

Time Oil Bulk Terminal Site

# Pre-Remedial Design Investigation Summary Report

Prepared for

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Chicago, IL 60608

May 2021

Certified



Corporation



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The interpretations and conclusions contained in this report are based in part on previous site characterization data collected by others and Floyd|Snider cannot assure the accuracy of this information.

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### List of Acronyms and Abbreviations

<b>Acronym/ Abbreviation</b>	<b>Definition</b>
AOC	Area of Concern
ASKO	ASKO Hydraulic
bgs	Below ground surface
CAA	Cleanup action area
CAP	Cleanup Action Plan
CUL	Cleanup level
DRO	Diesel-range organics
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
FBI	Friedman & Bruya, Inc.
Fremont	Fremont Analytical, Inc.
GRO	Gasoline-range organics
IHS	Indicator hazardous substance
ISS	In situ solidification and stabilization

<b>Acronym/ Abbreviation</b>	<b>Definition</b>
mg/kg	Milligrams per kilogram
MTCA	Model Toxics Control Act
OHWM	Ordinary high-water mark
PCUL	Preliminary cleanup level
PFM	Passive flux meter
PID	Photoionization detector
PRB	Permeable reactive barrier
PRDI	Pre-Remedial Design Investigation
Property	Time Oil Bulk Terminal Site
REL	Remediation level
RI/FS	Remedial Investigation and Feasibility Study
RIWP	Remedial Investigation Work Plan
TBT	Tributyltin
TCE	Trichloroethene
VOC	Volatile organic compound
WBZ	Water-bearing zone
Work Plan	Pre-Remedial Design Work Plan

## 1.0 Introduction

This Pre-Remedial Design Investigation (PRDI) Summary Report is presented as an appendix to the Engineering Design Report (EDR) for the Time Oil Bulk Terminal Site (Property) and presents the results of additional PRDI sample collection to inform the design of certain portions of the cleanup action for the EDR. The sample collection was performed in accordance with the Pre-Remedial Design Work Plan (Work Plan; Floyd|Snider 2020a) approved by the Washington State Department of Ecology (Ecology) in email correspondence on October 20, 2020, and the sampling protocols presented in the Sampling and Analysis Plan and Quality Assurance Project Plan provided in the Supplemental Upland Remedial Investigation Work Plan (RIWP; Floyd|Snider 2019).

The additional sample collection was completed to fill data gaps necessary to finalize engineering design for the remedial action in selected cleanup action areas (CAAs) in the Upland and Shoreline Areas of Concern (AOCs), including the following:

- CAA-4: Additional soil testing was completed to verify the design parameters of the interceptor trench and permeable reactive barrier (PRB) wall and hydrogeological parameters of the Perched Water-Bearing Zone (WBZ).
- CAA-5: Additional soil and groundwater testing was completed to verify the design parameters of the PlumeStop injections.

CAA-7: Additional soil sampling and analysis were completed to delineate the vertical and lateral extent of arsenic concentrations greater than its cleanup level (CUL) in shallow soils; to evaluate the presence of other metals potentially associated with arsenic and sandblast grit in shallow soils; and to investigate the potential presence of tributyltin (TBT), an organometallic paint additive, to determine whether TBT is present at concentrations that warrant cleanup.

The CAAs associated with the areas of PRDI data collection are shown on Figure 1. The PRDI data presented in this appendix were used to support the design for these elements, as presented in the EDR.

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## 2.0 Upland AOC Pre-Design Data Collection and Results

The Upland AOC encompasses CAA-4 and CAA-5 on the ASKO Hydraulic (ASKO) parcel. Data were collected in these CAAs to refine the design of the interceptor trench and PRB wall and of the PlumeStop injections, respectively. PRDI sample locations in the Upland AOC are shown on Figure 2.

### 2.1 CAA-4 PRE-DESIGN DATA COLLECTION

Additional data were collected by Crete Consulting, Inc., on October 7, 2020, to assess the soil characteristics in the Perched WBZ and refine the groundwater model. These data and the results of the groundwater modeling were used to estimate the flow of groundwater collected by the interceptor trench and routed through the PRB wall. Supporting documents for the CAA-4 investigation are provided in Attachment 1.

#### 2.1.1 Soil Sample Collection and Analysis

Soil samples were collected from one soil boring on the southern portion of the ASKO parcel in the Upland AOC (ISS-ASKO) as described in the Work Plan. The soil data collection was targeted within the zone for construction of the interceptor trench and PRB wall (approximately 5 to 15 feet below ground surface [bgs]) to provide information about soil composition. Continuous soil samples were collected using hollow stem augers with split spoons to a depth of 15 feet bgs. The silt layer underlying the Perched WBZ was observed at approximately 11 feet bgs and may have been fully penetrated at 14.5 feet bgs.

Soil samples were collected by Holocene Drilling, a Washington State licensed driller. Oversight of the soil boring and sample collection was performed by Crete Consulting, Inc. Soils were logged, photographed, and screened for evidence of contamination including staining, sheen, odor, and elevated headspace volatiles concentrations measured using a photoionization detector (PID). A soil boring field log for ISS-ASKO is presented in Attachment 1.

Four soil samples were collected for grain size analysis (ASTM D-422) at approximately 1.5-foot increments from the top of the saturated zone of the Perched WBZ (4.5 feet bgs) to slightly above the contact with the underlying silt layer (10.5 feet bgs). In addition, two representative samples were collected and submitted for analysis of total organic carbon by USEPA Method 9060. All samples were submitted to Friedman & Bruya, Inc. (FBI) and subsequently transferred to Fremont Analytical, Inc. (Fremont), in Seattle, Washington, for analysis. The borehole was backfilled with bentonite following sample collection. Laboratory analytical data for the ISS-ASKO boring are presented in Attachment 1.

#### 2.1.2 Groundwater Elevation Measurement

Depth to water was measured in Perched WBZ wells in the vicinity of CAA-4 concurrently with the soil sample collection. The elevations of groundwater in the Perched WBZ were used to refine the understanding of the groundwater flow direction and horizontal gradients. The PRB design



incorporating these measurements is presented in detail in the EDR and field measurements are included in Attachment 1.

## **2.2 CAA-5 PRE-DESIGN DATA COLLECTION AND RESULTS**

PRDI was performed by Floyd|Snider and Regenesi (the manufacturer of PlumeStop) to verify the final design parameters of the PlumeStop in situ treatment barrier. These tests included measurement of the contaminant mass flux, groundwater and soil mass characterization, soil grain size, and water injection rate testing. CAA-5 pre-design locations are shown on Figure 2. Supporting documents for the CAA-5 investigation are provided in Attachment 2.

### **2.2.1 Passive Flux Meter Installation and Sample Collection and Results**

Passive flux meters (PFMs) were installed in two Shallow WBZ monitoring wells on November 12, 2020, to measure the vertical profile of contaminant flux through the groundwater table. PFMs consisting of a 5-foot-long permeable mesh liner filled with a mixture of sorbent material were placed into target wells MW06 and 01MW46 (refer to Figure 2). Well 01MW46 was selected as an alternate location to 01MW80, which was specified in the Work Plan, for PFM sampling at Regenesi's direction because clean water injections were completed adjacent to 01MW80 on the same day and the addition of potable water to the Shallow WBZ could bias the results of contaminant flux analysis.

The PFMs were lowered to the bottom of the well screen to sample the approximate 5-foot-thick saturated zone at each location; the PFMs were from 23 to 28 feet bgs at MW06 (where groundwater was encountered at 22.4 feet bgs) and from 22.5 to 27.5 feet bgs at 01MW46 (where groundwater was encountered at 24.6 feet bgs).

The PFMs remained in the wells for 18 days (within the recommended 2 to 3 weeks) and were retrieved on November 30, 2020, to collect groundwater samples, in accordance with the manufacturer's PFM Protocol Manual provided in the Work Plan. Once retrieved, the media within the PFMs were sampled for contaminant flux analysis. Each 5-foot-long PFM was split into three equal depth intervals for analysis, and composite samples of the media spanning each depth interval were submitted to EnviroFlux, LLC, for analysis of Darcy flux and contaminant mass flux.

Darcy velocities measured in PFM samples ranged from 2.2 to 8.4 centimeters per day. Corresponding contaminant flux results for trichloroethene (TCE) ranged from 1.0 to 51.7 milligrams per square meter per day, with the maximum and minimum contaminant fluxes observed at the top and bottom of the saturated zone, respectively, at MW06. These values are within the ideal ranges for treatability with PlumeStop. Tables of the laboratory analytical data for PFM samples provided by EnviroFlux are presented in Attachment 2.

### 2.2.2 Groundwater Sample Collection and Results

Groundwater samples were collected from monitoring wells MW06, 01MW46, and 01MW80 using low-flow methodology on November 12, 2020, to analyze groundwater characteristics that can impact the effectiveness of the PlumeStop and microscale zero-valent iron materials to adsorb and break down chlorinated volatile organic compounds. The groundwater samples were collected prior to conducting the clean water injection test described in Section 2.2.4.

Water quality parameters including temperature, pH, oxidation-reduction potential, dissolved oxygen, conductivity and turbidity were recorded at approximately 5-minute intervals. Samples were collected once water quality parameters were stabilized in accordance with the criteria in the RIWP. Field indications such as odors or sheen were not observed in any of the samples.

To supplement existing groundwater total petroleum hydrocarbons and volatile organic compound (VOC) data collected as part of the RI and to inform PlumeStop design, groundwater samples were analyzed by FBI and Fremont for:

- VOCs by USEPA Method 8260
- Total calcium and magnesium
- Hardness
- Alkalinity
- Biochemical oxygen demand
- Total organic carbon
- Dissolved organic carbon
- Sulfate and nitrate

The primary detected VOC in groundwater was TCE, consistent with prior groundwater sampling results, with lesser detected concentrations of dichloroethene, vinyl chloride, and benzene. Results of metals and geochemical parameters were within the expected ranges assumed during the feasibility study. Laboratory reports for groundwater samples are provided in Attachment 2.

### 2.2.3 Soil Sample Collection and Grain Size Analysis

Soil samples were collected from three soil borings along the PlumeStop barrier installation (PDSB01 through PDSB03; refer to Figure 2). The soil data collection was targeted within the zone for PlumeStop injection above the base of the Shallow WBZ (approximately 20 to 30 feet bgs) to provide information about constituents in soil that can be adsorbed to the PlumeStop matrix or affect the PlumeStop's physical characteristics.

Soil borings were completed on November 12, 2020, by Holocene Drilling and overseen by Regenesis. Borings were advanced to 30 feet bgs and monitored for the occurrence of saturated soil defining the top of the Shallow WBZ and the silt layer defining the base of the Shallow WBZ,

as well as for field indications of contamination. Soils encountered were consistent with lithology described in the Supplemental Upland Remedial Investigation and Feasibility Study (RI/FS; Floyd|Snider 2020b), and field indications of contamination such as odor, sheen, or elevated headspace concentrations of VOCs measured using a PID were not encountered at these soil boring locations.

The Shallow WBZ was encountered as follows:

- PDSB-01: saturated soil (top of Shallow WBZ) at 21 feet bgs, low-permeability silt layer (base of Shallow WBZ) at 28.5 feet bgs
- PDSB-02: saturated soil at 20 feet bgs, low-permeability silt layer at 27.5 feet bgs
- PDSB-03: saturated soil at 25 feet bgs, low-permeability silt layer at 26 feet bgs

Starting at 15 feet bgs, about 5 feet above the target PlumeStop zone, Regenesis collected samples for grain size approximation in 1-foot increments to the bottom of the top of the silt layer that defines the base of the Shallow WBZ. Samples for grain sizes approximation to determine the fraction of clays, silts, fine sands, coarse sands, and gravels present in each interval were submitted to Regenesis's laboratory for visual analysis in accordance with the Work Plan.

Visual grain size analysis found that soil in the Shallow WBZ is composed primarily of medium to fine sand, with fractions of fine-grained material (silt and clay) ranging from approximately 12% to 45%. The proportion of silt and clay in the saturated zone was generally less at PDSB-01 than at PDSB-02 and PDSB-03. At all locations, the base of the Shallow WBZ was defined by a layer of primarily silt with clay fractions ranging from 7% to 20% and 0% to 15% fine sand. Grain size logs for the soil borings are presented in Attachment 2.

Representative samples from the top 1-foot interval of the water table and the 1-foot interval above the silt layer were collected with assistance from Floyd|Snider field staff for analysis of chemical constituents in soil with the potential to impact the PlumeStop application. Soil samples were analyzed by FBI and Fremont for the following:

- Gasoline-range organics (GRO)
- Diesel-range organics (DRO) and oil-range organics
- Total organic carbon
- VOCs
- Total calcium

GRO, DRO, and VOCs were generally not detected in soil except for one detection of GRO at the top of the saturated zone at PDSB-02 and one detection of TCE at the top of the saturated zone at PDSB-01. These results were consistent with the Supplemental Upland RI/FS (Floyd|Snider 2020b), which found that contamination at the northern boundary of CAA-5 is primarily in the dissolved phase. Results of geochemical parameters were within the expected ranges assumed during the feasibility study. Laboratory reports for the soil samples are provided in Attachment 2.

#### 2.2.4 Injection Testing

Injection testing was conducted to measure pressures and flows of the aquifer while being injected upon to determine the target injection rates and volumes that can be supported by the soils in the proposed PlumeStop injection area.

Injection was completed using direct-push methodology by Regenesis and Holocene Drilling on November 12, 2020. Injection testing was completed at location DVT-1 approximately 4 feet from well 01MW80 (the well closest to the pre-design soil borings; refer to Figure 2) at Regenesis's direction. Injections were attempted using two methodologies. First, an injection point with a 2-foot retractable screen was advanced to the base of the Shallow WBZ and injection of potable water was attempted while continuously raising the screen in a bottom-up fashion. The retractable screen methodology was found to cause clogging of the screen, and the test was repeated using pressure-activated probe points advanced in both bottom-up and top-down fashion. The bottom-up pressure-activated probe test was also unsuccessful; however, a successful test using top-down injection (designated DVT-1C) was completed from 20 to 26 feet bgs. A total of 250 gallons of water, or approximately 40 gallons per foot, was injected at rates of 2.1 to 5.3 gallons per minute. A field injection log noting the total volumes, injection pressures, and flow rates is provided in Attachment 2.

Prior to injection and while injection was proceeding, key water quality parameters including conductivity and dissolved oxygen were monitored at 01MW80 and compared to measurements of the same parameters in the potable water supply used for injection. Water quality parameters did not change relative to the baseline measurements at 01MW80 during injection testing.

#### 2.2.5 PlumeStop Design

The data collected as part of the PRDI as described in the previous sections were provided to Regenesis for the design of the PlumeStop in situ groundwater treatment zone. The layout of the PlumeStop injection is presented on Figure 3. As shown on Figure 3, the predicted groundwater flow direction in the treatment zone of the Shallow WBZ after in situ solidification and stabilization (ISS) is to the north, northeast, and northwest as groundwater moves downgradient of the ISS monolith (refer to Appendix E of the EDR for a detailed summary of ISS groundwater modeling). The target zone for PlumeStop injection, as shown on Figure 3, is the saturated soil of the Shallow WBZ from approximately 21 to 28 feet bgs. Injections will be performed in two offset rows along the length of the treatment zone to allow overlap in the radius of injection at each point. The target treatment zone will span the width of the inferred TCE plume in Shallow WBZ groundwater in the downgradient direction(s) from the ISS monolith (refer to Figure 3), with the expectation that TCE breakdown products will attenuate significantly after removal of the dissolved TCE source.

The design of the PlumeStop groundwater treatment is consistent with the preliminary assumptions presented in the Supplemental Upland RI/FS and Cleanup Action Plan (CAP; Ecology 2020). The size of the treatment zone and required quantity of reagent are consistent with the prior design assumptions. Minor adjustments were made in the engineering design to account

for slightly greater proportions of fine grained material in the saturated zone, with slightly closer spacing of injection points and greater pressure injection with lesser quantities of product injected at each point. The PlumeStop design recommendation, including injection volumes and injection point spacing, provided by Regenesi is presented in Attachment 2. During injection, observations of soil and field water quality parameters will be collected to verify injection in accordance with the PlumeStop design recommendation presented in Attachment 2.

### 3.0 Shoreline AOC Pre-Design Data Collection and Results

Additional characterization of arsenic in shallow soils was completed by Floyd|Snider within and surrounding CAA-7 on the East Waterfront parcel of the Shoreline AOC between November 13, 2020, and March 22, 2021, to delineate the lateral and vertical extents of shallow soil excavation for arsenic. Characterization of other metals in soil within CAA-7 was also completed at Ecology's request to determine whether other metals are correlated with the presence of arsenic. Characterization for TBT was also completed in surrounding areas to determine whether TBT is present at concentrations warranting cleanup.

In the Supplemental Upland RI/FS (Floyd|Snider 2020b), arsenic was identified as an indicator hazardous substance (IHS) and CAA-7 was designated as a cleanup area to remediate arsenic in surface soil collocated with arsenic-contaminated groundwater. The presumed source of metals in surface soils on the property identified in the Supplemental Upland RI/FS was sandblast grit associated with sandblasting and maintenance by former tenant Icicle Seafoods; therefore, other metals were presumed to be collocated with arsenic.<sup>1</sup> Evaluation of cadmium, copper, lead, mercury, silver, and zinc was completed at Ecology's request to determine whether these other metals are present when arsenic is present and, when arsenic is present at concentrations less than the CUL established in the CAP, whether other metals are present at concentrations that could pose potential risk to human health or the environment.

The CAP additionally identified TBT, which was historically used in marine paints, as a potential contaminant that may be of concern for erosion into to Salmon Bay and identified a target remediation level (REL) for TBT. Limited characterization of TBT within and surrounding CAA-7 was completed in May 2020 (not timely enough to be included in the CAP) and was summarized in the Work Plan. TBT was not detected in surface soils at concentrations exceeding the targeted REL during this focused event; however, further characterization of the surrounding areas was completed as part of the PRDI to more fully assess the presence of TBT.

#### 3.1 METALS AND TBT SOIL SAMPLE COLLECTION

PRDI soil sampling was completed in an initial study area defined in the Work Plan, which included the potentially erodible soils in the upper 2 feet in unpaved areas where Icicle Seafoods previously operated. Soil samples were collected and archived at the laboratory to allow a phased approach to laboratory analysis, with collection of sidewall and base samples within CAA-7 and composite samples in the surrounding areas. Additional step-out and step-down samples were collected and analyzed as needed to fully delineate soil impacts in the area surrounding CAA-7. PRDI soil sample locations in the Shoreline AOC are shown on Figure 4. Supporting documents for the Shoreline AOC investigation, including CAA-7 and the surrounding areas, are provided in Attachment 3.

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<sup>1</sup> Arsenic was the only metal that was detected in groundwater at concentrations greater than the preliminary CULs.

### 3.1.1 CAA-7 Delineation and Confirmation Samples

Collection of initial CAA-7 sidewall and base samples was completed on November 13, 2020, using hand sampling methodology. A total of 10 sidewall samples (CAA7-SW01 through CAA7-SW10; refer to Figure 4) were collected from 0.25 to 0.75 feet bgs at approximately every 20 feet of sidewall as proposed in the Work Plan. Four excavation base samples (CAA7-B01 through CAA7-B04) were collected from 1 to 1.25 feet bgs and 2 to 2.25 feet bgs at each location (the deeper samples were archived). The base samples were collected at the locations proposed in the Work Plan with the exception of the easternmost sample (CAA7-B04), which was relocated approximately 7.5 feet to the northeast due to repeated shallow refusal within the top 1 foot.

All sidewall samples and the upper base samples from CAA-7 were initially analyzed for arsenic, and follow-up analysis of the lower base sample at CAA7-B04 was also completed. Soil sample results for arsenic are discussed in detail in Section 3.2.1. In accordance with the Work Plan, four samples representing a range of arsenic concentrations were also selected for analysis of the other metals as described in Section 3.2.2.

### 3.1.2 Additional Arsenic and TBT Characterization

Initial sample collection for arsenic and TBT in the potentially erodible areas surrounding CAA-7 was completed on November 13, 2020. The sampling areas were mowed to remove thick brush including blackberries prior to sample collection. Samples were collected using hand sampling methodology after removing any recent surfacing material such as fresh gravel or vegetation in accordance with the Work Plan. A total of seven composite samples (COMP-1 through COMP-7) composed of four discrete samples each representing an approximate 400 square-foot area were collected as shown on Figure 4. Samples of composited material from the surface soil interval from 0 to 0.5 feet bgs in each composite area were collected for immediate analysis. Composite samples of the underlying 0.5 to 1 foot bgs interval in each composite area were collected and archived and the 0 to 0.5 and 0.5 to 1 foot bgs depth intervals at each discrete sample location were also collected and archived for potential follow-up analysis.

Composite samples were collected as proposed in the Work Plan, with minor adjustments to the locations or sample intervals including the following:

- One discrete sample location, originally designated as part of the COMP-1 composite, encountered refusal on pavement. This sample was located in the approximate vicinity of a former shed. The material overlying the pavement and in the remainder of the 400 square-foot sample grid area consisted of gravel with only trace fine-grained constituents. Therefore, a discrete sample was not collected at this location. The sample compositing schemes for the subsequent locations to the south (COMP-2, COMP-3, and COMP-6) were adjusted in order to create a 4-point composite for each area (refer to Figure 4 for final composite area and sample configuration).
- Refusal on compacted gravel was encountered at 0.4 feet bgs at location COMP-4b southeast of the former ASKO warehouse, and refusal on pavement was encountered between 0.4 and 0.5 feet bgs along the southwest side of the ASKO warehouse at

COMP-5a and COMP-7d (refer to Figure 5 for areas of pavement encountered during sampling). At these locations, lower samples were not able to be collected, and the resultant archived 0.5 to 1 foot bgs composite samples in these composite areas were 3-point composites.

The seven surface composite samples were analyzed for arsenic and TBT. Follow-up arsenic analysis was completed for multiple discrete samples and selected deeper samples were also analyzed for vertical delineation. Soil arsenic results are discussed in detail in Section 3.2.1, and TBT results are discussed in detail in Section 3.2.3.

#### **3.1.2.1 Supplemental Arsenic Characterization**

After receipt of results from the initial round of sampling, additional step-out samples to delineate arsenic in shallow soil were collected on November 30 and December 10, 2020. Step-out samples were collected at approximately 10-foot lateral intervals in accordance with the Work Plan to delineate arsenic along the eastern boundary on the initial study area (locations COMP-1e and COMP-2e) and the western boundary (locations COMP-7e through COMP-7j).

Surface soil samples were collected from the 0 to 0.5 feet bgs interval at all step-out locations except in the area to the southwest of the former ASKO warehouse. Pavement below the shallow soil in this vicinity was found to extend westward as shown on Figure 5, and refusal was encountered at 0.4 and 0.1 foot bgs at COMP-7e and COMP-7h, respectively. A deeper sample was also collected from 0.5 to 1 foot bgs at step-out location COMP-7i, and a step-down sample was collected from 1 to 2 feet bgs at location COMP-7b. Soil arsenic results for these step-out and step-down samples are discussed in detail in Section 3.2.1.

Following discussion of the initial arsenic data with Ecology, additional step-out and step-down samples were collected to further delineate the extents of arsenic in soil on February 22, 2021, and March 22, 2021. Step-out surface soil samples were collected from 0 to 0.5 foot bgs at 10-foot lateral intervals along the eastern and western boundaries of the initial study area (i.e., locations CAA7-SW11 through CAA7-SW14 and CAA7-SW18 through CAA7-SW26) and underlying samples from 0.5 to 1 foot bgs were collected at a subset of the step-out locations along the western portion of the study area. Additionally, samples were collected from 1 to 1.5 feet bgs to further define the depth of contamination at several locations in the western and northeastern portion of the initial study area (i.e., locations CAA7-B05 through CAA7-B10) and along the northern shoreline (CAA7-SW15 through CAA7-SW17). The shoreline locations CAA7-SW16 and CAA7-SW17 were re-occupied during the March 2021 sampling effort and designated as CAA7-B11 and CAA7-B12, respectively, and deeper samples were collected from 2 to 2.25 feet bgs. Soil arsenic results for these step-out and step-down samples are discussed in detail in Section 3.2.1.

During shallow soil sampling, surface soils generally consisted of topsoil or gravel underlain by sand with silt and gravel. Abundant earthworms and rootlets were observed throughout the soil in the study area. Below the surface soils, a firm gray silty sand with rounded gravel and orange mottling interpreted to be native soil was encountered and at depths ranging from 0.5 to 2 feet bgs. In the



area of the Salmon Bay shoreline adjacent to the concrete bank armoring, a seam of angular and coarse black sand with a vitreous appearance interpreted to be sandblast grit was encountered at approximately 0.5 to 0.75 feet bgs at location CAA7-B12. This grit was encountered in sandy material intermixed with smaller pieces of broken concrete interpreted to be fill. Suspected sandblast grit was not observed elsewhere in the study area.

### 3.2 SUMMARY OF SOIL ANALYTICAL RESULTS

The analytical results for arsenic, other metals, and TBT are presented in the following sections. These sample results were compared to criteria for cleanup established in the CAP and other criteria for soil quality established in the Supplemental Upland RI/FS, Work Plan, and Model Toxics Control Act (MTCA) regulation. Laboratory reports are provided in Attachment 3.

#### 3.2.1 Arsenic Results

Arsenic was detected in all samples analyzed, at concentrations ranging from 3.7 to 1,680<sup>2</sup> milligrams per kilogram (mg/kg). The greatest concentrations of arsenic were detected in surface soils from approximately 0 to 0.5 or 0 to 1 foot bgs, with significantly lesser concentrations detected in deeper intervals. Arsenic in shallow soil was found to be concentrated in the areas of Icicle Seafoods's former waterfront operations to the north, east, and west of the former ASKO warehouse building and along the paved areas to the east and west of the warehouse building. This distribution is consistent with storage of sandblast grit piles containing arsenic (and other metals) adjacent to waterfront operational areas, and limited distribution of sandblast grit to surrounding surface soils by handling, wind action, and equipment tracking. Arsenic concentrations were least to the south of the former ASKO warehouse, farthest from the former waterfront operations where surface soils were likely shielded from wind by the building and historical aerial photos indicate that the primary land use was parking of employee vehicles.

Arsenic results were compared to the Property CUL of 7.3 mg/kg established in the CAP, which is based on natural background concentrations of arsenic (In accordance with WAC 173-340-705(6), the CUL for arsenic was adjusted upward to this natural background value, which is considered a surrogate for protection of the groundwater leaching pathway and ecological receptors). Results were also compared to regulatory criteria to provide additional context regarding the magnitude of arsenic concentrations greater than the Property CUL. These additional regulatory criteria include the MTCA Method A CUL for unrestricted land use of 20 mg/kg and the MTCA Method C CUL of 88 mg/kg, which is based on protection of human health from carcinogenic effects of arsenic via direct contact for a commercial/industrial property consistent with current and future use.

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<sup>2</sup> An arsenic concentration of 1,680 mg/kg was reported by the laboratory for this sample. Consistent with established data presentation rules for the Property, the result has been rounded to two significant figures (i.e., 1,700 mg/kg) for presentation in data tables and figures. Refer to Attachment 3 for laboratory reports.

Arsenic results in soil are presented in Table 1 and shown relative to the above criteria on Figure 5. Available groundwater results and soil results for arsenic originally presented in the Supplemental Upland RI/FS are also shown on Figure 5.

In the initial samples analyzed, arsenic exceedances of the CUL of 7.3 mg/kg were encountered in all of the CAA-7 excavation area sidewall samples except westernmost sample SW10 and all of the surface soil composites except COMP-6 located farthest to the south and up-slope from the shoreline of Salmon Bay. The excavation base samples collected from 1 to 1.25 feet bgs were all less than the CUL except at easternmost sample location CAA7-B04, which is in an area with significantly elevated arsenic concentrations.

Follow-up analysis of archived discrete samples comprising the surface soil composites and selected deeper discrete samples from 0.5 to 1 foot bgs showed that arsenic is present primarily in surface soil at concentrations greater than the CUL above approximately 0.5 feet bgs. Arsenic concentrations exceeding the CUL are present in the areas surrounding the former ASKO warehouse, extending to the approximate boundary of the former Icicle Seafoods operations to the east and onto the West Waterfront parcel to the west. Arsenic concentrations were generally less than the CUL to the south and southeast of the warehouse except along the driveway (i.e., locations COMP-2a, COMP-3b, and COMP-4b, as shown on Figure 5) where the primary mechanism of soil contamination is presumed to be vehicle or equipment tracking.

Shallow soil hot spots with arsenic concentrations greater than the MTCA Method C CUL of 88 mg/kg were encountered along the waterfront within the former Icicle Seafoods operational area. In the eastern portion of CAA-7, east-northeast of the former ASKO warehouse (i.e., locations CAA7-B04 and CAA7-SW03 through CAA7-SW07, as shown on Figure 5), arsenic concentrations ranging from 150 to 1,680 mg/kg were detected in surface soil above 2 feet bgs. Along the waterfront to the west of the warehouse and extending south along the west wall of the building (i.e., locations COMP-7a through COMP-7h and COMP 7j, as shown on Figure 5), arsenic concentrations ranging from 32 to 620 mg/kg were detected in surface soil above 1 foot bgs. Both of these hot spots are generally correlated with sandblast grit pile locations and concrete structures along the shoreline, consistent with former waterfront operations. Additional localized hot spots with arsenic greater than the MTCA Method C CUL of 88 mg/kg are located at COMP-2c and COMP-4b, which are along the driveway close to the transition from pavement to compact gravel. The distribution of elevated shallow arsenic was also found to extend at lesser concentrations to localized areas in the southwestern portion of the study area, where an arsenic concentration of 37 mg/kg was detected in surface soil at location CAA7-SW22. This small and highly localized hot spot is also presumed to result from windborne deposition west of the former ASKO building or vehicle tracking at the edge of the former parking area.

Arsenic contamination in soil is limited to within the top 0.5 to 1 foot throughout the former Icicle Seafoods operation area and extends slightly deeper to 2 feet bgs in the hot spot area along the northern portion of CAA-7, where it is bounded by results less than the CUL from 2 to 2.25 feet at CAA7-B04, CAA7-B11, and CAA7-B12.

The results of the PRDI arsenic analysis indicate that an expansion of the CAA-7 footprint from what is depicted in the CAP is necessary to address shallow arsenic contaminated soil. The proposed revision to CAA-7 excavation boundary is discussed in Section 3.3.

### 3.2.2 Other Metals Results

After receipt of initial arsenic analytical results, four samples from CAA-7 were selected for follow-up analysis for other metals as specified in the Work Plan. Because there were no samples where arsenic was not detected, the sample selection criteria were adjusted slightly from the Work Plan to better evaluate the range of arsenic conditions encountered, including the least detected concentration (3.7 mg/kg at CAA7-B01), a concentration close to the CUL (7.2 mg/kg at CAA7-SW10), a concentration consistent with an elevated arsenic concentration of approximately 30 mg/kg (35 mg/kg at CAA7-SW01), and the greatest detected concentration (1,680 mg/kg at CAA7-SW04).

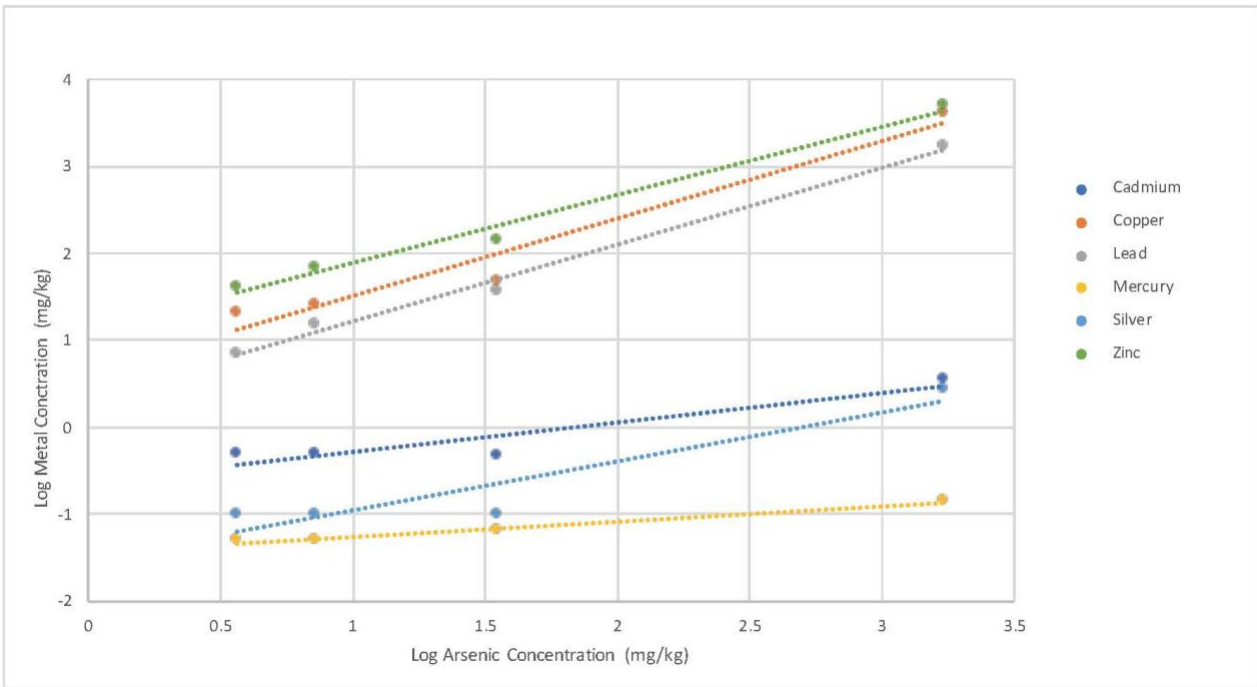
These four selected samples were analyzed for cadmium, copper, lead, mercury, silver, and zinc in accordance with the Work Plan to evaluate the correlation of these metals with arsenic and to verify that cleanup of arsenic as the IHS would clean up the other collocated metals. Soil results for these other metals, with the corresponding arsenic results, are presented in Table 2. Results for all of the other metals analyzed were found to be well-correlated with arsenic, with greater arsenic concentrations predicting greater concentrations of other metals.

The detected concentrations of other metals relative to arsenic are shown on Figure 6.<sup>3</sup>

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<sup>3</sup> Results are shown on a log-log scale plot in order to display results for multiple metals with varying magnitudes of concentrations on the same diagram.

**Figure 6**  
**Other Metals Correlation with Arsenic**



The comparison criteria used for evaluation of other metals results are the preliminary CULs (PCULs) for metals established in the Supplemental Upland RI/FS and other applicable MTCA criteria<sup>4</sup> including the following:

- The cadmium PCUL of 0.77 mg/kg, which is based on natural background concentrations
- The copper MTCA Method B CUL of 140 mg/kg, which is based on protection of groundwater via leaching
- The lead PCUL of 24 mg/kg, which is based on natural background concentrations
- The mercury PCUL of 0.070 mg/kg, which is based on natural background concentrations
- The silver PCUL of 0.10 mg/kg, which is based on the laboratory practical quantitation limit using standard analytical methods
- The zinc MTCA Method B CUL of 300 mg/kg, which is based on protection of groundwater via leaching

<sup>4</sup> PCULs were not established for copper or zinc in the RI/FS because these metals were not identified of chemicals of interest. The MTCA Method B criteria for copper and zinc to protect groundwater via leaching, which is identified as a complete pathway in the RI/FS, have been included in this analysis.

In all four samples analyzed, greater concentrations of other metals were positively correlated with greater arsenic concentrations. As presented in Table 2, in each sample analyzed, the exceedance factor of the arsenic CUL was greater than the exceedance factors of the PCULs for the other metals. Furthermore, at arsenic concentrations approximately equal to the PCUL, concentrations of other metals were significantly less than the PCULs (i.e., approximately 60% or less than PCUL concentrations), demonstrating that the CUL for arsenic is the most sensitive criterion for cleanup of metals contamination. Therefore, arsenic is the appropriate IHS for design of the cleanup action, and cleanup to address arsenic will also address other metals in shallow soil.

### 3.2.3 TBT Results

TBT was analyzed in the 0 to 0.5 feet bgs composite samples COMP-1 through COMP-7 in order to supplement the prior TBT data collected in CAA-7 that were presented in the Work Plan.

TBT concentrations ranged from nondetect at a reporting limit of 0.0038 mg/kg to detections between the method detection limit and the reporting limited estimated at 0.00066 mg/kg to 0.0020 mg/kg. The seven composite samples were all less than the trigger defined in the Work Plan for analyses of discrete samples (greater than one-fourth of the target REL of 0.047 mg/kg for TBT, or 0.012 mg/kg); therefore, additional TBT follow-up analyses were not warranted. Soil results for TBT are presented in Table 3.

The criteria used for evaluation of TBT results in soil include the following:

- The target REL of 0.047 mg/kg established in the CAP
- The MTCA Method B CUL of 24 mg/kg, which is based on protection of human health via direct contact

All of the soil results for TBT were less than the target REL and confirm that TBT is not a constituent of concern for the Property. Therefore, in accordance with the CAP, cleanup is not necessary for TBT.

### 3.3 UPDATED DELINEATION OF THE CAA-7 EXCAVATION

The results of the PRDI show that the lateral extents and depth of CAA-7 that were presented in the CAP do not encompass the full extent of arsenic-contaminated soil exceeding the CUL; therefore, the excavation extent has been revised as part of remedial design. As established in the Supplemental Upland RI/FS, and further demonstrated in this PRDI Summary Report, arsenic is an appropriate IHS for determining areas of metals impacts present as a result of former Icicle Seafoods operations that have the potential to pose potential risk to human health or the environment. The revised CAA-7 excavation will remove the lateral and vertical extent of arsenic in soil exceeding the CUL.

### 3.3.1 Revised CAA-7 Excavation Boundary

The area of shallow soil with arsenic concentrations greater than the CUL of 7.3 mg/kg is shown on Figure 7 and defines the revised extent of the CAA-7 excavation. Based on the available data, soil within the revised CAA-7 boundary would be excavated to a depth of 0.5 or 1 foot bgs consistent with the CAP, with an additional targeted hot spot excavation to 2 feet bgs in the vicinity of CAA7-B04 that extends approximately 75 feet to the west along the shoreline (refer to Figure 7). Excavation will be completed in the former operational areas surrounding the former ASKO warehouse and in the southwest corner of the former parking area. The total excavation area encompasses 13,025 square feet and 485 cubic yards of soil.

As shown on Figure 7, the excavation will include areas of vegetated and gravel ground surface, removal of subsurface paving encountered during field investigation, and soil removal beneath the vacant storage shed, which was constructed after the start of Icicle Seafoods operations at the Property. The excavation excludes the soil beneath surface improvements that predate Icicle Seafoods operations that would have prevented arsenic in sandblast grit from reaching the soil surface, including the former ASKO warehouse and the adjoining warehouse concrete pad.<sup>5</sup> The warehouse and the shed will be demolished prior to excavation. The warehouse slab and adjoining concrete pad will remain in place to limit the amount of exposed soils during excavation.

Soil will be removed to the target depths shown on Figure 7. In the area of the warehouse slab and concrete pad, excavation will remove all soil up to the edges of the concrete. Along the shoreline, excavation will remove the entirety of the bank to the water's edge of Salmon Bay above the ordinary high-water level.

### 3.3.2 CAA-7 Excavation Confirmation Samples

The final lateral and vertical extents of the excavation have been confirmed predominately by the PRDI sample collection described in previous sections. Surface (0 to 0.5 feet bgs) soil samples collected along the eastern, southern, and western/southwestern boundaries of CAA-7 excavation areas at a frequency of approximately 1 sample for every 40 or fewer feet define the lateral limits of the excavation. The lateral extent of excavation will be defined to the north by the shoreline of Salmon Bay above the ordinary high-water mark (OHWM), which is the demarcation between the uplands and the Salmon Bay sediments per the PPCD. The OHWM is, therefore, the maximum practical extent of excavation, and confirmation samples will not be collected from the northern extent of the excavation because the entirety of the upland soil will be removed (base samples along the shoreline confirm the necessary depth of excavation to meet cleanup objectives). Where the excavation is defined by improvements that pre-dated Icicle Seafoods operations, the lateral extent of excavation will extend to the edges of these improvements (i.e., edge of concrete) and, therefore, additional samples will not be collected from the lateral extents that border these improvements. Existing base and sidewall samples will

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<sup>5</sup> The former ASKO warehouse, east-adjacent paved ASKO warehouse pad, and the paved access driveway pre-date the start of Icicle Seafoods operations at the Property, as shown on Figures 4, 5, and 7.

be supplemented with additional proposed base samples in areas where deeper samples could not be collected due to obstruction and to fill spatial data gaps as shown on Figure 7, to achieve a base sample frequency of approximately one sample per 460 square feet of excavation.

