 A B		0940		2					X	X						

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/1/25	1733
Received by:	JOE MOHAMMED	FBE	05/01/25	1733
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Avenue S
Seattle, WA 98108
Ph. (206) 285-8282

JB

FORMS\COC\COC.DOC

505030

Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY 05/01/25 K3

Page # 2 of 2

Report To Delia Massey, Marc Chalfant
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-5407 Email Delia.

SAMPLERS (*signature*): Emily Rusen
PROJECT NAME: Glacier Northwest
PO #: AS230067
REMARKS: Field Filtered for TID Metals
Project Specific RLs - Yes / No
INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME
X Standard Turnaround
RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Archive Samples
Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: Total Dissolved Solids NWTPH-Dx (SM2540C)	Alkalinity (SM2540B) NWTPH-Gx	Alkalinity (EPA 310.1) BTEX EPA 8021	Total (4) (6020B) VOCs EPA 8260	Dissolved (4) (6020B) PAHs EPA 8270	Br, Cl, Fe, SO4 (EPA 300.0) PCBs EPA 8082	Total Organic Carbon (SM 5310)	Total Metals (Ca, Fe, Mn, Mg, K, Na) (6020B)	Dissolved Metals (Ca, Cu, Mg, Mn, Fe, Ag) (6020B)	NO3as N, NO2as N (EPA 300.0)	Notes
SOZVI-PORT2-050125	11 A-B	5/1/25	1155	W	2				X	X						
SOZVI-PORT1-050125	12 ↓	↓	1235	↓	2				X	X						
INFLUENT-050125	13 A-D	↓	1245	↓	4	X	X	X			X	X	X	X	X	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/1/25	1733
Received by:	JOE MOHAMMED	FBI	05/01/25	1733
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Avenue S
Seattle, WA 98108
Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 505030 CLIENT ASP INITIALS/ DATE: 05/01/25 JM

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 2 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ Date: " 5/2
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☐ YES ☑ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☐ Yes	☑ No	☐ Not on COC/label
Date Sampled	☑ Yes	☐ No	☐ Not on COC/label
Time Sampled	☑ Yes	☐ No	☐ Not on COC/label
# of Containers	☑ Yes	☐ No	
Relinquished	☑ Yes	☐ No	
Requested analysis	☑ Yes	☐ On Hold	

Other comments (use a separate page if needed)
SAMPLES IDENTICAL CONTAINERS TO THOSE IN COC 505029. 05/01 JM
5OZVI-PORT @ 12:35 Field Filtered container labeled Port 7 ID based on Time

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 505030, F-213
Work Order Number: 2505035

May 09, 2025

Attention Michael Erdahl:

Alliance Technical Group, LLC - Seattle received 4 sample(s) on 5/2/2025 for the analyses presented in the following report.

Dissolved Metals by EPA 6020B
Ion Chromatography by EPA 300.0
Salinity by SM 2520B
Total Alkalinity by EPA 310.2
Total Dissolved Solids by SM 2540C
Total Metals by EPA 6020B
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Alliance Technical Group is committed to accuracy, speed, and customer service. Thank you for choosing Alliance Technical Group's Seattle laboratory team for your analytical needs. We appreciate this opportunity to serve you!

Sincerely,

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Lyann Rivera
Project Manager

Date: *05/09/2025*

CLIENT: Friedman & Bruya
Project: 505030
Work Order: 2505035

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2505035-001	Control-EFF-050125	05/01/2025 9:30 AM	05/02/2025 10:50 AM
2505035-002	20ZVI-EFF-050125	05/01/2025 9:35 AM	05/02/2025 10:50 AM
2505035-003	50ZVI-EFF-050125	05/01/2025 11:00 AM	05/02/2025 10:50 AM
2505035-004	INFLUENT-050125	05/01/2025 12:45 PM	05/02/2025 10:50 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2505035**

Date: **5/9/2025**

CLIENT: Friedman & Bruya
Project: 505030

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

CLIENT: Friedman & Bruya
Project: 505030

Lab ID: 2505035-001 **Collection Date:** 5/1/2025 9:30:00 AM
Client Sample ID: **Control-EFF-050125** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47608		Analyst: OP
Fluoride	0.167	0.100		mg/L	1	5/2/2025 9:13:00 PM
Chloride	4.31	0.200		mg/L	1	5/2/2025 9:13:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	5/2/2025 9:13:00 PM
Bromide	ND	0.600		mg/L	1	5/2/2025 9:13:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	5/2/2025 9:13:00 PM
Ortho-Phosphate (as P)	0.440	0.400	Q	mg/L	1	5/2/2025 9:13:00 PM
Sulfate	4.48	1.00		mg/L	1	5/2/2025 9:13:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (85%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	65,000	60.0		µg/L	1	5/6/2025 5:59:00 PM
Magnesium	5,390	50.0		µg/L	1	5/6/2025 5:59:00 PM
Potassium	4,300	50.0		µg/L	1	5/6/2025 5:59:00 PM
Sodium	14,500	100		µg/L	1	5/6/2025 5:59:00 PM
Total Metals by EPA 6020B				Batch ID: 47611		Analyst: ME
Calcium	59,700	250		µg/L	1	5/5/2025 6:45:00 PM
Magnesium	5,450	50.0		µg/L	1	5/5/2025 6:45:00 PM
Potassium	4,030	50.0		µg/L	1	5/5/2025 6:45:00 PM
Sodium	14,700	100		µg/L	1	5/5/2025 6:45:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	3.57	0.700		mg/L	1	5/8/2024 7:27:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99485		Analyst: NR
Alkalinity, Total (As CaCO3)	227	25.0	D	mg/L	10	5/5/2025 11:52:00 AM
Salinity by SM 2520B				Batch ID: R99559		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/7/2025 2:44:10 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	268	5.00		mg/L	1	5/5/2025 10:56:13 AM

CLIENT: Friedman & Bruya
Project: 505030

Analytical Report

Work Order: **2505035**
Date Reported: **5/9/2025**

CLIENT: Friedman & Bruya
Project: 505030

Lab ID: 2505035-002 **Collection Date:** 5/1/2025 9:35:00 AM
Client Sample ID: **20ZVI-EFF-050125** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47608		Analyst: OP
Fluoride	0.155	0.100		mg/L	1	5/2/2025 10:45:00 PM
Chloride	4.38	0.200		mg/L	1	5/2/2025 10:45:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	5/2/2025 10:45:00 PM
Bromide	ND	0.600		mg/L	1	5/2/2025 10:45:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	5/2/2025 10:45:00 PM
Ortho-Phosphate (as P)	ND	0.400	Q	mg/L	1	5/2/2025 10:45:00 PM
Sulfate	4.98	1.00		mg/L	1	5/2/2025 10:45:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (85%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	61,200	60.0		µg/L	1	5/6/2025 6:02:00 PM
Magnesium	4,990	50.0		µg/L	1	5/6/2025 6:02:00 PM
Potassium	3,990	50.0		µg/L	1	5/6/2025 6:02:00 PM
Sodium	14,800	100		µg/L	1	5/6/2025 6:02:00 PM
Total Metals by EPA 6020B				Batch ID: 47611		Analyst: ME
Calcium	57,000	250		µg/L	1	5/5/2025 6:48:00 PM
Magnesium	5,170	50.0		µg/L	1	5/5/2025 6:48:00 PM
Potassium	3,750	50.0		µg/L	1	5/5/2025 6:48:00 PM
Sodium	14,800	100		µg/L	1	5/5/2025 6:48:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	3.53	0.700		mg/L	1	5/8/2024 7:48:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99485		Analyst: NR
Alkalinity, Total (As CaCO3)	221	25.0	D	mg/L	10	5/5/2025 11:54:00 AM
Salinity by SM 2520B				Batch ID: R99559		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/7/2025 2:44:10 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	234	5.00		mg/L	1	5/5/2025 10:56:13 AM