Confirmation samples will demonstrate that the soil cleanup achieves compliance with the cleanup standard in accordance with MTCA (WAC 173-340-740(7)) as described in the Construction Compliance Monitoring Plan presented in the EDR. Refer to Appendix G (and Figure G-7) of the EDR for more specific detail regarding confirmation sample collection and refer to Section 6.2.3.1 of the EDR for additional detail regarding verification of compliance with the cleanup standards.

## 4.0 References

Floyd|Snider. 2019. *Time Oil Bulk Terminal PPA Supplemental Upland Remedial Investigation Work Plan*. Prepared for Cantera Development Group, LLC. March.

\_\_\_\_\_. 2020a. *Pre-Remedial Design Work Plan*. Memorandum from Lynn Grochala, Floyd|Snider, to Mark Adams, Washington State Department of Ecology. 20 October.

\_\_\_\_\_. 2020b. *Time Oil Bulk Terminal PPA Supplemental Upland Remedial Investigation and Feasibility Study*. Prepared for Cantera Development Group, LLC. September.

Washington State Department of Ecology (Ecology). 2020. *Cleanup Action Plan, Time Oil Bulk Terminal, Seattle, WA*. 28 September.



**Time Oil Bulk Terminal Site**  
**Pre-Remedial Design**  
**Investigation Summary Report**

**Tables**

**Table 1**  
**Summary of Arsenic Results in Soil, Shoreline Area of Concern**

					Analyte	Arsenic (mg/kg)
					CUL	7.3
Sample Type	Location	Sample ID	Sample Date	Depth (feet bgs)		
Initial Cleanup Action Area 7 Excavation Base	CAA7-B01	CAA7-B01-1.0-1.25	11/13/20	1.0-1.25	3.7	
	CAA7-B02	CAA7-B02-1.0-1.25	11/13/20	1.0-1.25	5.7	
	CAA7-B03	CAA7-B03-1.0-1.25	11/13/20	1.0-1.25	6.7	
	CAA7-B04	CAA7-B04-1.0-1.25	11/13/20	1.0-1.25	550	
		CAA7-B4-2.0-2.25	11/13/20	2.0-2.25	6.0	
Additional Cleanup Action Area 7 Excavation Base	CAA7-B05	CAA7-B05-1.0-1.5	2/22/21	1.0-1.5	9.2	
	CAA7-B06	CAA7-B06-1.0-1.5	2/22/21	1.0-1.5	7.9	
	CAA7-B07	CAA7-B07-1.0-1.5	2/22/21	1.0-1.5	5.8	
	CAA7-B08	CAA7-B08-1.0-1.5	2/22/21	1.0-1.5	4.9	
	CAA7-B11	CAA7-B11-2.0-2.25	3/22/21	2.0-2.25	6.5	
	CAA7-B12	CAA7-B12-2.0-2.25	3/22/21	2.0-2.25	5.8	
Initial Cleanup Action Area 7 Excavation Sidewall	CAA7-SW01	CAA7-SW01-0.25-0.75	11/13/20	0.25-0.75	35	
	CAA7-SW02	CAA7-SW02-0.25-0.75	11/13/20	0.25-0.75	15	
	CAA7-SW03	CAA7-SW03-0.25-0.75	11/13/20	0.25-0.75	150	
	CAA7-SW04	CAA7-SW04-0.25-0.75	11/13/20	0.25-0.75	1700	
	CAA7-SW05	CAA7-SW05-0.25-0.75	11/13/20	0.25-0.75	150	
	CAA7-SW06	CAA7-SW06-0.25-0.75	11/13/20	0.25-0.75	230	
	CAA7-SW07	CAA7-SW07-0.25-0.75	11/13/20	0.25-0.75	550	
	CAA7-SW08	CAA7-SW08-0.25-0.75	11/13/20	0.25-0.75	6.8	
	CAA7-SW09	CAA7-SW09-0.25-0.75	11/13/20	0.25-0.75	9.5	
	CAA7-SW10	CAA7-SW10-0.25-0.75	11/13/20	0.25-0.75	7.2	
Composite Shallow Soil	COMP-1	COMP-1-0.0-0.5	11/13/20	0.0-0.5	27	
Discrete Shallow Soil	COMP-1a	COMP-1a-0.0-0.5	11/13/20	0.0-0.5	10	
		COMP-1b-0.0-0.5	11/13/20	0.0-0.5	14	
	COMP-1b	COMP-1b-0.5-1.0	11/13/20	0.5-1.0	12	
		COMP-1c-0.0-0.5	11/13/20	0.0-0.5	18	
	COMP-1c	COMP-1c-0.5-1.0	11/13/20	0.5-1.0	6.4	
		COMP-1d-0.0-0.5	11/13/20	0.0-0.5	22	
	COMP-1d	COMP-1d-0.5-1.0	11/13/20	0.5-1.0	7.5	
		COMP-1e	COMP-1e-0.0-0.5	11/30/20	0.0-0.5	24
Composite Shallow Soil	COMP-2	COMP-2-0.0-0.5	11/13/20	0.0-0.5	40	
Discrete Shallow Soil	COMP-2a	COMP-2a-0.0-0.5	11/13/20	0.0-0.5	16	
		COMP-2a-0.5-1.0	11/13/20	0.5-1.0	3.5	
	COMP-2b	COMP-2b-0.0-0.5	11/13/20	0.0-0.5	38	
		COMP-2b-0.5-1.0	11/13/20	0.5-1.0	2.1	
	COMP-2c	COMP-2c-0.0-0.5	11/13/20	0.0-0.5	150	
		COMP-2c-0.5-1.0	11/13/20	0.5-1.0	4.2	
	COMP-2d	COMP-2d-0.0-0.5	11/13/20	0.0-0.5	4.4	
	COMP-2e	COMP-2e-0.0-0.5	11/30/20	0.0-0.5	9.5	

**Table 1**  
**Summary of Arsenic Results in Soil, Shoreline Area of Concern**

					Analyte	Arsenic (mg/kg)
					CUL	7.3
Sample Type	Location	Sample ID	Sample Date	Depth (feet bgs)		
Composite Shallow Soil	COMP-3	COMP-3-0.0-0.5	11/13/20	0.0–0.5	<b>9.2</b>	
Discrete Shallow Soil	COMP-3a	COMP-3a-0.0-0.5	11/13/20	0.0–0.5	<b>16</b>	
		COMP-3a-0.5-1.0	11/13/20	0.5–1.0	4.6	
	COMP-3b	COMP-3b-0.0-0.5	11/13/20	0.0–0.5	<b>18</b>	
		COMP-3b-0.5-1.0	11/13/20	0.5–1.0	3.4	
	COMP-3c	COMP-3c-0.0-0.5	11/13/20	0.0–0.5	4.7	
COMP-3d	COMP-3d-0.0-0.5	11/13/20	0.0–0.5	3.8		
Composite Shallow Soil	COMP-4	COMP-4-0.0-0.5	11/13/20	0.0–0.5	<b>28</b>	
Discrete Shallow Soil	COMP-4a	COMP-4a-0.0-0.5	11/13/20	0.0–0.5	<b>20</b>	
		COMP-4a-0.5-1.0	11/13/20	0.5–1.0	<b>7.4</b>	
	COMP-4b	COMP-4b-0.0-0.4	11/13/20	0.0–0.4	<b>130</b>	
	COMP-4c	COMP-4c-0.0-0.5	11/13/20	0.0–0.5	4.7	
	COMP-4d	COMP-4d-0.0-0.5	11/13/20	0.0–0.5	4.0	
Composite Shallow Soil	COMP-5	COMP-5-0.0-0.5	11/13/20	0.0–0.5	<b>20</b>	
Discrete Shallow Soil	COMP-5a	COMP-5a-0.0-0.5	11/13/20	0.0–0.5	<b>47</b>	
	COMP-5b	COMP-5b-0.0-0.5	11/13/20	0.0–0.5	<b>12</b>	
		COMP-5b-0.5-1.0	11/13/20	0.5–1.0	<b>8.7</b>	
	COMP-5c	COMP-5c-0.0-0.5	11/13/20	0.0–0.5	4.1	
	COMP-5d	COMP-5d-0.0-0.5	11/13/20	0.0–0.5	5.7	
Composite Shallow Soil	COMP-6	COMP-6-0.0-0.5	11/13/20	0.0–0.5	4.7	
Discrete Shallow Soil	COMP-6a	COMP-6a-0.0-0.5	11/13/20	0.0–0.5	5.8	
	COMP-6d	COMP-6d-0.0-0.5	11/13/20	0.0–0.5	1.1	
Composite Shallow Soil	COMP-7	COMP-7-0.0-0.5	11/13/20	0.0–0.5	<b>300</b>	
Discrete Shallow Soil	COMP-7a	COMP-7a-0.0-0.5	11/13/20	0.0–0.5	<b>150</b>	
		COMP-7a-0.5-1.0	11/13/20	0.5–1.0	<b>36</b>	
	COMP-7b	COMP-7b-0.0-0.5	11/13/20	0.0–0.5	<b>620</b>	
		COMP-7b-0.5-1.0	11/13/20	0.5–1.0	<b>88</b>	
		COMP-7b-1.0-2.0	11/30/20	1.0–2.0	<b>8.1</b>	
	COMP-7c	COMP-7c-0.0-0.5	11/13/20	0.0–0.5	<b>38</b>	
		COMP-7c-0.5-1.0	11/13/20	0.5–1.0	<b>8.1</b>	
	COMP-7d	COMP-7d-0.0-0.4	11/13/20	0.0–0.4	<b>110</b>	
	COMP-7e	COMP-7e-0.0-0.4	11/30/20	0.0–0.4	<b>170</b>	
	COMP-7f	COMP-7f-0.0-0.5	11/30/20	0.0–0.5	<b>39</b>	
	COMP-7g	COMP-7g-0.0-0.5	11/30/20	0.0–0.5	<b>230</b>	
	COMP-7h	COMP-7h-0.0-0.1	12/10/20	0.0–0.1	<b>91</b>	
	COMP-7i	COMP-7i-0.0-0.5	12/10/20	0.0–0.5	<b>12</b>	
COMP-7i-0.5-1.0		12/10/20	0.5–1.0	<b>11</b>		
COMP-7j	COMP-7j-0.0-0.5	12/10/20	0.0–0.5	<b>32</b>		

**Table 1**  
**Summary of Arsenic Results in Soil, Shoreline Area of Concern**

					Analyte	Arsenic (mg/kg)
					CUL	7.3
Sample Type	Location	Sample ID	Sample Date	Depth (feet bgs)		
Discrete Shallow Soil	CAA7-SW11	CAA7-SW11-0.0-0.5	2/22/21	0.0–0.5	3.6	
		CAA7-SW11-0.5-1.0	2/22/21	0.5–1.0	4.9	
	CAA7-SW12	CAA7-SW12-0.0-0.5	2/22/21	0.0–0.5	4.0	
		CAA7-SW12-0.5-1.0	2/22/21	0.5–1.0	4.0	
	CAA7-SW13	CAA7-SW13-0.0-0.5	2/22/21	0.0–0.5	2.2	
		CAA7-SW13-0.5-1.0	2/22/21	0.5–1.0	2.0	
	CAA7-SW14	CAA7-SW14-0.0-0.5	2/22/21	0.0–0.5	<b>28</b>	
		CAA7-SW14-0.5-1.0	2/22/21	0.5–1.0	6.0	
	CAA7-SW15	CAA7-SW15-1.0-1.5	2/22/21	1.0–1.5	<b>7.8</b>	
	CAA7-SW16	CAA7-SW16-1.0-1.5	2/22/21	1.0–1.5	<b>30</b>	
	CAA7-SW17	CAA7-SW17-1.0-1.5	2/22/21	1.0–1.5	<b>18</b>	
	CAA7-SW18	CAA7-SW18-0.0-0.5	2/22/21	0.0–0.5	5.4	
	CAA7-SW19	CAA7-SW19-0.0-0.5	2/22/21	0.0–0.5	<b>19</b>	
	CAA7-SW20	CAA7-SW20-0.0-0.5	2/22/21	0.0–0.5	5.0	
	CAA7-SW21	CAA7-SW21-0.0-0.5	2/22/21	0.0–0.5	4.4	
	CAA7-SW22	CAA7-SW22-0.0-0.5	2/22/21	0.0–0.5	<b>37</b>	
	CAA7-SW23	CAA7-SW23-0.0-0.5	3/22/21	0.0–0.5	<b>11</b>	
	CAA7-SW24	CAA7-SW24-0.0-0.5	3/22/21	0.0–0.5	<b>13</b>	
	CAA7-SW25	CAA7-SW25-0.0-0.5	3/22/21	0.0–0.5	6.4	
	CAA7-SW26	CAA7-SW26-0.0-0.5	3/22/21	0.0–0.5	<b>14</b>	

Notes:

Criteria and results have been rounded to two significant digits.

**RED/BOLD** Indicates a concentration that exceeds the CUL.

Abbreviations:

bgs Below ground surface

CUL Cleanup level

mg/kg Milligrams per kilogram

**Table 2**  
**Summary of Metals Results in Soil, Shoreline Area of Concern**

Location					CAA7-B01		CAA7-SW01		CAA7-SW04		CAA7-SW10	
Sample ID					CAA7-B01-1.0-1.25		CAA7-SW01-0.25-0.75		CAA7-SW04-0.25-0.75		CAA7-SW10-0.25-0.75	
Sample Date					11/13/2020		11/13/2020		11/13/2020		11/13/2020	
Depth (feet bgs)					1.0–1.25		0.25–0.75		0.25–0.75		0.25–0.75	
Analyte	Unit	MTCA Method B <sup>(1)</sup>	PCUL	CUL	Result	EF	Result	EF	Result	EF	Result	EF
Arsenic	mg/kg	NA	--	7.3	3.7	0.51	<b>35</b>	<b>4.8</b>	<b>1,700</b>	<b>230</b>	7.2	0.99
Cadmium	mg/kg	NA	0.77	--	0.50 U	0.65	0.46	0.60	<b>3.6</b>	<b>4.7</b>	0.50 U	0.65
Copper	mg/kg	140	--	--	21	0.15	48	0.34	<b>4,100</b>	<b>29</b>	25	0.18
Lead	mg/kg	NA	24	--	7.0	0.29	<b>36</b>	<b>1.5</b>	<b>2,500</b>	<b>100</b>	15	0.63
Mercury	mg/kg	NA	0.070	--	0.050 U	0.71	0.064	0.91	<b>0.14</b>	<b>2.0</b>	0.050 U	0.71
Silver	mg/kg	NA	0.10	--	0.10 U	1.0	0.10 U	1.0	4.0 U	40	0.10 U	1.0
Zinc	mg/kg	300	--	--	40	0.13	140	0.47	<b>4,900</b>	<b>16</b>	69	0.23

Notes:

Criteria and results have been rounded to two significant digits.

-- Not established.

**RED/BOLD** Indicates a concentration that exceeds the applicable CUL or PCUL.

*italic* Exceedance factor calculated for the practical quantitation limit of a non-detect result; the true exceedance factor is less than the calculated value.

1 The criterion is the MTCA B cleanup level for protection of groundwater via leaching.

Abbreviations:

bgs Below ground surface

CUL Cleanup level

EF Exceedance factor

mg/kg Milligrams per kilogram

NA The criterion is not applicable because it is superceded by a PCUL or CUL.

PCUL Preliminary cleanup level

Qualifier:

U Analyte was not detected at the given reporting limit.

**Table 3**  
**Summary of Tributyltin Results in Soil, Shoreline Area of Concern**

Analyte			Tributyltin (mg/kg)
Target REL			0.047
MTCA Method B CUL			24
Location	Sample Date	Depth Range (feet bgs)	
COMP-1	11/13/2020	0.0–0.5	0.0020 JQ
COMP-2	11/13/2020	0.0–0.5	0.00066 JQ
COMP-3	11/13/2020	0.0–0.5	0.0038 U
COMP-4	11/13/2020	0.0–0.5	0.0038 UJ
COMP-5	11/13/2020	0.0–0.5	0.0011 JQ
COMP-6	11/13/2020	0.0–0.5	0.0038 U
COMP-7	11/13/2020	0.0–0.5	0.0012 JQ

Note:

Criteria and results have been rounded to two significant digits.

Abbreviations:

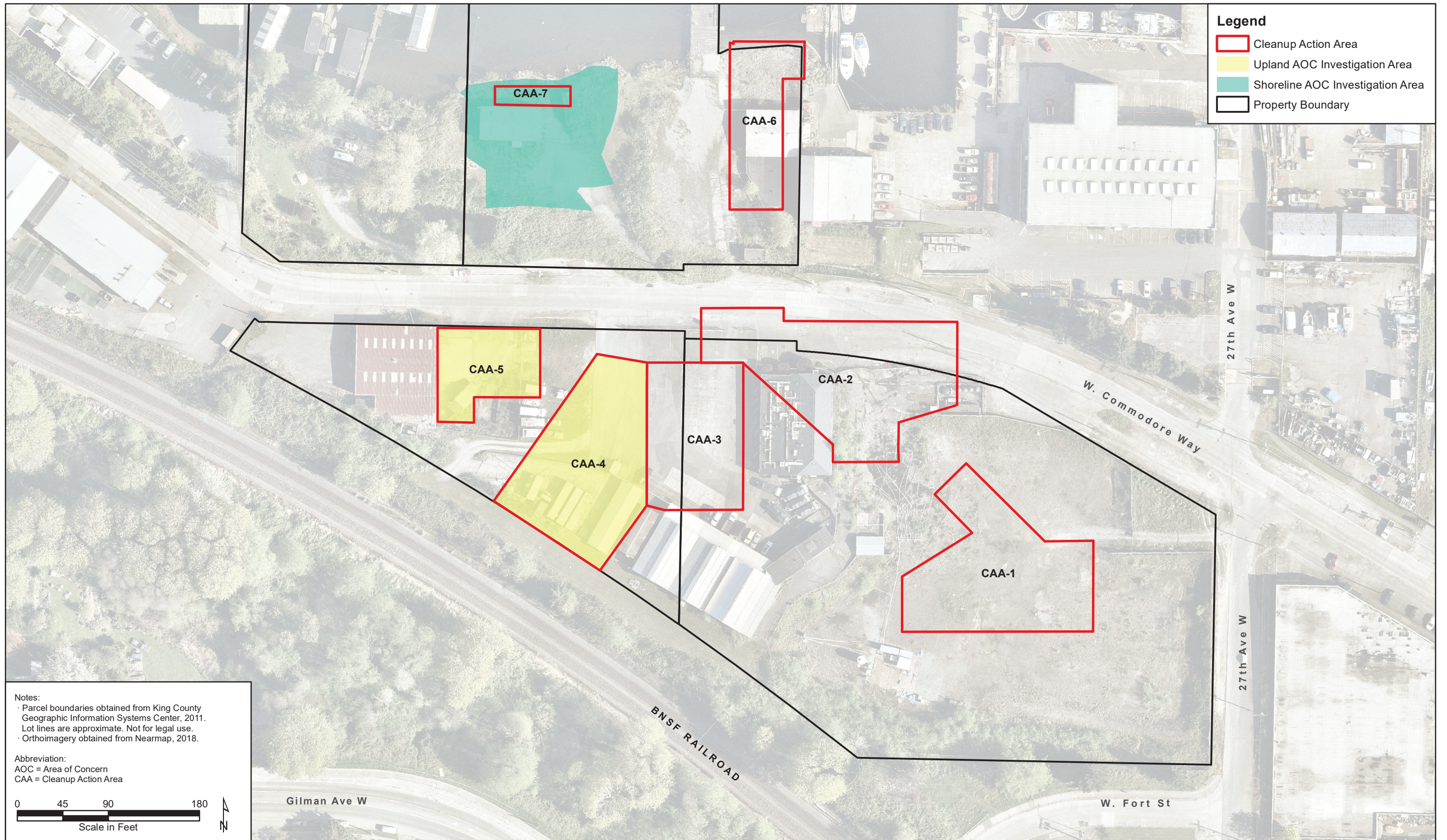
- bgs Below ground surface
- CUL Cleanup level
- mg/kg Milligrams per kilogram
- MTCA Model Toxics Control Act
- REL Remediation level

Qualifiers:

- JQ Analyte was detected between the method detection limit and reporting limit and is considered to be an estimate.
- U Analyte was not detected at the given reporting limit.
- UJ Analyte was not detected at the given reporting limit, which is considered to be an estimate.

**Time Oil Bulk Terminal Site**  
**Pre-Remedial Design**  
**Investigation Summary Report**

**Figures**



**Legend**

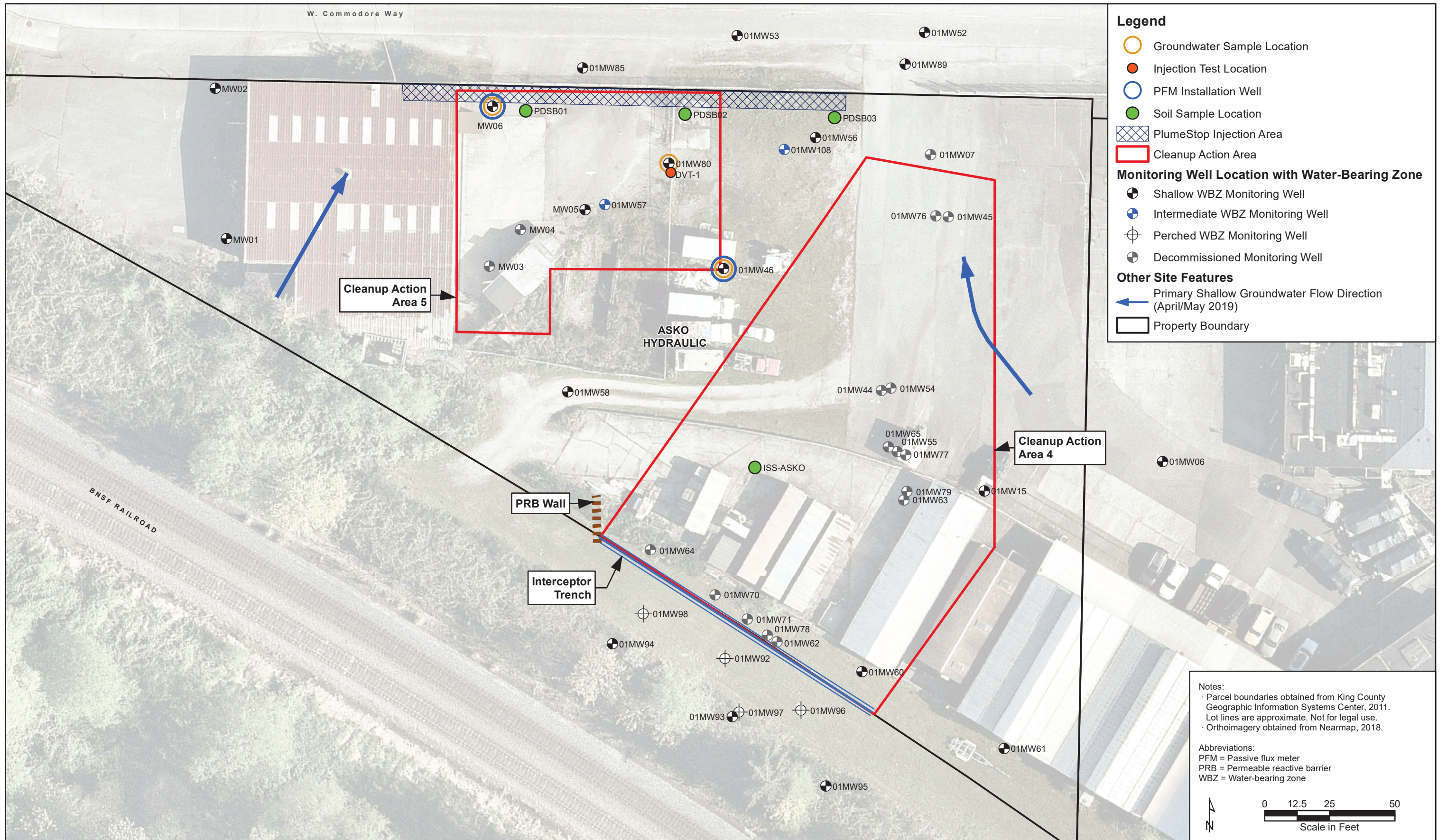
- Cleanup Action Area
- Upland AOC Investigation Area
- Shoreline AOC Investigation Area
- Property Boundary

Notes:  
 · Parcel boundaries obtained from King County Geographic Information Systems Center, 2011.  
 · Lot lines are approximate. Not for legal use.  
 · Orthoimagery obtained from Nearmap, 2018.

Abbreviation:  
 AOC = Area of Concern  
 CAA = Cleanup Action Area







**Legend**

- Groundwater Sample Location
- Injection Test Location
- PFM Installation Well
- Soil Sample Location
- PlumeStop Injection Area
- Cleanup Action Area

**Monitoring Well Location with Water-Bearing Zone**

- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well
- Decommissioned Monitoring Well

**Other Site Features**

- Primary Shallow Groundwater Flow Direction (April/May 2019)
- Property Boundary

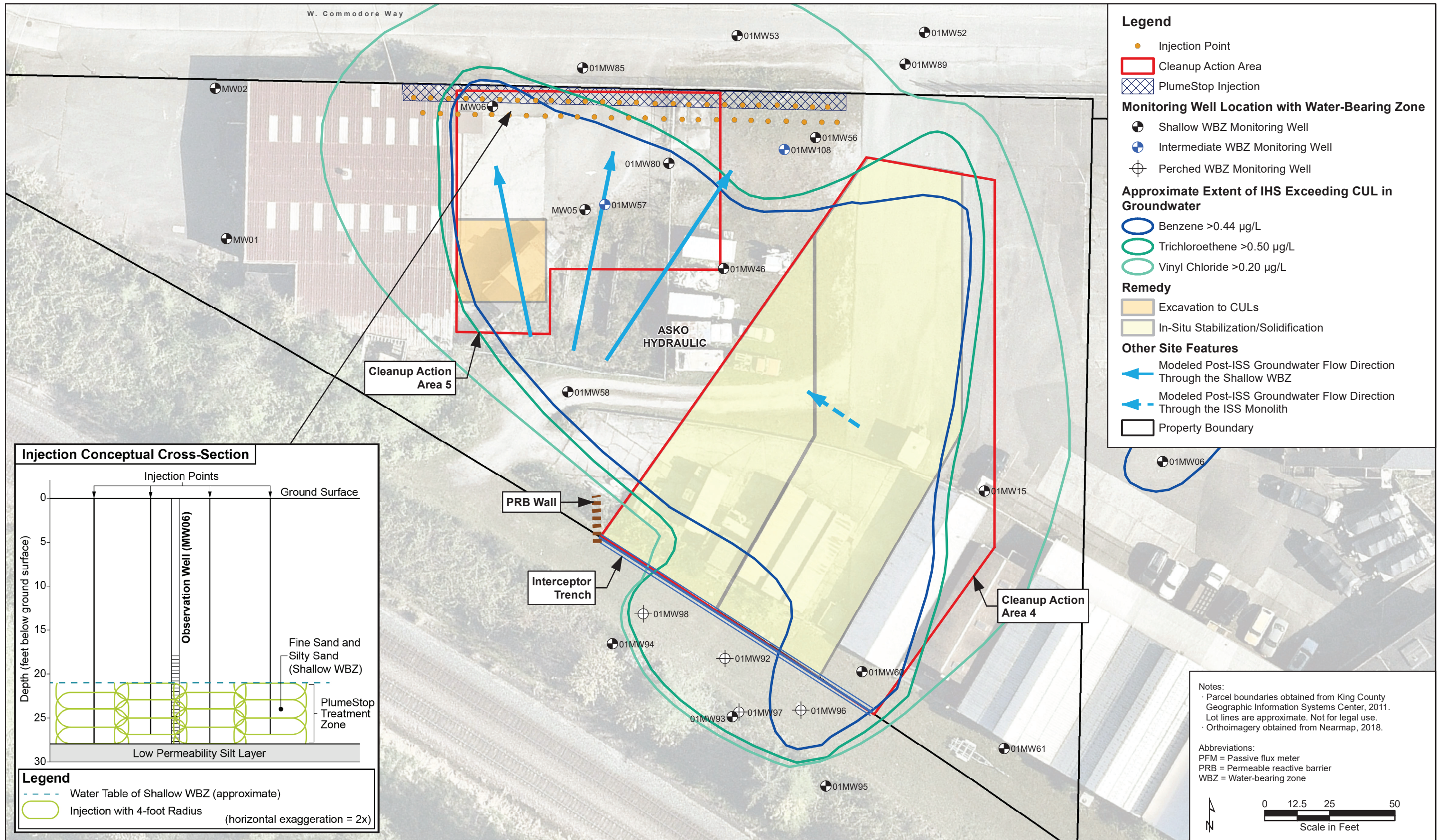
**Notes:**

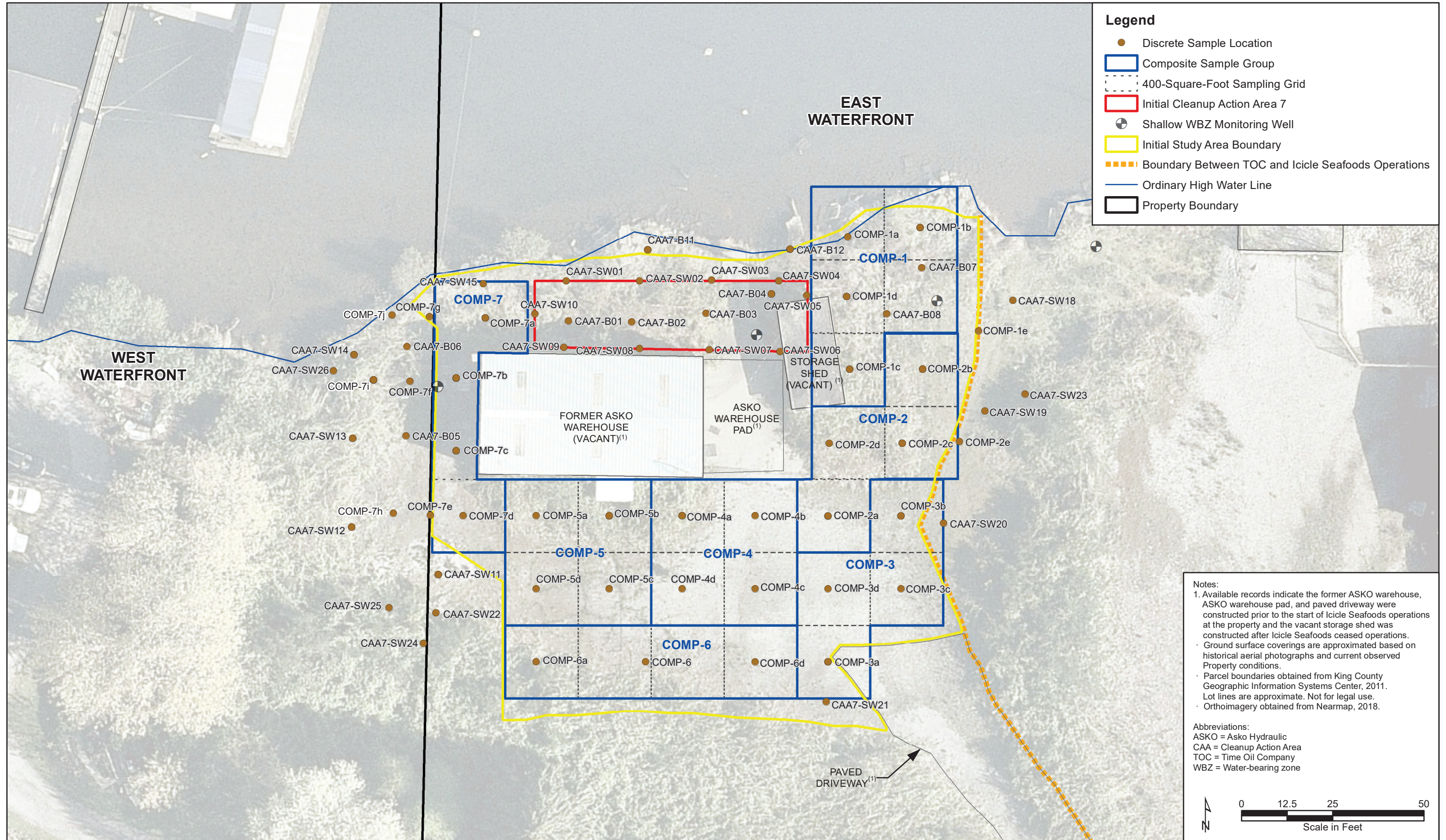
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2018.

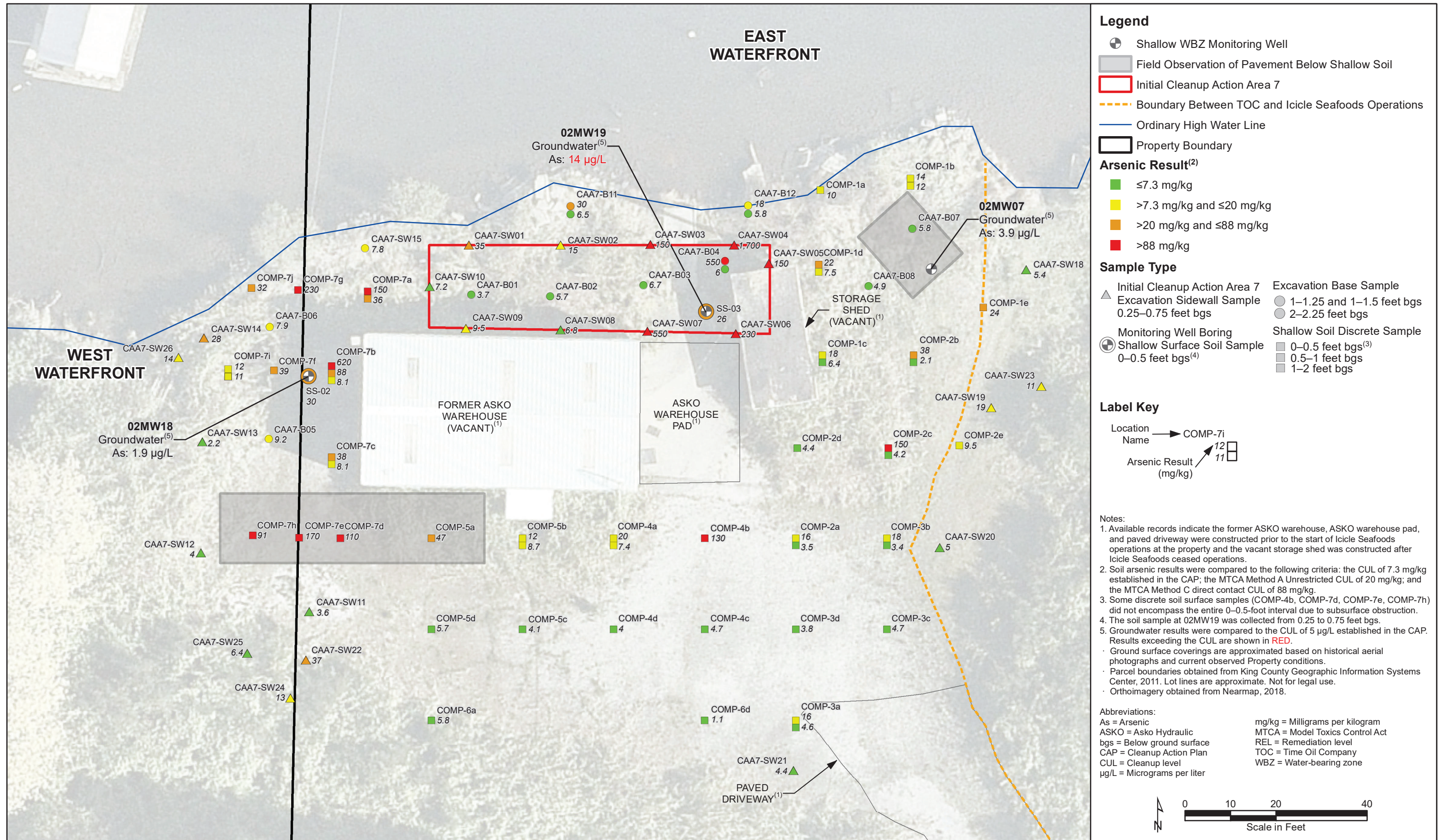
**Abbreviations:**

- PFM = Passive flux meter
- PRB = Permeable reactive barrier
- WBZ = Water-bearing zone

Scale in Feet







### Legend

- Shallow WBZ Monitoring Well
- Field Observation of Pavement Below Shallow Soil
- Initial Cleanup Action Area 7
- Boundary Between TOC and Icicle Seafoods Operations
- Ordinary High Water Line
- Property Boundary

### Arsenic Result<sup>(2)</sup>

- ≤7.3 mg/kg
- >7.3 mg/kg and ≤20 mg/kg
- >20 mg/kg and ≤88 mg/kg
- >88 mg/kg

### Sample Type

- Initial Cleanup Action Area 7 Excavation Base Sample
- Excavation Sidewall Sample 0.25–0.75 feet bgs
- Monitoring Well Boring
- Shallow Surface Soil Sample 0–0.5 feet bgs<sup>(4)</sup>
- Excavation Base Sample 1–1.25 and 1–1.5 feet bgs
- Shallow Soil Discrete Sample 0–0.5 feet bgs<sup>(3)</sup>
- 0.5–1 feet bgs
- 1–2 feet bgs

### Label Key

Location Name → COMP-7i

Arsenic Result (mg/kg) → 12, 11

Notes:

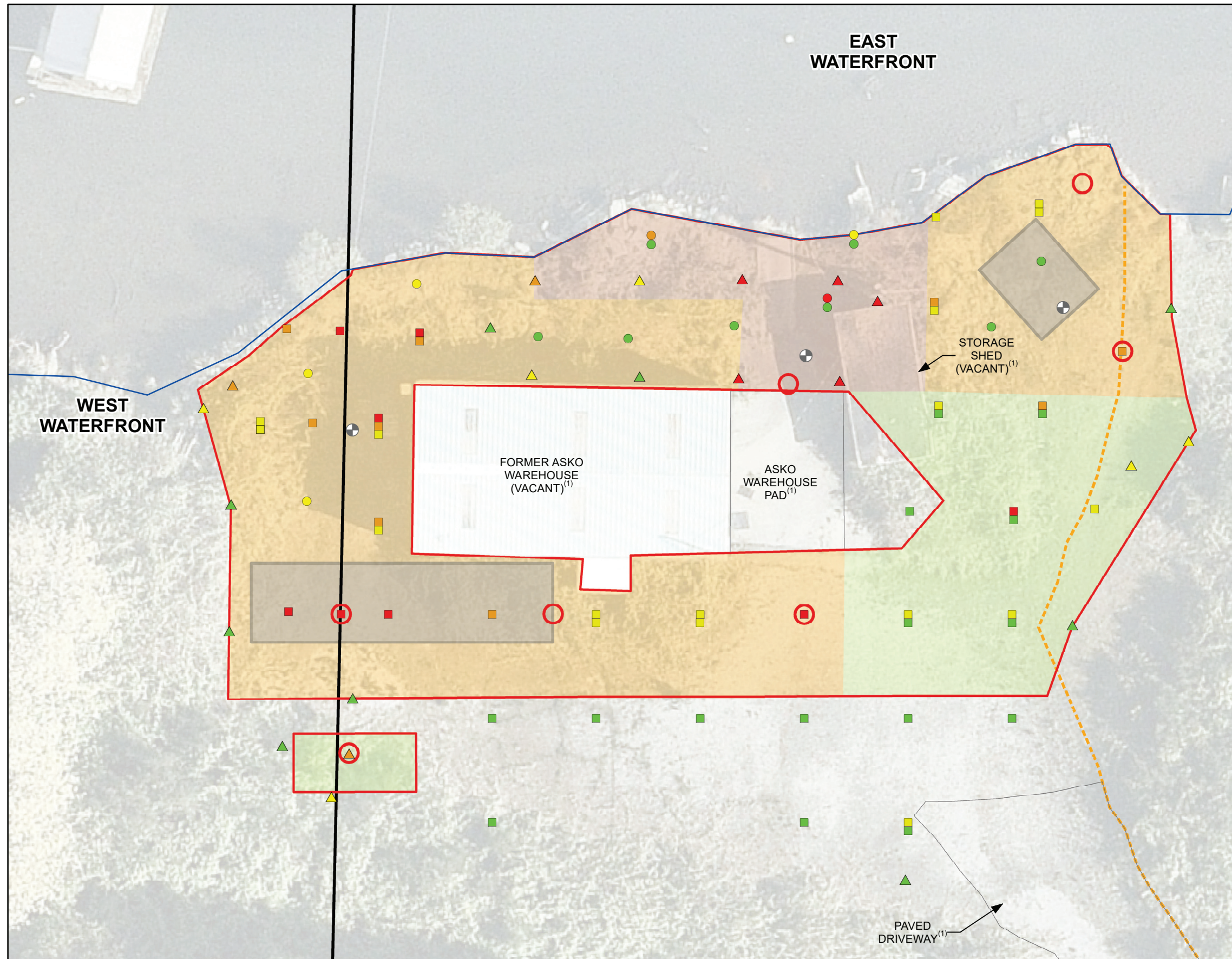
- Available records indicate the former ASKO warehouse, ASKO warehouse pad, and paved driveway were constructed prior to the start of Icicle Seafoods operations at the property and the vacant storage shed was constructed after Icicle Seafoods ceased operations.
- Soil arsenic results were compared to the following criteria: the CUL of 7.3 mg/kg established in the CAP; the MTCA Method A Unrestricted CUL of 20 mg/kg; and the MTCA Method C direct contact CUL of 88 mg/kg.
- Some discrete soil surface samples (COMP-4b, COMP-7d, COMP-7e, COMP-7h) did not encompass the entire 0–0.5-foot interval due to subsurface obstruction.
- The soil sample at 02MW19 was collected from 0.25 to 0.75 feet bgs.
- Groundwater results were compared to the CUL of 5 µg/L established in the CAP. Results exceeding the CUL are shown in RED.