CLIENT: Friedman & Bruya
Project: 505030

Analytical Report

Work Order: **2505035**
Date Reported: **5/9/2025**

CLIENT: Friedman & Bruya
Project: 505030

Lab ID: 2505035-003 **Collection Date:** 5/1/2025 11:00:00 AM
Client Sample ID: **50ZVI-EFF-050125** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47608		Analyst: OP
Fluoride	0.145	0.100		mg/L	1	5/2/2025 11:08:00 PM
Chloride	4.54	0.200		mg/L	1	5/2/2025 11:08:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	5/2/2025 11:08:00 PM
Bromide	ND	0.600		mg/L	1	5/2/2025 11:08:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	5/2/2025 11:08:00 PM
Ortho-Phosphate (as P)	ND	0.400	Q	mg/L	1	5/2/2025 11:08:00 PM
Sulfate	3.83	1.00		mg/L	1	5/2/2025 11:08:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (85%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	63,200	60.0		µg/L	1	5/6/2025 6:05:00 PM
Magnesium	5,010	50.0		µg/L	1	5/6/2025 6:05:00 PM
Potassium	4,100	50.0		µg/L	1	5/6/2025 6:05:00 PM
Sodium	15,500	100		µg/L	1	5/6/2025 6:05:00 PM
Total Metals by EPA 6020B				Batch ID: 47611		Analyst: ME
Calcium	58,400	250		µg/L	1	5/5/2025 6:52:00 PM
Magnesium	5,030	50.0		µg/L	1	5/5/2025 6:52:00 PM
Potassium	3,820	50.0		µg/L	1	5/5/2025 6:52:00 PM
Sodium	15,400	100		µg/L	1	5/5/2025 6:52:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	2.94	0.700		mg/L	1	5/8/2024 8:30:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99485		Analyst: NR
Alkalinity, Total (As CaCO3)	223	25.0	D	mg/L	10	5/5/2025 11:56:00 AM
Salinity by SM 2520B				Batch ID: R99559		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/7/2025 2:44:10 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	234	5.00		mg/L	1	5/5/2025 10:56:13 AM

CLIENT: Friedman & Bruya
Project: 505030

Analytical Report

Work Order: **2505035**
Date Reported: **5/9/2025**

CLIENT: Friedman & Bruya
Project: 505030

Lab ID: 2505035-004 **Collection Date:** 5/1/2025 12:45:00 PM
Client Sample ID: **INFLUENT-050125** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47608		Analyst: OP
Fluoride	0.173	0.100		mg/L	1	5/2/2025 11:32:00 PM
Chloride	3.63	0.200		mg/L	1	5/2/2025 11:32:00 PM
Nitrite (as N)	ND	0.200		mg/L	1	5/2/2025 11:32:00 PM
Bromide	ND	0.600		mg/L	1	5/2/2025 11:32:00 PM
Nitrate (as N)	ND	0.200		mg/L	1	5/2/2025 11:32:00 PM
Ortho-Phosphate (as P)	ND	0.400	Q	mg/L	1	5/2/2025 11:32:00 PM
Sulfate	3.83	1.00		mg/L	1	5/2/2025 11:32:00 PM

NOTES:
Q - Associated calibration verification is below acceptance criteria (85%, nominal 90-110). Result may be low-biased.

Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	73,100	60.0		µg/L	1	5/6/2025 6:15:00 PM
Magnesium	4,360	50.0		µg/L	1	5/6/2025 6:15:00 PM
Potassium	3,800	50.0		µg/L	1	5/6/2025 6:15:00 PM
Sodium	12,600	100		µg/L	1	5/6/2025 6:15:00 PM
Total Metals by EPA 6020B				Batch ID: 47611		Analyst: ME
Calcium	68,900	250		µg/L	1	5/5/2025 6:55:00 PM
Magnesium	4,500	50.0		µg/L	1	5/5/2025 6:55:00 PM
Potassium	3,630	50.0		µg/L	1	5/5/2025 6:55:00 PM
Sodium	13,100	100		µg/L	1	5/5/2025 6:55:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	4.94	0.700		mg/L	1	5/8/2024 9:20:00 PM
Total Alkalinity by EPA 310.2				Batch ID: R99485		Analyst: NR
Alkalinity, Total (As CaCO3)	179	25.0	D	mg/L	10	5/5/2025 12:02:00 PM
Salinity by SM 2520B				Batch ID: R99559		Analyst: OP
Salinity	0.0100	0.000100		%	1	5/7/2025 2:44:10 PM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	278	5.00		mg/L	1	5/5/2025 10:56:13 AM

CLIENT: Friedman & Bruya
Project: 505030

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **LCS-99485**	SampType: **LCS**			Units: **mg/L**		Prep Date: **5/5/2025**		RunNo: **99485**		
Client ID: **LCSW**	Batch ID: **R99485**					Analysis Date: **5/5/2025**		SeqNo: **2072290**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	26.8	2.50	25.00	0	107	79.4	136				

Sample ID: **2505026-001ADUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **5/5/2025**		RunNo: **99485**		
Client ID: **BATCH**	Batch ID: **R99485**					Analysis Date: **5/5/2025**		SeqNo: **2072292**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	335	25.0						328.8	1.93	20	D

Sample ID: **2505036-001ADUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **5/5/2025**		RunNo: **99485**		
Client ID: **BATCH**	Batch ID: **R99485**					Analysis Date: **5/5/2025**		SeqNo: **2072303**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	246	25.0						227.3	7.73	20	D

Sample ID: **MB-99485**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **5/5/2025**		RunNo: **99485**		
Client ID: **MBLKW**	Batch ID: **R99485**					Analysis Date: **5/5/2025**		SeqNo: **2072380**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-47608** SampType: **MBLK** Units: **mg/L** Prep Date: **5/2/2025** RunNo: **99647**
Client ID: **MBLKW** Batch ID: **47608** Analysis Date: **5/2/2025** SeqNo: **2075587**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	ND	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	ND	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	ND	1.00									

Sample ID: **LCS-47608** SampType: **LCS** Units: **mg/L** Prep Date: **5/2/2025** RunNo: **99647**
Client ID: **LCSW** Batch ID: **47608** Analysis Date: **5/2/2025** SeqNo: **2075589**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.522	0.100	0.5000	0	104	90	110				
Chloride	0.768	0.200	0.7500	0	102	90	110				
Nitrite (as N)	0.756	0.200	0.7500	0	101	90	110				
Bromide	2.57	0.600	2.500	0	103	90	110				
Nitrate (as N)	0.778	0.200	0.7500	0	104	90	110				
Ortho-Phosphate (as P)	1.14	0.400	1.250	0	91.4	90	110				
Sulfate	3.82	1.00	3.750	0	102	90	110				

Sample ID: **2505035-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/2/2025** RunNo: **99647**
Client ID: **Control-EFF-050125** Batch ID: **47608** Analysis Date: **5/2/2025** SeqNo: **2075592**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.167	0.100						0.1670	0	20	
Chloride	4.33	0.200						4.310	0.486	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	ND	0.200						0		20	
Ortho-Phosphate (as P)	0.557	0.400						0.4400	23.5	20	
Sulfate	4.49	1.00						4.479	0.178	20	

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2505035-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/2/2025** RunNo: **99647**
Client ID: **Control-EFF-050125** Batch ID: **47608** Analysis Date: **5/2/2025** SeqNo: **2075592**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2505035-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **5/2/2025** RunNo: **99647**
Client ID: **Control-EFF-050125** Batch ID: **47608** Analysis Date: **5/2/2025** SeqNo: **2075593**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.685	0.100	0.5000	0.1670	104	80	120				
Chloride	5.09	0.200	0.7500	4.310	103	80	120				
Nitrite (as N)	0.772	0.200	0.7500	0	103	80	120				
Bromide	2.63	0.600	2.500	0	105	80	120				
Nitrate (as N)	0.790	0.200	0.7500	0	105	80	120				
Ortho-Phosphate (as P)	1.63	0.400	1.250	0.4400	95.0	80	120				
Sulfate	8.70	1.00	3.750	4.479	113	80	120				

Sample ID: **2505035-001AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/2/2025** RunNo: **99647**
Client ID: **Control-EFF-050125** Batch ID: **47608** Analysis Date: **5/2/2025** SeqNo: **2075594**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.683	0.100	0.5000	0.1670	103	80	120	0.6850	0.292	20	
Chloride	5.08	0.200	0.7500	4.310	102	80	120	5.086	0.177	20	
Nitrite (as N)	0.770	0.200	0.7500	0	103	80	120	0.7720	0.259	20	
Bromide	2.62	0.600	2.500	0	105	80	120	2.628	0.343	20	
Nitrate (as N)	0.788	0.200	0.7500	0	105	80	120	0.7900	0.253	20	
Ortho-Phosphate (as P)	1.78	0.400	1.250	0.4400	107	80	120	1.627	8.76	20	
Sulfate	8.73	1.00	3.750	4.479	113	80	120	8.700	0.310	20	