- Ground surface coverings are approximated based on historical aerial photographs and current observed Property conditions.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2018.

Abbreviations:

- As = Arsenic
- ASKO = Asko Hydraulic
- bgs = Below ground surface
- CAP = Cleanup Action Plan
- CUL = Cleanup level
- µg/L = Micrograms per liter
- mg/kg = Milligrams per kilogram
- MTCA = Model Toxics Control Act
- REL = Remediation level
- TOC = Time Oil Company
- WBZ = Water-bearing zone

Scale in Feet: 0, 10, 20, 40



**Legend**

- Shallow WBZ Monitoring Well
- Field Observation of Pavement Below Shallow Soil
- Proposed Revised Cleanup Action Area 7<sup>(2)</sup>
- 0.5-foot Excavation Area
- 1-foot Excavation Area
- 2-foot Excavation Area
- Proposed Excavation Base Confirmation Sample
- Boundary Between TOC and Icicle Seafoods Operations
- Ordinary High Water Mark
- Property Boundary

**Arsenic Result<sup>(3)</sup>**

- ≤7.3 mg/kg
- >7.3 mg/kg and ≤20 mg/kg
- >20 mg/kg and ≤88 mg/kg
- >88 mg/kg

**Sample Type**

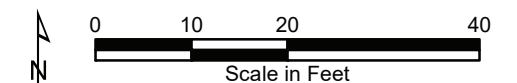
- Initial Cleanup Action Area 7
- Excavation Base Sample
- Excavation Sidewall Sample
- Shallow Soil Discrete Sample
- 1–1.25 and 1–1.5 feet bgs
- 2–2.25 feet bgs
- 0–0.5 feet bgs<sup>(3)</sup>
- 0.5–1 feet bgs
- 1–2 feet bgs

**Notes:**

1. Available records indicate the former ASKO warehouse, ASKO warehouse pad, and paved driveway were constructed prior to the start of Icicle Seafoods operations at the property and the vacant storage shed was constructed after Icicle Seafoods ceased operations.
2. The Cleanup Action Area 7 excavation will extend to the edges of the paved pads and structures that pre-date Icicle Seafoods operations. Other pavement will be removed during excavation. Confirmation samples will not be collected along the sidewalls of the excavation defined by the paved pads and structures that predated Icicle Seafoods operations.
3. Soil arsenic results were compared to the following criteria: the CUL of 7.3 mg/kg established in the CAP; the MTCA Method A Unrestricted CUL of 20 mg/kg; and the MTCA Method C direct contact CUL of 88 mg/kg.
4. Some discrete soil surface samples (COMP-4b, COMP-7d, COMP-7e, COMP-7h) did not encompass the entire 0–0.5-foot interval due to subsurface obstruction.
4. Monitoring wells within Cleanup Action Area 7 will be protected during excavation.
  - Ground surface coverings are approximated based on historical aerial photographs and current observed Property conditions.
  - Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
  - Orthoimagery obtained from Nearmap, 2018.

**Abbreviations:**

- As = Arsenic
- ASKO = Asko Hydraulic
- bgs = Below ground surface
- CAP = Cleanup Action Plan
- CUL = Cleanup level
- mg/kg = Milligrams per kilogram
- MTCA = Model Toxics Control Act
- TOC = Time Oil Company
- WBZ = Water-bearing zone



**Time Oil Bulk Terminal Site**  
**Pre-Remedial Design**  
**Investigation Summary Report**

**Attachment 1**  
**Cleanup Action Area 4**  
**Investigation Supporting Documentation**



Crete Consulting, Inc.  
108 South Washington  
Suite 300  
Seattle, WA 98104

# Boring Log

LOCATION/BORING ID:

**ISS-ASKO**

## PROJECT INFORMATION

## DRILLING INFORMATION

PROJECT: **TOC, In Situ Solidification**  
 SITE NAME: **TOC Seattle Terminal 1  
2737 W. Commodore Way**  
 SITE LOCATION: **Seattle, WA**  
 JOB NUMBER:  
 PROJECT MANAGER: **M. Byers, P.E.**  
 LOGGED BY: **R. Jones**  
 DATE(S) DRILLED: **10/7/2020**  
 START TIME: **09:35** END TIME: **11:00**

DRILLING COMPANY: **Holocene Drilling**  
 DRILLING METHOD: **4.25-Inch ID Hollow Stem Auger**  
 BORING DEPTH: **35 ft bgs**  
 BORING DIAMETER: **8-inch**  
 SOIL SCREENING: **MiniRAE PID**  
 PLUGGING METHOD: **Bentonite chips**

GROUND ELEV: **NM**  
 ELEV. METHOD: **NM**  
 COOR. METHOD: **Lat./Long.**

LATITUDE (°N) **47.662189** LONGITUDE (°W) **122.393821**  
 INITIAL WATER LEVEL: **20 ft bgs**

REMARKS: **ASKO, CAA-4.**

DEPTH	LITHOLOGY	USCS	SOIL DESCRIPTION	SAMPLE ID	SPT #s	PID (ppm)	COMMENTS
0			CONCRETE at surface, no rebar.		3/5/6	1.9	
			CLAYEY GRAVEL, wet, tan to gray, black wet staining.		4/6/9	1.8	
		SM	SILTY SAND, minor to some GRAVEL, moist, brown to gray.		2/3/3	2.3	
		SM	SILTY SAND, fine to medium-grained, moist, reddish brown.		2/3/6	2.2	
5		SM	SILTY SAND, trace GRAVEL, fine to medium grained, moist.	ISS-ASKO 4.5-5.8'	2/3/6	2.2	
		SM	SILT and SAND, very fine to medium-grained, firm, slightly moist to moist, light tan.	ISS-ASKO 5.8-7.5'	3/6/9	1.9	
		SP	SAND, trace to minor SILT, medium-grained, moist, reddish brown to reddish orange.	ISS-ASKO 7.5-9'	6/13/18	2.3	
		SP	At 9 to 9.5 ft bgs: GRAVEL	ISS-ASKO 9-10.5'	3/15/23	2.6	
10		SW	SAND, moist, reddish orange.	ISS-ASKO 11-11.7'	11/13/15	3.2	Split spoons cores to 0 to 15 ft bgs.
		ML	SILT, hard, dry to slightly moist, tan/brown to gray.	ISS-ASKO 11.7-12.5'	3/5/6	2.4	
		ML	ISS-ASKO 12.5-13.5'	6/14/28	3.8		
15			SANDY SILT, friable, slightly moist, oxidized minerals, red to tan/brown.				Mixed auger cuttings 15 to 35 ft bgs.
			SAND, fine to medium-grained, minor to some SILT, moist, gray to dark gray, no appreciable odors.				
20			At 20 ft bgs: Wet.				
25		SP		ISS-ASKO 1-35 ft	N/A	N/A	
30							
35							

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

November 6, 2020

Jamie Stevens, Project Manager  
Crete Consulting  
108 S. Washington St., Suite 300  
Seattle, WA 98104

Dear Ms Stevens:

Included are the results from the testing of material submitted on October 7, 2020 from the TOC Seattle Terminal, F&BI 010129 project. There is 1 page 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
CTC1106R.DOC



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 7, 2020 by Friedman & Bruya, Inc. from the Crete Consulting TOC Seattle Terminal, F&BI 010129 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Crete Consulting</u>
010129 -01	ISS-ASKO 4.5-5.8'
010129 -02	ISS-ASKO 5.8-7.5'
010129 -03	ISS-ASKO 7.5-9'
010129 -04	ISS-ASKO 9-10.5'
010129 -05	ISS-ASKO 11-11.7'
010129 -06	ISS-ASKO 11.7-12.5'
010129 -07	ISS-ASKO 12.5-13.5'

Samples ISS-ASKO 4.5-5.8', ISS-ASKO 5.8-7.5', ISS-ASKO 7.5-9', and ISS-ASKO 9-10.5' were sent to Fremont Analytical for grain size analysis. In addition, samples ISS-ASKO 7.5-9' and ISS-ASKO 9-10.5' were sent to Fremont for total organic carbon analysis. The report is enclosed.



**Friedman & Bruya**

Michael Erdahl  
3012 16th Ave. W.  
Seattle, WA 98119

**RE: 010129**

**Work Order Number: 2010106**

November 10, 2020

**Attention Michael Erdahl:**

Fremont Analytical, Inc. received 4 sample(s) on 10/8/2020 for the analyses presented in the following report.

***Grain Size by ASTM D422***

***Total Organic Carbon by EPA 9060***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes  
Project Manager

---

**CLIENT:** Friedman & Bruya  
**Project:** 010129  
**Work Order:** 2010106

---

**Work Order Sample Summary**

---

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Date/Time Collected</b>	<b>Date/Time Received</b>
2010106-001	ISS-ASKO-4.5-5.8'	10/07/2020 11:00 AM	10/08/2020 9:37 AM
2010106-002	ISS-ASKO-4.8-7.5'	10/07/2020 11:05 AM	10/08/2020 9:37 AM
2010106-003	ISS-ASKO-7.5-9'	10/07/2020 11:10 AM	10/08/2020 9:37 AM
2010106-004	ISS-ASKO-9-10.5'	10/07/2020 11:15 AM	10/08/2020 9:37 AM

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

**CLIENT:** Friedman & Bruya  
**Project:** 010129

---

**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.

Note: The grainsize data indicate a discontinuity between the sieve analyses and hydrometer analyses in the size range below 100 microns. It is not uncommon to observe a discontinuity in this range due to differences in analytical procedure and the effects of irregular soil particle shape.

11/10/2020: Revision 1 includes a correction to the "Percent Retained" table of the grain size data.

### 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 (<20%RSD, <20% Drift or minimum RRF)
- 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
- 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:** 010129

**Lab ID:** 2010106-003

**Collection Date:** 10/7/2020 11:10:00 AM

**Client Sample ID:** ISS-ASKO-7.5-9'

**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Organic Carbon by EPA 9060</u></b>					Batch ID: 30009	Analyst: SS
Total Organic Carbon	ND	0.0750		%-dry	1	10/14/2020 12:34:00 PM

**Lab ID:** 2010106-004

**Collection Date:** 10/7/2020 11:15:00 AM

**Client Sample ID:** ISS-ASKO-9-10.5'

**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Organic Carbon by EPA 9060</u></b>					Batch ID: 30009	Analyst: SS
Total Organic Carbon	ND	0.0750		%-dry	1	10/14/2020 2:24:00 PM

## Grain Size by ASTM D422

Project: 010129  
 Client: Friedman & Bruya  
 Lab Project #: 2010106

### Percent Retained in Each Size Fraction

UOM = Percent

Grain Size Classification	Gravel							Coarse Sand	Medium Sand		Fine Sand			Silt and Finer
Sieves Size	3"	2"	1 1/2"	1"	3/4"	3/8"	#4 (4750 $\mu$ )	#10 (2000 $\mu$ )	#20 (850 $\mu$ )	#40 (425 $\mu$ )	#60 (250 $\mu$ )	#140 (106 $\mu$ )	#200 (75 $\mu$ )	
Particle Size (Microns)	>76200	76200-50800	50800-38100	38100-25400	25400-19000	19050-9525	9525-4750	4750-2000	2000-850	850-425	425-250	250-106	106-75	<75
Sample ID														
ISS-ASKO-4.5-5.8'	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.424%	7.79%	6.03%	5.36%	5.38%	10.4%	8.22%	56.4%
ISS-ASKO-4.8-7.5'	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	4.18%	4.54%	11.6%	39.1%	6.25%	31.0%
ISS-ASKO-7.5-9'	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.535%	0.811%	0.00%	0.846%	13.8%	50.2%	9.33%	24.5%
ISS-ASKO-9-10.5'	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.23%	0.00%	1.63%	16.8%	22.2%	3.29%	46.8%

## Grain Size by ASTM D422

Project: 010129  
Client: Friedman & Bruya  
Lab Project #: 2010106

### Percent Finer (Passing) than the Indicated Size

UOM = Percent

Grain Size Classification	Gravel						Coarse Sand	Medium Sand		Fine Sand			Silt and Finer
	Sieve Size	3"	2"	1 1/2"	1"	3/4"	3/8"	#4	#10	#20	#40	#60	#140
Particle Size (Microns)	76200	50800	38100	25400	19050	9525	4750	2000	850	425	250	106	75
<b>Sample ID</b>													
ISS-ASKO-4.5-5.8'	100%	100%	100%	100%	100%	100%	100%	91.8%	85.9%	80.5%	75.1%	64.7%	56.5%
ISS-ASKO-4.8-7.5'	100%	100%	100%	100%	100%	100%	100%	96.7%	92.7%	88.2%	76.6%	37.4%	31.2%
ISS-ASKO-7.5-9'	100%	100%	100%	100%	100%	100%	99.5%	98.7%	98.7%	97.8%	84.0%	33.8%	24.5%
ISS-ASKO-9-10.5'	100%	100%	100%	100%	100%	100%	100%	90.8%	90.8%	89.1%	72.3%	50.1%	46.8%



## Grainsize by ASTM D422 - Hydrometer

Project: 010129

Client: Friedman &amp; Bruya

Lab Project #: 2010106

Sample	Specific Gravity Determination				Hygroscopic Moisture Determination		
	Initial Mass of Volumetric Flask + Water	Mass of Soil in empty flask	Flask with Soil filled to 500mL DI	Specific Gravity	Air Dried Weight (g)	Oven Dried Weight (g)	Hygroscopic Moisture Correction Factor
ISS-ASKO-4.5-5.8'	380	11.5	387	2.62	11.5	11.2	0.973
ISS-ASKO-4.8-7.5'	380	11.1	387	2.56	10.7	10.5	0.984
ISS-ASKO-7.5-9'	380	11.0	387	2.90	11.2	11.1	0.989
ISS-ASKO-9-10.5'	380	11.1	387	2.74	10.7	10.6	0.988

Blank Hydrometer Reading:

5

**Sample 1: ISS-ASKO-4.5-5.8'**

Corrected Soil Weight through #10:

53.2

Air-dried aliquot through #10 used for hydrometer:

50.2

Time (minutes)

2

5

15

30

60

250

1440

Temperature, °C

19.7

19.9

20.4

20.4

21.3

21.9

20.7

Hydrometer Reading

33

30

27

23

20

16.25

13.5

Percent finer than

53.1%

47.4%

41.7%

34.2%

28.5%

21.3%

16.1%

Diameter of particle (microns)

32.8

21.2

12.3

8.95

6.37

3.20

1.38

**Sample 2: ISS-ASKO-4.8-7.5'**

Corrected Soil Weight through #10:

51.0

Air-dried aliquot through #10 used for hydrometer:

50.14

Time (minutes)

2

5

15

30

60

250

1440

Temperature, °C

20.7

20.7

20.8

21.2

21.3

22.0

20.9

Hydrometer Reading

25.6

24

22.5

21.8

20.5

20

18

Percent Finer than

41.2%

38.0%

35.0%

33.5%

31.0%

30.0%

26.0%

Diameter of particle (microns)

34.8

22.2

13.0

9.12

6.47

3.13

1.35

## Grainsize by ASTM D422 - Hydrometer

Project: 010129  
 Client: Friedman & Bruya  
 Lab Project #: 2010106

		Specific Gravity Determination				Hygroscopic Moisture Determination		
<b>Sample 3:</b>	<b>ISS-ASKO-7.5-9'</b>							
Corrected Soil Weight through #10:	<b>50.3</b>	Air-dried aliquot through #10 used for hydrometer:						<b>50.1</b>
Time (minutes)		2	5	15	30	60	250	1440
Temperature, °C		21.0	21.0	21.2	21.2	21.4	21.3	20.1
Hydrometer Reading		11.0	10.0	9.50	9.25	7.75	6.50	6.00
Percent Finer than		<b>11.3%</b>	<b>9.45%</b>	<b>8.50%</b>	<b>8.03%</b>	<b>5.20%</b>	<b>2.83%</b>	<b>1.89%</b>
Diameter of particle (microns)		<b>37.3</b>	<b>23.8</b>	<b>13.6</b>	<b>9.62</b>	<b>6.89</b>	<b>3.39</b>	<b>1.43</b>
<b>Sample 4:</b>	<b>ISS-ASKO-9-10.5'</b>							
Corrected Soil Weight through #10:	<b>54.6</b>	Air-dried aliquot through #10 used for hydrometer:						<b>50.2</b>
Time (minutes)		2	5	15	30	60	250	1440
Temperature, °C		21.1	21.1	21.2	21.3	21.4	21.3	20.1
Hydrometer Reading		28.5	28.0	26.5	24.5	23.000	18.0	13.3
Percent Finer than		<b>42.6%</b>	<b>41.7%</b>	<b>39.0%</b>	<b>35.3%</b>	<b>32.6%</b>	<b>23.6%</b>	<b>14.9%</b>
Diameter of particle (microns)		<b>32.1</b>	<b>20.3</b>	<b>11.9</b>	<b>8.54</b>	<b>6.06</b>	<b>3.06</b>	<b>1.33</b>

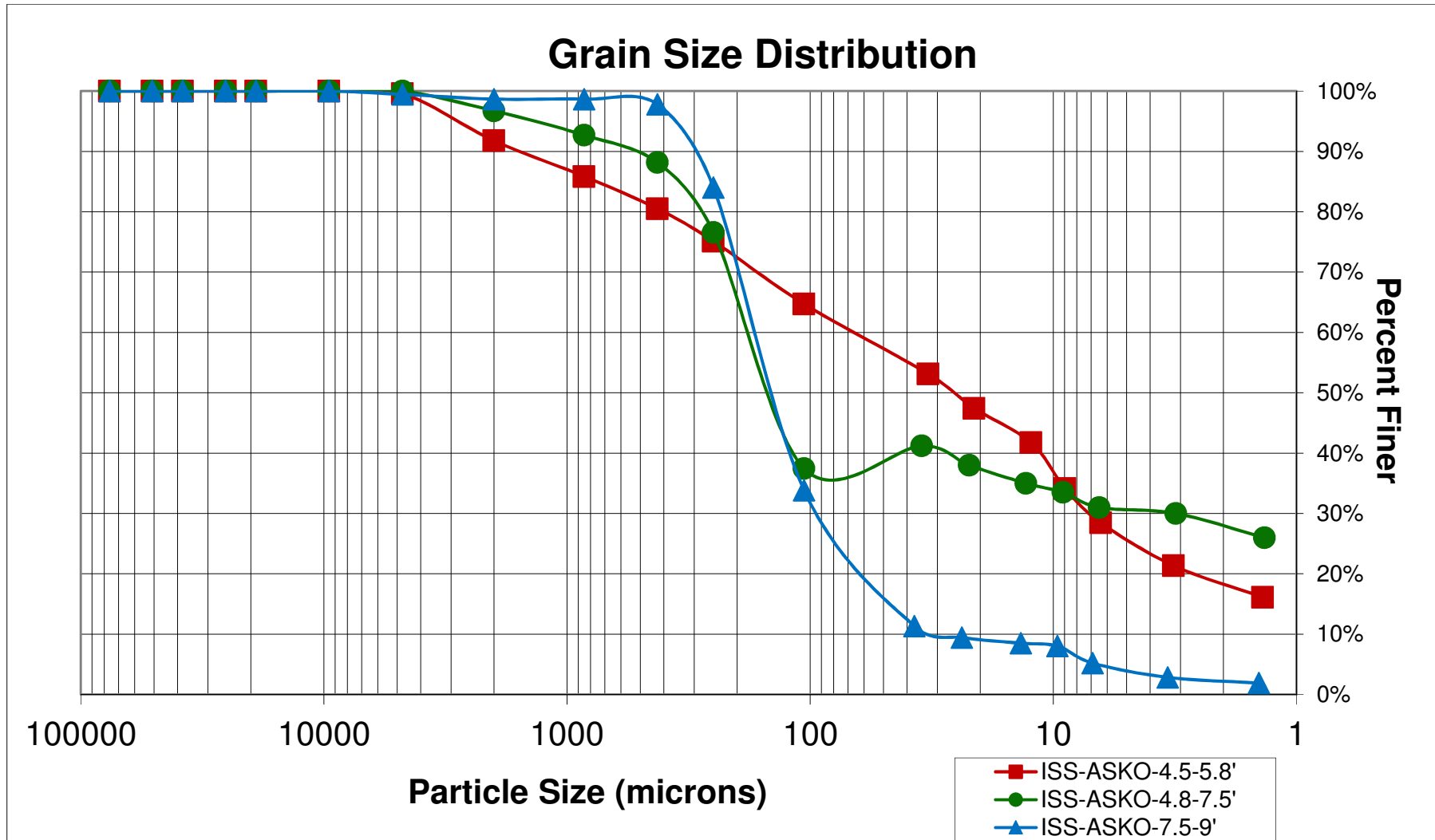


## Grain Size by ASTM D422

Project: 010129

Client: Friedman & Bruya

Lab Project #: 2010106

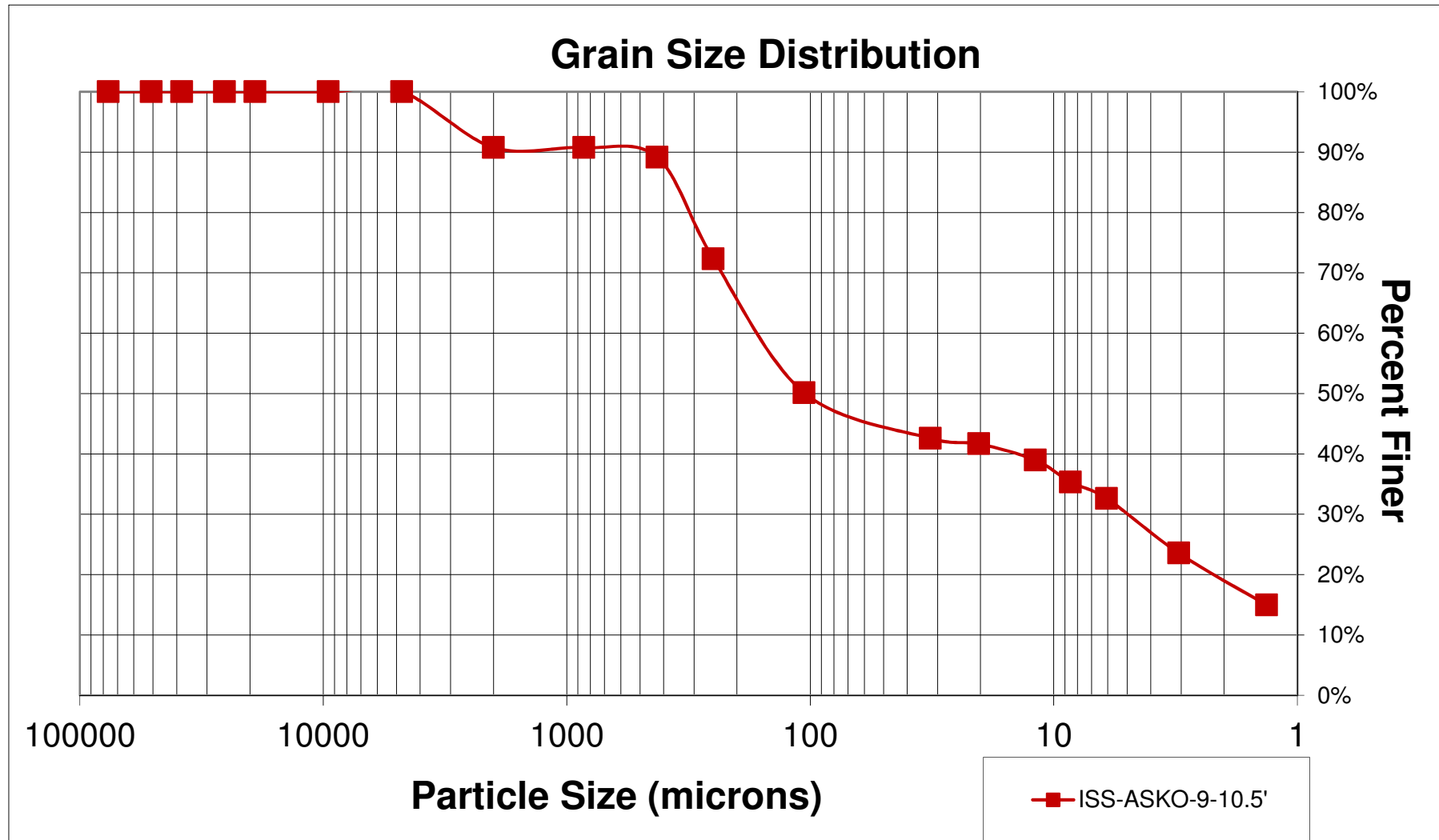


**Grain Size by ASTM D422**

Project: 010129

Client: Friedman & Bruya

Lab Project #: 2010106





**Work Order:** 2010106  
**CLIENT:** Friedman & Bruya  
**Project:** 010129

## QC SUMMARY REPORT

### Total Organic Carbon by EPA 9060

Sample ID: <b>MB-30009</b>	SampType: <b>MBLK</b>	Units: <b>%-dry</b>	Prep Date: <b>10/14/2020</b>	RunNo: <b>62564</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>30009</b>	Analysis Date: <b>10/14/2020</b>	SeqNo: <b>1255535</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.0750									

Sample ID: <b>LCS-30009</b>	SampType: <b>LCS</b>	Units: <b>%-dry</b>	Prep Date: <b>10/14/2020</b>	RunNo: <b>62564</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>30009</b>	Analysis Date: <b>10/14/2020</b>	SeqNo: <b>1255536</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.01	0.0750	1.000	0	101	80	120				

Sample ID: <b>2010106-003ADUP</b>	SampType: <b>DUP</b>	Units: <b>%-dry</b>	Prep Date: <b>10/14/2020</b>	RunNo: <b>62564</b>							
Client ID: <b>ISS-ASKO-7.5-9'</b>	Batch ID: <b>30009</b>	Analysis Date: <b>10/14/2020</b>	SeqNo: <b>1255538</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.0750						0		20	

Sample ID: <b>2010106-003AMS</b>	SampType: <b>MS</b>	Units: <b>%-dry</b>	Prep Date: <b>10/14/2020</b>	RunNo: <b>62564</b>							
Client ID: <b>ISS-ASKO-7.5-9'</b>	Batch ID: <b>30009</b>	Analysis Date: <b>10/14/2020</b>	SeqNo: <b>1255539</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.12	0.0750	1.000	0.05200	107	75	125				

Sample ID: <b>2010106-003AMSD</b>	SampType: <b>MSD</b>	Units: <b>%-dry</b>	Prep Date: <b>10/14/2020</b>	RunNo: <b>62564</b>							
Client ID: <b>ISS-ASKO-7.5-9'</b>	Batch ID: <b>30009</b>	Analysis Date: <b>10/14/2020</b>	SeqNo: <b>1255540</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.13	0.0750	1.000	0.05200	108	75	125	1.121	0.622	20	

Client Name: <b>FB</b>	Work Order Number: <b>2010106</b>
Logged by: <b>Carissa True</b>	Date Received: <b>10/8/2020 9:37:00 AM</b>

### Chain of Custody

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

### Log In

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

### Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes  No  NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

### Item Information

Item #	Temp °C
Sample 1	2.0

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

# SUBCONTRACT SAMPLE CHAIN OF CUSTODY

20101014

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com



SUBCONTRACTOR <u>Fremont</u>	
PROJECT NAME/NO. <u>010129</u>	PO # <u>A-422</u>
REMARKS <p style="text-align: center;">Please Email Results</p>	

TURNAROUND TIME
<input checked="" type="checkbox"/> Standard TAT
<input type="checkbox"/> RUSH
Rush charges authorized by: _____
SAMPLE DISPOSAL
<input type="checkbox"/> Dispose after 30 days
<input type="checkbox"/> Return samples
<input type="checkbox"/> Will call with instructions

Page 14 of 14

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED							Notes	
						Dioxins/Furans	EPH	VPH	Grain Size w/ Hydrocarbons	TOC				
ISS-ASKO 4.5-5.8'		10/7/20	1100	Soil	21				X					
ISS-ASKO 5.8-7.5'			1105		21				X					
ISS-ASKO 7.5-9'			1110		21				X	X				
ISS-ASKO 9-10.5'			1115		21				X	X				
					MS									
					10/8/20									

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	10/8/20	0600
Received by: 	Carter Johnson	EAI	10/8/20	0937
Relinquished by: _____				
Received by: _____				

010129

SAMPLE CHAIN OF CUSTODY

ME 10-07-20

Page # 1 of 1 BLY

Report To Jamie Stevens / Kim Hengel  
 Company Pioneer Engineering & Environmental Services  
 Address 2753 West 31st Street  
 City, State, ZIP Chicago, Illinois 60608  
 Phone 773-435-3125 Email \_\_\_\_\_

SAMPLERS (signature) Rusty Jones R. Jones  
 PROJECT NAME TOC Seattle Terminal PO # \_\_\_\_\_  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

TURNAROUND TIME  
 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										Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Grain Size	TOC				
ISS-ASKO 4.5-5.8'	01 A-B	10.07.2020	1100	SOIL	2										X			
ISS-ASKO 5.8-7.5'	02		1105		2										X			
ISS-ASKO 7.5-9'	03		1110		2										X	X		
ISS-ASKO 9-10.5'	04		1115		2										X	Y		
ISS-ASKO 11-11.7'	05		1120		2													HOLD
ISS-ASKO 11.7-12.5'	06		1125		1													HOLD
ISS-ASKO 12.5-13.5'	07		1130		1													HOLD
Samples received at <u>5</u> °C																		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>R. Jones</u>	<u>Rusty Jones</u>	<u>Crete Consulting</u>	<u>10.07.2020</u>	<u>1443</u>
Received by: <u>Ann W Bruya</u>	<u>Ann Webber Bruya</u>	<u>F&amp;B</u>	<u>10/7/20</u>	<u>1443</u>
Relinquished by:				
Received by:				



Gauging data for wells, including perched aquifer wells along south property line:

Time	Well ID	DTW (# BToc)	TD (# BToc)	NOTES
1235	01MW70	12.10	20.30	
1236	01MW78	37.15	46.40	← Tagged top of installed pump
1238	01MW71	11.39	20.11	
1248	01MW79	9.55	20.XX	
1255	MW03	10.68/10.70	13.62	Gaged twice

BY R. Jones DATE 10/7/2021

Sheet No      of     

PROJECT TOC, ISS Bulk Soil Collection

PROJECT NUMBER

**Time Oil Bulk Terminal Site**  
**Pre-Remedial Design**  
**Investigation Summary Report**

**Attachment 2**  
**Cleanup Action Area 5**  
**Investigation Supporting Documentation**

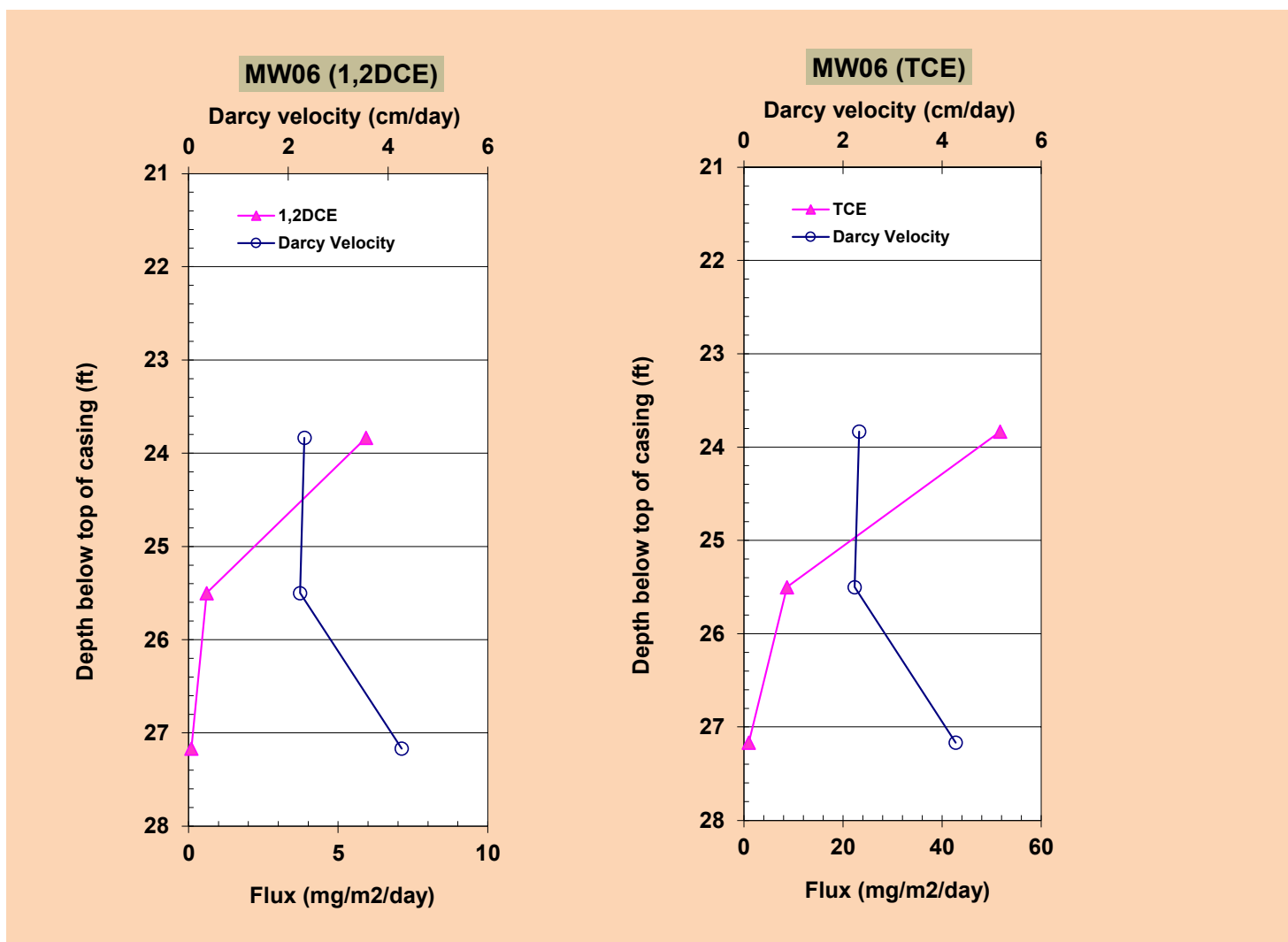
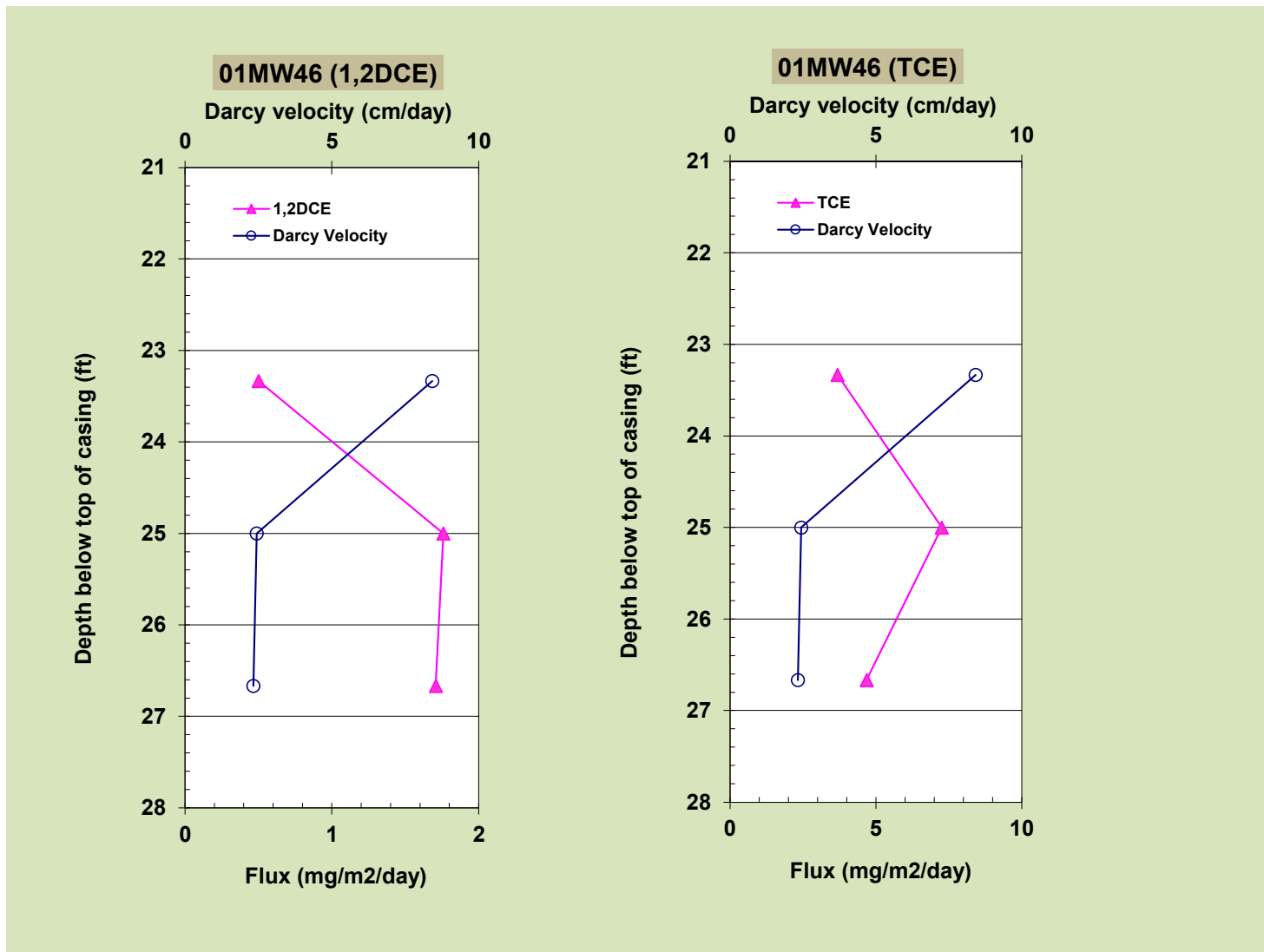
<b>Floyd/Snider</b>	
Project name:	Contera-TOC
Project Manager	Lynn Grochala/Kim Hempel
Installation Date	11/12/2020
Sampling Date	11/30/2020
Reporting Date	12/15/2020

**Table1. Summary of flux values for each well**

Well_ID	Sample_ID	Depth below top of well casing (ft)	Darcy Velocity (cm/day)	VC (mg/m <sup>2</sup> /day)	cis-1,2DCE (mg/m <sup>2</sup> /day)	TCE (mg/m <sup>2</sup> /day)
01MW46	01MW46-22'6"-24'2"	23.3	8.4	0.0	0.5	3.7
	01MW46-24'2"-25'10"	25.0	2.4	0.0	1.8	7.3
	01MW46-25'10"-27'6"	26.7	2.3	3.4	1.7	4.7
MW06	MW06-23-24'8"	23.8	2.3	4.0	5.9	51.7
	MW06-24'8"-26'4"	25.5	2.2	0.0	0.6	8.7
	MW06-26'4"-28"	27.2	4.3	0.0	0.1	1.0

**Table2. Summary of flux average contaminant concentration**

Well_ID	Sample_ID	Depth below top of well casing (ft)	Darcy Velocity (cm/day)	VC (ug/L)	cis-1,2DCE (ug/L)	TCE (ug/L)
01MW46	01MW46-22'6"-24'2"	23.3	8.4	0	6	44
	01MW46-24'2"-25'10"	25.0	2.4	0	72	297
	01MW46-25'10"-27'6"	26.7	2.3	147	74	202
MW06	MW06-23-24'8"	23.8	2.3	171	255	2224
	MW06-24'8"-26'4"	25.5	2.2	0	27	389
	MW06-26'4"-28"	27.2	4.3	0	2	23



**Table 3. Mass discharge per unit width for aquifer of each well**

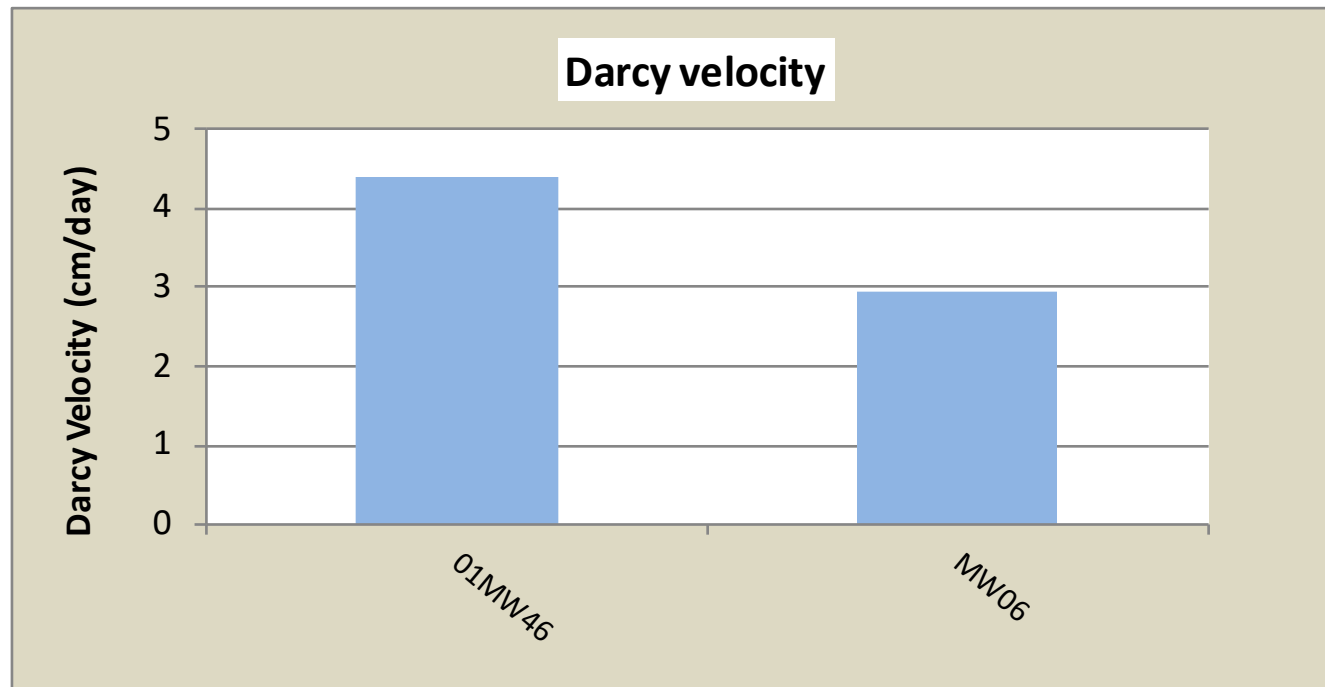
Well	Darcy Velocity (cm/day)	VC (mg/m/day)	cis-1,2DCE (mg/m/day)	TCE (mg/m/day)
01MW46	4.4	1.7	2.0	7.9
MW06	2.9	2.0	3.4	31.2

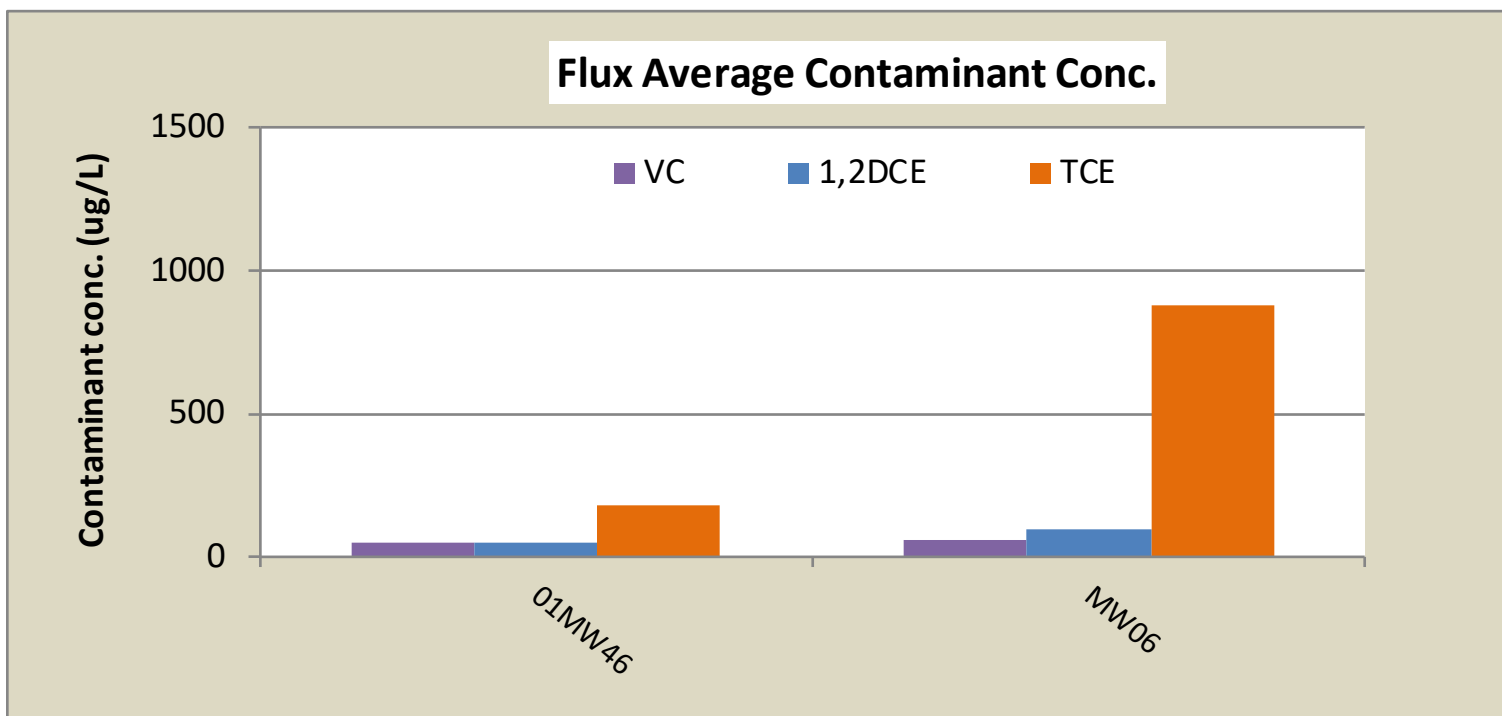
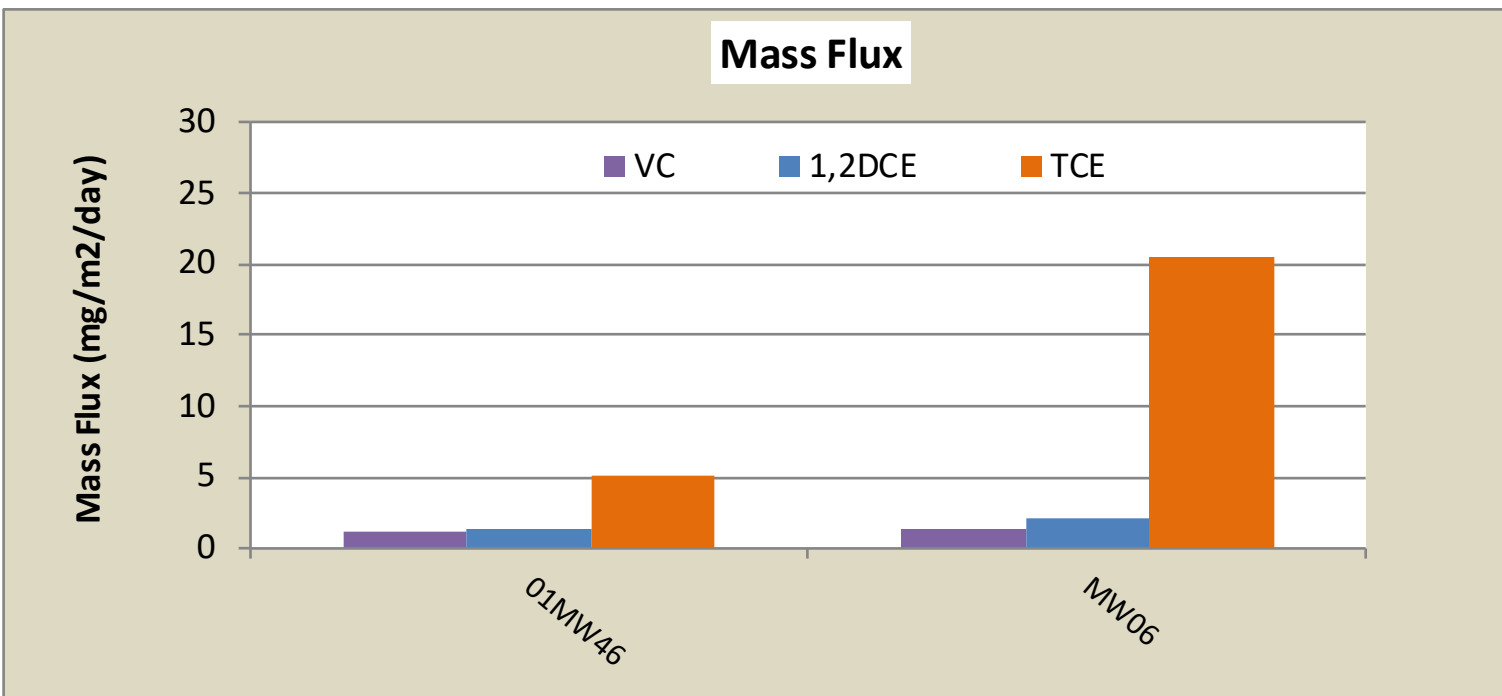
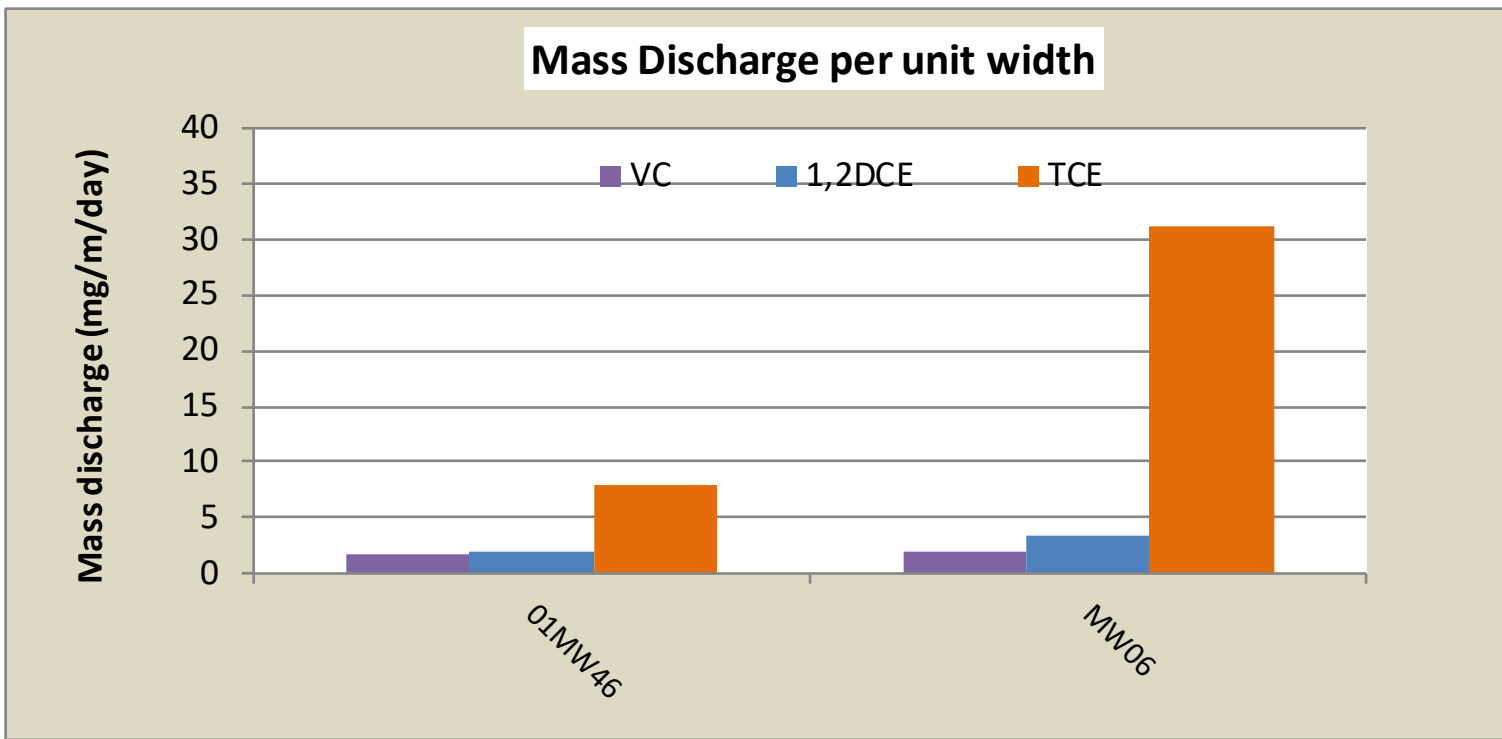
**Table 4. Well average values of mass flux based on PFMs**

Well	Darcy Velocity (cm/day)	VC (mg/m <sup>2</sup> /day)	cis-1,2DCE (mg/m <sup>2</sup> /day)	TCE (mg/m <sup>2</sup> /day)
01MW46	4.4	1.1	1.3	5.2
MW06	2.9	1.3	2.2	20.46

**Table 5. Flux average contaminant concentration on PFMs**

Well	Darcy Velocity (cm/day)	VC (ug/L)	cis-1,2DCE (ug/L)	TCE (ug/L)
01MW46	4.4	49	51	181
MW06	2.9	57	95	879





FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

November 24, 2020

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the results from the testing of material submitted on November 12, 2020 from the Cantera TOC, F&BI 011245 project. There are 35 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Kristin Anderson  
FDS1124R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 12, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera TOC, F&BI 011245 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011245 -01	PDSB03-21-22FT
011245 -02	PDSB03-25-26FT
011245 -03	PDSB02-20-21FT
011245 -04	PDSB02-26.5-27.5FT
011245 -05	PDSB01-23-24FT
011245 -06	PDSB01-27.5-28.5FT
011245 -07	01MW80-111220
011245 -08	MW06-111220
011245 -09	01MW46-111220
011245 -10	trip blanks

Samples PDSB03-21-22FT, PDSB03-25-26FT, PDSB02-20-21FT, PDSB02-26.5-27.5FT, PDSB01-23-24FT, and PDSB01-27.5-28.5FT were sent to Fremont Analytical for total organic carbon and calcium analysis. In addition, samples 01MW80-111220, MW06-111220, and 01MW46-111220 were sent to Fremont Analytical for alkalinity, BOD, TOC, DOC, sulfate, and nitrate analyses. The report is enclosed.

The 8260D calibration standard failed the acceptance criteria for acetone. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20  
Date Received: 11/12/20  
Project: Cantera TOC, F&BI 011245  
Date Extracted: 11/16/20  
Date Analyzed: 11/17/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE  
USING METHOD NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Gasoline Range</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 50-150)
PDSB03-21-22FT 011245-01	<5	90
PDSB03-25-26FT 011245-02	<5	87
PDSB02-20-21FT 011245-03	20	90
PDSB02-26.5-27.5FT 011245-04	<5	83
PDSB01-23-24FT 011245-05	<5	91
PDSB01-27.5-28.5FT 011245-06	<5	88
Method Blank 00-2420 MB	<5	88



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20  
Date Received: 11/12/20  
Project: Cantera TOC, F&BI 011245  
Date Extracted: 11/17/20  
Date Analyzed: 11/17/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE  
USING METHOD NWTPH-Gx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Gasoline Range</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-134)
01MW80-111220 011245-07	680	86
MW06-111220 011245-08	260	87
01MW46-111220 011245-09	520	85
Method Blank 00-2421 MB	<100	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20  
Date Received: 11/12/20  
Project: Cantera TOC, F&BI 011245  
Date Extracted: 11/17/20  
Date Analyzed: 11/17/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
trip blanks 011245-10	<1	<1	<1	<3	79
Method Blank 00-2421 MB	<1	<1	<1	<3	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20  
Date Received: 11/12/20  
Project: Cantera TOC, F&BI 011245  
Date Extracted: 11/13/20  
Date Analyzed: 11/13/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
PDSB03-21-22FT 011245-01	<50	<250	52
PDSB03-25-26FT 011245-02	<50	<250	84
PDSB02-20-21FT 011245-03	<50	<250	78
PDSB02-26.5-27.5FT 011245-04	<50	<250	88
PDSB01-23-24FT 011245-05	<50	<250	84
PDSB01-27.5-28.5FT 011245-06	<50	<250	81
Method Blank 00-2510 MB	<50	<250	79

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20  
Date Received: 11/12/20  
Project: Cantera TOC, F&BI 011245  
Date Extracted: 11/13/20  
Date Analyzed: 11/13/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
01MW80-111220 011245-07	270	<250	114
MW06-111220 011245-08	150	<250	109
01MW46-111220 011245-09	180	<250	108
Method Blank 00-2506 MB	<50	<250	106

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	01MW80-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/17/20	Lab ID:	011245-07 x10
Date Analyzed:	11/18/20	Data File:	011245-07 x10.069
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	52.8
Magnesium	66.1
Hardness (as CaCO <sub>3</sub> )	404

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	MW06-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/17/20	Lab ID:	011245-08 x10
Date Analyzed:	11/18/20	Data File:	011245-08 x10.072
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	73.1
Magnesium	38.4
Hardness (as CaCO <sub>3</sub> )	341

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	01MW46-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/17/20	Lab ID:	011245-09 x10
Date Analyzed:	11/18/20	Data File:	011245-09 x10.073
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	66.6
Magnesium	49.9
Hardness (as CaCO <sub>3</sub> )	372

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/17/20	Lab ID:	I0-717 mb
Date Analyzed:	11/18/20	Data File:	I0-717 mb.066
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	<0.05
Magnesium	<0.05
Hardness (as CaCO <sub>3</sub> )	<0.35



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	PDSB03-21-22FT	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/16/20	Lab ID:	011245-01
Date Analyzed:	11/16/20	Data File:	111613.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	62	145
Toluene-d8	100	55	145
4-Bromofluorobenzene	101	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5 ca	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	PDSB03-25-26FT	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/16/20	Lab ID:	011245-02
Date Analyzed:	11/16/20	Data File:	111614.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	62	145
Toluene-d8	98	55	145
4-Bromofluorobenzene	100	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5 ca	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	PDSB02-20-21FT	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/16/20	Lab ID:	011245-03
Date Analyzed:	11/16/20	Data File:	111615.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	62	145
Toluene-d8	100	55	145
4-Bromofluorobenzene	98	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5 ca	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	PDSB02-26.5-27.5FT	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/16/20	Lab ID:	011245-04
Date Analyzed:	11/16/20	Data File:	111616.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	62	145
Toluene-d8	98	55	145
4-Bromofluorobenzene	99	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5 ca	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	0.082	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	PDSB01-23-24FT	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/16/20	Lab ID:	011245-05
Date Analyzed:	11/16/20	Data File:	111617.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	62	145
Toluene-d8	99	55	145
4-Bromofluorobenzene	97	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5 ca	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	0.87	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	PDSB01-27.5-28.5FT	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/16/20	Lab ID:	011245-06
Date Analyzed:	11/16/20	Data File:	111618.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	62	145
Toluene-d8	100	55	145
4-Bromofluorobenzene	102	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5 ca	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/16/20	Lab ID:	00-2687 mb
Date Analyzed:	11/16/20	Data File:	111609.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	95	62	145
Toluene-d8	101	55	145
4-Bromofluorobenzene	96	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5 ca	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	01MW80-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/13/20	Lab ID:	011245-07
Date Analyzed:	11/17/20	Data File:	111638.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	9.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50 ca	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	3.6	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	210 ve	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	1.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	14	sec-Butylbenzene	<1
Trichloroethene	1,000 ve	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	01MW80-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/13/20	Lab ID:	011245-07 1/10
Date Analyzed:	11/17/20	Data File:	111635.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	<10
Vinyl chloride	9.7	Dibromochloromethane	<10
Bromomethane	<50	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	<10
Acetone	<500 ca	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	<20
Hexane	<50	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	<10
trans-1,2-Dichloroethene	<10	Bromoform	<50
1,1-Dichloroethane	<10	n-Propylbenzene	<10
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	230	1,3,5-Trimethylbenzene	<10
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<200	1,2,3-Trichloropropane	<10
1,2-Dichloroethane (EDC)	<10	2-Chlorotoluene	<10
1,1,1-Trichloroethane	<10	4-Chlorotoluene	<10
1,1-Dichloropropene	<10	tert-Butylbenzene	<10
Carbon tetrachloride	<10	1,2,4-Trimethylbenzene	<10
Benzene	14	sec-Butylbenzene	<10
Trichloroethene	990	p-Isopropyltoluene	<10
1,2-Dichloropropane	<10	1,3-Dichlorobenzene	<10
Bromodichloromethane	<10	1,4-Dichlorobenzene	<10
Dibromomethane	<10	1,2-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dibromo-3-chloropropane	<100
cis-1,3-Dichloropropene	<10	1,2,4-Trichlorobenzene	<10
Toluene	<10	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	MW06-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/13/20	Lab ID:	011245-08
Date Analyzed:	11/17/20	Data File:	111639.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	94	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	2.1	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50 ca	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	1.0	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	21	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	1.7	sec-Butylbenzene	<1
Trichloroethene	300 ve	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	MW06-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/13/20	Lab ID:	011245-08 1/10
Date Analyzed:	11/17/20	Data File:	111636.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	<10
Vinyl chloride	2.0	Dibromochloromethane	<10
Bromomethane	<50	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	<10
Acetone	<500 ca	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	<20
Hexane	<50	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	<10
trans-1,2-Dichloroethene	<10	Bromoform	<50
1,1-Dichloroethane	<10	n-Propylbenzene	<10
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	23	1,3,5-Trimethylbenzene	<10
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<200	1,2,3-Trichloropropane	<10
1,2-Dichloroethane (EDC)	<10	2-Chlorotoluene	<10
1,1,1-Trichloroethane	<10	4-Chlorotoluene	<10
1,1-Dichloropropene	<10	tert-Butylbenzene	<10
Carbon tetrachloride	<10	1,2,4-Trimethylbenzene	<10
Benzene	<3.5	sec-Butylbenzene	<10
Trichloroethene	320	p-Isopropyltoluene	<10
1,2-Dichloropropane	<10	1,3-Dichlorobenzene	<10
Bromodichloromethane	<10	1,4-Dichlorobenzene	<10
Dibromomethane	<10	1,2-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dibromo-3-chloropropane	<100
cis-1,3-Dichloropropene	<10	1,2,4-Trichlorobenzene	<10
Toluene	<10	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	01MW46-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/13/20	Lab ID:	011245-09
Date Analyzed:	11/17/20	Data File:	111640.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	107	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	9.4	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50 ca	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	2.5	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	170 ve	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	2.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	9.8	sec-Butylbenzene	<1
Trichloroethene	690 ve	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	01MW46-111220	Client:	Floyd-Snider
Date Received:	11/12/20	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/13/20	Lab ID:	011245-09 1/10
Date Analyzed:	11/17/20	Data File:	111637.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	94	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	<10
Vinyl chloride	10	Dibromochloromethane	<10
Bromomethane	<50	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	<10
Acetone	<500 ca	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	<20
Hexane	<50	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	<10
trans-1,2-Dichloroethene	<10	Bromoform	<50
1,1-Dichloroethane	<10	n-Propylbenzene	<10
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	180	1,3,5-Trimethylbenzene	<10
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<200	1,2,3-Trichloropropane	<10
1,2-Dichloroethane (EDC)	<10	2-Chlorotoluene	<10
1,1,1-Trichloroethane	<10	4-Chlorotoluene	<10
1,1-Dichloropropene	<10	tert-Butylbenzene	<10
Carbon tetrachloride	<10	1,2,4-Trimethylbenzene	<10
Benzene	9.6	sec-Butylbenzene	<10
Trichloroethene	610	p-Isopropyltoluene	<10
1,2-Dichloropropane	<10	1,3-Dichlorobenzene	<10
Bromodichloromethane	<10	1,4-Dichlorobenzene	<10
Dibromomethane	<10	1,2-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dibromo-3-chloropropane	<100
cis-1,3-Dichloropropene	<10	1,2,4-Trichlorobenzene	<10
Toluene	<10	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera TOC, F&BI 011245
Date Extracted:	11/13/20	Lab ID:	00-2680 mb
Date Analyzed:	11/13/20	Data File:	111316.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	109	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	96	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50 ca	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TPH AS GASOLINE  
USING METHOD NWTPH-Gx**

Laboratory Code: 011265-02 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	20	90	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TPH AS GASOLINE  
USING METHOD NWTPH-G<sub>x</sub>**

Laboratory Code: 011245-07 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	680	650	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	94	69-134



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
AND XYLENES  
USING EPA METHOD 8021B**

Laboratory Code: 011245-07 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	15	15	0
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	100	65-118
Toluene	ug/L (ppb)	50	92	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	91	74-118

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 011244-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	104	112	64-133	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	98	58-147

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	112	100	63-142	11

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8 AND SM 2340B**

Laboratory Code: 011245-07 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	52.8	16 b	45 b	70-130	95 b
Magnesium	mg/L (ppm)	1.0	66.1	45 b	0 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	98	85-115
Magnesium	mg/L (ppm)	1.0	102	85-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: 011245-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	1	<0.5	55	52	10-142	6
Chloromethane	mg/kg (ppm)	1	<0.5	72	66	10-126	9
Vinyl chloride	mg/kg (ppm)	1	<0.05	76	69	10-138	10
Bromomethane	mg/kg (ppm)	1	<0.5	94	80	10-163	16
Chloroethane	mg/kg (ppm)	1	<0.5	89	78	10-176	13
Trichlorofluoromethane	mg/kg (ppm)	1	<0.5	88	83	10-176	6
Acetone	mg/kg (ppm)	5	<5	106	88	10-163	19
1,1-Dichloroethene	mg/kg (ppm)	1	<0.05	105	90	10-160	15
Hexane	mg/kg (ppm)	1	<0.25	68	75	10-137	10
Methylene chloride	mg/kg (ppm)	1	<0.5	91	96	10-156	5
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	<0.05	90	92	21-145	2
trans-1,2-Dichloroethene	mg/kg (ppm)	1	<0.05	98	97	14-137	1
1,1-Dichloroethane	mg/kg (ppm)	1	<0.05	93	97	19-140	4
2,2-Dichloropropane	mg/kg (ppm)	1	<0.05	88	84	10-158	5
cis-1,2-Dichloroethene	mg/kg (ppm)	1	<0.05	99	97	25-135	2
Chloroform	mg/kg (ppm)	1	<0.05	95	94	21-145	1
2-Butanone (MEK)	mg/kg (ppm)	5	<0.5	93	93	19-147	0
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	<0.05	91	88	12-160	3
1,1,1-Trichloroethane	mg/kg (ppm)	1	<0.05	88	87	10-156	1
1,1-Dichloropropene	mg/kg (ppm)	1	<0.05	95	93	17-140	2
Carbon tetrachloride	mg/kg (ppm)	1	<0.05	84	84	9-164	0
Benzene	mg/kg (ppm)	1	<0.03	98	95	29-129	3
Trichloroethene	mg/kg (ppm)	1	<0.02	100	83	21-139	19
1,2-Dichloropropane	mg/kg (ppm)	1	<0.05	101	83	30-135	20
Bromodichloromethane	mg/kg (ppm)	1	<0.05	98	82	23-155	18
Dibromomethane	mg/kg (ppm)	1	<0.05	99	83	23-145	18
4-Methyl-2-pentanone	mg/kg (ppm)	5	<0.5	109	91	24-155	18
cis-1,3-Dichloropropene	mg/kg (ppm)	1	<0.05	99	85	28-144	15
Toluene	mg/kg (ppm)	1	<0.05	101	93	35-130	8
trans-1,3-Dichloropropene	mg/kg (ppm)	1	<0.05	97	88	26-149	10
1,1,2-Trichloroethane	mg/kg (ppm)	1	<0.05	107	95	10-205	12
2-Hexanone	mg/kg (ppm)	5	<0.5	99	88	15-166	12
1,3-Dichloropropane	mg/kg (ppm)	1	<0.05	102	93	31-137	9
Tetrachloroethene	mg/kg (ppm)	1	<0.025	102	95	20-133	7
Dibromochloromethane	mg/kg (ppm)	1	<0.05	102	93	28-150	9
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	<0.05	108	98	28-142	10
Chlorobenzene	mg/kg (ppm)	1	<0.05	105	96	32-129	9
Ethylbenzene	mg/kg (ppm)	1	<0.05	103	94	32-137	9
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	1	<0.05	100	91	31-143	9
m,p-Xylene	mg/kg (ppm)	2	<0.1	103	94	34-136	9
o-Xylene	mg/kg (ppm)	1	<0.05	103	94	33-134	9
Styrene	mg/kg (ppm)	1	<0.05	108	99	35-137	9
Isopropylbenzene	mg/kg (ppm)	1	<0.05	101	94	31-142	7
Bromoform	mg/kg (ppm)	1	<0.05	104	92	21-156	12
n-Propylbenzene	mg/kg (ppm)	1	<0.05	101	91	23-146	10
Bromobenzene	mg/kg (ppm)	1	<0.05	105	94	34-130	11
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	<0.05	99	90	18-149	10
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	1	<0.05	104	95	28-140	9
1,2,3-Trichloropropane	mg/kg (ppm)	1	<0.05	101	93	25-144	8
2-Chlorotoluene	mg/kg (ppm)	1	<0.05	101	90	31-134	12
4-Chlorotoluene	mg/kg (ppm)	1	<0.05	102	92	31-136	10
tert-Butylbenzene	mg/kg (ppm)	1	<0.05	99	90	30-137	10
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	<0.05	99	92	10-182	7
sec-Butylbenzene	mg/kg (ppm)	1	<0.05	98	89	23-145	10
p-Isopropyltoluene	mg/kg (ppm)	1	<0.05	99	89	21-149	11
1,3-Dichlorobenzene	mg/kg (ppm)	1	<0.05	105	96	30-131	9
1,4-Dichlorobenzene	mg/kg (ppm)	1	<0.05	106	96	29-129	10
1,2-Dichlorobenzene	mg/kg (ppm)	1	<0.05	102	91	31-132	11
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	1	<0.5	87	81	11-161	7
1,2,4-Trichlorobenzene	mg/kg (ppm)	1	<0.25	94	85	22-142	10
Hexachlorobutadiene	mg/kg (ppm)	1	<0.25	94	84	10-142	11
Naphthalene	mg/kg (ppm)	1	<0.05	96	87	14-157	10
1,2,3-Trichlorobenzene	mg/kg (ppm)	1	<0.25	93	85	20-144	9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	1	65	10-146
Chloromethane	mg/kg (ppm)	1	83	27-133
Vinyl chloride	mg/kg (ppm)	1	95	22-139
Bromomethane	mg/kg (ppm)	1	112	38-114
Chloroethane	mg/kg (ppm)	1	96	9-163
Trichlorofluoromethane	mg/kg (ppm)	1	107	10-196
Acetone	mg/kg (ppm)	5	105	52-141
1,1-Dichloroethene	mg/kg (ppm)	1	118	47-128
Hexane	mg/kg (ppm)	1	77	43-142
Methylene chloride	mg/kg (ppm)	1	91	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	94	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	1	95	67-129
1,1-Dichloroethane	mg/kg (ppm)	1	93	68-115
2,2-Dichloropropane	mg/kg (ppm)	1	97	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	1	99	72-127
Chloroform	mg/kg (ppm)	1	94	66-120
2-Butanone (MEK)	mg/kg (ppm)	5	99	72-127
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	88	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	1	94	62-131
1,1-Dichloropropene	mg/kg (ppm)	1	92	69-128
Carbon tetrachloride	mg/kg (ppm)	1	95	60-139
Benzene	mg/kg (ppm)	1	95	68-114
Trichloroethene	mg/kg (ppm)	1	99	64-117
1,2-Dichloropropane	mg/kg (ppm)	1	94	72-127
Bromodichloromethane	mg/kg (ppm)	1	98	72-130
Dibromomethane	mg/kg (ppm)	1	96	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	5	106	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	1	98	75-136
Toluene	mg/kg (ppm)	1	92	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	1	89	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	1	93	75-113
2-Hexanone	mg/kg (ppm)	5	99	33-152
1,3-Dichloropropane	mg/kg (ppm)	1	89	72-130
Tetrachloroethene	mg/kg (ppm)	1	93	72-114
Dibromochloromethane	mg/kg (ppm)	1	96	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	96	74-132
Chlorobenzene	mg/kg (ppm)	1	94	76-111
Ethylbenzene	mg/kg (ppm)	1	92	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	1	99	69-135
m,p-Xylene	mg/kg (ppm)	2	94	78-122
o-Xylene	mg/kg (ppm)	1	94	77-124
Styrene	mg/kg (ppm)	1	97	74-126
Isopropylbenzene	mg/kg (ppm)	1	94	76-127
Bromoform	mg/kg (ppm)	1	99	56-132
n-Propylbenzene	mg/kg (ppm)	1	85	74-124
Bromobenzene	mg/kg (ppm)	1	90	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	87	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	1	90	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	1	88	61-137
2-Chlorotoluene	mg/kg (ppm)	1	87	74-121
4-Chlorotoluene	mg/kg (ppm)	1	87	75-122
tert-Butylbenzene	mg/kg (ppm)	1	89	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	88	76-125
sec-Butylbenzene	mg/kg (ppm)	1	85	71-130
p-Isopropyltoluene	mg/kg (ppm)	1	87	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	1	90	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	1	90	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	1	90	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	1	86	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	1	86	64-135
Hexachlorobutadiene	mg/kg (ppm)	1	82	50-153
Naphthalene	mg/kg (ppm)	1	91	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	1	88	63-138

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: 011198-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent	
				Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	10	<1	127	10-172
Chloromethane	ug/L (ppb)	10	<10	114	25-166
Vinyl chloride	ug/L (ppb)	10	<0.2	117	36-166
Bromomethane	ug/L (ppb)	10	<5	136	47-169
Chloroethane	ug/L (ppb)	10	<1	117	46-160
Trichlorofluoromethane	ug/L (ppb)	10	<1	126	44-165
Acetone	ug/L (ppb)	50	<50	54	10-182
1,1-Dichloroethene	ug/L (ppb)	10	<1	119	60-136
Hexane	ug/L (ppb)	10	<5	91	52-150
Methylene chloride	ug/L (ppb)	10	<5	111	67-132
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	<1	95	74-127
trans-1,2-Dichloroethene	ug/L (ppb)	10	<1	101	72-129
1,1-Dichloroethane	ug/L (ppb)	10	<1	94	70-128
2,2-Dichloropropane	ug/L (ppb)	10	<1	95	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	10	<1	100	71-127
Chloroform	ug/L (ppb)	10	<1	96	65-132
2-Butanone (MEK)	ug/L (ppb)	50	<20	64	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	<1	87	48-149
1,1,1-Trichloroethane	ug/L (ppb)	10	<1	94	60-146
1,1-Dichloropropene	ug/L (ppb)	10	<1	95	69-133
Carbon tetrachloride	ug/L (ppb)	10	<1	95	56-152
Benzene	ug/L (ppb)	10	<0.35	96	76-125
Trichloroethene	ug/L (ppb)	10	<1	96	66-135
1,2-Dichloropropane	ug/L (ppb)	10	<1	94	78-125
Bromodichloromethane	ug/L (ppb)	10	<1	94	61-150
Dibromomethane	ug/L (ppb)	10	<1	94	66-141
4-Methyl-2-pentanone	ug/L (ppb)	50	<10	103	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	10	<1	97	72-132
Toluene	ug/L (ppb)	10	<1	95	76-122
trans-1,3-Dichloropropene	ug/L (ppb)	10	<1	92	76-130
1,1,2-Trichloroethane	ug/L (ppb)	10	<1	98	68-131
2-Hexanone	ug/L (ppb)	50	<10	86	10-185
1,3-Dichloropropane	ug/L (ppb)	10	<1	93	71-128
Tetrachloroethene	ug/L (ppb)	10	<1	98	10-226
Dibromochloromethane	ug/L (ppb)	10	<1	97	70-139
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	<1	97	69-134
Chlorobenzene	ug/L (ppb)	10	<1	97	77-122
Ethylbenzene	ug/L (ppb)	10	<1	96	69-135
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	<1	99	73-137
m,p-Xylene	ug/L (ppb)	20	<2	98	69-135
o-Xylene	ug/L (ppb)	10	<1	97	60-140
Styrene	ug/L (ppb)	10	<1	101	71-133
Isopropylbenzene	ug/L (ppb)	10	<1	96	65-142
Bromoform	ug/L (ppb)	10	<5	101	65-142
n-Propylbenzene	ug/L (ppb)	10	<1	93	58-144
Bromobenzene	ug/L (ppb)	10	<1	96	75-124
1,3,5-Trimethylbenzene	ug/L (ppb)	10	<1	94	66-137
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	<1	97	51-154
1,2,3-Trichloropropane	ug/L (ppb)	10	<1	93	53-150
2-Chlorotoluene	ug/L (ppb)	10	<1	92	66-127
4-Chlorotoluene	ug/L (ppb)	10	<1	92	65-130
tert-Butylbenzene	ug/L (ppb)	10	<1	94	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	10	<1	93	59-146
sec-Butylbenzene	ug/L (ppb)	10	<1	93	64-140
p-Isopropyltoluene	ug/L (ppb)	10	<1	95	65-141
1,3-Dichlorobenzene	ug/L (ppb)	10	<1	97	72-123
1,4-Dichlorobenzene	ug/L (ppb)	10	<1	96	69-126
1,2-Dichlorobenzene	ug/L (ppb)	10	<1	96	69-128
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	<10	88	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	10	<1	94	66-136
Hexachlorobutadiene	ug/L (ppb)	10	<1	96	60-143
Naphthalene	ug/L (ppb)	10	<1	93	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	10	<1	92	69-148

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/12/20

Project: Cantera TOC, F&BI 011245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCS/D	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	10	106	92	25-158	14
Chloromethane	ug/L (ppb)	10	105	95	45-156	10
Vinyl chloride	ug/L (ppb)	10	109	96	50-154	13
Bromomethane	ug/L (ppb)	10	126	111	55-143	13
Chloroethane	ug/L (ppb)	10	115	99	58-146	15
Trichlorofluoromethane	ug/L (ppb)	10	120	106	50-150	12
Acetone	ug/L (ppb)	50	57	51	22-155	11
1,1-Dichloroethene	ug/L (ppb)	10	115	101	67-136	13
Hexane	ug/L (ppb)	10	75	70	57-137	7
Methylene chloride	ug/L (ppb)	10	102	85	39-148	18
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	108	98	64-147	10
trans-1,2-Dichloroethene	ug/L (ppb)	10	110	102	68-128	8
1,1-Dichloroethane	ug/L (ppb)	10	94	100	74-135	6
2,2-Dichloropropane	ug/L (ppb)	10	62	65	55-143	5
cis-1,2-Dichloroethene	ug/L (ppb)	10	98	101	74-136	3
Chloroform	ug/L (ppb)	10	92	99	74-134	7
2-Butanone (MEK)	ug/L (ppb)	50	66	75	37-150	13
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	84	98	66-129	15
1,1,1-Trichloroethane	ug/L (ppb)	10	93	98	74-142	5
1,1-Dichloropropene	ug/L (ppb)	10	91	97	77-129	6
Carbon tetrachloride	ug/L (ppb)	10	92	97	75-158	5
Benzene	ug/L (ppb)	10	96	98	69-134	2
Trichloroethene	ug/L (ppb)	10	94	96	67-133	2
1,2-Dichloropropane	ug/L (ppb)	10	95	96	71-134	1
Bromodichloromethane	ug/L (ppb)	10	95	98	76-132	3
Dibromomethane	ug/L (ppb)	10	94	96	68-132	2
4-Methyl-2-pentanone	ug/L (ppb)	50	103	106	65-138	3
cis-1,3-Dichloropropene	ug/L (ppb)	10	88	91	74-140	3
Toluene	ug/L (ppb)	10	94	107	72-122	13
trans-1,3-Dichloropropene	ug/L (ppb)	10	84	99	80-136	16
1,1,2-Trichloroethane	ug/L (ppb)	10	99	107	75-124	8
2-Hexanone	ug/L (ppb)	50	85	89	60-136	5
1,3-Dichloropropane	ug/L (ppb)	10	93	103	76-126	10
Tetrachloroethene	ug/L (ppb)	10	91	103	76-121	12
Dibromochloromethane	ug/L (ppb)	10	97	96	84-133	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	99	101	82-115	2
Chlorobenzene	ug/L (ppb)	10	96	98	83-114	2
Ethylbenzene	ug/L (ppb)	10	93	94	77-124	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	99	102	84-127	3
m,p-Xylene	ug/L (ppb)	20	94	95	81-112	1
o-Xylene	ug/L (ppb)	10	98	98	81-121	0
Styrene	ug/L (ppb)	10	100	101	84-119	1
Isopropylbenzene	ug/L (ppb)	10	95	96	80-117	1
Bromoform	ug/L (ppb)	10	101	100	74-136	1
n-Propylbenzene	ug/L (ppb)	10	88	92	74-126	4
Bromobenzene	ug/L (ppb)	10	96	99	80-121	3
1,3,5-Trimethylbenzene	ug/L (ppb)	10	91	95	78-123	4
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	97	104	66-126	7
1,2,3-Trichloropropane	ug/L (ppb)	10	94	99	67-124	5
2-Chlorotoluene	ug/L (ppb)	10	90	95	77-127	5
4-Chlorotoluene	ug/L (ppb)	10	88	93	78-128	6
tert-Butylbenzene	ug/L (ppb)	10	93	95	80-123	2
1,2,4-Trimethylbenzene	ug/L (ppb)	10	90	95	79-122	5
sec-Butylbenzene	ug/L (ppb)	10	88	93	80-116	6
p-Isopropyltoluene	ug/L (ppb)	10	88	92	81-123	4
1,3-Dichlorobenzene	ug/L (ppb)	10	94	97	83-113	3
1,4-Dichlorobenzene	ug/L (ppb)	10	92	99	81-112	7
1,2-Dichlorobenzene	ug/L (ppb)	10	94	98	84-112	4
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	89	92	57-141	3
1,2,4-Trichlorobenzene	ug/L (ppb)	10	88	91	72-130	3
Hexachlorobutadiene	ug/L (ppb)	10	78	84	53-141	7
Naphthalene	ug/L (ppb)	10	93	99	64-133	6
1,2,3-Trichlorobenzene	ug/L (ppb)	10	89	94	65-136	5



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.