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Salinity by SM 2520B

Sample ID: **MB-R99559**	SampType: **MBLK**	Units: **%**	Prep Date: **5/7/2025**	RunNo: **99559**
Client ID: **MBLKW**	Batch ID: **R99559**		Analysis Date: **5/7/2025**	SeqNo: **2073711**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100									

Sample ID: **LCS-R99559**	SampType: **LCS**	Units: **µS/cm**	Prep Date: **5/7/2025**	RunNo: **99559**
Client ID: **LCSW**	Batch ID: **R99559**		Analysis Date: **5/7/2025**	SeqNo: **2073712**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	992	0.00100	1,000	0	99.2	79.1	119.1				

Sample ID: **2504714-002ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/7/2025**	RunNo: **99559**
Client ID: **BATCH**	Batch ID: **R99559**		Analysis Date: **5/7/2025**	SeqNo: **2073715**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Sample ID: **2505022-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/7/2025**	RunNo: **99559**
Client ID: **BATCH**	Batch ID: **R99559**		Analysis Date: **5/7/2025**	SeqNo: **2073719**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99468**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **MBLKW**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072391**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99468**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **LCSW**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072392**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	286	5.00	300.0	0	95.3	65	135				

Sample ID: **2505053-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **BATCH**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072448**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	9,430	5.00						9,036	4.25	30	

Sample ID: **2505053-002BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **BATCH**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072450**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	6,590	5.00						6,684	1.42	30	

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB** SampType: **MBLK** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **MBLKW** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075132**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS** SampType: **LCS** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **LCSW** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075133**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	21.6	0.700	25.00	0	86.4	79.6	120				

Sample ID: **2505035-002BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **20ZVI-EFF-050125** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075136**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.52	0.700						3.529	0.398	15	

Sample ID: **2505035-003BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **50ZVI-EFF-050125** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075138**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.0	0.700	25.00	2.942	80.4	85	115				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Sample ID: **2505036-002BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075144**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	6.17	0.700						6.144	0.422	15	

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2505036-002BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075145**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	25.4	0.700	25.00	6.144	76.9	85	115				S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2505036-002BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075146**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	25.2	0.700	25.00	6.144	76.3	85	115	25.36	0.561	15	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **MB-47634** SampType: **MBLK** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **MBLKW** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073444**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	60.0									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47634** SampType: **LCS** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **LCSW** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073445**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	983	60.0	1,000	0	98.3	80	120				
Magnesium	966	50.0	1,000	0	96.6	80	120				
Potassium	1,000	50.0	1,000	0	100	80	120				
Sodium	1,030	100	1,000	0	103	80	120				

Sample ID: **2505001-001DMS** SampType: **MS** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **BATCH** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073447**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	36,300	60.0	1,000	36,890	-63.9	75	125				ES
Magnesium	33,300	50.0	1,000	33,560	-28.2	75	125				ES
Potassium	1,960	50.0	1,000	1,010	94.7	75	125				
Sodium	48,700	100	1,000	49,540	-79.8	75	125				ES

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2505001-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **BATCH** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073449**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	36,700	60.0	1,000	36,890	-22.6	75	125	36,260	1.13	20	ES
Magnesium	33,500	50.0	1,000	33,560	-4.89	75	125	33,280	0.699	20	ES

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **2505001-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **BATCH** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073449**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	2,010	50.0	1,000	1,010	99.7	75	125	1,957	2.51	20	
Sodium	48,900	100	1,000	49,540	-64.4	75	125	48,740	0.316	20	ES

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **MB-47611** SampType: **MBLK** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99504**
Client ID: **MBLKW** Batch ID: **47611** Analysis Date: **5/5/2025** SeqNo: **2072831**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47611** SampType: **LCS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99504**
Client ID: **LCSW** Batch ID: **47611** Analysis Date: **5/5/2025** SeqNo: **2072832**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	936	250	1,000	0	93.6	80	120				
Magnesium	1,030	50.0	1,000	0	103	80	120				
Potassium	1,000	50.0	1,000	0	100	80	120				
Sodium	1,080	100	1,000	0	108	80	120				

Sample ID: **2505005-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99504**
Client ID: **BATCH** Batch ID: **47611** Analysis Date: **5/5/2025** SeqNo: **2072834**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	23,000	250	1,000	22,910	6.83	75	125				ES
Magnesium	9,850	50.0	1,000	9,143	70.3	75	125				ES
Potassium	2,720	50.0	1,000	1,866	85.4	75	125				
Sodium	67,100	100	1,000	68,360	-130	75	125				ES

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2505005-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99504**
Client ID: **BATCH** Batch ID: **47611** Analysis Date: **5/5/2025** SeqNo: **2072836**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	23,800	250	1,000	22,910	90.6	75	125	22,980	3.58	20	E
Magnesium	10,300	50.0	1,000	9,143	113	75	125	9,846	4.25	20	E

Work Order: 2505035
CLIENT: Friedman & Bruya
Project: 505030

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **2505005-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/5/2025** RunNo: **99504**
Client ID: **BATCH** Batch ID: **47611** Analysis Date: **5/5/2025** SeqNo: **2072836**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	2,800	50.0	1,000	1,866	93.7	75	125	2,720	3.00	20	
Sodium	69,200	100	1,000	68,360	86.1	75	125	67,060	3.17	20	E

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2505035
Logged by:	Morgan Wilson	Date Received:	5/2/2025 10:50:00 AM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp ºC
Sample	3.8

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
ATG

PROJECT NAME/NO.	PO #
~~504476~~ 505030 MS	F-213

REMARKS
Aspect EDD
Limited Volume, use project
RLS

2505035

TURNAROUND TIME
☒ Standard TAT
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Anions	Alkalinity	TOC	TDS	Salinity	Total Cations (Mg, K, Na, Ca)	Dissolved Cations (Mg, K, Na, Ca)				Notes
Control-EFF-050125		5/1/2025	930	water	4	x	x	x	x	x	x	x				anions=Br, Cl, F,
20ZVI-EFF-050125		5/1/2025	935	water	4	x	x	x	x	x	x	x				SO4, NO2, NO3,
~~50ZVI-EFF-050125~~		5/1/2025	1100	water	4	x	x	x	x	x	x	x				PO4
INFLUENT-050125		5/1/2025	1245	water	4	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	5/2/25	0729
Received by:		Jack Hawthorne		5/2/25	1050
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 6, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the results from the testing of material submitted on May 2, 2025 from the Glacier Northwest AS230067, F&BI 505054 project. There are 32 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkowski, Marc Chalfant
ASP0506R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 2, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 505054 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
505054 -01	Control-EFF-050225
505054 -02	Control-PORT 3-050225
505054 -03	Control-PORT 2-050225
505054 -04	Control-PORT 1-050225
505054 -05	20ZVI-EFF-050225
505054 -06	20ZVI-PORT 3-050225
505054 -07	20ZVI-PORT 2-050225
505054 -08	20ZVI-PORT 1-050225
505054 -09	50ZVI-EFF-050225
505054 -10	50ZVI-PORT 3-050225
505054 -11	50ZVI-PORT 2-050225
505054 -12	50ZVI-PORT 1-050225
505054 -13	INFLUENT-050225

All quality control requirements were acceptable.