**Friedman & Bruya**  
Michael Erdahl  
3012 16th Ave. W.  
Seattle, WA 98119

**RE: 011245**  
**Work Order Number: 2011243**

November 23, 2020

**Attention Michael Erdahl:**

Fremont Analytical, Inc. received 9 sample(s) on 11/13/2020 for the analyses presented in the following report.

***Biochemical Oxygen Demand by SM 5210B***  
***Dissolved Organic Carbon by SM 5310C***  
***Ion Chromatography by EPA Method 300.0***  
***Sample Moisture (Percent Moisture)***  
***Total Alkalinity by SM 2320B***  
***Total Metals by EPA Method 6020B***  
***Total Organic Carbon by EPA 9060***  
***Total Organic Carbon by SM 5310C***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 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

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing  
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing  
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

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Original

[www.fremontanalytical.com](http://www.fremontanalytical.com)

**CLIENT:** Friedman & Bruya  
**Project:** 011245  
**Work Order:** 2011243

## Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2011243-001	PDSB03-21-22 ft	11/12/2020 9:50 AM	11/13/2020 9:04 AM
2011243-002	PDSB03-25-26 ft	11/12/2020 10:00 AM	11/13/2020 9:04 AM
2011243-003	PDSB02-20-21 ft	11/12/2020 10:50 AM	11/13/2020 9:04 AM
2011243-004	PDSB02-26.5-27.5 ft	11/12/2020 11:00 AM	11/13/2020 9:04 AM
2011243-005	PDSB01-23-24 ft	11/12/2020 12:05 PM	11/13/2020 9:04 AM
2011243-006	PDSB01-27.5-28.5 ft	11/12/2020 12:15 PM	11/13/2020 9:04 AM
2011243-007	01MW80-111220	11/12/2020 10:10 AM	11/13/2020 9:04 AM
2011243-008	MW06-111220	11/12/2020 11:40 AM	11/13/2020 9:04 AM
2011243-009	01MW46-111220	11/12/2020 12:55 PM	11/13/2020 9:04 AM

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

**CLIENT:** Friedman & Bruya  
**Project:** 011245

---

**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 (<20%RSD, <20% Drift or minimum RRF)
- 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
- 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:** 011245

**Lab ID:** 2011243-001

**Collection Date:** 11/12/2020 9:50:00 AM

**Client Sample ID:** PDSB03-21-22 ft

**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Metals by EPA Method 6020B</u></b>				Batch ID: 30418		Analyst: CO
Calcium	4,510	276	D	mg/Kg-dry	10	11/17/2020 2:58:16 PM
<b><u>Sample Moisture (Percent Moisture)</u></b>				Batch ID: R63449		Analyst: LB
Percent Moisture	16.3	0.500		wt%	1	11/17/2020 10:28:46 AM
<b><u>Total Organic Carbon by EPA 9060</u></b>				Batch ID: 30491		Analyst: SS
Total Organic Carbon	0.0760	0.0750		%-dry	1	11/20/2020 11:55:00 AM

**Lab ID:** 2011243-002

**Collection Date:** 11/12/2020 10:00:00 AM

**Client Sample ID:** PDSB03-25-26 ft

**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Metals by EPA Method 6020B</u></b>				Batch ID: 30418		Analyst: CO
Calcium	4,350	274	D	mg/Kg-dry	10	11/17/2020 3:03:49 PM
<b><u>Sample Moisture (Percent Moisture)</u></b>				Batch ID: R63449		Analyst: LB
Percent Moisture	14.5	0.500		wt%	1	11/17/2020 10:28:46 AM
<b><u>Total Organic Carbon by EPA 9060</u></b>				Batch ID: 30491		Analyst: SS
Total Organic Carbon	0.119	0.0750		%-dry	1	11/20/2020 12:55:00 PM



**CLIENT:** Friedman & Bruya  
**Project:** 011245

**Lab ID:** 2011243-003      **Collection Date:** 11/12/2020 10:50:00 AM  
**Client Sample ID:** PDSB02-20-21 ft      **Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Metals by EPA Method 6020B</u></b>				Batch ID: 30418		Analyst: CO
Calcium	5,210	258	D	mg/Kg-dry	10	11/17/2020 3:09:23 PM
<b><u>Sample Moisture (Percent Moisture)</u></b>				Batch ID: R63449		Analyst: LB
Percent Moisture	18.7	0.500		wt%	1	11/17/2020 10:28:46 AM
<b><u>Total Organic Carbon by EPA 9060</u></b>				Batch ID: 30491		Analyst: SS
Total Organic Carbon	0.285	0.0750		%-dry	1	11/20/2020 1:11:00 PM

**Lab ID:** 2011243-004      **Collection Date:** 11/12/2020 11:00:00 AM  
**Client Sample ID:** PDSB02-26.5-27.5 ft      **Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Metals by EPA Method 6020B</u></b>				Batch ID: 30418		Analyst: CO
Calcium	3,670	296	D	mg/Kg-dry	10	11/17/2020 3:14:56 PM
<b><u>Sample Moisture (Percent Moisture)</u></b>				Batch ID: R63449		Analyst: LB
Percent Moisture	15.5	0.500		wt%	1	11/17/2020 10:28:46 AM
<b><u>Total Organic Carbon by EPA 9060</u></b>				Batch ID: 30491		Analyst: SS
Total Organic Carbon	0.0770	0.0750		%-dry	1	11/20/2020 1:24:00 PM





**CLIENT:** Friedman & Bruya  
**Project:** 011245

**Lab ID:** 2011243-005

**Collection Date:** 11/12/2020 12:05:00 PM

**Client Sample ID:** PDSB01-23-24 ft

**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Metals by EPA Method 6020B</u></b>				Batch ID: 30418		Analyst: CO
Calcium	3,970	295	D	mg/Kg-dry	10	11/17/2020 3:20:30 PM
<b><u>Sample Moisture (Percent Moisture)</u></b>				Batch ID: R63449		Analyst: LB
Percent Moisture	16.1	0.500		wt%	1	11/17/2020 10:28:46 AM
<b><u>Total Organic Carbon by EPA 9060</u></b>				Batch ID: 30491		Analyst: SS
Total Organic Carbon	0.0850	0.0750		%-dry	1	11/20/2020 2:53:00 PM

**Lab ID:** 2011243-006

**Collection Date:** 11/12/2020 12:15:00 PM

**Client Sample ID:** PDSB01-27.5-28.5 ft

**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Total Metals by EPA Method 6020B</u></b>				Batch ID: 30418		Analyst: CO
Calcium	4,030	290	D	mg/Kg-dry	10	11/17/2020 3:26:03 PM
<b><u>Sample Moisture (Percent Moisture)</u></b>				Batch ID: R63449		Analyst: LB
Percent Moisture	15.2	0.500		wt%	1	11/17/2020 10:28:46 AM
<b><u>Total Organic Carbon by EPA 9060</u></b>				Batch ID: 30491		Analyst: SS
Total Organic Carbon	ND	0.0750		%-dry	1	11/20/2020 3:07:00 PM



**CLIENT:** Friedman & Bruya  
**Project:** 011245

**Lab ID:** 2011243-007

**Collection Date:** 11/12/2020 10:10:00 AM

**Client Sample ID:** 01MW80-111220

**Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>Biochemical Oxygen Demand by SM 5210B</b>				Batch ID: R63542		Analyst: SS
Biochemical Oxygen Demand	ND	2.00	*	mg/L	1	11/13/2020 7:00:00 PM
<b>NOTES:</b>						
All dilutions resulted in insufficient oxygen depletion. Result calculated using the largest amount of sample (smallest dilution). True value equal to or less than posted result.						
* - Flagged value is not within established control limits.						
<b>Ion Chromatography by EPA Method 300.0</b>				Batch ID: 30416		Analyst: TN
Nitrate (as N)	ND	0.200	DH	mg/L	2	11/16/2020 11:45:00 AM
Nitrate (as N)	ND	1.00	D	mg/L	10	11/13/2020 8:02:00 PM
Sulfate	61.2	3.00	D	mg/L	10	11/13/2020 8:02:00 PM
<b>Dissolved Organic Carbon by SM 5310C</b>				Batch ID: R63480		Analyst: SS
Organic Carbon, Dissolved	3.78	0.500		mg/L-dry	1	11/17/2020 5:47:00 PM
<b>Total Organic Carbon by SM 5310C</b>				Batch ID: R63479		Analyst: SS
Total Organic Carbon	3.83	0.500		mg/L-dry	1	11/17/2020 1:27:00 PM
<b>Total Alkalinity by SM 2320B</b>				Batch ID: R63575		Analyst: WF
Alkalinity, Total (As CaCO3)	368	2.50		mg/L	1	11/20/2020 2:52:14 PM



**CLIENT:** Friedman & Bruya  
**Project:** 011245

**Lab ID:** 2011243-008

**Collection Date:** 11/12/2020 11:40:00 AM

**Client Sample ID:** MW06-111220

**Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>Biochemical Oxygen Demand by SM 5210B</b>				Batch ID: R63542		Analyst: SS
Biochemical Oxygen Demand	ND	2.00	*	mg/L	1	11/13/2020 7:00:00 PM
<b>NOTES:</b>						
All dilutions resulted in insufficient oxygen depletion. Result calculated using the largest amount of sample (smallest dilution). True value equal to or less than posted result.						
* - Flagged value is not within established control limits.						
<b>Ion Chromatography by EPA Method 300.0</b>				Batch ID: 30416		Analyst: TN
Nitrate (as N)	ND	0.100	H	mg/L	1	11/16/2020 12:08:00 PM
Nitrate (as N)	ND	1.00	D	mg/L	10	11/13/2020 8:25:00 PM
Sulfate	46.3	3.00	D	mg/L	10	11/13/2020 8:25:00 PM
<b>Dissolved Organic Carbon by SM 5310C</b>				Batch ID: R63480		Analyst: SS
Organic Carbon, Dissolved	3.72	0.500		mg/L-dry	1	11/17/2020 6:08:00 PM
<b>Total Organic Carbon by SM 5310C</b>				Batch ID: R63479		Analyst: SS
Total Organic Carbon	3.78	0.500		mg/L-dry	1	11/17/2020 2:52:00 PM
<b>Total Alkalinity by SM 2320B</b>				Batch ID: R63575		Analyst: WF
Alkalinity, Total (As CaCO3)	309	2.50		mg/L	1	11/20/2020 2:52:14 PM



**CLIENT:** Friedman & Bruya  
**Project:** 011245

**Lab ID:** 2011243-009

**Collection Date:** 11/12/2020 12:55:00 PM

**Client Sample ID:** 01MW46-111220

**Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>Biochemical Oxygen Demand by SM 5210B</b>				Batch ID: R63542		Analyst: SS
Biochemical Oxygen Demand	ND	2.00	*	mg/L	1	11/13/2020 7:00:00 PM
<b>NOTES:</b>						
All dilutions resulted in insufficient oxygen depletion. Result calculated using the largest amount of sample (smallest dilution). True value equal to or less than posted result.						
* - Flagged value is not within established control limits.						
<b>Ion Chromatography by EPA Method 300.0</b>				Batch ID: 30416		Analyst: TN
Nitrate (as N)	0.106	0.100	H	mg/L	1	11/16/2020 12:31:00 PM
Nitrate (as N)	ND	1.00	D	mg/L	10	11/13/2020 8:48:00 PM
Sulfate	43.4	3.00	D	mg/L	10	11/13/2020 8:48:00 PM
<b>Dissolved Organic Carbon by SM 5310C</b>				Batch ID: R63480		Analyst: SS
Organic Carbon, Dissolved	4.42	0.500		mg/L-dry	1	11/17/2020 6:29:00 PM
<b>Total Organic Carbon by SM 5310C</b>				Batch ID: R63479		Analyst: SS
Total Organic Carbon	4.54	0.500		mg/L-dry	1	11/17/2020 3:13:00 PM
<b>Total Alkalinity by SM 2320B</b>				Batch ID: R63575		Analyst: WF
Alkalinity, Total (As CaCO3)	348	2.50		mg/L	1	11/20/2020 2:52:14 PM

Work Order: 2011243  
 CLIENT: Friedman & Bruya  
 Project: 011245

**QC SUMMARY REPORT**  
**Biochemical Oxygen Demand by SM 5210B**

Sample ID: <b>MB-63542</b>	SampType: <b>MBLK</b>	Units: <b>mg/L</b>			Prep Date: <b>11/13/2020</b>	RunNo: <b>63542</b>					
Client ID: <b>MBLKW</b>	Batch ID: <b>R63542</b>				Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1275440</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Biochemical Oxygen Demand	ND	2.00									*
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**NOTES:**

\* - Flagged value is not within established control limits.

Sample ID: <b>LCS-63542</b>	SampType: <b>LCS</b>	Units: <b>mg/L</b>			Prep Date: <b>11/13/2020</b>	RunNo: <b>63542</b>					
Client ID: <b>LCSW</b>	Batch ID: <b>R63542</b>				Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1275441</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Biochemical Oxygen Demand	129	2.00	198.0	0	65.0	84.6	115.4				S
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**NOTES:**

S - Outlying spike recovery observed (low bias). Samples will be qualified with a \*.

Sample ID: <b>2011254-001BDUP</b>	SampType: <b>DUP</b>	Units: <b>mg/L</b>			Prep Date: <b>11/13/2020</b>	RunNo: <b>63542</b>					
Client ID: <b>BATCH</b>	Batch ID: <b>R63542</b>				Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1275443</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Biochemical Oxygen Demand	3.55	2.00						3.158	11.6	20	*
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**NOTES:**

\* - Flagged value is not within established control limits.

**Work Order:** 2011243  
**CLIENT:** Friedman & Bruya  
**Project:** 011245

**QC SUMMARY REPORT**  
**Total Alkalinity by SM 2320B**

Sample ID: <b>MB-R63575</b>	SampType: <b>MBLK</b>	Units: <b>mg/L</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63575</b>							
Client ID: <b>MBLKW</b>	Batch ID: <b>R63575</b>		Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276166</b>							
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: <b>LCS-R63575</b>	SampType: <b>LCS</b>	Units: <b>mg/L</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63575</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>R63575</b>		Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276167</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	102	2.50	100.0	0	102	99.6	108				

Sample ID: <b>2011243-007ADUP</b>	SampType: <b>DUP</b>	Units: <b>mg/L</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63575</b>							
Client ID: <b>01MW80-111220</b>	Batch ID: <b>R63575</b>		Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276169</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	372	2.50						367.5	1.32	20	

Work Order: 2011243  
 CLIENT: Friedman & Bruya  
 Project: 011245

**QC SUMMARY REPORT**  
**Dissolved Organic Carbon by SM 5310C**

Sample ID: <b>MB-R63480</b>	SampType: <b>MBLK</b>	Units: <b>mg/L</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63480</b>							
Client ID: <b>MBLKW</b>	Batch ID: <b>R63480</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274246</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	ND	0.500									

Sample ID: <b>LCS-R63480</b>	SampType: <b>LCS</b>	Units: <b>mg/L</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63480</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>R63480</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274247</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	5.00	0.500	5.000	0	100	94.4	109				

Sample ID: <b>2011243-009DDUP</b>	SampType: <b>DUP</b>	Units: <b>mg/L-dry</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63480</b>							
Client ID: <b>01MW46-111220</b>	Batch ID: <b>R63480</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274251</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	4.48	0.500						4.422	1.30	20	

Sample ID: <b>2011243-009DMS</b>	SampType: <b>MS</b>	Units: <b>mg/L-dry</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63480</b>							
Client ID: <b>01MW46-111220</b>	Batch ID: <b>R63480</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274252</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	9.24	0.500	5.000	4.422	96.4	80.9	124				

Sample ID: <b>2011243-009DMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/L-dry</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63480</b>							
Client ID: <b>01MW46-111220</b>	Batch ID: <b>R63480</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274253</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	9.20	0.500	5.000	4.422	95.6	80.9	124	9.244	0.477	30	

**Work Order:** 2011243  
**CLIENT:** Friedman & Bruya  
**Project:** 011245

**QC SUMMARY REPORT**  
**Ion Chromatography by EPA Method 300.0**

Sample ID: <b>MB-30416</b>	SampType: <b>MBLK</b>	Units: <b>mg/L</b>			Prep Date: <b>11/13/2020</b>	RunNo: <b>63413</b>					
Client ID: <b>MBLKW</b>	Batch ID: <b>30416</b>				Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1272624</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID: <b>LCS-30416</b>	SampType: <b>LCS</b>	Units: <b>mg/L</b>			Prep Date: <b>11/13/2020</b>	RunNo: <b>63413</b>					
Client ID: <b>LCSW</b>	Batch ID: <b>30416</b>				Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1272625</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrate (as N)	0.704	0.100	0.7500	0	93.9	90	110				
Sulfate	3.81	0.300	3.750	0	102	90	110				

Sample ID: <b>2011254-001BDUP</b>	SampType: <b>DUP</b>	Units: <b>mg/L</b>			Prep Date: <b>11/13/2020</b>	RunNo: <b>63413</b>					
Client ID: <b>BATCH</b>	Batch ID: <b>30416</b>				Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1272631</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrate (as N)	ND	1.00						0		20	D
Sulfate	12.2	3.00						12.21	0.164	20	D

Sample ID: <b>2011254-001BMS</b>	SampType: <b>MS</b>	Units: <b>mg/L</b>			Prep Date: <b>11/13/2020</b>	RunNo: <b>63413</b>					
Client ID: <b>BATCH</b>	Batch ID: <b>30416</b>				Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1272632</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrate (as N)	7.13	1.00	7.500	0	95.1	80	120				D
Sulfate	53.0	3.00	37.50	12.21	109	80	120				D



**Work Order:** 2011243  
**CLIENT:** Friedman & Bruya  
**Project:** 011245

**QC SUMMARY REPORT**  
**Ion Chromatography by EPA Method 300.0**

Sample ID: <b>2011254-001BMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/L</b>	Prep Date: <b>11/13/2020</b>	RunNo: <b>63413</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>30416</b>		Analysis Date: <b>11/13/2020</b>	SeqNo: <b>1272633</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	7.19	1.00	7.500	0	95.9	80	120	7.130	0.838	20	D
Sulfate	53.4	3.00	37.50	12.21	110	80	120	53.01	0.770	20	D

Work Order: 2011243  
 CLIENT: Friedman & Bruya  
 Project: 011245

**QC SUMMARY REPORT**  
**Total Organic Carbon by EPA 9060**

Sample ID: <b>MB-30491</b>	SampType: <b>MBLK</b>	Units: <b>%-dry</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63576</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>30491</b>	Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276213</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon ND 0.0750

Sample ID: <b>LCS-30491</b>	SampType: <b>LCS</b>	Units: <b>%-dry</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63576</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>30491</b>	Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276214</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 1.03 0.0750 1.000 0 103 80 120

Sample ID: <b>2011243-001ADUP</b>	SampType: <b>DUP</b>	Units: <b>%-dry</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63576</b>							
Client ID: <b>PDSB03-21-22 ft</b>	Batch ID: <b>30491</b>	Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276216</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon ND 0.0750 0.07600 32.1 20

Sample ID: <b>2011243-001AMS</b>	SampType: <b>MS</b>	Units: <b>%-dry</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63576</b>							
Client ID: <b>PDSB03-21-22 ft</b>	Batch ID: <b>30491</b>	Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276217</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 1.08 0.0750 1.000 0.07600 101 75 125

Sample ID: <b>2011243-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>%-dry</b>	Prep Date: <b>11/20/2020</b>	RunNo: <b>63576</b>							
Client ID: <b>PDSB03-21-22 ft</b>	Batch ID: <b>30491</b>	Analysis Date: <b>11/20/2020</b>	SeqNo: <b>1276218</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 1.10 0.0750 1.000 0.07600 102 75 125 1.083 1.28 20

Work Order: 2011243  
 CLIENT: Friedman & Bruya  
 Project: 011245

**QC SUMMARY REPORT**  
**Total Organic Carbon by SM 5310C**

Sample ID: <b>MB-R63479</b>	SampType: <b>MBLK</b>	Units: <b>mg/L</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63479</b>							
Client ID: <b>MBLKW</b>	Batch ID: <b>R63479</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274195</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon ND 0.500

Sample ID: <b>LCS-R63479</b>	SampType: <b>LCS</b>	Units: <b>mg/L</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63479</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>R63479</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274196</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 4.92 0.500 5.000 0 98.5 90 118

Sample ID: <b>2011243-007CDUP</b>	SampType: <b>DUP</b>	Units: <b>mg/L-dry</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63479</b>							
Client ID: <b>01MW80-111220</b>	Batch ID: <b>R63479</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274198</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 3.80 0.500 3.831 0.812 20

Sample ID: <b>2011243-007CMS</b>	SampType: <b>MS</b>	Units: <b>mg/L-dry</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63479</b>							
Client ID: <b>01MW80-111220</b>	Batch ID: <b>R63479</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274199</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 8.55 0.500 5.000 3.831 94.4 80.9 124

Sample ID: <b>2011243-007CMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/L-dry</b>	Prep Date: <b>11/17/2020</b>	RunNo: <b>63479</b>							
Client ID: <b>01MW80-111220</b>	Batch ID: <b>R63479</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1274200</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 8.42 0.500 5.000 3.831 91.7 80.9 124 8.553 1.59 30

Work Order: 2011243  
 CLIENT: Friedman & Bruya  
 Project: 011245

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>MB-30418</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>11/16/2020</b>	RunNo: <b>63437</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>30418</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1273933</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Calcium ND 22.2

Sample ID: <b>LCS-30418</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>11/16/2020</b>	RunNo: <b>63437</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>30418</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1273934</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Calcium 393 22.4 373.1 0 105 80 120

Sample ID: <b>2011269-002AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>11/16/2020</b>	RunNo: <b>63437</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>30418</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1273937</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Calcium 13,000 30.8 513.6 11,640 270 75 125 ES

**NOTES:**

- S - Analyte concentration was too high for accurate spike recovery(ies).
- E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: <b>2011269-002APDS</b>	SampType: <b>PDS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>11/16/2020</b>	RunNo: <b>63437</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>30418</b>	Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1273939</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Calcium 12,800 33.1 552 11,600 203 75 125 ES

**NOTES:**

- S - Analyte concentration was too high for accurate spike recovery(ies).
- E - Estimated value. The amount exceeds the linear working range of the instrument.

**Work Order:** 2011243  
**CLIENT:** Friedman & Bruya  
**Project:** 011245

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>2011269-002AMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>11/16/2020</b>	RunNo: <b>63437</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>30418</b>		Analysis Date: <b>11/17/2020</b>	SeqNo: <b>1273992</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	12,900	30.6	509.7	11,640	243	75	125	13,030	1.16	20	ES

**NOTES:**

- S - Analyte concentration was too high for accurate spike recovery(ies).
- E - Estimated value. The amount exceeds the linear working range of the instrument.

Client Name: <b>FB</b>	Work Order Number: <b>2011243</b>
Logged by: <b>Clare Griggs</b>	Date Received: <b>11/13/2020 9:04:00 AM</b>

### Chain of Custody

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

### Log In

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

### Special Handling (if applicable)

18. Was client notified of all discrepancies with this order?      Yes       No       NA

Person Notified:	<input type="text" value="Eric Young"/>	Date:	<input type="text" value="11/13/2020"/>
By Whom:	<input type="text" value="Clare Griggs"/>	Via:	<input type="checkbox"/> eMail <input checked="" type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text" value="Confirming volume received."/>		
Client Instructions:	<input type="text" value="250mL polys with Zn Acetate &amp; NaOH should be placed on hold."/>		

19. Additional remarks:

### Item Information

Item #	Temp °C
Sample	2.4

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

**SUBCONTRACT SAMPLE CHAIN OF CUSTODY**

2011243

Page # \_\_\_\_\_ of \_\_\_\_\_

Send Report To Michael Erdahl

Company Friedman and Bryya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbryya.com

SUBCONTRACTOR <u>Fremont</u>	
PROJECT NAME/NO. <u>01245</u>	PO # <u>A-489</u>
REMARKS <u>Please Email Results</u>	

TURNAROUND TIME	Standard TAT <input checked="" type="checkbox"/>
RUSH	<input type="checkbox"/>
Rush charges authorized by:	_____
SAMPLE DISPOSAL	<input checked="" type="checkbox"/> Dispose after 30 days
	<input type="checkbox"/> Return samples
	<input type="checkbox"/> Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED							Notes			
						Dioxins/Furans	EPH	VPH	TOC	Alkalinity	BOD	TOC/DOC		SULFATE	NITRATE	Calcium
PDSB03-21-22FT		11/12/20	0950	S	1				✓							
PDSB03-25-26FT			1000	S	1				✓							
PDSB02-20-21FT			1050	S	1				✓							
PDSB02-26.5-27.5FT			1100	S	1				✓							
PDSB01-23-24FT			1205	S	1				✓							
PDSB01-27.5-28.5FT			1215	S	1				✓							
01NW80-111220			1010	W	4				✓							
MJ06-11220			1140	W	4				✓							
01NW46-11220			1255	W	4				✓							



Friedman & Bryya, Inc.

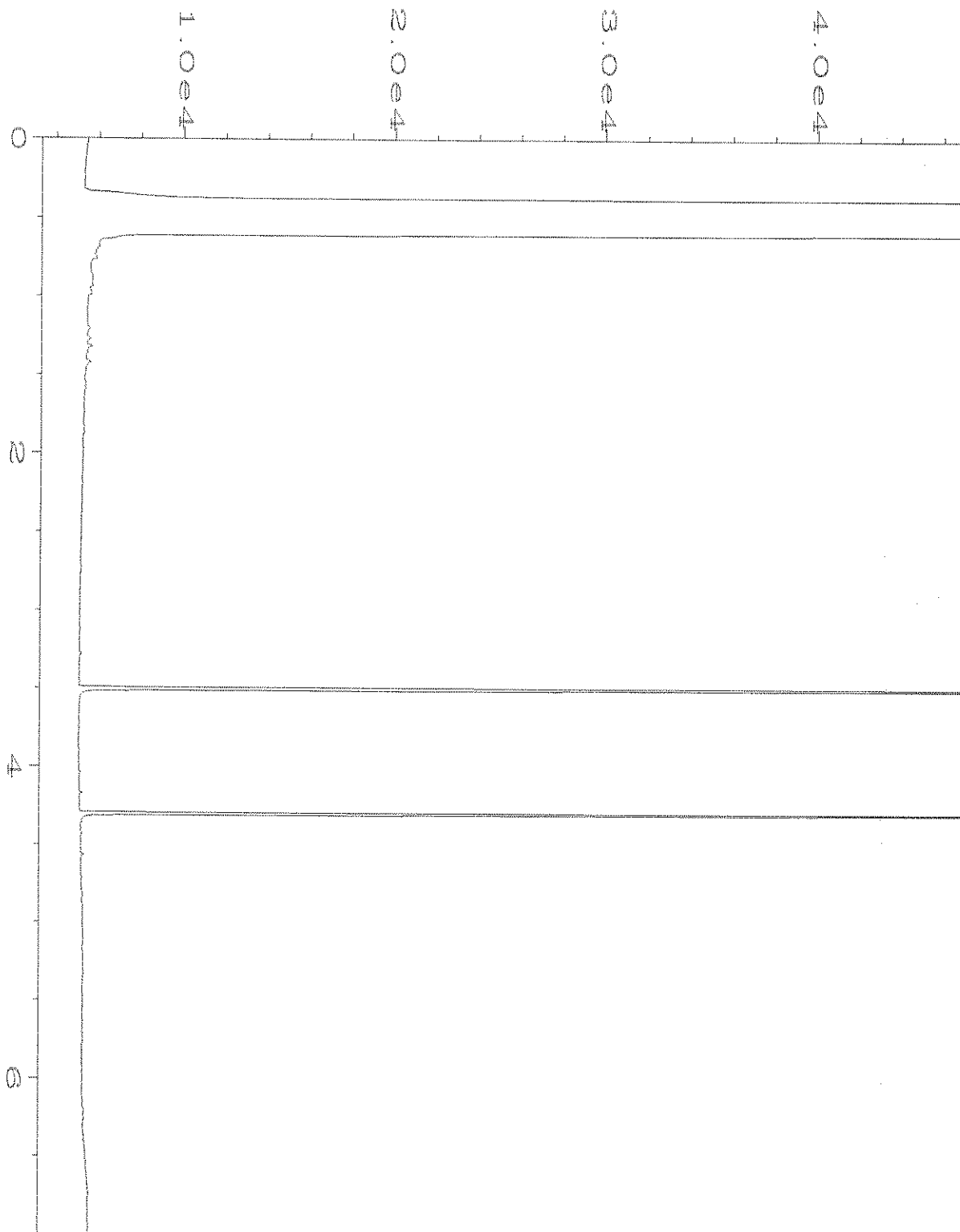
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

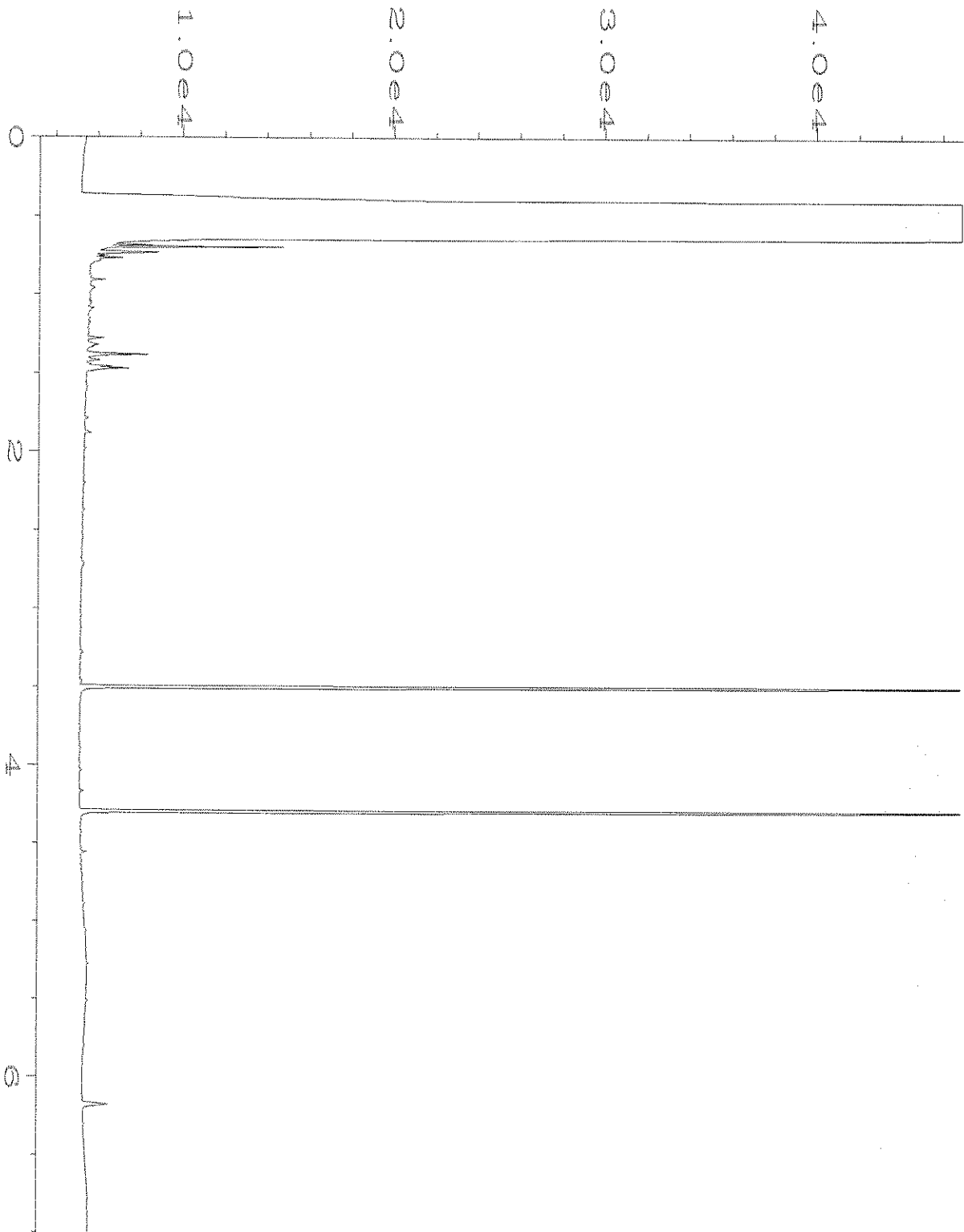
Fax (206) 283-5044

SIGNATURE		PRINT NAME		COMPANY		DATE		TIME	
		Michael Erdahl		Friedman & Bryya		11/13/20		900	
Received by: 		Carter Johnson		FAI		11/13/20		0904	
Relinquished by:									
Received by:									

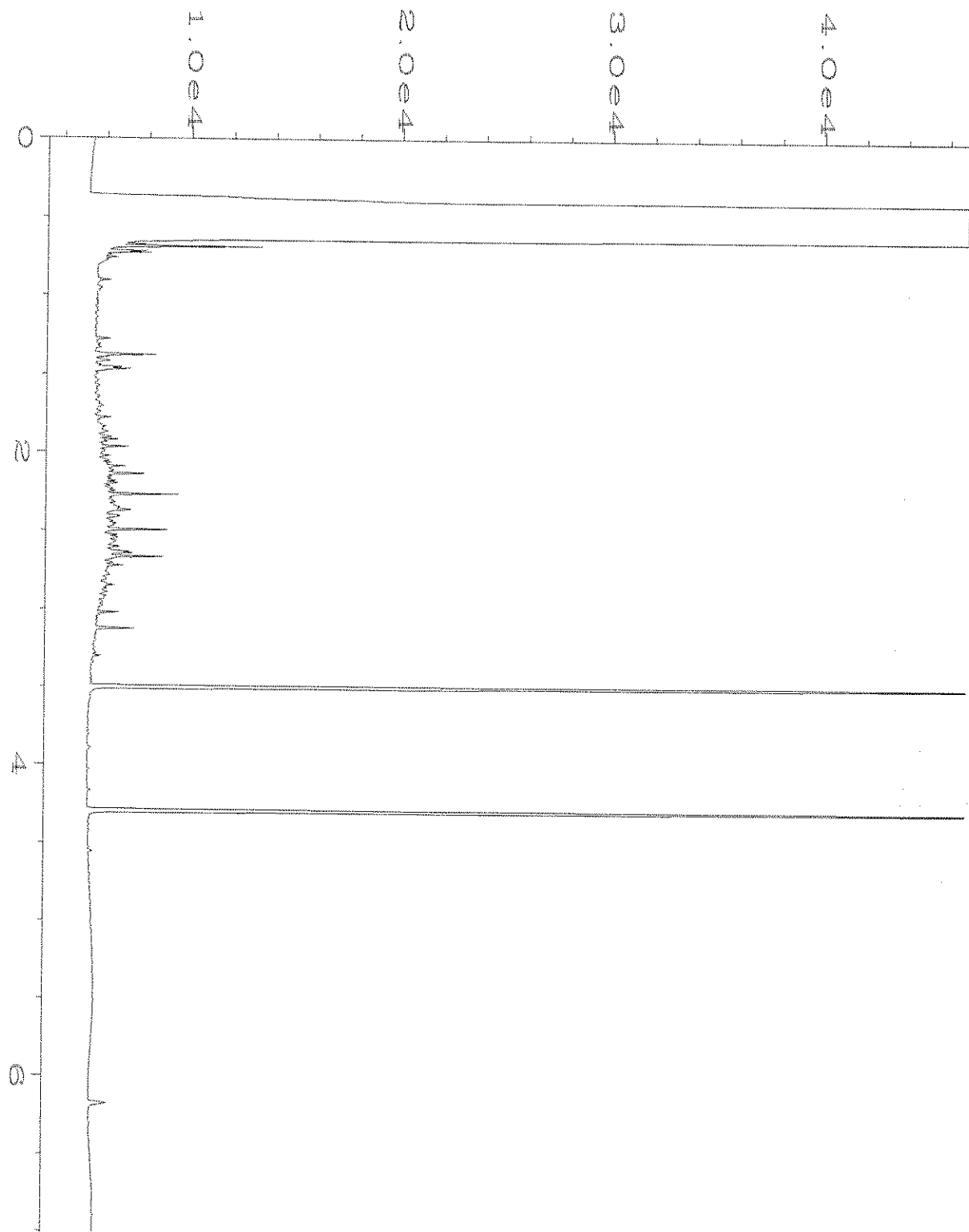


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Instrument	: GC6	Injection Number	: 1
Sample Name	: 011245-01	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 02:31 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:13 AM		