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-01 x5
Date Analyzed:	05/05/25	Data File:	505054-01 x5.097
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	360

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-02 x5
Date Analyzed:	05/05/25	Data File:	505054-02 x5.119
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	390

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-03 x5
Date Analyzed:	05/05/25	Data File:	505054-03 x5.120
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	310

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-04 x5
Date Analyzed:	05/05/25	Data File:	505054-04 x5.121
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	240

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-05 x5
Date Analyzed:	05/05/25	Data File:	505054-05 x5.098
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	4.2

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-06 x5
Date Analyzed:	05/05/25	Data File:	505054-06 x5.122
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.8

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-07 x5
Date Analyzed:	05/05/25	Data File:	505054-07 x5.123
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	21

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-08 x5
Date Analyzed:	05/05/25	Data File:	505054-08 x5.124
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	57

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-09 x5
Date Analyzed:	05/05/25	Data File:	505054-09 x5.099
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.2

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-10 x5
Date Analyzed:	05/05/25	Data File:	505054-10 x5.125
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.9

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-11 x5
Date Analyzed:	05/05/25	Data File:	505054-11 x5.126
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	7.2

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-12 x5
Date Analyzed:	05/05/25	Data File:	505054-12 x5.127
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	15

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-13 x5
Date Analyzed:	05/05/25	Data File:	505054-13 x5.100
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	680

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	I5-383 mb
Date Analyzed:	05/05/25	Data File:	I5-383 mb.106
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-01 x5
Date Analyzed:	05/05/25	Data File:	505054-01 x5.093
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	350

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-02 x5
Date Analyzed:	05/05/25	Data File:	505054-02 x5.108
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	390

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-03 x5
Date Analyzed:	05/05/25	Data File:	505054-03 x5.109
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	360

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-04 x5
Date Analyzed:	05/05/25	Data File:	505054-04 x5.110
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	330

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-05 x5
Date Analyzed:	05/05/25	Data File:	505054-05 x5.094
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	32

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-06 x5
Date Analyzed:	05/05/25	Data File:	505054-06 x5.111
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	15

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-07 x5
Date Analyzed:	05/05/25	Data File:	505054-07 x5.112
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	21

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-08 x5
Date Analyzed:	05/05/25	Data File:	505054-08 x5.113
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	61

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-09 x5
Date Analyzed:	05/05/25	Data File:	505054-09 x5.095
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.6

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-10 x5
Date Analyzed:	05/05/25	Data File:	505054-10 x5.114
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.1

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-11 x5
Date Analyzed:	05/05/25	Data File:	505054-11 x5.115
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	11

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-12 x5
Date Analyzed:	05/05/25	Data File:	505054-12 x5.118
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	15

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505054-13 x5
Date Analyzed:	05/05/25	Data File:	505054-13 x5.096
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	730

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	I5-382 mb
Date Analyzed:	05/05/25	Data File:	I5-382 mb.102
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2

Date of Report: 05/06/25
Date Received: 05/02/25
Project: Glacier Northwest AS230067, F&BI 505054

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	98	97	80-120	1

Date of Report: 05/06/25
Date Received: 05/02/25
Project: Glacier Northwest AS230067, F&BI 505054

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	95	90	80-120	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505054

Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY

05/02/25 KY

Page # 1 of 2

Report To Delia Massey, Marc Chalfault
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-413-5407 Email Delia.Massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals
Project specific RLs? - Yes / No

INVOICE TO: Please invoice through Coupa

TURNAROUND TIME
☐ Standard turnaround
☒ RUSH 24-hr
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total As (6020B)	Dissolved As (6020B)			Notes
Control-EFF-050225	01 A-E	5/2/25	0915	W	5								X	X			RUSH TAT FOR ALL SAMPLES FOR MARKED ANALYSES
Control-PORT3-050225	02 A-B	"	1025	"	2								"	"			
Control-PORT2-050225	03	"	1105	"	2								"	"			
Control-PORT1-050225	04	"	1220	"	2								"	"			
20ZVI-EFF-050225	05 A-D	"	0905	"	4								"	"			
20ZVI-PORT3-050225	06 A-B	"	1020	"	2								"	"			
20ZVI-PORT2-050225	07	"	1110	"	2								"	"			
20ZVI-PORT1-050225	08 A-B	"	1230	"	2								"	"			
50ZVI-EFF-050225	09 A-E	"	0910	"	5								"	"			
50ZVI-PORT3-050225	10 A B	↓	1030	↓	2								↓	↓			

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/2/25	1602
Received by:	Eric Young	FedEx	5/2/25	1602
Relinquished by:		Samples received at 4 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

Andrew Yonkofski

505054

SAMPLE CHAIN OF CUSTODY

05/02/25 KH

Page # 2 of 2

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone 206-713-5407 Email Delia.massey@aecosystems.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filtered for T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME
- ☐ Standard turnaround
- ☒ RUSH 24-hr

Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total As (6020B)	Dissolved As (6020B)			Notes
50ZVI-PORT2-050225	11 AB	5/2/25	1115	W	2								X	X			RUSH TAT FOR ALL SAMPLES
50ZVI-PORT1-050225	12	↓	1225	↓	2								↓	↓			FOR MARKED ANALYSES
INFLUENT-050225	13 A-E	↓	1240	↓	5								↓	↓			

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/2/25	1602
Received by:	ERIC JOHNS	FCB	5/2/25	1602
Relinquished by:		Samples received at 4 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 505054 CLIENT ASP INITIALS/ DATE: E 5/2/25

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ NA Date: 5/5
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No		☐ Not on COC/label
Date Sampled	☑ Yes ☐ No		☐ Not on COC/label
Time Sampled	☑ Yes ☐ No		☐ Not on COC/label
# of Containers	☑ Yes ☐ No		
Relinquished	☑ Yes ☐ No		
Requested analysis	☑ Yes ☐ On Hold		

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____
**Fill out Green manifolds billing sheet

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Elizabeth Webber-Bruya
Ann Webber-Bruya
Michael Erdahl
Vineta Mills
Eric Young

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 13, 2025

Delia Massey, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Massey:

Included are the results from the testing of material submitted on May 2, 2025 from the Glacier Northwest AS230067, F&BI 505055 project. There are 47 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data, Andrew Yonkowski, Marc Chalfant
ASP0513R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 2, 2025 by Friedman & Bruya, Inc. from the Aspect Consulting Glacier Northwest AS230067, F&BI 505055 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
505055 -01	Control-EFF-050225
505055 -02	Control-PORT 3-050225
505055 -03	Control-PORT 2-050225
505055 -04	Control-PORT 1-050225
505055 -05	20ZVI-EFF-050225
505055 -06	20ZVI-PORT 3-050225
505055 -07	20ZVI-PORT 2-050225
505055 -08	20ZVI-PORT 1-050225
505055 -09	50ZVI-EFF-050225
505055 -10	50ZVI-PORT 3-050225
505055 -11	50ZVI-PORT 2-050225
505055 -12	50ZVI-PORT 1-050225
505055 -13	INFLUENT-050225

The samples selected for total organic carbon, salinity, total dissolved solids, total and dissolved cations (K, Ca, Mg, K), and anions (SO4, NO2, NO3, PO4, Cl, Fl, Br) were sent to Alliance Technical Group for testing. The report is enclosed.

All quality control requirements were acceptable.

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/06/25	Lab ID:	505055-01 1/50
Date Analyzed:	05/07/25	Data File:	050706.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	126 d	10	140

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	760

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	50ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/06/25	Lab ID:	505055-09 1/50
Date Analyzed:	05/07/25	Data File:	050707.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	123 d	10	140

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	290

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	INFLUENT-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/06/25	Lab ID:	505055-13 1/50
Date Analyzed:	05/07/25	Data File:	050708.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	173 d	10	140

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	660

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/06/25	Lab ID:	05-1124 mb 1/0.5
Date Analyzed:	05/06/25	Data File:	050611.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	DBA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	73	10	140

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	<0.2

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-01 x5
Date Analyzed:	05/05/25	Data File:	505055-01 x5.093
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	3.1

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-01 x10
Date Analyzed:	05/05/25	Data File:	505055-01 x10.151
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	1,700

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-01 x100
Date Analyzed:	05/05/25	Data File:	505055-01 x100.150
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	650

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-02 x5
Date Analyzed:	05/05/25	Data File:	505055-02 x5.108
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-03 x5
Date Analyzed:	05/05/25	Data File:	505055-03 x5.109
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	2.8

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-04 x5
Date Analyzed:	05/05/25	Data File:	505055-04 x5.110
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-05 x5
Date Analyzed:	05/05/25	Data File:	505055-05 x5.094
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	38

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-05 x1000
Date Analyzed:	05/05/25	Data File:	505055-05 x1000.216
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	200,000
Manganese	1,200