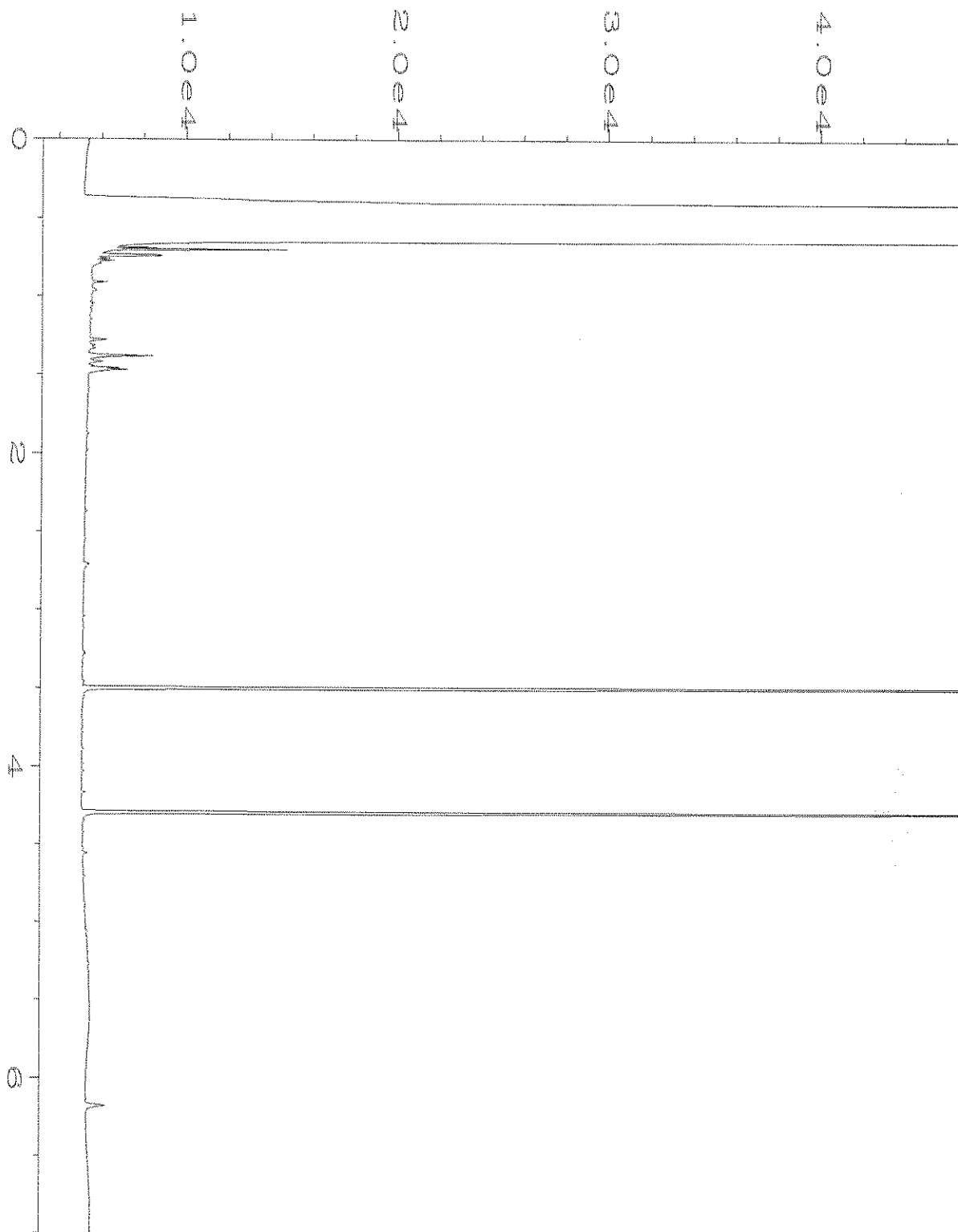




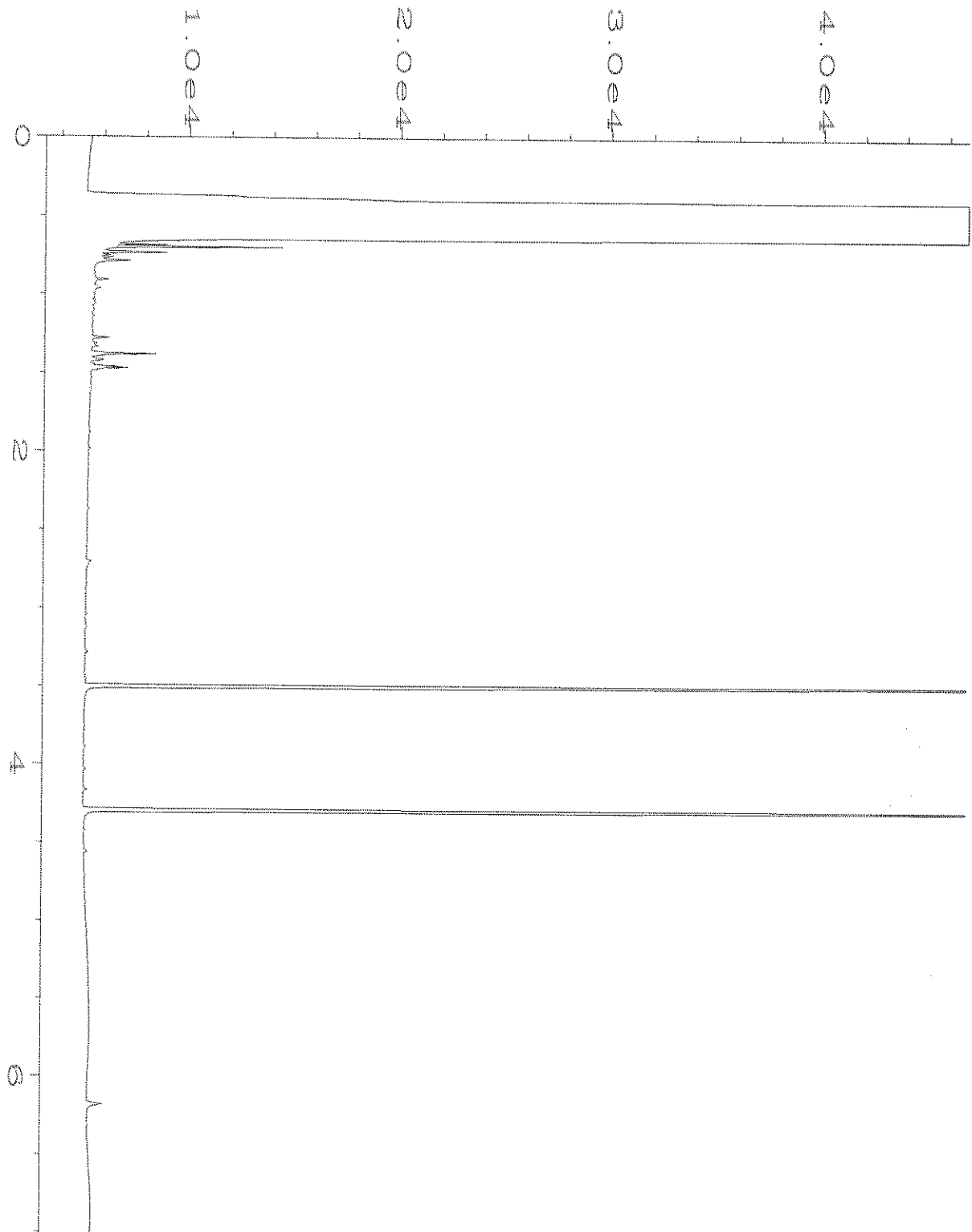
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Instrument	: GC6	Injection Number	: 1
Sample Name	: 011245-02	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 02:39 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:14 AM		



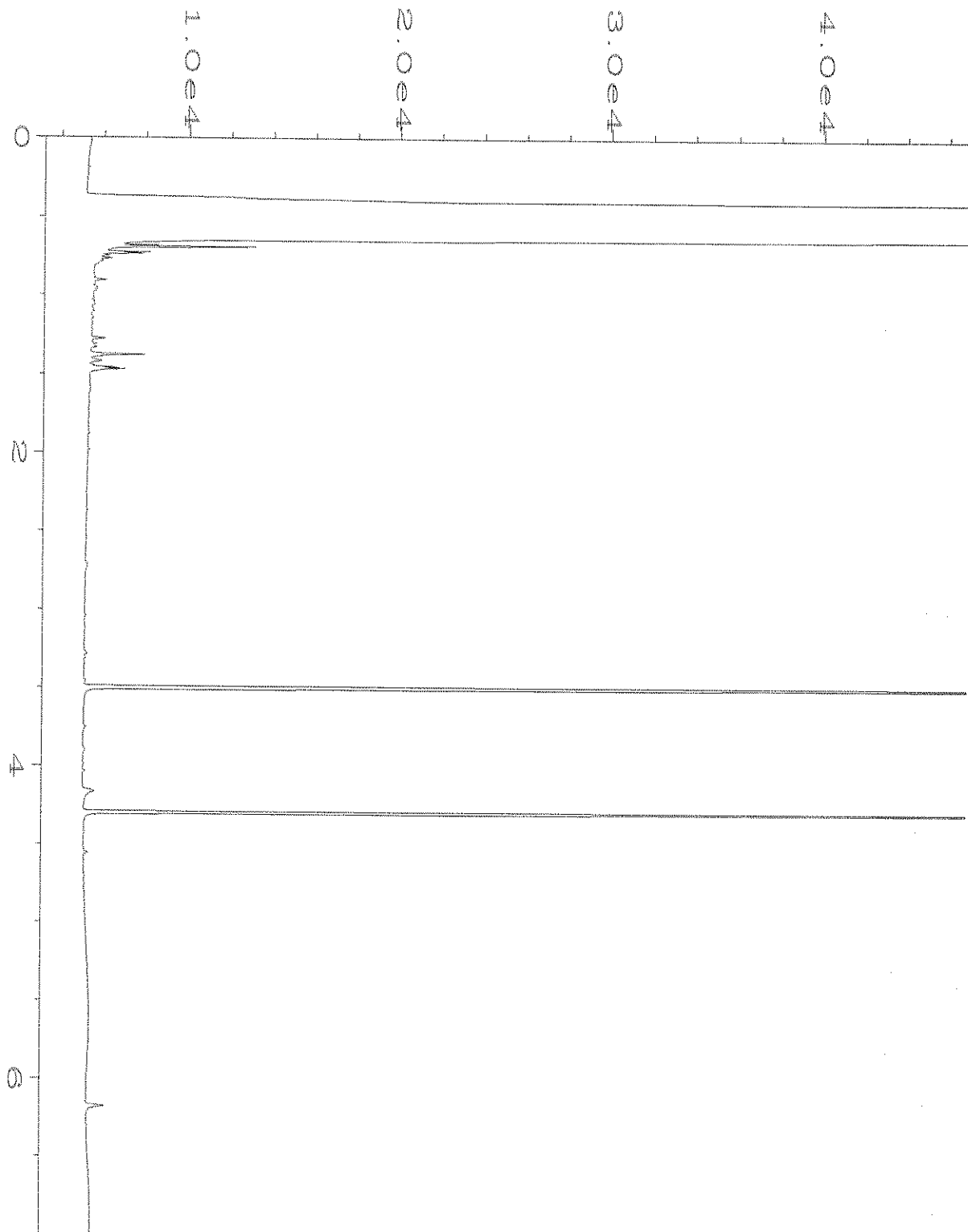
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Instrument	: GC6	Injection Number	: 1
Sample Name	: 011245-03	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 02:50 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:14 AM		



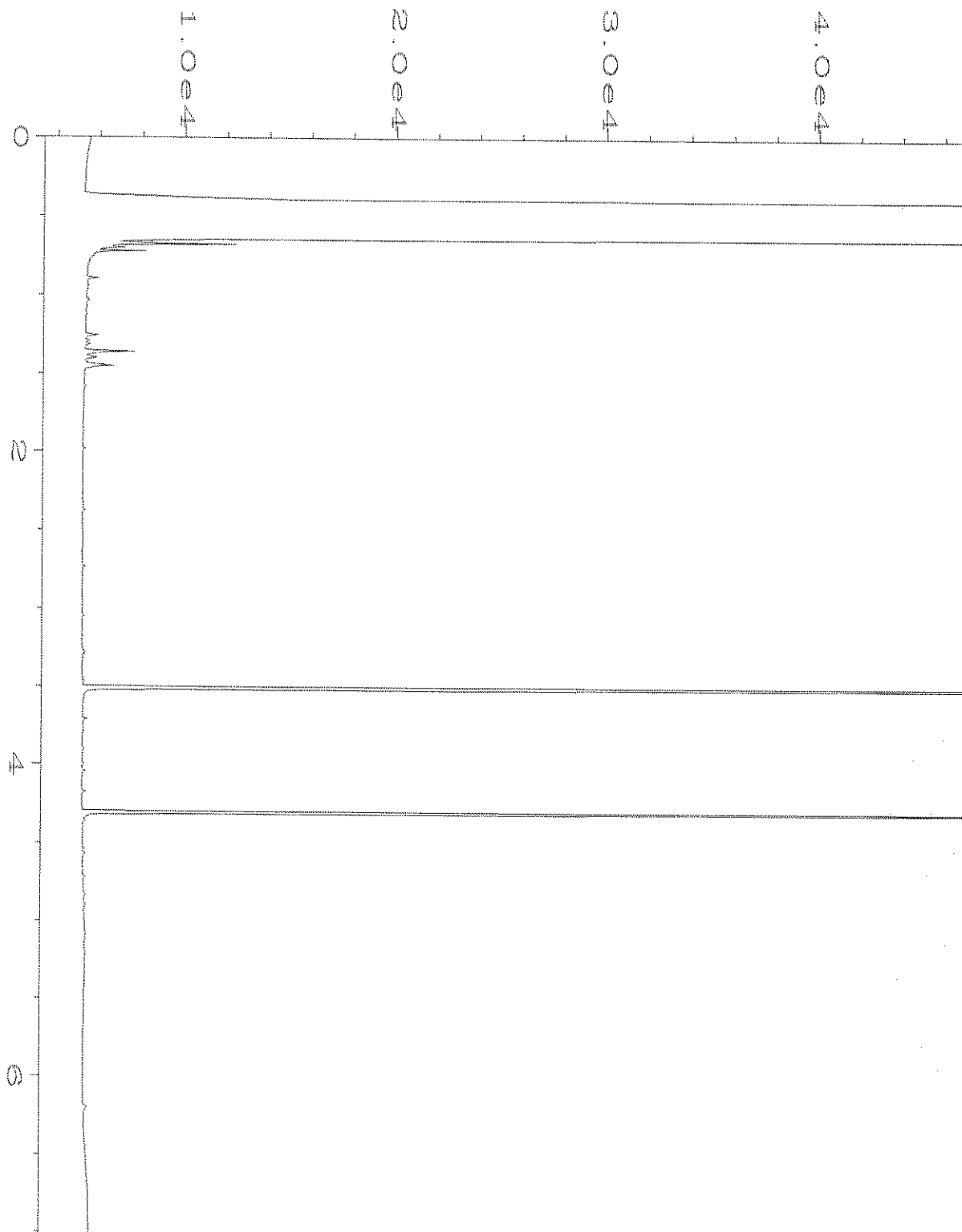
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Operator	: TL	Vial Number	: 19
Instrument	: GC6	Injection Number	: 1
Sample Name	: 011245-04	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 03:01 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:14 AM		



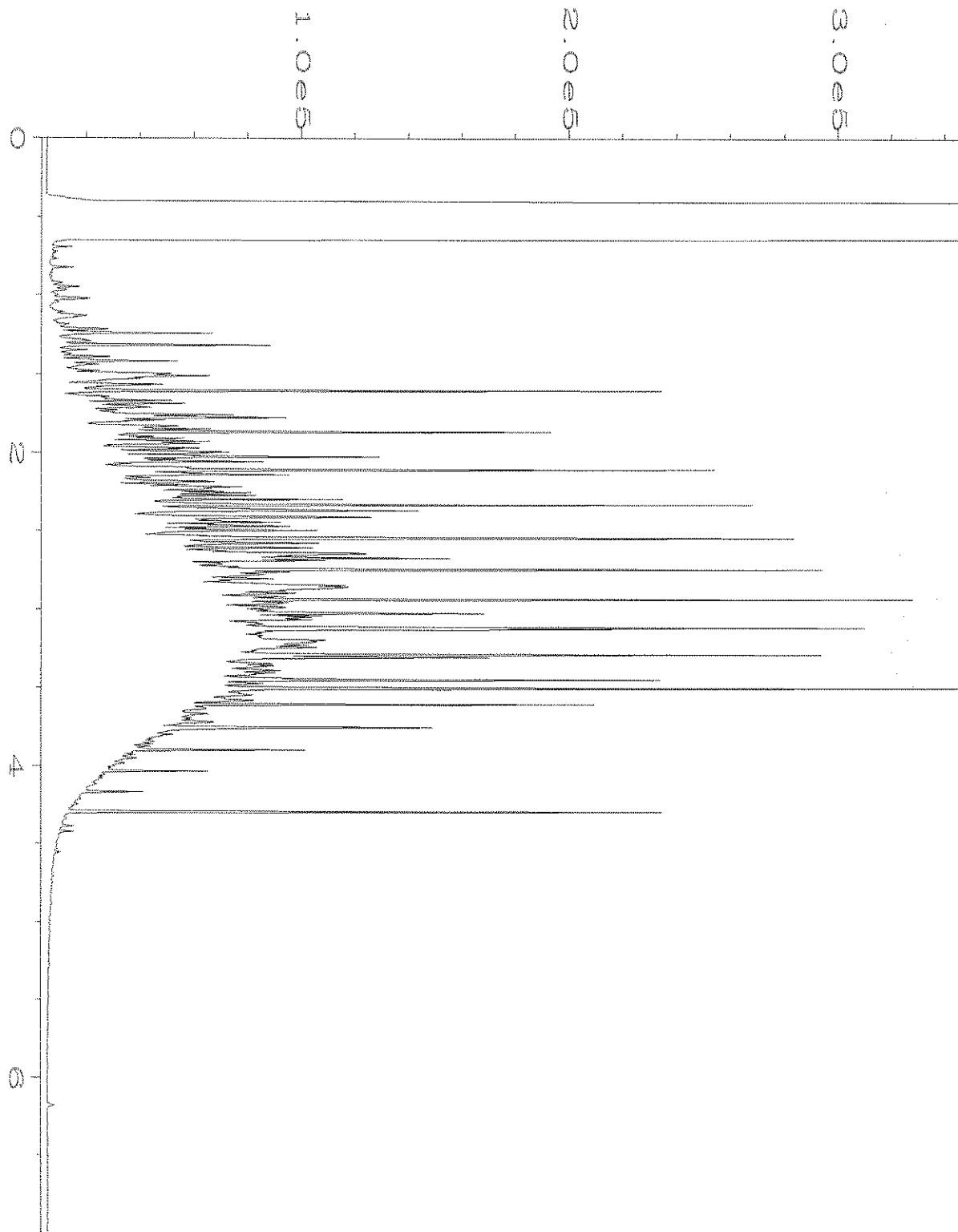
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Operator	: TL	Vial Number	: 20
Instrument	: GC6	Injection Number	: 1
Sample Name	: 011245-05	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 03:12 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:14 AM		



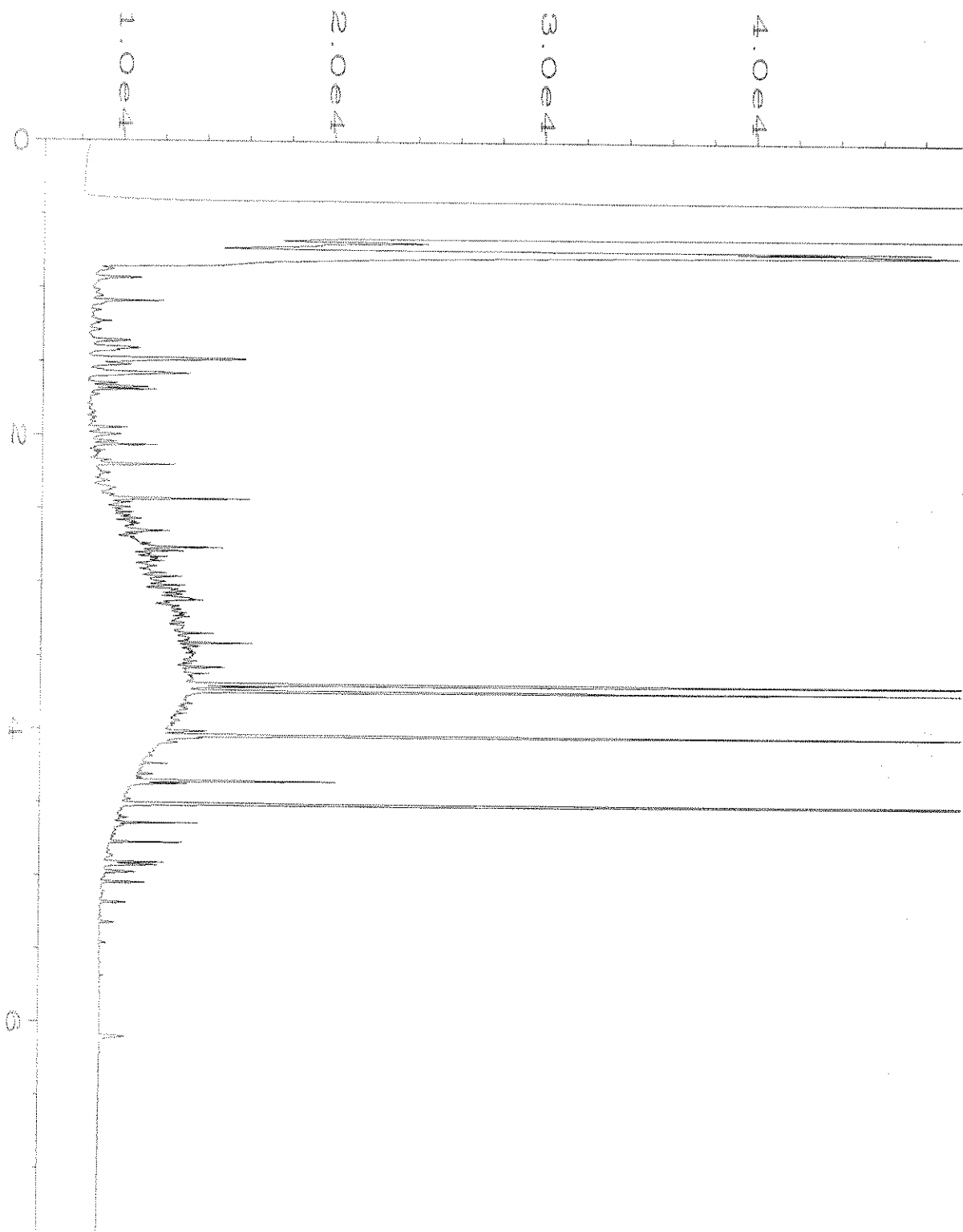
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Operator	: TL	Vial Number	: 21
Instrument	: GC6	Injection Number	: 1
Sample Name	: 011245-06	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 03:24 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:14 AM		



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Operator	: TL	Vial Number	: 6
Instrument	: GC6	Injection Number	: 1
Sample Name	: 00-2510 mb	Sequence Line	: 3
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 08:03 AM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:14 AM		

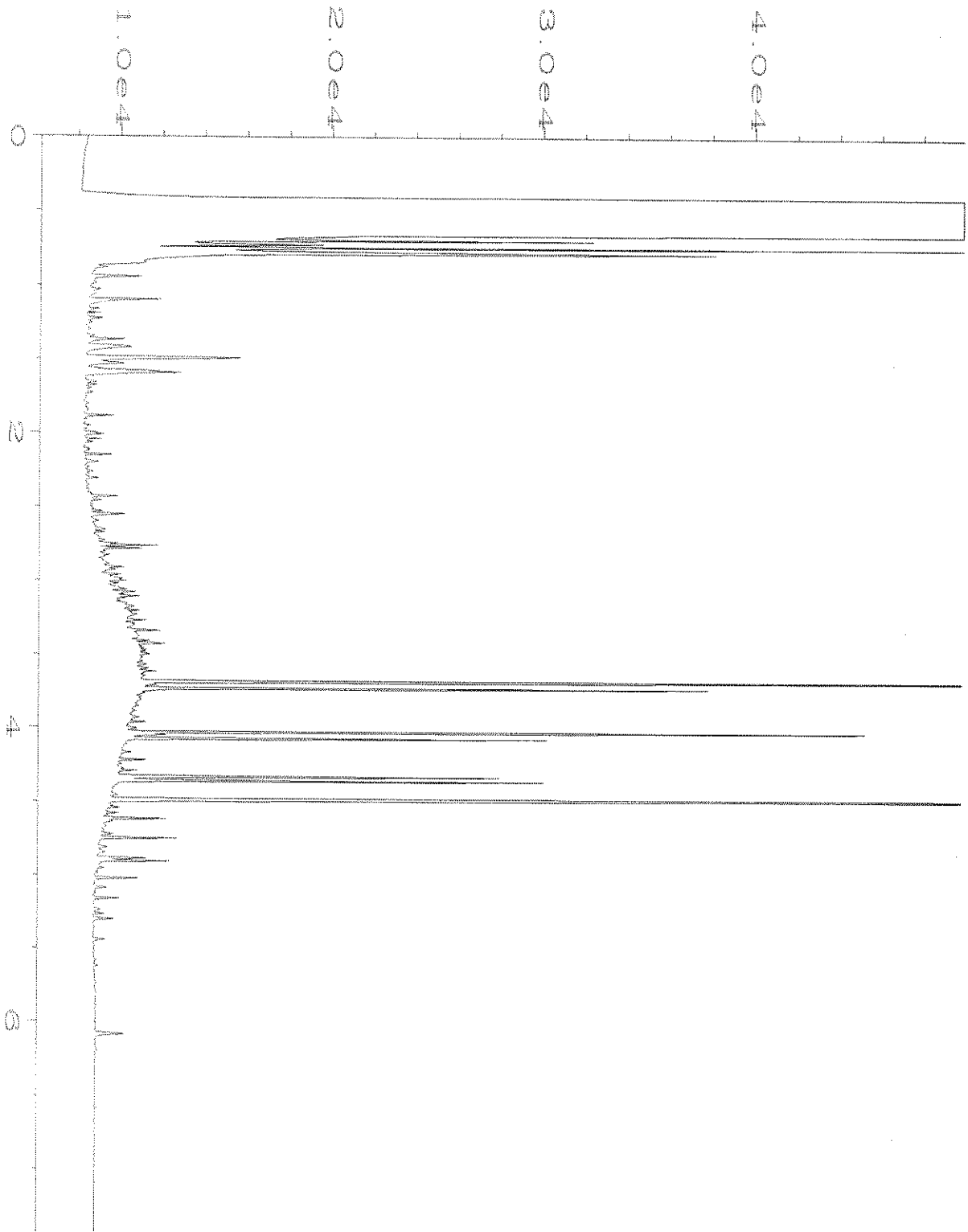


Data File Name	: C:\HPCHEM\6\DATA\11-13-20\005F0401.D	Page Number	: 1
Operator	: TL	Vial Number	: 5
Instrument	: GC6	Injection Number	: 1
Sample Name	: 1000 Dx 61-146C	Sequence Line	: 4
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 02:10 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:14 AM		

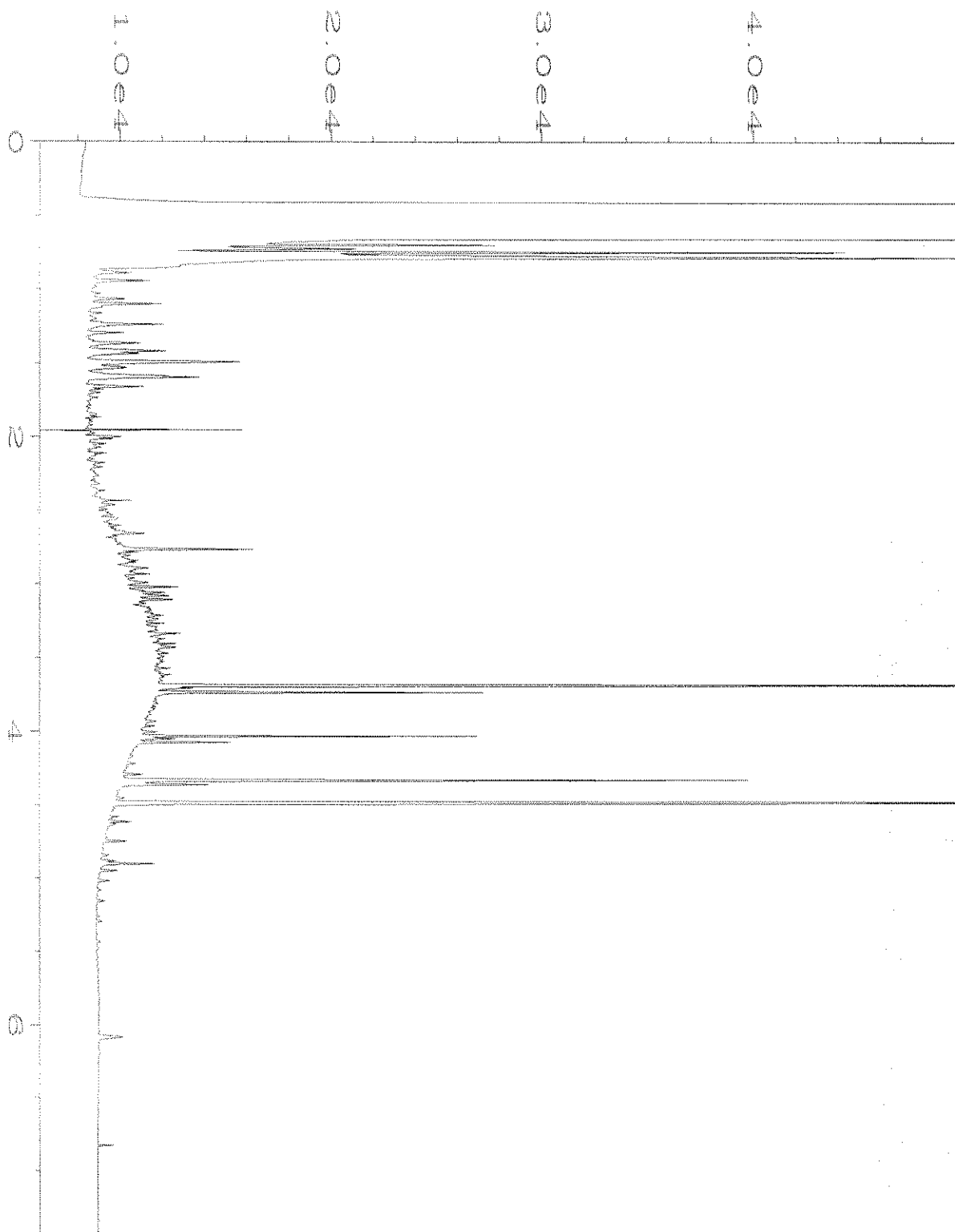


Data File Name	: C:\HPCHEM\1\DATA\11-13-20\032F1301.D	Page Number	: 1
Operator	: TL	Vial Number	: 32
Instrument	: GC1	Injection Number	: 1
Sample Name	: 011245-07	Sequence Line	: 13
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 05:32 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:54 AM		

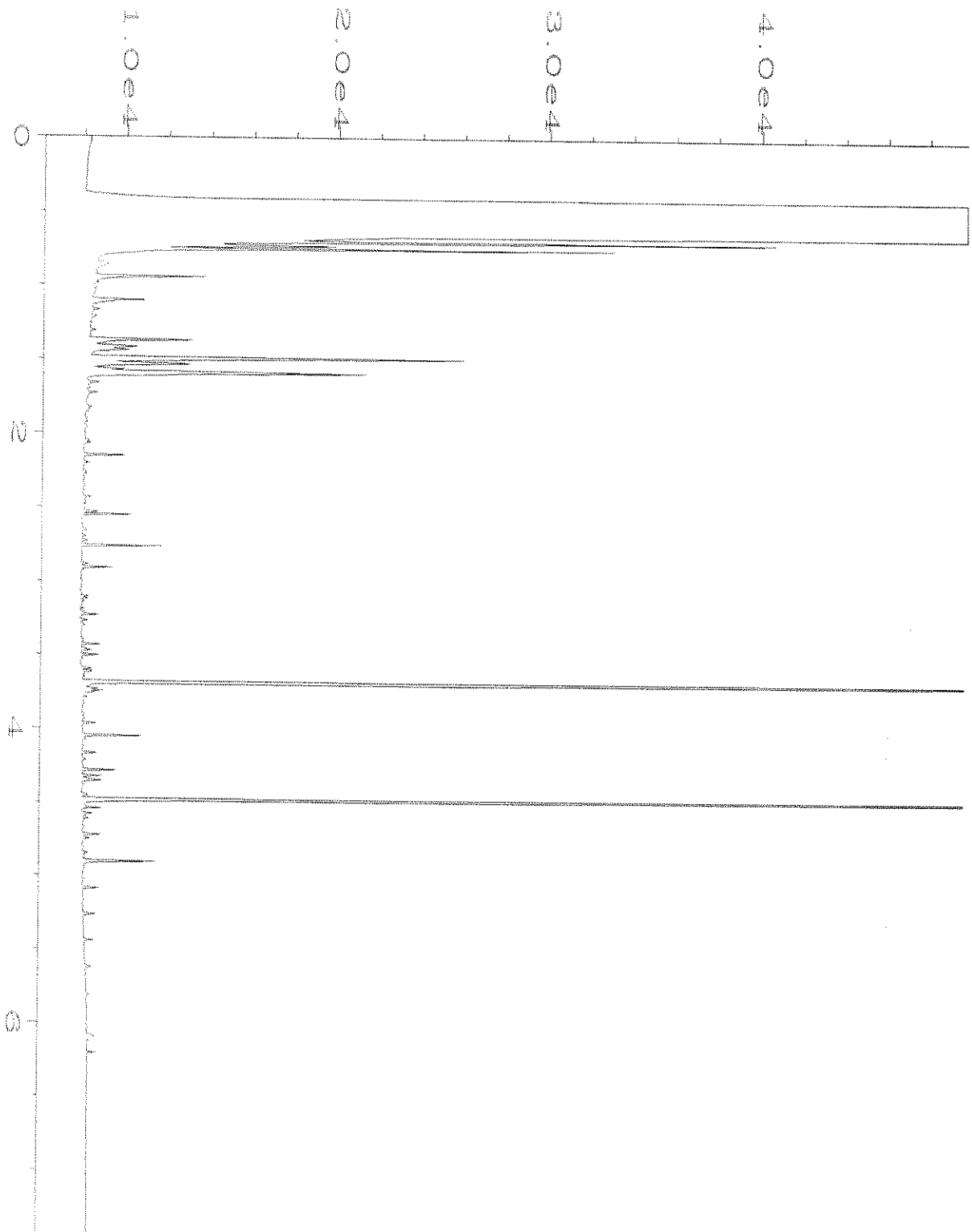




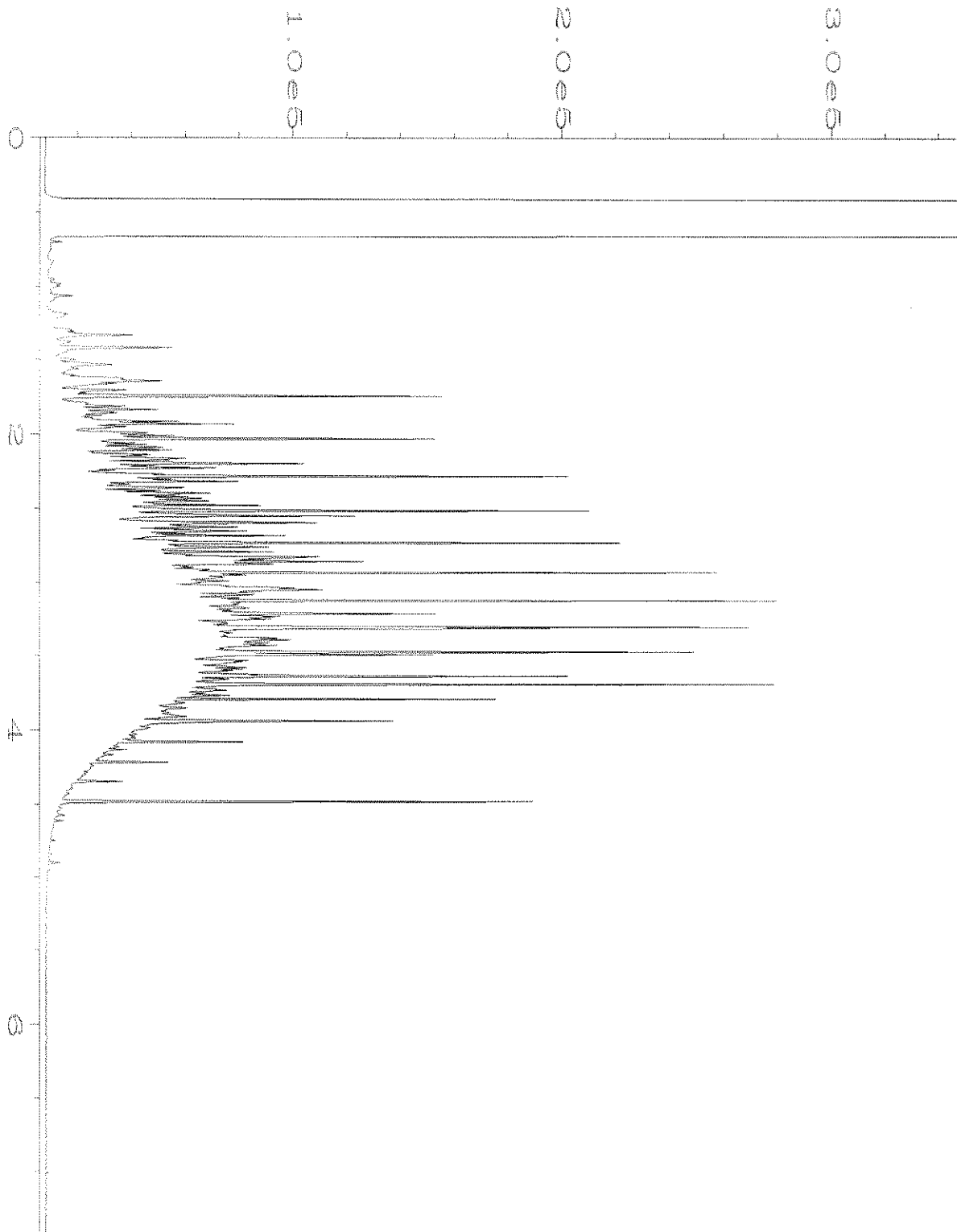
Data File Name	: C:\HPCHEM\1\DATA\11-13-20\033F1301.D	Page Number	: 1
Operator	: TL	Vial Number	: 33
Instrument	: GC1	Injection Number	: 1
Sample Name	: 011245-08	Sequence Line	: 13
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 05:41 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:54 AM		



Data File Name	: C:\HPCHEM\1\DATA\11-13-20\034F1301.D	Page Number	: 1
Operator	: TL	Vial Number	: 34
Instrument	: GC1	Injection Number	: 1
Sample Name	: 011245-09	Sequence Line	: 13
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 05:53 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:54 AM		



Data File Name	: C:\HPCHEM\1\DATA\11-13-20\024F1101.D	Page Number	: 1
Operator	: TL	Vial Number	: 24
Instrument	: GC1	Injection Number	: 1
Sample Name	: 00-2506 mb	Sequence Line	: 11
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 03:18 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:54 AM		



Data File Name	: C:\HPCHEM\1\DATA\11-13-20\005F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 5
Instrument	: GC1	Injection Number	: 1
Sample Name	: 1000 Dx 61-146C	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 13 Nov 20 02:18 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	16 Nov 20 08:54 AM		

Report To 011245  
 Lynn Grochala  
 Company Floyd Snider  
 Address 601 Union St, Ste 600  
 City, State, ZIP Seattle, WA 98101  
 Phone 206-292-2078 Email lynn.grochala@floydsnider.com

**SAMPLE CHAIN OF CUSTODY** <sup>MEB</sup> 11-12-20

SAMPLERS (signature)

PROJECT NAME Camera TOC PO # \_\_\_\_\_

REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_

Project specific RIs?  Yes  No

Page # \_\_\_\_\_ of \_\_\_\_\_

**TURNAROUND TIME**

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																	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	TOC/EPA 9060	Metals /EPA 5020	Hardness SS (SM 2520)	Alkalinity (SM 2320)	BOD (SM 5210 B)	TOC /DOC (SM 5210 B)	Sulfate (SM 4500)	Nitrate (EPA 8330)			
PDSB03-21-22 FT	01A-F	11/12/20	0950	soil	6	X	X			X			X	X									soil metals = ca
PDSB03-25-26 FT	02		1000		6	X	X			X			X	X									water metals = ca + Hg
PDSB02-20-21 FT	03		1050		6	X	X			X			X	X									
PDSB02-26.5-27.5 FT	04		1100		6	X	X			X			X	X									
PDSB01-23-24 FT	05		1205		6	X	X			X			X	X									
PDSB01-27.5-28.5 FT	06		1215		6	X	X			X			X	X									
01MW80-111220	07A-M		1010	water	13	X	X			X			X	X	X	X	X	X	X	X	X	X	
MW06-111220	08		1140		13	X	X			X			X	X	X	X	X	X	X	X	X	X	
01MW46-111220	09		1255		13	X	X			X			X	X	X	X	X	X	X	X	X	X	
trip blanks	10A-B				2			X															

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Kristin Anderson	Floyd Snider	11/12/20	1735
Received by: _____				
Relinquished by:	JOE MOHAMMED	F&B	11/12/20	1735
Received by: _____				
Samples received at <u>3</u> °C				

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



## Soil Settling Tube/Grain Size Analysis

			Percent Distribution					
	Interval		Clays	Silts	Fine Sand	Medium Sand	Coarse Sand	Gravel
PDSB01	15	to 17	0.5	9.5	15	75		
	17	to 19	0.5	9.5	10	80		
	19	to 21	0.5	9.5	10	80		
	21	to 23	0.1	19.9	10	70		
	23	to 25	0.1	11.9	10	78		
	25	to 27	0.1	14.9	15	70		
	27	to 29	5	10	5	80		
	29	to 30	10	75	15			

			Percent Distribution					
	Interval		Clays	Silts	Fine Sand	Medium Sand	Coarse Sand	Gravel
PDSB02	15	to 17		85	10	5		
	17	to 19	0.5	44.5	30	25		
	19	to 21	3	42	20	35		
	21	to 23	10	23	17	50		
	23	to 25	10	20	20	50		
	25	to 27	2	23	15	60		
	27	to 30	7	80	13			

			Percent Distribution					
	Interval		Clays	Silts	Fine Sand	Medium Sand	Coarse Sand	Gravel
PDSB03	15	to 17	0.5	14.5	25	60		
	17	to 19	0.5	14.5	20	65		
	19	to 21	0.5	19.5	15	65		
	21	to 23	10	27	13	50		
	23	to 25	10	25	10	55		
	25	to 27	12	35	13	40		
	27	to 30	20	80				

**TOC - Seattle Oil Site  
Injection Field Log  
DVT; November 2020  
Table 1**

Injection Point	Date	Time	Injection Depth (ft. bgs)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of Flush Water			Gallons Per Location	Comments	Injection Tooling
						Beginning Flow Meter (gal.)	Ending Flow Meter (gal.)	Gallons Per Interval			
DVT-1A	11/12/2020	12:45	30-28	60	0.0	0.0	0.0	0.0	0	Bottom-Up	2-Foot Screen
	11/12/2020	12:47	30-28	100	0.0	0.0	0.0	0.0			
	11/12/2020	12:50	30-28	150	0.0	0.0	0.0	0.0			
	11/12/2020	13:30	28-26	60	0.0	0.0	0.0	0.0			
	11/12/2020	13:32	28-26	100	0.0	0.0	0.0	0.0			
	11/12/2020	13:38	26-24	100	0.0	0.0	0.0	0.0			
	11/12/2020	13:40	26-24	150	0.0	0.0	0.0	0.0			
	11/12/2020	13:43	24-22	100	0.0	0.0	0.0	0.0			
	11/12/2020	13:45	24-22	150	0.0	0.0	0.0	0.0			
	11/12/2020	13:47	22-20	150	0.0	0.0	0.0	0.0	Tooling clogged.		
DVT-1B	11/12/2020	14:15	30-29	150	0.0	0.0	0.0	0.0	0	Bottom-Up	Pressure Activated Probe
	11/12/2020	14:20	29-28	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:25	28-27	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:30	27-26	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:35	26-25	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:40	25-24	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:41	24-23	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:42	23-22	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:43	22-21	170	0.0	0.0	0.0	0.0			
	11/12/2020	14:44	21-20	170	0.0	0.0	0.0	0.0	Tooling clogged.		
DVT-1C	11/12/2020	15:00	20-21	150	2.4	0.0	45.0	45.0	250	Top-Down	Pressure Activated Probe
	11/12/2020	15:30	21-22	100	2.3	45.0	90.0	45.0			
	11/12/2020	15:50	22-23	150	2.1	90.0	135.0	45.0			
	11/12/2020	16:20	23-24	160	4.0	135.0	180.0	45.0			
	11/12/2020	16:35	24-25	130	4.8	180.0	225.0	45.0			
	11/12/2020	16:40	25-26	50	5.3	225.0	250.0	25.0			
									<b>Total Gallons</b>		
									250		

January 27, 2021

To:

TOC Seattle Terminal 1, LLC | ATTN: Kim Hempel  
[khempel@pioneerees.com](mailto:khempel@pioneerees.com) | [Kristin.Anderson@floydsnider.com](mailto:Kristin.Anderson@floydsnider.com)

Project #:

ChL66181

Subject:

Proposal for Application of PlumeStop™, Bio-Dechlor Inoculum®  
and S-MicroZVI® - Time Oil Bulk Terminal Site in Seattle,  
WA.