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-06 x5
Date Analyzed:	05/05/25	Data File:	505055-06 x5.209
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	7.9

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-07 x5
Date Analyzed:	05/05/25	Data File:	505055-07 x5.210
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	3.9

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-08 x5
Date Analyzed:	05/05/25	Data File:	505055-08 x5.211
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	8.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-09 x5
Date Analyzed:	05/05/25	Data File:	505055-09 x5.095
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-09 x500
Date Analyzed:	05/05/25	Data File:	505055-09 x500.218
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	110,000
Manganese	650

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-10 x5
Date Analyzed:	05/05/25	Data File:	505055-10 x5.212
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	4.7

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-11 x5
Date Analyzed:	05/05/25	Data File:	505055-11 x5.213
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-12 x5
Date Analyzed:	05/05/25	Data File:	505055-12 x5.118
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-13 x5
Date Analyzed:	05/05/25	Data File:	505055-13 x5.096
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-13 x100
Date Analyzed:	05/05/25	Data File:	505055-13 x100.226
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	180

Analysis For Total Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	I5-382 mb
Date Analyzed:	05/05/25	Data File:	I5-382 mb.102
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<0.5
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-01 x5
Date Analyzed:	05/05/25	Data File:	505055-01 x5.097
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	3.0

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-01 x10
Date Analyzed:	05/05/25	Data File:	505055-01 x10.228
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	1,300

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-01 x100
Date Analyzed:	05/05/25	Data File:	505055-01 x100.227
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	610

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-02 x5
Date Analyzed:	05/05/25	Data File:	505055-02 x5.119
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-03 x5
Date Analyzed:	05/05/25	Data File:	505055-03 x5.120
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Control-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-04 x5
Date Analyzed:	05/05/25	Data File:	505055-04 x5.121
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-05 x5
Date Analyzed:	05/05/25	Data File:	505055-05 x5.098
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-05 x500
Date Analyzed:	05/06/25	Data File:	505055-05 x500.070
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	98,000
Manganese	880

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-06 x5
Date Analyzed:	05/05/25	Data File:	505055-06 x5.122
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-07 x5
Date Analyzed:	05/05/25	Data File:	505055-07 x5.123
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	20ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-08 x5
Date Analyzed:	05/05/25	Data File:	505055-08 x5.214
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-09 x5
Date Analyzed:	05/05/25	Data File:	505055-09 x5.099
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-EFF-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-09 x500
Date Analyzed:	05/05/25	Data File:	505055-09 x500.230
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	96,000
Manganese	620

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 3-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-10 x5
Date Analyzed:	05/05/25	Data File:	505055-10 x5.125
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 2-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-11 x5
Date Analyzed:	05/05/25	Data File:	505055-11 x5.215
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	50ZVI-PORT 1-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-12 x5
Date Analyzed:	05/05/25	Data File:	505055-12 x5.127
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-13 x5
Date Analyzed:	05/05/25	Data File:	505055-13 x5.100
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<2.5

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	INFLUENT-050225	Client:	Aspect Consulting
Date Received:	05/02/25	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	505055-13 x100
Date Analyzed:	05/05/25	Data File:	505055-13 x100.232
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	15,000
Manganese	170

Analysis For Dissolved Metals By EPA Method 6020B

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Glacier Northwest AS230067
Date Extracted:	05/05/25	Lab ID:	I5-383 mb
Date Analyzed:	05/05/25	Data File:	I5-383 mb.106
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Copper	<0.5
Iron	<50
Manganese	<1

Date of Report: 05/13/25
Date Received: 05/02/25
Project: Glacier Northwest AS230067, F&BI 505055

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Pentachlorophenol	ug/L (ppb)	10	94	81	10-144	15

Date of Report: 05/13/25
Date Received: 05/02/25
Project: Glacier Northwest AS230067, F&BI 505055

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Copper	ug/L (ppb)	20	98	95	80-120	3
Iron	ug/L (ppb)	100	96	92	80-120	4
Manganese	ug/L (ppb)	20	98	97	80-120	1

Date of Report: 05/13/25
Date Received: 05/02/25
Project: Glacier Northwest AS230067, F&BI 505055

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Copper	ug/L (ppb)	20	102	101	80-120	1
Iron	ug/L (ppb)	100	99	98	80-120	1
Manganese	ug/L (ppb)	20	102	101	80-120	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505055

Andrew Yonkofski,

SAMPLE CHAIN OF CUSTODY

05/02/25 KH

Page # 1 of 2

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone 206-413-5407 Email DeliaMassey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filter T/D Metals

Project specific RLs? - Yes / No

INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME
- [x] Standard turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: TotalDissolved Solids (SM 2540C/E) NWTPH-Dx	Salinity (SM 2520B) NWTPH-Gx	Alkalinity (EPA 310.1) BTEX EPA 8021	Total Inorganic Carbon (SM 5310C) NWTPH-HCID	Br, F, Cl, SO4 (EPA 300.0) VOCs EPA 8260	Total Cu (6020B) PAHs EPA 8270	Dissolved Cu (6020B) PCBs EPA 8082	Total metals (Cu, Fe, Mn, Mg, K, Na) (6020B)	Dissolved Metals (Cu, Ca, Fe, Mn, Mg, K, Na) (6020B)	NO3 as N, NO2 as N, Orthophosphate as PO4 (EPA 300.0)	PCP (SM 6420-B) SIM	Notes
Control-EFF-050225	01 A-E	5/2/25	0915	W	5	X	X	X	X	X			X	X	X	X	
Control-PORT3-050225	02 A-B		1025		2						X	X					
Control-PORT2-050225	03		1105		2						X	X					
Control-PORT1-050225	04		1220		2						X	X					
20ZVI-EFF-050225	05 A-D		0905		4	X	X	X	X	X			X	X	X		
20ZVI-PORT3-050225	06 A-B		1020		2						X	X					
20ZVI-PORT2-050225	07		1110		2						X	X					
20ZVI-PORT1-050225	08		1230		2						X	X					
50ZVI-EFF-050225	09 A-E		0910		5	X	X	X	X	X			X	X	X	X	
90ZVI-PORT3-050225	10 AB		1030		2						X	X					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/2/25	1601
Received by:	ERIC YOUNG	FedEx	5/2/25	1691
Relinquished by:		Samples received at 4 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

~~505055~~

505055 Andrew Yonkofski

SAMPLE CHAIN OF CUSTODY

05/02/25 KY

Page # 2 of 2

Report To Delia Massey, Marc Chalfant

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone 206-413-5407 Email Delia.massey@Geosyntec.com

SAMPLERS (*signature*): Emily Rusen

PROJECT NAME: Glacier Northwest

PO #: AS230067

REMARKS: Field Filter T/D metals

Project specific RLs? - Yes / No

INVOICE TO: Please Invoice through Coupa

TURNAROUND TIME
- [X] Standard turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
- Default: Dispose after 30 days

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	Total Dissolved Solids (SM2540C) NWTPH-Dx	Salinity (SM2520B) NWTPH-Gx	Alkalinity (EPA 310.1) BTEX EPA 8021	Total Organic Carbon (SM5310C) NWTPH-HCID	Br, F, Cl, SO4 (EPA 300.0) VOCs EPA 8260	Total Arg, Cu (6020B) PAHs EPA 8270	Dissolved Cu (6020B) PCBs EPA 8082	Total Metals (Cu, Fe, Mn, Mg, K, Na) (6020B)	Dissolved Metals (Cu, Fe, Mn, Mg, K, Na) (6020B)	NO3 as N, NO2 as N, Orthophosphate as PO4 (EPA 300.0)	PCP (SM6470E-SIM)	Notes
SOZVI-PORT2-050225	11 A-B	5/2/25	1115	W	2						X	X					
SOZVI-PORT1-050225	12 ↓	|	1225	|	2						X	X					
INFLUENT-050225	13 A-E	↓	1240	↓	5	X	X	X	X	X			X	X	X	X	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Emily Rusen	EMILY RUSEN	ASPECT	5/2/25	1601
Received by:	Eric Houser	FaB	5/2/25	1601
Relinquished by:		Samples received at 4 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 505053 (NP) 505054 CLIENT ASP INITIALS/ DATE: E 5/2/25

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☒ YES ☐ NO Initials/ Date: (NP) 5/5
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☒ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☒ YES ☐ NO

Were appropriate sample containers used? ☒ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☒ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☒ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☒ Yes	☐ No	☐ Not on COC/label
Date Sampled	☒ Yes	☐ No	☐ Not on COC/label
Time Sampled	☒ Yes	☐ No	☐ Not on COC/label
# of Containers	☒ Yes	☐ No	
Relinquished	☒ Yes	☐ No	
Requested analysis	☐ Yes	☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☒ NA ☐ YES ☐ NO

Number of unused TO15 canisters** _____ Number of unused TO17 tubes _____
**Fill out Green manifolds billing sheet

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 505055,
Work Order Number: 2505080

May 12, 2025

Attention Michael Erdahl:

Alliance Technical Group, LLC - Seattle received 4 sample(s) on 5/5/2025 for the analyses presented in the following report.

Dissolved Metals by EPA 6020B
Ion Chromatography by EPA 300.0
Salinity by SM 2520B
Total Alkalinity by EPA 310.2
Total Dissolved Solids by SM 2540C
Total Metals by EPA 6020B
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Alliance Technical Group is committed to accuracy, speed, and customer service. Thank you for choosing Alliance Technical Group's Seattle laboratory team for your analytical needs. We appreciate this opportunity to serve you!

Sincerely,

Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Date: *05/12/2025*

CLIENT: Friedman & Bruya
Project: 505055
Work Order: 2505080

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2505080-001	Control-EFF-050225	05/02/2025 9:15 AM	05/05/2025 3:30 PM
2505080-002	20ZVI-EFF-050225	05/02/2025 9:05 AM	05/05/2025 3:30 PM
2505080-003	50ZVI-EFF-050225	05/02/2025 9:10 AM	05/05/2025 3:30 PM
2505080-004	INFLUENT-050225	05/02/2025 12:40 PM	05/05/2025 3:30 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Original

Case Narrative

WO#: **2505080**

Date: **5/12/2025**

CLIENT: Friedman & Bruya
Project: 505055

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2505080**
Date Reported: **5/12/2025**

CLIENT: Friedman & Bruya
Project: 505055

Lab ID: 2505080-001 **Collection Date:** 5/2/2025 9:15:00 AM
Client Sample ID: **Control-EFF-050225** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47626		Analyst: OP
Fluoride	ND	0.100		mg/L	1	5/6/2025 6:28:00 PM
Chloride	4.42	0.200		mg/L	1	5/6/2025 6:28:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	5/6/2025 6:28:00 PM
Bromide	ND	0.600		mg/L	1	5/6/2025 6:28:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	5/6/2025 6:28:00 PM
Ortho-Phosphate (as P)	0.625	0.400	H	mg/L	1	5/6/2025 6:28:00 PM
Sulfate	4.60	1.00		mg/L	1	5/6/2025 6:28:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	65,200	60.0		µg/L	1	5/6/2025 6:18:00 PM
Magnesium	5,560	50.0		µg/L	1	5/6/2025 6:18:00 PM
Potassium	4,700	50.0		µg/L	1	5/6/2025 6:18:00 PM
Sodium	14,300	100		µg/L	1	5/6/2025 6:18:00 PM
Total Metals by EPA 6020B				Batch ID: 47662		Analyst: ME
Calcium	62,700	250		µg/L	1	5/8/2025 1:51:00 PM
Magnesium	5,790	50.0		µg/L	1	5/8/2025 1:51:00 PM
Potassium	4,440	50.0		µg/L	1	5/8/2025 1:51:00 PM
Sodium	14,600	100		µg/L	1	5/8/2025 1:51:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	7.16	0.700		mg/L	1	5/9/2024 3:23:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99675		Analyst: NR
Alkalinity, Total (As CaCO3)	174	25.0	D	mg/L	10	5/12/2025 11:49:00 AM
Salinity by SM 2520B				Batch ID: R99660		Analyst: BB
Salinity	0.0100	0.000100		%	1	5/12/2025 9:54:17 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	450	5.00		mg/L	1	5/5/2025 10:56:13 AM

CLIENT: Friedman & Bruya
Project: 505055

Lab ID: 2505080-002 **Collection Date:** 5/2/2025 9:05:00 AM
Client Sample ID: **20ZVI-EFF-050225** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47626		Analyst: OP
Fluoride	0.154	0.100		mg/L	1	5/6/2025 6:51:00 PM
Chloride	4.53	0.200		mg/L	1	5/6/2025 6:51:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	5/6/2025 6:51:00 PM
Bromide	ND	0.600		mg/L	1	5/6/2025 6:51:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	5/6/2025 6:51:00 PM
Ortho-Phosphate (as P)	ND	0.400	H	mg/L	1	5/6/2025 6:51:00 PM
Sulfate	5.05	1.00		mg/L	1	5/6/2025 6:51:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	61,400	60.0		µg/L	1	5/6/2025 6:21:00 PM
Magnesium	4,970	50.0		µg/L	1	5/6/2025 6:21:00 PM
Potassium	4,090	50.0		µg/L	1	5/6/2025 6:21:00 PM
Sodium	14,600	100		µg/L	1	5/6/2025 6:21:00 PM
Total Metals by EPA 6020B				Batch ID: 47662		Analyst: ME
Calcium	57,000	250		µg/L	1	5/8/2025 1:54:00 PM
Magnesium	5,140	50.0		µg/L	1	5/8/2025 1:54:00 PM
Potassium	3,750	50.0		µg/L	1	5/8/2025 1:54:00 PM
Sodium	14,200	100		µg/L	1	5/8/2025 1:54:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	4.83	0.700		mg/L	1	5/9/2024 3:51:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99675		Analyst: NR
Alkalinity, Total (As CaCO3)	101	25.0	D	mg/L	10	5/12/2025 11:51:00 AM
Salinity by SM 2520B				Batch ID: R99660		Analyst: BB
Salinity	ND	0.000100		%	1	5/12/2025 9:54:17 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	246	5.00		mg/L	1	5/5/2025 10:56:13 AM

Analytical Report

Work Order: **2505080**
Date Reported: **5/12/2025**

CLIENT: Friedman & Bruya
Project: 505055

Lab ID: 2505080-003 **Collection Date:** 5/2/2025 9:10:00 AM
Client Sample ID: **50ZVI-EFF-050225** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47626		Analyst: OP
Fluoride	0.145	0.100		mg/L	1	5/6/2025 7:14:00 PM
Chloride	4.68	0.200		mg/L	1	5/6/2025 7:14:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	5/6/2025 7:14:00 PM
Bromide	ND	0.600		mg/L	1	5/6/2025 7:14:00 PM
Nitrate (as N)	ND	0.200	H	mg/L	1	5/6/2025 7:14:00 PM
Ortho-Phosphate (as P)	ND	0.400	H	mg/L	1	5/6/2025 7:14:00 PM
Sulfate	4.04	1.00		mg/L	1	5/6/2025 7:14:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	62,900	60.0		µg/L	1	5/6/2025 6:24:00 PM
Magnesium	4,920	50.0		µg/L	1	5/6/2025 6:24:00 PM
Potassium	4,090	50.0		µg/L	1	5/6/2025 6:24:00 PM
Sodium	15,000	100		µg/L	1	5/6/2025 6:24:00 PM
Total Metals by EPA 6020B				Batch ID: 47662		Analyst: ME
Calcium	61,300	250		µg/L	1	5/8/2025 1:57:00 PM
Magnesium	5,140	50.0		µg/L	1	5/8/2025 1:57:00 PM
Potassium	4,000	50.0		µg/L	1	5/8/2025 1:57:00 PM
Sodium	15,600	100		µg/L	1	5/8/2025 1:57:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	3.44	0.700		mg/L	1	5/9/2024 4:20:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99675		Analyst: NR
Alkalinity, Total (As CaCO3)	153	25.0	D	mg/L	10	5/12/2025 11:52:00 AM
Salinity by SM 2520B				Batch ID: R99660		Analyst: BB
Salinity	0.0100	0.000100		%	1	5/12/2025 9:54:17 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	242	5.00		mg/L	1	5/5/2025 10:56:13 AM