REGENESIS Remediation Services (RRS) appreciates the opportunity to provide TOC Seattle Terminal 1, LLC (TOC) with this proposal for in situ remedial treatment application at the former Time Oil Bulk Terminal Site located at 2737 W. Commodore Way Seattle, Washington (the Site). In this proposal we discuss our remedial approach, summarize our design, and present our implementation scope of work including cost estimates.

RRS has successfully completed hundreds of similar remediation applications across the country and has the product knowledge and implementation expertise to actively manage this field application. RRS will provide custom built injection equipment and a team of experienced personnel who specialize in applying REGENESIS' remedial technologies. Our team will ensure a high probability of success, while minimizing risks with our institutional in-house knowledge. Our best-in-class remediation design team and application services ensures proper placement, distribution, and performance of the remedial technologies being applied. With the information provided by TOC and gained during the on-site DVT event, RRS is estimating it will take a total of seven (7) days on-site to safely complete the remediation application.

If you have any questions regarding the application details provided within this proposal, please contact Isaac Gregg at 720.955.5142 ([lgregg@regenesiS.com](mailto:lgregg@regenesiS.com)); for design questions please contact Andrew Punsoni at 503.504.1399 ([Apunsoni@regenesiS.com](mailto:Apunsoni@regenesiS.com)).

Sincerely,



Isaac Gregg  
Proposal Manager



Andrew Punsoni  
Northwest District Technical Manager



## Remedial Approach

### Injection Methods

RRS will apply all materials in situ using direct-push technology (DPT) drilling techniques with appropriate injection tooling (discrete lateral pressure activated injection tool) as the delivery method. TOC will provide a qualified DPT drilling contractor.

### Summary of Relevant Design Information

A tabulated summary of pertinent design assumptions and is provided in **Table 1**. Product technical description sheets have been provided in **Appendix B**.

**Table 1: Remedial Design Summary**

<b>PlumeStop®, S-MZVI &amp; BDI Plus Application Design Summary</b>		
<i>Time Oil Final Design</i>		
<b>PlumeStop + S-MZVI</b>		<b>Technical Notes</b>
<b>Treatment Type</b>	<b>Barrier</b>	
Distance Perpendicular to Flow (ft)	165	<u>Injection Radius for Soil Coverage (ft-est.avg.)</u>
Spacing Within Rows (ft)	6.6	4.0
Number of Rows	2	
		<u>PlumeStop Injection Concentration</u>
<b>DPT Injection Points</b>	<b>50</b>	<u>(mg/L)</u>
Top Application Depth (ft bgs)	20	<b>12,142</b>
Bottom Application Depth (ft bgs)	28	
<b>PlumeStop to be Applied (lbs)</b>	<b>10,000</b>	
PlumeStop to be Applied (gals)	1,110	
<b>In Situ Chemical Reduction - S-MZVI</b>		<b>Special Instructions:</b>
S-MZVI to be added to PlumeStop (lbs)	3,500	Gallons per Foot
S-MZVI to be added to PlumeStop (gals)	232	50.00
<u>PlumeStop + S-MZVI Volume Totals</u>		-Injection to be done with pressure activated top with top-down approach.
Mixing Water (gal)	18,628	-Two-foot pushes are recommended.
<b>Total Application Volume (gals)</b>	<b>20,000</b>	-First row of points show push the tip to 22, 24, 26 and 28 feet.
Injection Volume per Point (gals)	400	
<b>Bioaugmentation - BDI Plus</b>		-The second row of points should push the tip to 21, 23, 25 and 27 feet.
<b>BDI Plus Application Points</b>	<b>50</b>	-Injection startup should complete points closest to MW-06
BDI Plus to be Applied (Liters)	18	
BDI Plus per point (Liters)	0.36	

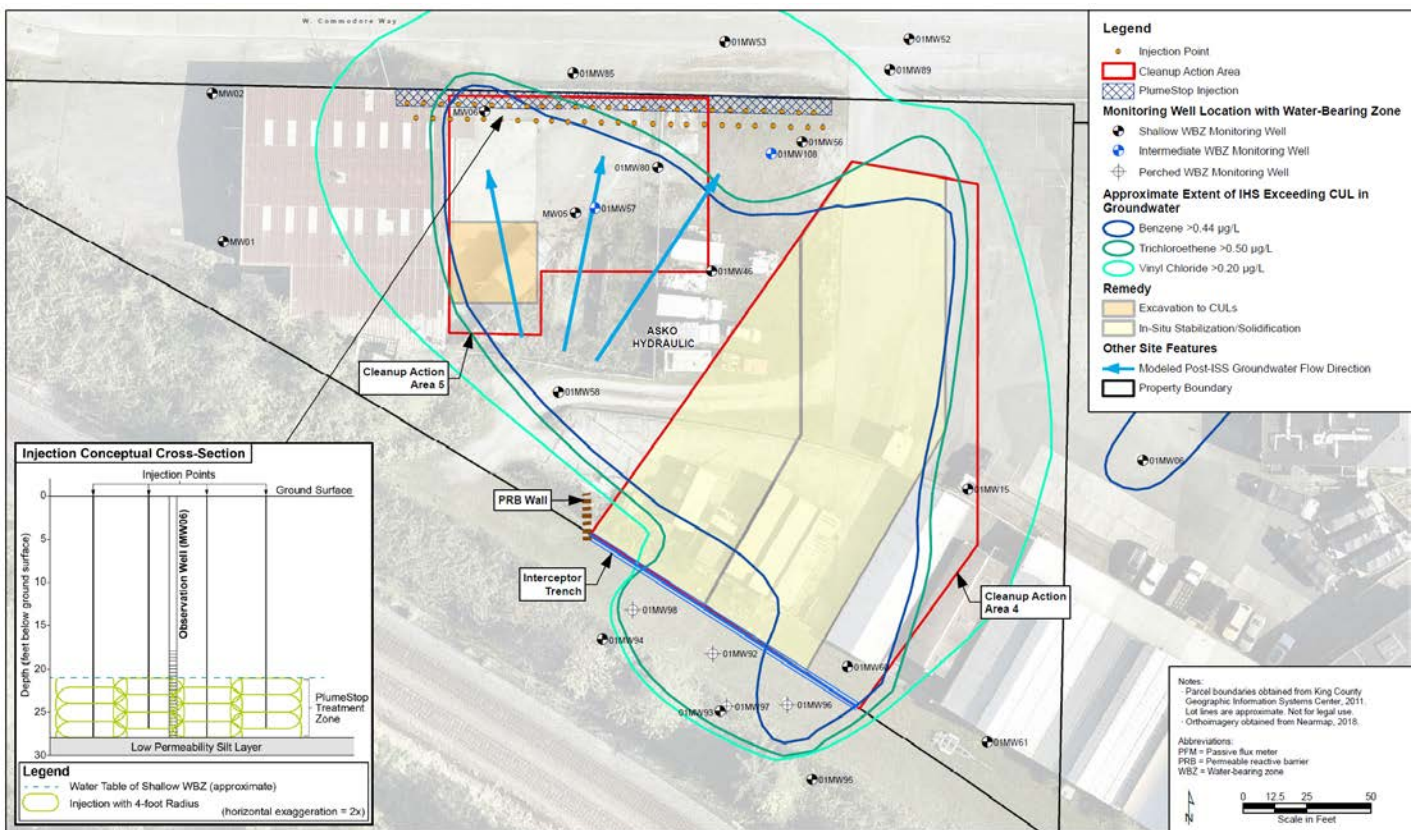
## Work Plan Summary

RRS has a national team of experts with decades of experience in the remediation industry and trained/certified field personnel with in-depth product and application knowledge. Our custom-built injection systems are specifically designed to properly apply REGENESIS products to ensure your investment in our remediation technologies achieves its full potential. Below is a summary of the work plan process, assigned responsibilities and on-site equipment that is intended to be used.

RRS will work under the direction of TOC to implement the field work associated with the application of the selected remediation technologies. Responsibilities for the implementation of this scope of work will be shared between RRS and TOC. Responsibilities for each are outlined in this section and further under the Assumptions/Qualification section.

The application of the remediation technologies will be performed via DPT injection points within the proposed PlumeStop Barrier (**Figure 1**). A secure storage/staging area for the product containers will need to be identified by TOC prior to the start of the full-scale injection activities. TOC will provide a forklift to maneuver product containers for the duration of this application.

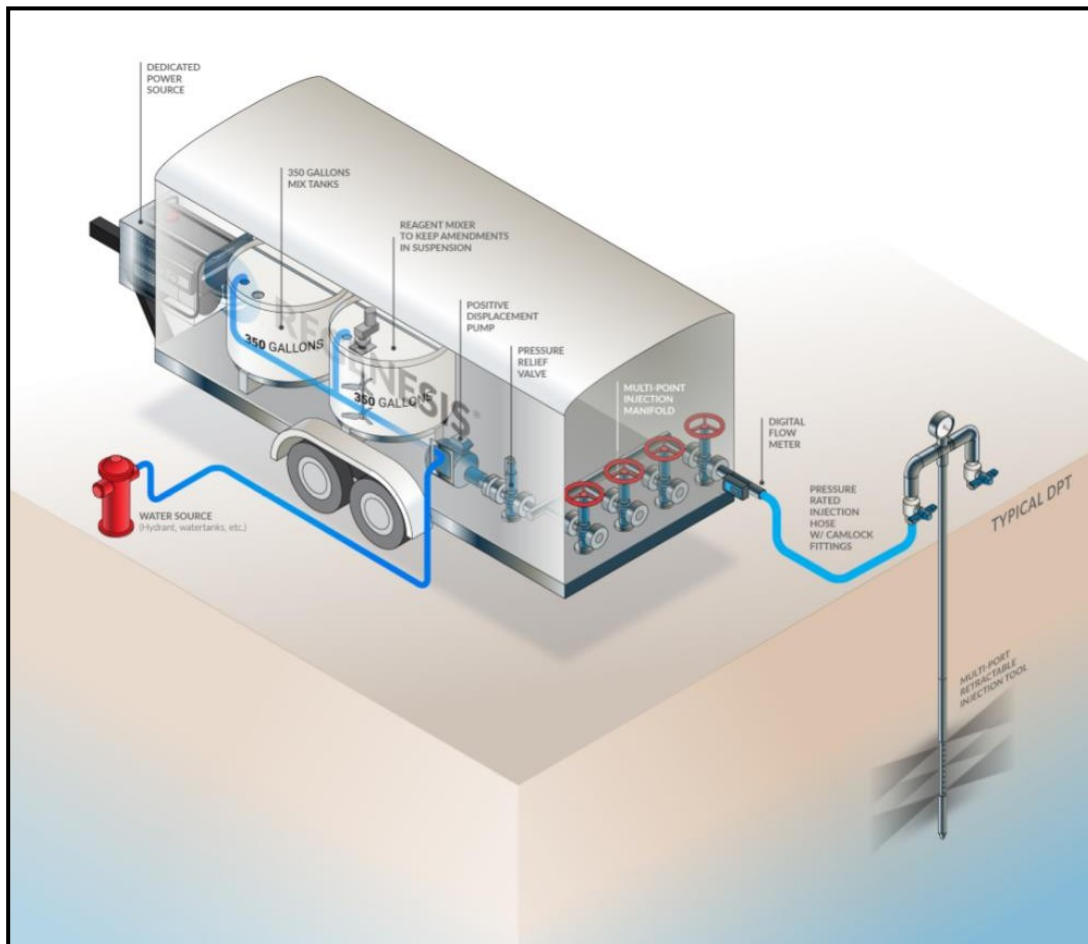
**Figure 1: Proposed PlumeStop Barrier Injection Area**



### RRS Responsibilities

- **RRS** will provide and ship the specified quantities of the remediation reagents (PlumeStop, BDI and S-MZVI) to the site address provided by TOC. RRS shipping estimates assume all products will be shipped to the site at the same time. RRS will coordinate with TOC prior to any shipment of product. Alternative shipping locations or phases could lead to an increase in freight costs.
- **RRS** will mobilize a 40-hour HAZWOPER certified crew experienced in the proper application of REGENESIS remediation technologies.
- **RRS** will supply the necessary injection tooling (DPT contractor to supply minimum of 120 linear feet of 1.5" diameter Geoprobe rods).
- **RRS** will perform site reconnaissance and pre-application activities that include H&S orientation, sensitive receptor identification and protection, treatment area layout, point location placement assistance, and equipment staging.
- **RRS** will provide site safety equipment including cones and caution tape to delineate the work area (efforts will be made to limit the impact on business operations at the site).
- **RRS** will supply and operate a custom-built injection system (**Figure 2**) equipped with:
  - Self-sufficient, dedicated power
  - Onboard mixing tanks
  - Positive displacement pump (or similar) for injecting into the TTZ
  - Injection manifold with pressure rated hosing capable of injecting into multiple points simultaneously
  - Pressure and flow gauges to monitor injection data for individual points
  - Custom injection caps equipped with safety controls for the DPT injection tool string
  - Site safety equipment and spill response kit (including wet vac)
- **RRS** will perform real-time reagent distribution diagnostics during injection activities to allow for field modifications, as needed, to ensure optimal results.
- **RRS** will work directly with our design team to fill any data gaps identified during the injection application to more effectively maintain the project objectives and goals.

**Figure 2: Injection System Diagram**



At the beginning of each day a safety tailgate meeting will be conducted and an overview of the procedures, responsibilities and goals for the day will be discussed. Injection rods equipped with an appropriate injection tool will be advanced to the bottom of the TTZ and injection will be performed in a bottom up method. The remediation technologies will be mixed with water in batches at the designated solution percentage and kept in constant suspension throughout the injection application. The mixing process ensures a homogenous solution is prepared prior to injection into the subsurface and throughout the application event. The batches will continuously be made throughout the entirety of the project until the full volume has been achieved with the appropriate amount of remedial solution being applied for each injection point and per vertical foot as best as possible.

Pressures, flow rates and total volume will be monitored and digitally documented for each injection interval. Multiple injection points may be injected into simultaneously (up to 4) to increase efficiencies on-site. The injection points and surrounding areas will be monitored for any signs of surfacing and a spill response kit will be on standby.

During the application, real-time information will be collected by the Floyd Snider Field Staff. RegenesiS will analyze and help verify design assumptions and subsurface reagent distribution. Data collected and analyzed may consist of groundwater quality parameters (i.e., pH, conductivity, DO, ORP, etc.), depth to water measurements, visual indicators through groundwater or soil samples, and in-field injection concentration test kits. No samples from the injection verification will be submitted for lab analysis. This information is typically collected during the application when within 10 feet of an appropriately screened monitoring well. All in-field data will be used for the sole purpose of reagent placement validation. Based on the information collected, the project team may choose to modify the remediation design to further optimize the injection application. This includes modification to injection concentrations, volume per vertical foot, injection intervals, etc.

Once the injection event is completed, RRS will demobilize all equipment and personnel off-site. A detailed injection summary report which includes injection point data (interval depths, injection pressure/flow rates, reagent volume, time elapsed and if surfacing occurred), field observations and any other noteworthy information will be generated and made available to TOC.

### **TOC Responsibilities**

- **TOC** will coordinate project schedule and reagent order with REGENESIS to ensure adequate mobilization time.
- **TOC** will coordinate site access with property owner to coincide with project schedule and identify a secure product staging area.
- **TOC** will contract a qualified DPT drilling rig and operator equipped with at least 120 linear feet of 1.5" diameter Geoprobe rod and proper abandonment materials per King County regulations.
- **TOC** Will call in public utility locates, should private underground utilities be within the treatment area, **TOC** will contract with a private utility locating service to mark utilities prior to RRS mobilization. RRS can provide costs if requested.
- **TOC** will provide a water source (e.g. hydrant, water truck) capable of producing at least 30 GPM for the duration of the project within 300 ft. of the project staging area, at no cost to RRS. **TOC** will coordinate and provide a backflow preventer for on-site hydrants utilization if needed. RRS can provide costs if requested.
- **TOC** will procure any necessary permits needed to complete the project including right of way, UIC and municipal.
- **TOC** is responsible for all soil, air and groundwater sampling and analysis.
- **TOC** is responsible for transportation and disposal of any contaminated waste generated on-site during injection activities, though we do not anticipate generating any such waste during injection activities.
- All empty product containers will be the responsibility of **TOC** for proper disposal/recycling. General refuse will be collected and disposed of in a **TOC** provided refuse container on-site.
- **TOC** will provide a depth to water meter and field water quality meter similar to a YSI 556 with a down-hole sensor capable of reaching the water table and well screen interval while on-site for injection activities.
- **TOC** will provide access to a restroom during on-site hours. RRS can provide costs if requested.

Once an executed agreement has been established and a work schedule has been agreed upon, RRS will begin to implement the assigned responsibilities and work with TOC accordingly.

## Safety Program

REGENESIS is committed to providing a safe and healthy working environment for all employees, clients and contractors on-site. Prior to mobilization RRS will develop a site-specific Health and Safety Plan (HASP) and designate an on-site safety officer. All personnel on-site are required to participate in daily safety tailgate meetings with the goal of proactively identifying potential hazards and mitigating risks to the full extent possible. In addition to the hours of rigorous safety training courses all personnel are required to complete, REGENESIS also incorporates a behavior-based safety program by utilizing our DoneSafe® mobile application (app) interface on every site. This app encourages our personnel to actively search for potential on-site risks and document mitigation actions taken. The effectiveness of our safety program can be seen in our industry leading EMR ratings listed in **Table 2**.

**Table 2: REGENESIS EMR Rating 2017-2020**

Year	Total Hours	EMR
2020	162,037	0.64
2019	169,964	0.66
2018	144,600	0.70
2017	140,706	0.70

## Health and Safety Plan

RRS safety tailgate meetings and HASP will include the following:

- Site map with entrance and exit points and best possible muster points depending on conditions.
- List of personnel and contact information for employees on-site and supporting the project.
- Rout to the nearest hospital or medical facility along with contact information.
- Job Hazard Analysis (JHA) detailing each job task on-site with its potential hazards and best practices to avoid those hazards.
- Description and hazards of the contaminants of concern (COC) with appropriate Personal Protection Equipment (PPE) requirements.
- List and description of REGENESIS chemicals on-site including a Safety Data Sheet (SDS) for each chemical.
- Personnel will be equipped with face coverings and follow all local Covid-19 regulation.
- Checklist of site safety equipment including fire extinguishers, eyewash station, first aid kit, spill prevention kit and any site-specific equipment needed.
- Daily Tailgate safety meeting sheet with identified hazards and risks associated with the site and job tasks for that day, along with shared learning observations from the previous day.

## Project Cost Estimate

Below is the cost estimate for RRS to provide the remediation technologies (PlumeStop, BDI and S-MZVI) and execute the application design provided in this proposal. Please also see the assumptions and qualifications section.

Time Oil Application				
Description	Quantity	Unit	Price per Unit	Subtotal
RRS Application Services (10 Days)	1	Lump Sum	\$44,440.00	\$44,440.00
Remediation Technologies <b>PlumeStop/S-MZVI/BDI</b> (Including Tax & Freight)	1	Lump Sum	\$117,640.00	\$117,440.00
<b>Total</b>				<b>\$162,080.00</b>

The cost provided above is inclusive of all product, estimated product freight, product mixing, injection services as outlined within this proposal, tax and materials to complete the work. We will submit invoice(s) when product ships and upon project completion, or end of calendar month, for RRS services. Payment terms are Net 30 days upon invoice submittal unless indicated otherwise in a master service agreement (MSA).

**\*Please note that this pricing is contingent upon completion of this scope of work without delays or work stoppages once mobilization occurs. RRS has allotted seven (7) on-site working days (10-hr days, Monday through Saturday) to apply the remediation technologies. RRS believes the scope of work provided above can be completed in this timeframe, however, if the project is delayed due to circumstances beyond our control, RRS will utilize a daily rate of \$3,500.00 plus applicable tax to the invoice price. Should the project be completed ahead of schedule, a portion of the daily rate may be credited to the final invoice after review. RRS reserves the right to modify the design and associated cost if additional information gathered warrants modification.**

## Assumption/Qualifications

In generating this proposal, REGENESIS relied upon professional judgment and site-specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site. The attached design summary tables specify the assumptions used in preparation for this technical design. We request that these modeling input assumptions be verified by your firm prior to application of PlumeStop. Other assumptions and qualifications related to this proposal are as follows:

- The above cost outlined will be valid for 60 days from date of proposal. If beyond 60 days, REGENESIS reserves the right to update cost.
- If applicable, sales tax charges for product, freight, and services are considered estimated at the time of proposal submittal. The appropriate sales tax category (i.e., product, freight, and services) and actual sales tax rate is finalized at the time of invoice and may change from date of proposal submittal.
- RRS personnel will take delivery of the Product, and **TOC** will arrange for secure storage. If additional deliveries are requested, changes to the price will be incorporated as necessary. If material needs to be stored off-site, **TOC** personnel will coordinate the delivery of the material to the site.
- RRS will have access to the site for equipment operation and secure storage of materials and equipment. Access to each work area location will be clear and free of obstructions. RRS assumes the injection trailer will be staged within 80 ft. of the furthest injection point location.
- Pricing and work schedule assume union labor and prevailing wages (Davis-Bacon) are not required.
- **TOC** will provide access to a restroom during on-site hours.
- **TOC** is responsible for securing any permits prior to mobilizing to the site.
- **TOC** is responsible for all soil, air and groundwater sampling and analysis.
- **TOC** is responsible for transportation and disposal of any contaminated waste generated on-site during injection activities, though we do not anticipate generating any such waste during injection activities.
- All private, on-site underground utilities and any known subsurface features (e.g., piping, storage tanks, septic systems, etc.) will be clearly marked/cleared by **TOC** prior to RRS mobilization to the site. RRS is not responsible for damage to any unmarked utilities or subsurface features. If as-built drawings are available for any on-site subsurface features, RRS request the right to review these drawing with **TOC** to confirm clearance for the advancement of DPT injection points.
- For safety reasons, access to the treatment area will be limited to RRS and **TOC** personnel. RRS will provide delineators and cones to section off working areas.
- The remediation design and injection procedures contain the necessary precautions to minimize the likelihood of surfacing of the treatment chemistry. RRS will monitor treatment chemistry application flow rates and pressures as well as observe for signs of reagent surfacing around active injection areas. If surfacing is detected, RRS will stop or slow down injection activities at that location to stop additional surfacing and remove/vacuum up recoverable surfaced fluid. RRS is not be responsible for treatment chemistry infiltration into undesired locations beyond our visible control.



- RRS personnel can have access to site for work up to 12 hours per day Sunday-Saturday, though, in generating the costs, a 9.5-hour, Monday through Saturday workday schedule was assumed. Additional charges will be applied for Saturday and/or Sunday work schedules.
- RRS assumes that there will be complete site access, with no areas being blocked by persons, vehicles or buildings. The injection flow rates and schedule are based on having full site access.
- RRS assumes that direct-push style drill rig can access all injection point locations and drive injection tooling to the required depth. If site conditions limit the use of the provided direct-push rig for any injection point and other drilling methods are required to complete the task, additional charges will apply.
- All injection points will be closed/backfilled according to county regulations by the DPT contractor.
- Site conditions can change over time and should be monitored post injection. REGENESIS is not responsible for changing site conditions after completing the scope of work and demobilizing from the site. This includes but is not limited to changes related to borehole abandonment (i.e., swelling of backfill material), surface restoration, well conditions, and on-site utilities.
- In generating this estimate, REGENESIS relied upon professional judgment and site-specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

## Acknowledgment

Please sign below to acknowledge acceptance of proposal **ChL66181** for the **Time Oil Bulk Terminal Site** and authorize REGENESIS to proceed with a final contract and work authorization:

### TOC Seattle Terminal 1, LLC

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name (print)

\_\_\_\_\_  
P.O. or Project Number

Signature above confirms signee has reviewed the proposal and agrees with all outlined responsibilities and assumptions/qualifications. Please also see our terms and conditions located in **Appendix A**. Below is a list of next steps toward implementation of this project. Please note these steps may take 4-6 weeks to complete depending upon the complexity of the project and previous experience with your company. REGENESIS Remediation Services will contact you soon to begin the implementation process.

### Steps to Project Implementation

- Sign acceptance of proposal
- Finalize contract documents incorporating this proposal or formal REGENESIS Subcontract Agreement
- Confirm account credit status
- Complete remediation services logistics evaluation
- Confirm delivery address and date
- Schedule application



## Appendix A

## Terms and Conditions Products and Services

- 1. PAYMENT TERMS.** Net 30 Days. Accounts outstanding after 30 days will be assessed 1.5% monthly interest. Volume discount pricing will be rescinded on all accounts outstanding over 90 days. An early payment discount of 1.5% Net 10 is available for cash or check payments only. We accept Master Card, Visa and American Express.
- 2. RETURN POLICY.** A 15% re-stocking fee will be charged for all returned goods. All requests to return product must be pre-approved by seller. Returned product must be in original condition and no product will be accepted for return after a period of 90 days.
- 3 FORCE MAJEURE.** Seller shall not be liable for delays in delivery or services or failure to manufacture or deliver due to causes beyond its reasonable control, including but not limited to acts of God, acts of buyer, acts of military or civil authorities, fires, strikes, flood, epidemic, war, riot, delays in transportation or car shortages, or inability to obtain necessary labor, materials, components or services through seller's usual and regular sources at usual and regular prices. In any such event Seller may, without notice to buyer, at any time and from time to time, postpone the delivery or service dates under this contract or make partial delivery or performance or cancel all or any portion of this and any other contract with buyer without further liability to buyer. Cancellation of any part of this order shall not affect Seller's right to payment for any product delivered or service performed hereunder.
- 4. LIMITED WARRANTY.** Seller warrants the product(s) sold and services provided as specified on face of invoice, solely to buyer. Seller makes no other warranty of any kind respecting the product and services, and expressly DISCLAIMS ALL OTHER WARRANTIES OF WHATEVER KIND RESPECTING THE PRODUCT AND SERVICES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE AND NON-INFRINGEMENT.
- 5. DISCLAIMER.** Where warranties to a person other than buyer may not be disclaimed under law, seller extends to such a person the same warranty seller makes to buyer as set forth herein, subject to all disclaimers, exclusions and limitations of warranties, all limitations of liability and all other provisions set forth in the Terms and Conditions herein. Buyer agrees to transmit a copy of the Terms and Conditions set forth herein to any and all persons to whom buyer sells, or otherwise furnishes the products and/or services provided buyer by seller and buyer agrees to indemnify seller for any liability, loss, costs and attorneys' fees which seller may incur by reason, in whole or in part, of failure by buyer to transmit the Terms and Conditions as provided herein.
- 6. LIMITATION OF SELLER'S LIABILITY AND LIMITATION OF BUYER'S REMEDY.** Seller's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair or use of any goods or performance of any services covered by or furnished hereunder, shall in no case exceed the lesser of (1) the cost of repairing or replacing goods and repeating the services failing to conform to the forgoing warranty or the price of the goods and/or services or part thereof which gives rise to the claim. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, OR FOR DAMAGES IN THE NATURE OF PENALTIES.
- 7. INDEMNIFICATION.** Buyer agrees to defend and indemnify seller of and from any and all claims or liabilities asserted against seller in connection with the manufacture, sale, delivery, resale or repair or use of any goods, and performance of any services, covered by or furnished hereunder arising in whole or in part out of or by reason of the failure of buyer, its agents, servants, employees or customers to follow instructions, warnings or recommendations furnished by seller in connection with such goods and services, by reason of the failure of buyer, its agents, servants, employees or customers to comply with all federal, state and local laws applicable to such goods and services, or the use thereof, including the Occupational Safety and Health Act of 1970, or by reason of the negligence or misconduct of buyer, its agents, servants, employees or customers.
- 8. EXPENSES OF ENFORCEMENT.** In the event seller undertakes any action to collect amounts due from buyer, or otherwise enforce its rights hereunder, Buyer agrees to pay and reimburse Seller for all such expenses, including, without limitation, all attorneys and collection fees.
- 9. TAXES.** Liability for all taxes and import or export duties, imposed by any city, state, federal or other governmental authority, shall be assumed and paid by buyer. Buyer further agrees to defend and indemnify seller against any and all liabilities for such taxes or duties and legal fees or costs incurred by seller in connection therewith.

**10. ASSISTANCE AND ADVICE.** Upon request, seller in its discretion will furnish as an accommodation to buyer such technical advice or assistance as is available in reference to the goods and services. Seller assumes no obligation or liability for the advice or assistance given or results obtained, all such advice or assistance being given and accepted at buyer's risk.

**11. SITE SAFETY.** Buyer shall provide a safe working environment at the site of services and shall comply with all applicable provisions of federal, state, provincial and municipal safety laws, building codes, and safety regulations to prevent accidents or injuries to persons on, about or adjacent to the site.

**12. INDEPENDENT CONTRACTOR.** Seller and Buyer are independent contractors and nothing shall be construed to place them in the relationship of partners, principal and agent, employer/employee or joint ventures. Neither party will have the power or right to bind or obligate the other party except as may be expressly agreed and delegated by other party, nor will it hold itself out as having such authority.

**13. REIMBURSEMENT.** Seller shall provide the products and services in reliance upon the data and professional judgments provided by or on behalf of buyer. The fees and charges associated with the products and services thus may not conform to billing guidelines, constraints or other limits on fees. Seller does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where seller may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by seller, it is the sole responsibility of the buyer or other entity seeking reimbursement to ensure the products and services and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, seller does not knowingly present or cause to be presented any claim for payment to the Government.

**14. APPLICABLE LAW/JURISDICTION AND VENUE.** The rights and duties of the parties shall be governed by, construed, and enforced in accordance with the laws of the State of California (excluding its conflict of laws rules which would refer to and apply the substantive laws of another jurisdiction). Any suit or proceeding hereunder shall be brought exclusively in state or federal courts located in Orange County, California. Each party consents to the personal jurisdiction of said state and federal courts and waives any objection that such courts are an inconvenient forum.

**15. ENTIRE AGREEMENT.** This agreement constitutes the entire contract between buyer and seller relating to the goods or services identified herein. No modifications hereof shall be binding upon the seller unless in writing and signed by seller's duly authorized representative, and no modification shall be effected by seller's acknowledgment or acceptance of buyer's purchase order forms containing different provisions. Trade usage shall neither be applicable nor relevant to this agreement, nor be used in any manner whatsoever to explain, qualify or supplement any of the provisions hereof. No waiver by either party of default shall be deemed a waiver of any subsequent default.



## Remedial Design Assumptions and Qualifications

**Cost Estimate Disclaimer:** The cost listed assumes conditions set forth within the proposed scope of work and assumptions and qualifications. Changes to either could impact the final cost of the project. This may include final shipping arrangements, sales tax or application related tasks such as product storage and handling, access to water, etc. If items listed need to be modified, please contact RegenesiS for further evaluation.

**Shipping Estimates:** Shipping estimates are valid for 30 days. All shipping charges are estimates and actual freight charges are calculated at the time of invoice. Additional freight charges may be assessed for any accessorial requested at the time of delivery. The estimate included within assumes standard shipping.

Standard delivery is between 8am -5pm Monday –Friday. \*accessorial – can include, but not limited to lift gate and pallet jack at delivery, inside delivery, time definite deliveries, and delivery appointments.

Please communicate any requirements for delivery with the customer service department at the time the order is placed.

**Return Policy:** To initiate a return please contact your local sales manager for an RMA. A 15% re-stocking fee will be charged for all returned goods. Return freight must be prepaid. All requests to return product must be in original condition and no product will be accepted for return after 90 days from date of delivery.

**Professional Judgement:** In generating this estimate, REGENESIS relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s), and in reliance upon REGENESIS' prior experience on similar project sites. The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the government.

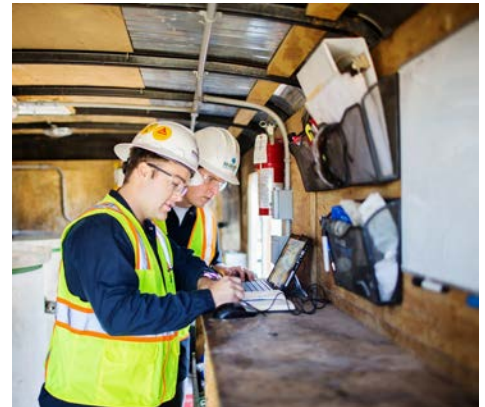
## Appendix B



# S-MicroZVI Specification Sheet

## S-MicroZVI Technical Description

S-MicroZVI<sup>™</sup> is an *In Situ* Chemical Reduction (ISCR) reagent that promotes the destruction of many organic pollutants and is most commonly used with chlorinated hydrocarbons. It is engineered to provide an optimal source of micro-scale zero valent iron (ZVI) that is both easy to use and delivers enhanced reactivity with the target contaminants via multiple pathways. S-MicroZVI can destroy many chlorinated contaminants through a direct chemical reaction (see **Figure I**). S-MicroZVI will also stimulate anaerobic biological degradation by rapidly creating a reducing environment that is favorable for reductive dechlorination.

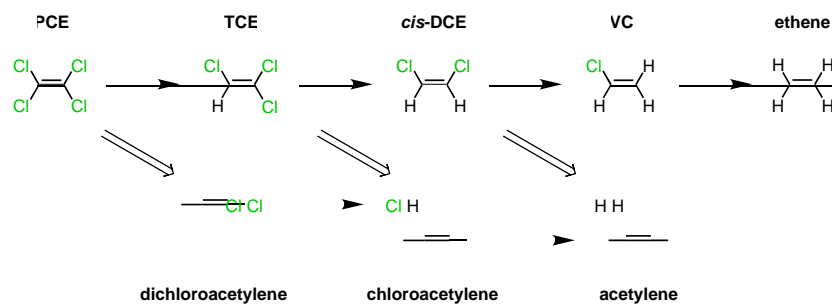


### Sulfidated ZVI

S-MicroZVI is composed of colloidal, sulfidated zero-valent iron particles suspended in glycerol using proprietary environmentally acceptable dispersants. The passivation technique of sulfidation, completed using proprietary processing methods, provides unparalleled reactivity with chlorinated hydrocarbons like PCE and TCE and increases its stability and longevity by minimizing undesirable side reactions. In addition to superior reactivity, S-MicroZVI is designed for easy handling that is unmatched by any ZVI product on the market. Shipped as a liquid suspension, S-MicroZVI requires no powder feeders, no thickening with guar, and pneumatic or hydraulic fracturing is not mandatory. When diluted with water prior to application, the resulting suspension is easy to inject using either direct push or permanent injection wells.

### S-MicroZVI is Best in Class For

- Longevity
- Kinetics
- Transport



**Figure I:** Chlorinated ethene degradation pathways and products. The top pathway with single line arrows represent the reductive dechlorination (hydrogenolysis) pathway. The lower pathway with downward facing double line arrows represent the beta-elimination pathway.

To see a list of treatable contaminants, view the S-MicroZVI treatable contaminants guide.

# S-MicroZVI Specification Sheet

## Chemical Composition

Iron, powders CAS 7439-89-6  
Iron (II) sulfide CAS 1317-37-9  
Glycerol CAS 56-81-8

## Properties

Physical State: Liquid  
Form: Viscous metallic suspension  
Color: Dark gray  
Odor: Slight  
pH: Typically 7-9 as applied  
Density: 15 lb/gal

## Storage and Handling Guidelines

### Storage:

- Use within four weeks of delivery
- Store in original containers
- Store at temperatures below 95F°
- Store away from incompatible materials

### Handling:

- Never mix with oxidants or acids
- Wear appropriate personal protective equipment
- Do not taste or swallow
- Observe good industrial hygiene practices

## Applications

S-MicroZVI is diluted with water on site and easily applied into the subsurface through low-pressure injections. S-MicroZVI can also be mixed with products like 3-D Microemulsion<sup>®</sup> or PlumeStop<sup>®</sup> prior to injection.

## Health and Safety

The material is relatively safe to handle; however, avoid contact with eyes, skin and clothing. OSHA Level D personal protection equipment including: vinyl or rubber gloves and eye protection are recommended when handling this product. Please review the Safety Data Sheet for additional storage, and handling requirements here: S-MicroZVI SDS.



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## BDI PLUS® Technical Description

Bio-Dechlor INOCULUM Plus (BDI PLUS®) is an enriched natural consortium containing species of *Dehalococcoides* sp. (DHC). BDI PLUS has been shown to simulate the rapid and complete dechlorination of chlorinated solvents such as tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE) and vinyl chloride (VC) to non-toxic end products, ethene, carbon dioxide and water.

The culture also contains microbes capable of dehalogenating halomethanes (e.g., carbon tetrachloride and chloroform) and haloethanes (e.g., 1,1,1-TCA and 1,1-DCA) as well as mixtures of these contaminants.



Species of *Dehalococcoides* sp. (DHC)

For a list of treatable contaminants with the use of BDI PLUS, view the [Range of Treatable Contaminants Guide](#)

### Chemical Composition

- Non-hazardous, naturally-occurring, non-altered anaerobic microbes and enzymes in a water-based medium.

### Properties

- Appearance – Murky, yellow to grey water
- Odor – Musty
- pH 6.0 to 8.0
- Density – Approximately 1.0 grams per cubic centimeter (0.9 to 1.1 g/cc)
- Solubility – Soluble in Water
- Vapor Pressure – None
- Non-hazardous

### Storage and Handling Guidelines

#### Storage

Store in original tightly closed container

Store away from incompatible materials

Recommended storage containers: plastic lined steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass

Store in a cool, dry area at 4-5°C (39 - 41°F)

Material may be stored for up to 3 weeks at 2-4°C without aeration

#### Handling

Avoid prolonged exposure

Observe good industrial hygiene practices

Wear appropriate personal protective equipment

# BDI PLUS® Technical Description

## Applications

- BDI PLUS is delivered to the site in liquid form and is designed to be injected directly into the saturated zone requiring treatment.
- Most often diluted with de-oxygenated water prior to injection into either hydraulic push injection points or properly constructed injection wells.
- The typical dilution rate of the injected culture is 10 gallons of deoxygenated water to 1 liter of standard BDI PLUS culture.