CLIENT: Friedman & Bruya
Project: 505055

Lab ID: 2505080-004 **Collection Date:** 5/2/2025 12:40:00 PM
Client Sample ID: **INFLUENT-050225** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA 300.0				Batch ID: 47626		Analyst: OP
Fluoride	0.177	0.100		mg/L	1	5/6/2025 7:37:00 PM
Chloride	3.83	0.200		mg/L	1	5/6/2025 7:37:00 PM
Nitrite (as N)	ND	0.200	H	mg/L	1	5/6/2025 7:37:00 PM
Bromide	ND	0.600		mg/L	1	5/6/2025 7:37:00 PM
Nitrate (as N)	0.588	0.200	H	mg/L	1	5/6/2025 7:37:00 PM
Ortho-Phosphate (as P)	ND	0.400	H	mg/L	1	5/6/2025 7:37:00 PM
Sulfate	4.09	1.00		mg/L	1	5/6/2025 7:37:00 PM
Dissolved Metals by EPA 6020B				Batch ID: 47634		Analyst: ME
Calcium	72,700	60.0		µg/L	1	5/6/2025 6:28:00 PM
Magnesium	4,470	50.0		µg/L	1	5/6/2025 6:28:00 PM
Potassium	3,920	50.0		µg/L	1	5/6/2025 6:28:00 PM
Sodium	12,900	100		µg/L	1	5/6/2025 6:28:00 PM
Total Metals by EPA 6020B				Batch ID: 47662		Analyst: ME
Calcium	69,000	250		µg/L	1	5/8/2025 2:06:00 PM
Magnesium	4,510	50.0		µg/L	1	5/8/2025 2:06:00 PM
Potassium	3,640	50.0		µg/L	1	5/8/2025 2:06:00 PM
Sodium	12,900	100		µg/L	1	5/8/2025 2:06:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R99630		Analyst: SS
Total Organic Carbon	4.88	0.700		mg/L	1	5/9/2024 4:38:00 AM
Total Alkalinity by EPA 310.2				Batch ID: R99675		Analyst: NR
Alkalinity, Total (As CaCO3)	129	25.0	D	mg/L	10	5/12/2025 11:54:00 AM
Salinity by SM 2520B				Batch ID: R99660		Analyst: BB
Salinity	0.0100	0.000100		%	1	5/12/2025 9:54:17 AM
Total Dissolved Solids by SM 2540C				Batch ID: R99468		Analyst: JH
Total Dissolved Solids	296	5.00		mg/L	1	5/5/2025 10:56:13 AM

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **MB-99675**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/12/2025**	RunNo: **99675**
Client ID: **MBLKW**	Batch ID: **R99675**		Analysis Date: **5/12/2025**	SeqNo: **2076118**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-99675**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/12/2025**	RunNo: **99675**
Client ID: **LCSW**	Batch ID: **R99675**		Analysis Date: **5/12/2025**	SeqNo: **2076119**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	24.1	2.50	25.00	0	96.4	79.4	136				

Sample ID: **2505087-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/12/2025**	RunNo: **99675**
Client ID: **BATCH**	Batch ID: **R99675**		Analysis Date: **5/12/2025**	SeqNo: **2076125**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	4.91	2.50						3.626	30.0	20	

Sample ID: **2505103-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/12/2025**	RunNo: **99675**
Client ID: **BATCH**	Batch ID: **R99675**		Analysis Date: **5/12/2025**	SeqNo: **2076132**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	17.5	2.50						16.15	8.14	20	

Sample ID: **2505103-001BMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **5/12/2025**	RunNo: **99675**
Client ID: **BATCH**	Batch ID: **R99675**		Analysis Date: **5/12/2025**	SeqNo: **2076133**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	26.6	2.50	10.00	16.15	104	80	120				

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Total Alkalinity by EPA 310.2

Sample ID: **2505103-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/12/2025** RunNo: **99675**
Client ID: **BATCH** Batch ID: **R99675** Analysis Date: **5/12/2025** SeqNo: **2076134**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	24.9	2.50	10.00	16.15	87.8	80	120	26.57	6.39	20	

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **LCS-47626** SampType: **LCS** Units: **mg/L** Prep Date: **5/5/2025** RunNo: **99502**
Client ID: **LCSW** Batch ID: **47626** Analysis Date: **5/5/2025** SeqNo: **2072943**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.482	0.100	0.5000	0	96.4	90	110				
Chloride	0.727	0.200	0.7500	0	96.9	90	110				
Nitrite (as N)	0.720	0.200	0.7500	0	96.0	90	110				
Bromide	2.47	0.600	2.500	0	98.6	90	110				
Nitrate (as N)	0.738	0.200	0.7500	0	98.4	90	110				
Ortho-Phosphate (as P)	1.20	0.400	1.250	0	95.9	90	110				
Sulfate	3.66	1.00	3.750	0	97.7	90	110				

Sample ID: **MB-47626** SampType: **MBLK** Units: **mg/L** Prep Date: **5/5/2025** RunNo: **99502**
Client ID: **MBLKW** Batch ID: **47626** Analysis Date: **5/5/2025** SeqNo: **2072945**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100									
Chloride	ND	0.200									
Nitrite (as N)	ND	0.200									
Bromide	ND	0.600									
Nitrate (as N)	ND	0.200									
Ortho-Phosphate (as P)	ND	0.400									
Sulfate	ND	1.00									

Sample ID: **2504673-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/5/2025** RunNo: **99502**
Client ID: **BATCH** Batch ID: **47626** Analysis Date: **5/6/2025** SeqNo: **2072951**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.100						0		20	
Chloride	33.9	0.200						33.87	0.0413	20	E
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	1.04	0.200						1.044	0.192	20	
Ortho-Phosphate (as P)	ND	0.400						0		20	
Sulfate	7.21	1.00						7.243	0.415	20	

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2504673-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/5/2025** RunNo: **99502**
Client ID: **BATCH** Batch ID: **47626** Analysis Date: **5/6/2025** SeqNo: **2072951**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2504673-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/5/2025** RunNo: **99502**
Client ID: **BATCH** Batch ID: **47626** Analysis Date: **5/6/2025** SeqNo: **2072952**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.537	0.100	0.5000	0.05000	97.4	80	120				
Chloride	34.1	0.200	0.7500	33.87	32.1	80	120				ES
Nitrite (as N)	0.741	0.200	0.7500	0	98.8	80	120				
Bromide	2.57	0.600	2.500	0	103	80	120				
Nitrate (as N)	1.85	0.200	0.7500	1.044	108	80	120				
Ortho-Phosphate (as P)	1.27	0.400	1.250	0	102	80	120				
Sulfate	11.3	1.00	3.750	7.243	109	80	120				

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2504673-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/5/2025** RunNo: **99502**
Client ID: **BATCH** Batch ID: **47626** Analysis Date: **5/6/2025** SeqNo: **2072953**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.545	0.100	0.5000	0.05000	99.0	80	120	0.5370	1.48	20	
Chloride	34.1	0.200	0.7500	33.87	35.5	80	120	34.11	0.0733	20	ES
Nitrite (as N)	0.752	0.200	0.7500	0	100	80	120	0.7410	1.47	20	
Bromide	2.61	0.600	2.500	0	104	80	120	2.573	1.39	20	
Nitrate (as N)	1.86	0.200	0.7500	1.044	109	80	120	1.852	0.646	20	
Ortho-Phosphate (as P)	1.34	0.400	1.250	0	108	80	120	1.271	5.66	20	
Sulfate	11.4	1.00	3.750	7.243	112	80	120	11.34	0.896	20	

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2505087-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/6/2025** RunNo: **99502**
Client ID: **BATCH** Batch ID: **47626** Analysis Date: **5/6/2025** SeqNo: **2074417**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.123	0.100						0.1240	0.810	20	
Chloride	1.21	0.200						1.203	0.828	20	
Nitrite (as N)	ND	0.200						0		20	
Bromide	ND	0.600						0		20	
Nitrate (as N)	ND	0.200						0		20	
Ortho-Phosphate (as P)	ND	0.400						0		20	
Sulfate	ND	1.00						0		20	

Sample ID: **2505087-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/6/2025** RunNo: **99502**
Client ID: **BATCH** Batch ID: **47626** Analysis Date: **5/6/2025** SeqNo: **2074418**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	0.625	0.100	0.5000	0.1240	100	80	120				
Chloride	2.01	0.200	0.7500	1.203	108	80	120				
Nitrite (as N)	0.732	0.200	0.7500	0	97.6	80	120				
Bromide	2.52	0.600	2.500	0	101	80	120				
Nitrate (as N)	0.752	0.200	0.7500	0	100	80	120				
Ortho-Phosphate (as P)	1.13	0.400	1.250	0	90.2	80	120				
Sulfate	4.13	1.00	3.750	0.4050	99.4	80	120				

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Salinity by SM 2520B

Sample ID: **MB-R99660**	SampType: **MBLK**	Units: **%**	Prep Date: **5/12/2025**	RunNo: **99660**
Client ID: **MBLKW**	Batch ID: **R99660**		Analysis Date: **5/12/2025**	SeqNo: **2075744**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	0.000100									

Sample ID: **LCS-R99660**	SampType: **LCS**	Units: **µS/cm**	Prep Date: **5/12/2025**	RunNo: **99660**
Client ID: **LCSW**	Batch ID: **R99660**		Analysis Date: **5/12/2025**	SeqNo: **2075745**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	1,000	0.000100	1,000	0	100	79.1	119.1				

Sample ID: **2505080-001ADUP**	SampType: **DUP**	Units: **%**	Prep Date: **5/12/2025**	RunNo: **99660**
Client ID: **Control-EFF-050225**	Batch ID: **R99660**		Analysis Date: **5/12/2025**	SeqNo: **2075747**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	0.0100	0.000100						0.01000	0	30	

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Total Dissolved Solids by SM 2540C

Sample ID: **MB-R99468**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **MBLKW**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072391**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	5.00									

Sample ID: **LCS-R99468**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **LCSW**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072392**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	286	5.00	300.0	0	95.3	65	135				

Sample ID: **2505053-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **BATCH**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072448**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	9,430	5.00						9,036	4.25	30	

Sample ID: **2505053-002BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/5/2025**	RunNo: **99468**
Client ID: **BATCH**	Batch ID: **R99468**		Analysis Date: **5/5/2025**	SeqNo: **2072450**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	6,590	5.00						6,684	1.42	30	

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB** SampType: **MBLK** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **MBLKW** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075132**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS** SampType: **LCS** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **LCSW** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075133**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	21.6	0.700	25.00	0	86.4	79.6	120				

Sample ID: **2505035-002BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075136**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.52	0.700						3.529	0.398	15	

Sample ID: **2505035-003BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075138**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	23.0	0.700	25.00	2.942	80.4	85	115				S

NOTES:
S - Outlying spike recoveries were associated with this sample.

Sample ID: **2505036-002BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075144**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	6.17	0.700						6.144	0.422	15	

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2505036-002BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075145**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	25.4	0.700	25.00	6.144	76.9	85	115				S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2505036-002BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/8/2024** RunNo: **99630**
Client ID: **BATCH** Batch ID: **R99630** Analysis Date: **5/8/2024** SeqNo: **2075146**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	25.2	0.700	25.00	6.144	76.3	85	115	25.36	0.561	15	S

NOTES:
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **MB-47634** SampType: **MBLK** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **MBLKW** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073444**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	60.0									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47634** SampType: **LCS** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **LCSW** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073445**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	983	60.0	1,000	0	98.3	80	120				
Magnesium	966	50.0	1,000	0	96.6	80	120				
Potassium	1,000	50.0	1,000	0	100	80	120				
Sodium	1,030	100	1,000	0	103	80	120				

Sample ID: **2505001-001DMS** SampType: **MS** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **BATCH** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073447**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	36,300	60.0	1,000	36,890	-63.9	75	125				ES
Magnesium	33,300	50.0	1,000	33,560	-28.2	75	125				ES
Potassium	1,960	50.0	1,000	1,010	94.7	75	125				
Sodium	48,700	100	1,000	49,540	-79.8	75	125				ES

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2505001-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **BATCH** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073449**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	36,700	60.0	1,000	36,890	-22.6	75	125	36,260	1.13	20	ES
Magnesium	33,500	50.0	1,000	33,560	-4.89	75	125	33,280	0.699	20	ES

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Dissolved Metals by EPA 6020B

Sample ID: **2505001-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/6/2025** RunNo: **99543**
Client ID: **BATCH** Batch ID: **47634** Analysis Date: **5/6/2025** SeqNo: **2073449**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	2,010	50.0	1,000	1,010	99.7	75	125	1,957	2.51	20	
Sodium	48,900	100	1,000	49,540	-64.4	75	125	48,740	0.316	20	ES

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **MB-47662** SampType: **MBLK** Units: **µg/L** Prep Date: **5/8/2025** RunNo: **99612**
Client ID: **MBLKW** Batch ID: **47662** Analysis Date: **5/8/2025** SeqNo: **2074791**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	250									
Magnesium	ND	50.0									
Potassium	ND	50.0									
Sodium	ND	100									

Sample ID: **LCS-47662** SampType: **LCS** Units: **µg/L** Prep Date: **5/8/2025** RunNo: **99612**
Client ID: **LCSW** Batch ID: **47662** Analysis Date: **5/8/2025** SeqNo: **2074792**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	972	250	1,000	0	97.2	80	120				
Magnesium	1,040	50.0	1,000	0	104	80	120				
Potassium	1,010	50.0	1,000	0	101	80	120				
Sodium	1,050	100	1,000	0	105	80	120				

Sample ID: **2505090-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **5/8/2025** RunNo: **99612**
Client ID: **BATCH** Batch ID: **47662** Analysis Date: **5/8/2025** SeqNo: **2074794**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	25,300	2,500	1,000	24,980	33.2	75	125				DS
Magnesium	72,900	500	1,000	72,530	35.3	75	125				DES
Potassium	3,780	500	1,000	2,925	85.0	75	125				D
Sodium	12,600	1,000	1,000	11,780	84.8	75	125				D

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2505090-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/8/2025** RunNo: **99612**
Client ID: **BATCH** Batch ID: **47662** Analysis Date: **5/8/2025** SeqNo: **2074796**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	26,500	2,500	1,000	24,980	150	75	125	25,310	4.50	20	DS
Magnesium	75,100	500	1,000	72,530	253	75	125	72,880	2.94	20	DES

Work Order: 2505080
CLIENT: Friedman & Bruya
Project: 505055

QC SUMMARY REPORT

Total Metals by EPA 6020B

Sample ID: **2505090-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **5/8/2025** RunNo: **99612**
Client ID: **BATCH** Batch ID: **47662** Analysis Date: **5/8/2025** SeqNo: **2074796**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	3,920	500	1,000	2,925	99.7	75	125	3,776	3.80	20	D
Sodium	13,100	1,000	1,000	11,780	134	75	125	12,620	3.82	20	DS

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2505080
Logged by:	Morgan Wilson	Date Received:	5/5/2025 3:30:00 PM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☐	No ☑	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified:	Michael Erdahl	Date:	5/6/2025
By Whom:	Morgan Wilson	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Anions OOH. Plan to Proceed per Historical for "ZVI" project		
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp ºC
Sample	5.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2505080

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
ATG

PROJECT NAME/NO.	PO #
505055	F-217

REMARKS
Aspect EDD
Limited Volume, use project
RLS

TURNAROUND TIME
☒ Standard TAT
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Anions	Alkalinity	TOC	TDS	Salinity	Total Cations (Mg, K, Na, Ca)	Dissolved Cations (Mg, K, Na, Ca)				Notes
Control-EFF-050225		5/2/2025	915	water	4	x	x	x	x	x	x	x				anions=Br, Cl, F,
20ZVI-EFF-050225		5/2/2025	905	water	4	x	x	x	x	x	x	x				SO4, NO2, NO3,
50ZVI-EFF-050225		5/2/2025	910	water	4	x	x	x	x	x	x	x				PO4
INFLUENT-050225		5/2/2025	1240	water	4	x	x	x	x	x	x	x				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	5/5/25	0717
Received by:		Nathan Weller	ATG	5/5/25	1530
Relinquished by:					
Received by:					