Application instructions for this product are contained here [BDI PLUS Application Instructions](#).

## Health and Safety

Material is non-hazardous and relatively safe to handle; however avoid contact with eyes and prolonged contact with skin. OSHA Level D personal protection equipment including: vinyl or rubber gloves and safety goggles or a splash shield are recommended when handling this product. An eyewash station is recommended. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: [BDI PLUS SDS](#).



# PlumeStop® Liquid Activated Carbon™ Technical Description

PlumeStop Liquid Activated Carbon is an innovative groundwater remediation technology designed to rapidly remove and permanently degrade groundwater contaminants. PlumeStop is composed of very fine particles of activated carbon (1-2µm) suspended in water through the use of unique organic polymer dispersion chemistry. Once in the subsurface, the material behaves as a colloidal biomatrix, binding to the aquifer matrix, rapidly removing contaminants from groundwater, and promoting permanent contaminant biodegradation.

This unique remediation technology accomplishes treatment with the use of highly dispersible, fast-acting, sorption-based technology, capturing and concentrating dissolved-phase contaminants within its matrix-like structure. Once contaminants are sorbed onto the regenerative matrix, biodegradation processes achieve complete remediation.



Distribution of PlumeStop in water

To see a list of treatable contaminants with the use of PlumeStop, view the [Range of Treatable Contaminants Guide](#).

## Chemical Composition

- Water - CAS# 7732-18-5
- Colloidal Activated Carbon ≤2.5 - CAS# µm 7440-44-0
- Proprietary Additives

## Properties

- Physical state: Liquid
- Form: Aqueous suspension
- Color: Black
- Odor: Odorless
- pH: 8 - 10

## Storage and Handling Guidelines

### Storage

- Store in original tightly closed container
- Store away from incompatible materials
- Protect from freezing

### Handling

- Avoid contact with skin and eyes
- Avoid prolonged exposure
- Observe good industrial hygiene practices
- Wash thoroughly after handling
- Wear appropriate personal protective equipment

# PlumeStop® Liquid Activated Carbon™ Technical Description

## Applications

PlumeStop is easily applied into the subsurface through gravity-feed or low-pressure injection.

## Health and Safety

Wash hands after handling. Dispose of waste and residues in accordance with local authority requirements. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: [PlumeStop SDS](#).



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1011 Calle Sombra, San Clemente CA 92673  
949.366.8000

**Time Oil Bulk Terminal Site**  
**Pre-Remedial Design**  
**Investigation Summary Report**

**Attachment 3**  
**Shoreline Area of Concern**  
**Investigation Supporting Documentation**

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

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Seattle, WA 98119-2029  
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www.friedmanandbruya.com

December 2, 2020

Lynn Grochala, Project Manager  
Floyd-Snyder  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the results from the testing of material submitted on November 13, 2020 from the Cantera - TOC, F&BI 011267 project. There are 81 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Kristin Anderson  
FDS1202R.DOC



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 13, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera - TOC, F&BI 011267 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -01	Comp1-A-0-0.5
011267 -02	Comp1-A-0.5-1
011267 -03	Comp1-B-0-0.5
011267 -04	Comp1-B-0.5-1
011267 -05	Comp1-D-0-0.5
011267 -06	Comp1-D-0.5-1
011267 -07	Comp1-C-0-0.5
011267 -08	Comp1-C-0.5-1
011267 -09	Comp-1-0-0.5
011267 -10	Comp-1-0.5-1
011267 -11	Comp2-A-0-0.5
011267 -12	Comp2-A-0.5-1
011267 -13	Comp2-B-0-0.5
011267 -14	Comp2-B-0.5-1
011267 -15	Comp2-C-0-0.5
011267 -16	Comp2-C-0.5-1
011267 -17	Comp2-D-0-0.5
011267 -18	Comp2-D-0.5-1
011267 -19	Comp-2-0-0.5
011267 -20	Comp-2-0.5-1
011267 -21	Comp3-A-0-0.5
011267 -22	Comp3-A-0.5-1
011267 -23	Comp3-B-0-0.5
011267 -24	Comp3-B-0.5-1
011267 -25	Comp3-C-0-0.5
011267 -26	Comp3-C-0.5-1
011267 -27	Comp3-D-0-0.5
011267 -28	Comp3-D-0.5-1
011267 -29	Comp-3-0-0.5
011267 -30	Comp-3-0.5-1
011267 -31	Comp4-A-0-0.5
011267 -32	Comp4-A-0.5-1
011267 -33	Comp4-B-0-0.4
011267 -34	Comp4-C-0-0.5
011267 -35	Comp4-C-0.5-1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (CONTINUED)

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -36	Comp4-D-0-0.5
011267 -37	Comp4-D-0.5-1
011267 -38	Comp-4-0-0.5
011267 -39	Comp-4-0.5-1
011267 -40	Comp5-A-0-0.5
011267 -41	Comp5-B-0-0.5
011267 -42	Comp5-B-0.5-1
011267 -43	Comp5-C-0-0.5
011267 -44	Comp5-C-0.5-1
011267 -45	Comp5-D-0-0.5
011267 -46	Comp5-D-0.5-1
011267 -47	Comp-5-0-0.5
011267 -48	Comp-5-0.5-1
011267 -49	Comp6-A-0-0.5
011267 -50	Comp6-A-0.5-1
011267 -51	Comp6-B-0-0.5
011267 -52	Comp6-B-0.5-1
011267 -53	Comp6-C-0-0.5
011267 -54	Comp6-C-0.5-1
011267 -55	Comp6-C-0.5-1-D
011267 -56	Comp6-D-0-0.4
011267 -57	Comp6-D-0-0.4-D
011267 -58	Comp-6-0-0.5
011267 -59	Comp-6-0.5-1
011267 -60	Comp-6-0.5-1-D
011267 -61	Comp7-A-0-0.5
011267 -62	Comp7-A-0.5-1
011267 -63	Comp7-B-0-0.5
011267 -64	Comp7-B-0.5-1
011267 -65	Comp7-C-0-0.5
011267 -66	Comp7-C-0.5-1
011267 -67	Comp7-D-0-0.4
011267 -68	Comp-7-0-0.5
011267 -69	Comp-7-0.5-1
011267 -70	SW1-0.25-0.75

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (CONTINUED)

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -71	SW2-0.25-0.75
011267 -72	SW3-0.25-0.75
011267 -73	SW4-0.25-0.75
011267 -74	SW5-0.25-0.75
011267 -75	SW6-0.25-0.75
011267 -76	SW7-0.25-0.75
011267 -77	SW8-0.25-0.75
011267 -78	SW9-0.25-0.75
011267 -79	SW10-0.25-0.75
011267 -80	B1-1.0-1.25
011267 -81	B1-2.0-2.25
011267 -82	B2-1.0-1.25
011267 -83	B2-2.0-2.25
011267 -84	B3-1.0-1.25
011267 -85	B3-2.0-2.25
011267 -86	B3-2.0-2.25-D
011267 -87	B4-1.0-1.25
011267 -88	B4-2.0-2.25

Samples Comp-1-0-0.5, Comp-2-0-0.5, Comp-3-0-0.5, Comp-4-0-0.5, Comp-5-0-0.5, Comp-6-0-0.5, Comp-7-0-0.5 were sent to ARI for tributyltin analysis. The results generated by ARI will be issued in a separate report.

The 1631E matrix spike and matrix spike duplicate failed the relative percent difference for mercury. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp1-A-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-01
Date Analyzed:	11/19/20	Data File:	011267-01.131
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	10.3
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp1-B-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-03
Date Analyzed:	11/19/20	Data File:	011267-03.138
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	13.5
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp1-D-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-05
Date Analyzed:	11/19/20	Data File:	011267-05.139
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	22.4
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp1-D-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	011267-06
Date Analyzed:	11/24/20	Data File:	011267-06.132
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	7.52
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp1-C-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-07
Date Analyzed:	11/19/20	Data File:	011267-07.140
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	18.1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp-1-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-09
Date Analyzed:	11/16/20	Data File:	011267-09.053
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	27.3
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp2-A-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-11
Date Analyzed:	11/19/20	Data File:	011267-11.141
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	15.8
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp2-B-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-13
Date Analyzed:	11/19/20	Data File:	011267-13.142
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	38.0
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp2-C-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-15
Date Analyzed:	11/19/20	Data File:	011267-15.143
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	153
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp2-C-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	011267-16
Date Analyzed:	11/24/20	Data File:	011267-16.133
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.16
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp2-D-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-17
Date Analyzed:	11/19/20	Data File:	011267-17.144
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.38
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp-2-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-19
Date Analyzed:	11/16/20	Data File:	011267-19.104
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	39.8
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp3-A-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-21
Date Analyzed:	11/19/20	Data File:	011267-21.145
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	16.0
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp3-B-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-23
Date Analyzed:	11/19/20	Data File:	011267-23.148
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	17.6
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp3-C-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-25
Date Analyzed:	11/19/20	Data File:	011267-25.149
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.66
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp3-D-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-27
Date Analyzed:	11/19/20	Data File:	011267-27.150
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	3.75
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp-3-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-29
Date Analyzed:	11/16/20	Data File:	011267-29.105
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	9.16
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp4-A-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-31
Date Analyzed:	11/19/20	Data File:	011267-31.151
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	20.1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp4-A-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	011267-32
Date Analyzed:	11/24/20	Data File:	011267-32.134
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	7.42
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp4-B-0-0.4	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-33
Date Analyzed:	11/19/20	Data File:	011267-33.152
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	133
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp4-C-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-34
Date Analyzed:	11/19/20	Data File:	011267-34.153
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.74
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp4-D-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-36
Date Analyzed:	11/19/20	Data File:	011267-36.154
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	3.99
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp-4-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-38
Date Analyzed:	11/16/20	Data File:	011267-38.106
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	27.6
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp5-A-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-40
Date Analyzed:	11/19/20	Data File:	011267-40.155
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	46.5
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp5-B-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-41
Date Analyzed:	11/19/20	Data File:	011267-41.156
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	12.4
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp5-C-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-43
Date Analyzed:	11/19/20	Data File:	011267-43.157
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.13
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp5-D-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-45
Date Analyzed:	11/19/20	Data File:	011267-45.160
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	5.69
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp-5-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-47
Date Analyzed:	11/16/20	Data File:	011267-47.109
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	20.3
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp-6-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-58
Date Analyzed:	11/16/20	Data File:	011267-58.110
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.74
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp7-A-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-61
Date Analyzed:	11/19/20	Data File:	011267-61.161
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	145
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp7-A-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	011267-62
Date Analyzed:	11/24/20	Data File:	011267-62.135
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	36.4
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp7-B-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-63 x10
Date Analyzed:	11/20/20	Data File:	011267-63 x10.046
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	624
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp7-B-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	011267-64
Date Analyzed:	11/24/20	Data File:	011267-64.136
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	87.9
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp7-C-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-65
Date Analyzed:	11/19/20	Data File:	011267-65.165
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	38.3
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp7-D-0-0.4	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-67
Date Analyzed:	11/19/20	Data File:	011267-67.166
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	106
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp-7-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-68 x5
Date Analyzed:	11/16/20	Data File:	011267-68 x5.130
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	302
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW1-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-70
Date Analyzed:	11/16/20	Data File:	011267-70.111
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	35.0
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW2-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-71
Date Analyzed:	11/16/20	Data File:	011267-71.112
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	15.4
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW3-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-72 x5
Date Analyzed:	11/16/20	Data File:	011267-72 x5.133
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	149
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW4-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-73 x10
Date Analyzed:	11/16/20	Data File:	011267-73 x10.134
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	1,680
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW5-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-74
Date Analyzed:	11/16/20	Data File:	011267-74.113
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	150
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW6-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-75
Date Analyzed:	11/16/20	Data File:	011267-75.114
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	234
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW7-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-76 x10
Date Analyzed:	11/17/20	Data File:	011267-76 x10.169
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	548
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW8-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-77
Date Analyzed:	11/16/20	Data File:	011267-77.116
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	6.76
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW9-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-78
Date Analyzed:	11/16/20	Data File:	011267-78.117
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	9.54
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW10-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-79
Date Analyzed:	11/16/20	Data File:	011267-79.118
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	7.24
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	B1-1.0-1.25	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-80
Date Analyzed:	11/16/20	Data File:	011267-80.121
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	3.65
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	B2-1.0-1.25	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-82
Date Analyzed:	11/16/20	Data File:	011267-82.122
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	5.70
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	B3-1.0-1.25	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-84
Date Analyzed:	11/16/20	Data File:	011267-84.123
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	6.73
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	B4-1.0-1.25	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-87 x5
Date Analyzed:	11/16/20	Data File:	011267-87 x5.127
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	547
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	B4-2.0-2.25	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	011267-88
Date Analyzed:	11/19/20	Data File:	011267-88.167
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	6.01
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	I0-707 mb
Date Analyzed:	11/16/20	Data File:	I0-707 mb.037
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	I0-708 mb
Date Analyzed:	11/16/20	Data File:	I0-708 mb.039
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	I0-724 mb
Date Analyzed:	11/19/20	Data File:	I0-724 mb.129
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/19/20	Lab ID:	I0-725 mb
Date Analyzed:	11/19/20	Data File:	I0-725 mb.136
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	I0-732 mb
Date Analyzed:	11/24/20	Data File:	I0-732 mb.120
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW1-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-70
Date Analyzed:	11/16/20	Data File:	011267-70.111
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Cadmium	0.458
Copper	47.6
Lead	36.1
Silver	<0.2 ca
Zinc	138

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW1-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-70 x0.5
Date Analyzed:	11/19/20	Data File:	011267-70 x0.5.087
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Silver	<0.1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW4-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-73
Date Analyzed:	11/16/20	Data File:	011267-73.067
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Cadmium	1.22 J
Copper	2,520 J ve
Lead	1,410 ve
Silver	0.870 J
Zinc	3,130 J ve

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW4-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-73 x10
Date Analyzed:	11/16/20	Data File:	011267-73 x10.134
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Cadmium	3.63
Copper	4,060
Zinc	4,930

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW4-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-73 x20
Date Analyzed:	11/23/20	Data File:	011267-73 x20.122
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Lead	2,470
Silver	<4



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW10-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-79
Date Analyzed:	11/16/20	Data File:	011267-79.118
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Cadmium	<0.5
Copper	24.8
Lead	15.3
Silver	<0.2 ca
Zinc	69.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	SW10-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-79 x0.5
Date Analyzed:	11/19/20	Data File:	011267-79 x0.5.093
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Silver	<0.1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	B1-1.0-1.25	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-80
Date Analyzed:	11/16/20	Data File:	011267-80.121
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Cadmium	<0.5
Copper	20.7
Lead	7.00
Silver	<0.2 ca
Zinc	40.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	B1-1.0-1.25	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	011267-80 x0.5
Date Analyzed:	11/19/20	Data File:	011267-80 x0.5.096
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Silver	<0.1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/16/20	Lab ID:	I0-707 mb x0.5
Date Analyzed:	11/19/20	Data File:	I0-707 mb x0.5.086
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Cadmium	<0.25
Copper	<2.5
Lead	<0.5
Silver	<0.1
Zinc	<2.5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20  
Date Received: 11/13/20  
Project: Cantera - TOC, F&BI 011267  
Date Extracted: 11/16/20  
Date Analyzed: 11/23/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL MERCURY  
USING EPA METHOD 1631E**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Total Mercury</u>
SW1-0.25-0.75 011267-70	0.064
SW4-0.25-0.75 011267-73	0.14
SW10-0.25-0.75 011267-79	<0.05
B1-1.0-1.25 011267-80	<0.05
Method Blank i0-707 MB	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	SW4-0.25-0.75	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	011267-73
Date Analyzed:	11/25/20	Data File:	011267-73.059
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Lead	1.13	5.0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	11/24/20	Lab ID:	I0-734 mb
Date Analyzed:	11/25/20	Data File:	I0-734 mb.045
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Lead	<1	5.0



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 011267-09 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	20.8	128 b	206 b	75-125	47 b
Cadmium	mg/kg (ppm)	10	<5	97	93	75-125	4
Copper	mg/kg (ppm)	50	73.0	95 b	131 b	75-125	32 b
Lead	mg/kg (ppm)	50	94.9	127 b	119 b	75-125	7 b
Silver	mg/kg (ppm)	10	<5	87	88	75-125	1
Zinc	mg/kg (ppm)	50	313	100 b	327 b	75-125	106 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	96	80-120
Cadmium	mg/kg (ppm)	10	98	80-120
Copper	mg/kg (ppm)	50	104	80-120
Lead	mg/kg (ppm)	50	99	80-120
Silver	mg/kg (ppm)	10	98	80-120
Zinc	mg/kg (ppm)	50	105	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 011267-09 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	20.8	128 b	206 b	75-125	47 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	96	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 011267-87 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	465	374 b	0 b	75-125	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	100	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 011267-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	8.35	78 b	129 b	75-125	49 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	92	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 011267-61 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	135	0 b	0 b	75-125	0 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	86	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 011259-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	4.77	115 b	294 b	75-125	88 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	90	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS  
OF SOIL SAMPLES FOR TOTAL MERCURY  
USING EPA METHOD 1631E**

Laboratory Code: 011267-09 1/20 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<1	79	99	71-125	22 vo

Laboratory Code: Laboratory Control Sample 1/20

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	93	68-125

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/02/20

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL/SOLID SAMPLES  
FOR TCLP METALS USING  
EPA METHODS 6020B AND 1311**

Laboratory Code: 011380-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	100	98	75-125	2
Lead	mg/L (ppm)	1.0	<1	87	85	75-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	98	80-120
Lead	mg/L (ppm)	1.0	87	80-120



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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 <sup>ME</sup> 11-13-20

DL4

Report To: <sup>MM/13</sup> Lynn Grochak ~~017867~~  
 Kristin Anderson 017867  
 Company: Floyd Smider  
 Address: 601 Union Street Suite 600  
 City, State, ZIP: Seattle, WA 98101  
 Phone: 206-292-2078 Email: <sup>lynn.grochak@floydsmider.com</sup> Lynn.Grochak@floydsmider.com  
 Kristin.Anderson@floydsmider.com

SAMPLERS (signature) *Coli Jay*

PROJECT NAME: CANTERA-TOC PO #: CANTERA-TOC

REMARKS: INVOICE TO

Project specific RLs? - Yes / No

Page # 1 of 9

TURNAROUND TIME

Standard turnaround  
 RUSH As only 2 day  
 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	Arsenic	TBT	Archive	Notes				
COMP1-A-0-0.5	01	11/13/20	9:45	Soil	1															
COMP1-A-0.5-1	02	}	9:46	}	1													24 hr TAT per KA 11/24/20		
COMP1-B-0-0.5	03		9:55		1														Notes ml	
COMP1-B-0.5-1	04		9:56		1														std TAT per KA 11/24/20	
<del>COMP1-C-0-0.5</del>	<del>05</del>																			
<del>COMP1-C-0.5-1</del>	<del>06</del>																			
COMP1-D-0-0.5	05				10:05	}	1													1-per KA
COMP1-D-0.5-1	06				10:06		1													11/18
COMP1-C-0-0.5	07				10:25		1													3-day TAT
COMP1-C-0.5-1	08		10:26	1																

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Kristin Anderson	FS	11/13/20	1721
Received by: <i>[Signature]</i>	Isaac Lessig	FBI	11/13/20	1720
Relinquished by:				
Received by:		Samples received at 3 °C		

SAMPLE CHAIN OF CUSTODY *MS* 11-13-20

014  
9

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

011267

SAMPLERS (signature) *G. G. G.*

PROJECT NAME CANTERA-TOC PO# \_\_\_\_\_

REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_

Project specific RLs? - Yes / No

Page # 2 of 9

TURNAROUND TIME  
 Standard turnaround  
 RUSH As only 2 day  
 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											Notes
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive		
COMP-1-0-0.5	09	11/13/20	10:30	soil	1									X	X		
COMP-1-0.5-1	10		10:31	}	1											X	
COMP2-A-0-0.5	11		1110		1									✓		X	
COMP2-A-0.5-1	12		1111		1											X	
COMP2-B-0-0.5	13		1035		1									✓		X	
COMP2-B-0.5-1	14		1036		1											X	
COMP2-C-0-0.5	15		1045		1									✓		X	
COMP2-C-0.5-1	16		1046		1									◆		X	
COMP2-D-0-0.5	17		1050		1									✓		X	
COMP2-D-0.5-1	18		1051	1											X		

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 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	<i>Kristin Anderson</i>	<i>RS</i>	<i>11/13/20</i>	<i>17:21</i>
Received by: <i>[Signature]</i>	<i>Isaac Lessig</i>	<i>RS</i>	<i>11/13/20</i>	<i>17:4</i>
Relinquished by:				
Received by:		Samples received at <u>3</u> °C		

SAMPLE CHAIN OF CUSTODY ME

11-13-20

01267

014

Page # 3 of 9

Report To See page 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

TURNAROUND TIME  
 Standard turnaround  
 RUSH See page 1  
 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										Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive			
COMP-2-0-0.5	19	11/13/20	1115	Soil	1								X	X				
COMP-2-0.5-1	20	}	1116	}	1											X		
COMP3-A-0-0.5	21		1140		1								✓				X	
COMP3-A-0.5-1	22		1141		1													X
COMP3-B-0-0.5	23		1125		1									✓				X
COMP3-B-0.5-1	24		1126		1													X
COMP3-C-0-0.5	25		1130		1										✓			X
COMP3-C-0.5-1	26		1131		1													X
COMP3-D-0-0.5	27		1135		1										✓			X
COMP3-D-0.5-1	28		1136		1													X

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristan Anderson	FB	11/13/20	17:21
<u>[Signature]</u>	Isabel Leasing	FB1	11/17/20	19:11
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Samples received at OC

011267

SAMPLE CHAIN OF CUSTODY *ME* 11-13-20

BF4

Page # 4 of 9

Report To See pg 1  
 Company Cloud/Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) <i>[Signature]</i>	
PROJECT NAME <u>CANTERA-TOC</u>	PO # <u>CANTERA-TOC</u>
REMARKS	INVOICE TO
Project specific RLs? - Yes / No	

TURNAROUND TIME <input type="checkbox"/> Standard turnaround <input checked="" type="checkbox"/> RUSH <i>only 2 day</i> Rush charges authorized by: _____
SAMPLE DISPOSAL <input checked="" type="checkbox"/> Archive samples <input type="checkbox"/> Other _____ Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED										Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive		
COMP-3-0-0.5	29	11/13/20	1145	soil	1									X	X		
COMP-3-0.5-1	30	}	1146	}	1											X	
COMP4-A-0-0.5	31		1230		1												X
COMP4-A-0.5-1	32		1231		1												X
COMP4-B-0-0.5	33		1236		1												X
COMP4-C-0-0.5	34		1240		1												X
COMP4-C-0.5-1	35		1241		1												X
COMP4-D-0-0.5	36		1235		1												X
COMP4-D-0.5-1	37		1236		1												X
COMP-4-0-0.5	38	✓	1240	↓	1									X	X		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Kristin Andersen	FS	11/13/20	1721
Received by: <i>[Signature]</i>	Becca Lessig	FS	11/13/20	1721
Relinquished by:				
Received by:			Samples received at	3 <sup>00</sup>

011267

SAMPLE CHAIN OF CUSTODY ME 11-13-20

B14

Page # 5 of 9

Report To See pg 1  
 Company Floyd Snyder  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO # CANTER-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

TURNAROUND TIME  
 Standard turnaround  
 RUSH AS ONLY 2 day  
 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										Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive			
COMP-4-0.5-1	39	11/13/20	1241	soil	1												X	
COMPS-A-0-0.5	40	}	1300	}	1												X	
COMPS-B-0-0.5	41		1305		1													X
COMPS-B-0.5-1	42		1306		1													X
COMPS-C-0-0.5	43		1310		1													X
COMPS-C-0.5-1	44		1311		1													X
COMPS-D-0-0.5	45		1315		1													X
COMPS-D-0.5-1	46		1316		1													X
COMP-5-0-0.5	47		1320		1										X	X		
COMP-5-0.5-1	48	1321	1													X		

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	FS	11/13/20	17:21
<u>[Signature]</u>	Isaac Lessig	FSI	11/17/20	17:01
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				
Samples received at <u>3</u> °C				

011267

SAMPLE CHAIN OF CUSTODY ME 4-13-20

BJP  
9

Page # 10 of 9

Report To See pg 1  
 Company Floyd/Smider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) <i>cdm</i>	
PROJECT NAME <u>CANTERA-TOC</u>	PO # <u>CANTERA-TOC</u>
REMARKS	INVOICE TO
Project specific RLs? - Yes / No	

TURNAROUND TIME <input type="checkbox"/> Standard turnaround <input checked="" type="checkbox"/> RUSH <u>As early as possible</u> Rush charges authorized by: _____
SAMPLE DISPOSAL <input checked="" type="checkbox"/> Archive samples <input type="checkbox"/> Other _____ Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED											Notes		
						NWTPH-Dx	NWTPH-Cx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive				
COMP6-A-0-0.5	49		1330		1													X	
COMP6-A-0.5-1	50		1331		1													X	
COMP6-B-0-0.5	51		1340		1													X	
COMP6-B-0.5-1	52		1341		1													X	
COMP6-C-0-0.5	53		1345		1													X	
COMP6-C-0.5-1	54		1346		1													X	
COMP6-C-0.5-1-D	55		1348		1													X	
COMP6-D-0-0.4	56		1350		1													X	
COMP6-D-0-0.4-D	57		1352		1													X	
COMP6-0-0.5	58		1355										X	X					

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<i>[Signature]</i>	Krish Anderson	FS	4/13/20	1721
<i>[Signature]</i>	Isaac Lessig	FB1	4/13/20	1721
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				
			Samples received at	3 °C

**SAMPLE CHAIN OF CUSTODY** *WB* 11-13-20

BEP  
9

Page # 7 of 9

Report To See page 1  
 Company Floyd/Snyder  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) <i>Calvin Jr</i>	
PROJECT NAME <u>CANTERA-TOC</u>	PO # <u>CANTERA-TOC</u>
REMARKS	INVOICE TO
Project specific RLs? - Yes / No	

TURNAROUND TIME <input type="checkbox"/> Standard turnaround <input checked="" type="checkbox"/> RUSH <u>AS SOON AS POSSIBLE</u> Rush charges authorized by: _____
SAMPLE DISPOSAL <input checked="" type="checkbox"/> Archive samples <input type="checkbox"/> Other _____ Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED											Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Arilene				
COMP-6-0.5-1	59	11/13/20	1357	Soil	1													X	
COMP-6-0.5-1-D	60	}	1358	}	1													X	
COMP7-A-0-0.5	66		1405		1														X
COMP7-A-0.5-1	62		1406		1														X
COMP7-B-0-0.5	63		1410		1														X
COMP7-B-0.5-1	64		1411		1														X
COMP7-C-0-0.5	65		1415		1														X
COMP7-C-0.5-1	66		1416		1														X
COMP7-D-0-0.4	67		1420		1														X
COMP7-0-0.5	68		1425		1														X X

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Kristin Anderson	FS	11/13/20	17:21
Received by: <i>[Signature]</i>	Isaac Lessig	FBI	11/13/20	17:21
Relinquished by:				
Received by:		Samples received at <u>3</u> °C		



SAMPLE CHAIN OF CUSTODY *ME* 11-13-20

011267

Report To See pg 1  
 Company Floyd/Smider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) <i>Cody J...</i>	
PROJECT NAME <u>CANTERA-TOC</u>	PO # <u>CANTERA-TOC</u>
REMARKS	INVOICE TO
Project specific RLs? - Yes / No	

TURNAROUND TIME

Standard turnaround  
 RUSH As with 2 day  
 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											Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	Cu, Cd, Pb, Ag, Zn	1/31 Hg	Archive		TCLP As/Pb	
COMP-7-0.5-1	69	11/13/20	1426	Soil	1														
SW1-0.25-0.75	70	}	1430	}	1								X	✓	✓				
SW2-0.25-0.75	71		1432		1								X						
SW3-0.25-0.75	72		1448		1								X						
SW4-0.25-0.75	73		1450		1								X	✓	✓				
SW5-0.25-0.75	74		1458		1								X						
SW6-0.25-0.75	75		1500		1								X						
SW7-0.25-0.75	76		1502		1								X						
SW8-0.25-0.75	77		1504		1								X						
SW9-0.25-0.75	78		1515		1								X						

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Kristin Anderson	FS	11/13/20	19:21
Received by: <i>[Signature]</i>	Isaac Lesse	FB1	11/13/20	17:24
Relinquished by:				
Received by:			Samples received at	3 <sup>00</sup>

Report To Kristin Anderson <sup>011267</sup>  
 Company Floyd/Smider  
 Address 601 Union Street Suite 600  
 City, State, ZIP Seattle, WA 98101  
 Phone 206-292-2988 Email Kristin.Anderson@floydsmider.com

SAMPLE CHAIN OF CUSTODY ME

11-13-20

DI4

Page # 9 of 9

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TAC PO # \_\_\_\_\_  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

TURNAROUND TIME  
 Standard turnaround  
 RUSH As only 2 day  
 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											Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCEs EPA 8082	Arsenic	Cr, Cd, Pb, Ag, Zn	1631 Hg	ARCHIVE		
SW10-0.25-0.75	79	11/13/20	1517	Soil	1									X	✓	✓		
B1-1.0-1.25	80	}	1535	}	1									X	✓	✓		
B1-2.0-2.25	81		1536		1													X
B2-1.0-1.25	82		1545		1									X				
B2-2.0-2.25	83		1547		1													X
B3-1.0-1.25	84		1550		1									X				
B3-2.0-2.25	85		1552		1													X
B3-2.0-2.25-D	86		1554		1													X
B4-1.0-1.25	87		1610		1									X				
B4-2.0-2.25	88	1612	1									✓				X		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Kristin Anderson	FS	11/13/20	1721
Received by: <u>[Signature]</u>	Isaac Lessig	FBI	11/13/20	1724
Relinquished by:				
Received by:			Samples received at	<u>3</u> °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

January 14, 2021

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the additional results from the testing of material submitted on November 13, 2020 from the Cantera - TOC, F&BI 011267 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures

c: Kristin Anderson  
FDS0114R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 13, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera - TOC, F&BI 011267 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -01	Comp1-A-0-0.5
011267 -02	Comp1-A-0.5-1
011267 -03	Comp1-B-0-0.5
011267 -04	Comp1-B-0.5-1
011267 -05	Comp1-D-0-0.5
011267 -06	Comp1-D-0.5-1
011267 -07	Comp1-C-0-0.5
011267 -08	Comp1-C-0.5-1
011267 -09	Comp-1-0-0.5
011267 -10	Comp-1-0.5-1
011267 -11	Comp2-A-0-0.5
011267 -12	Comp2-A-0.5-1
011267 -13	Comp2-B-0-0.5
011267 -14	Comp2-B-0.5-1
011267 -15	Comp2-C-0-0.5
011267 -16	Comp2-C-0.5-1
011267 -17	Comp2-D-0-0.5
011267 -18	Comp2-D-0.5-1
011267 -19	Comp-2-0-0.5
011267 -20	Comp-2-0.5-1
011267 -21	Comp3-A-0-0.5
011267 -22	Comp3-A-0.5-1
011267 -23	Comp3-B-0-0.5
011267 -24	Comp3-B-0.5-1
011267 -25	Comp3-C-0-0.5
011267 -26	Comp3-C-0.5-1
011267 -27	Comp3-D-0-0.5
011267 -28	Comp3-D-0.5-1
011267 -29	Comp-3-0-0.5
011267 -30	Comp-3-0.5-1
011267 -31	Comp4-A-0-0.5
011267 -32	Comp4-A-0.5-1
011267 -33	Comp4-B-0-0.4
011267 -34	Comp4-C-0-0.5
011267 -35	Comp4-C-0.5-1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (continued)

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -36	Comp4-D-0-0.5
011267 -37	Comp4-D-0.5-1
011267 -38	Comp-4-0-0.5
011267 -39	Comp-4-0.5-1
011267 -40	Comp5-A-0-0.5
011267 -41	Comp5-B-0-0.5
011267 -42	Comp5-B-0.5-1
011267 -43	Comp5-C-0-0.5
011267 -44	Comp5-C-0.5-1
011267 -45	Comp5-D-0-0.5
011267 -46	Comp5-D-0.5-1
011267 -47	Comp-5-0-0.5
011267 -48	Comp-5-0.5-1
011267 -49	Comp6-A-0-0.5
011267 -50	Comp6-A-0.5-1
011267 -51	Comp6-B-0-0.5
011267 -52	Comp6-B-0.5-1
011267 -53	Comp6-C-0-0.5
011267 -54	Comp6-C-0.5-1
011267 -55	Comp6-C-0.5-1-D
011267 -56	Comp6-D-0-0.4
011267 -57	Comp6-D-0-0.4-D
011267 -58	Comp-6-0-0.5
011267 -59	Comp-6-0.5-1
011267 -60	Comp-6-0.5-1-D
011267 -61	Comp7-A-0-0.5
011267 -62	Comp7-A-0.5-1
011267 -63	Comp7-B-0-0.5
011267 -64	Comp7-B-0.5-1
011267 -65	Comp7-C-0-0.5
011267 -66	Comp7-C-0.5-1
011267 -67	Comp7-D-0-0.4
011267 -68	Comp-7-0-0.5
011267 -69	Comp-7-0.5-1
011267 -70	SW1-0.25-0.75
011267 -71	SW2-0.25-0.75
011267 -72	SW3-0.25-0.75
011267 -73	SW4-0.25-0.75
011267 -74	SW5-0.25-0.75

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (continued)

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -75	SW6-0.25-0.75
011267 -76	SW7-0.25-0.75
011267 -77	SW8-0.25-0.75
011267 -78	SW9-0.25-0.75
011267 -79	SW10-0.25-0.75
011267 -80	B1-1.0-1.25
011267 -81	B1-2.0-2.25
011267 -82	B2-1.0-1.25
011267 -83	B2-2.0-2.25
011267 -84	B3-1.0-1.25
011267 -85	B3-2.0-2.25
011267 -86	B3-2.0-2.25-D
011267 -87	B4-1.0-1.25
011267 -88	B4-2.0-2.25

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp2-B-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/12/21	Lab ID:	011267-14
Date Analyzed:	01/12/21	Data File:	011267-14.118
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	2.07
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp7-C-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/12/21	Lab ID:	011267-66
Date Analyzed:	01/12/21	Data File:	011267-66.119
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	8.06
---------	------



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/12/21	Lab ID:	I1-15 mb2
Date Analyzed:	01/12/21	Data File:	I1-15 mb2.039
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	<1
---------	----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/14/21

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 101101-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	5.15	144 b	82 b	75-125	55 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	95	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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 <sup>11-13-20</sup>

Report To: <sup>MM/15</sup> Lynn Grochala ~~801767~~  
 Kristin Anderson 011267  
 Company: Floyd Smider  
 Address: 601 Union Street Suite 600  
 City, State, ZIP: Seattle, WA 98101  
 Phone: 206-292-2078 Email: <sup>lynn.grochala@floydsmider.com</sup> Kristin.Anderson@floydsmider.com

SAMPLERS (signature) *Coli Jy*

PROJECT NAME: CANTERA-TOC PO #: CANTERA-TOC

REMARKS: INVOICE TO

Project specific RLs? - Yes / No

Page # 1 of 9

TURNAROUND TIME  
 Standard turnaround  
 RUSH As only 2 day  
 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	ARSENIC	TBT	Archive	Notes			
COMP1-A-0-0.5	01	11/13/20	9:45	Soil	1														24 hr TAT per KA 11/24/20
COMP1-A-0.5-1	02		9:46		1														Notes MI
COMP1-B-0-0.5	03		9:55		1														std TAT per KA 11/16/20
COMP1-B-0.5-1	04		9:56		1														
<del>COMP1-C-0-0.5</del>	<del>05</del>																		1 per KA
<del>COMP1-C-0.5-1</del>	<del>06</del>																		11/18
COMP1-D-0-0.5	05		10:05		1														3-day TAT
COMP1-D-0.5-1	06		10:06		1														
COMP1-C-0-0.5	07		10:25		1														std TAT
COMP1-C-0.5-1	08		10:26		1														per KA 1/12/21

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Kristin Anderson	FS	11/13/20	1721
Received by: <i>[Signature]</i>	Isaac Lessig	FB1	11/13/20	1721
Relinquished by:				
Received by:		Samples received at	3	00

**SAMPLE CHAIN OF CUSTODY** *MB* 11-13-20

014  
9

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

011267

SAMPLERS (signature) <i>C. Snider</i>	
PROJECT NAME <u>CANTERA-TOC</u>	PO # <u>CANTERA-TOC</u>
REMARKS	INVOICE TO
Project specific RLs? - Yes / No	

Page # 2 of 9

**TURNAROUND TIME**  
 Standard turnaround  
 RUSH As only 2 day  
 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										Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive		
COMP-1-0-0.5	09	11/13/20	10:30	soil	1									X	X		
COMP-1-0.5-1	10		10:31	}	1												X
COMP2-A-0-0.5	11		11:10		1									✓			X
COMP2-A-0.5-1	12		11:11		1												X
COMP2-B-0-0.5	13		10:35		1									✓			X
COMP2-B-0.5-1	14		10:36		1									●			X
COMP2-C-0-0.5	15		10:45		1									✓			X
COMP2-C-0.5-1	16		10:46		1									◆			X
COMP2-D-0-0.5	17		10:50		1									✓			X
COMP2-D-0.5-1	18		10:51		1												X

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	<u>Kristin Anderson</u>	<u>RS</u>	<u>11/13/20</u>	<u>17:21</u>
Received by: <i>[Signature]</i>	<u>Leanne Leasing</u>	<u>RSB</u>	<u>11/13/20</u>	<u>17:14</u>
Relinquished by:				
Received by:		Samples received at <u>3</u> °C		

SAMPLE CHAIN OF CUSTODY ME

11-13-20

DI4

Report To See page 1  
 Company Hyd/ Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

01267

SAMPLERS (signature) Ali J...  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

Page # 3 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH See page 1  
 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											Notes			
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive					
COMP-2-0-0.5	19	11/13/20	1115	SOIL	1										X	X				
COMP-2-0.5-1	20	}	1116	}	1												X			
COMP3-A-0-0.5	21		1140		1									✓				X		
COMP3-A-0.5-1	22		1141		1														X	
COMP3-B-0-0.5	23		1125		1										✓				X	
COMP3-B-0.5-1	24		1126		1														X	
COMP3-C-0-0.5	25		1130		1											✓			X	
COMP3-C-0.5-1	26		1131		1														X	
COMP3-D-0-0.5	27		1135		1											✓			X	
COMP3-D-0.5-1	28	1136	1														X			

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	<u>Kristin Anderson</u>	<u>FB</u>	<u>11/13/20</u>	<u>17:21</u>
Received by: <u>[Signature]</u>	<u>Isaac Leberg</u>	<u>FB1</u>	<u>11/13/20</u>	<u>19:21</u>
Relinquished by:				
Received by:			Samples received at <u>B OC</u>	

011267

SAMPLE CHAIN OF CUSTODY ME 11-13-20

BT4

Report To See pg 1  
 Company Fluor/Smide  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO # CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

Page # 4 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH only 2 day  
 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										Notes				
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive					
COMP-3-0-0.5	29	11/13/20	1145	soil	1											X	X			
COMP-3-0.5-1	30	}	1146	}	1														X	
COMP4-A-0-0.5	31		1230		1												✓			X
COMP4-A-0.5-1	32		1231		1												■			X
COMP4-B-0-0.5	33		1236		1												✓			X
COMP4-C-0-0.5	34		1240		1												✓			X
COMP4-C-0.5-1	35		1241		1															X
COMP4-D-0-0.5	36		1235		1												✓			X
COMP4-D-0.5-1	37		1236		1															X
COMP-4-0-0.5	38		1240		1												X	X		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Kristin Anderson	FS	11/13/20	17:21
Received by: <u>[Signature]</u>	Jana Leary	FSB	11/13/20	17:21
Relinquished by: _____				
Received by: _____				

Samples received at 3 oc

011267

SAMPLE CHAIN OF CUSTODY ME 11-13-20

BE4

Report To See pg 1  
 Company Glynd/Snyder  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO # CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

Page # 5 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH AS ONLY 2 DAY  
 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										Notes			
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive				
COMP-4-0.5-1	39	11/13/20	1241	soil	1												X		
COMPS-A-0-0.5	40	}	1300	}	1												X		
COMPS-B-0-0.5	41		1305		1													X	
COMPS-B-0.5-1	42		1306		1													X	
COMPS-C-0-0.5	43		1310		1													X	
COMPS-C-0.5-1	44		1311		1													X	
COMPS-D-0-0.5	45		1315		1													X	
COMPS-D-0.5-1	46		1316		1													X	
COMP-5-0-0.5	47		1320		1									X	X				
COMP-5-0.5-1	48		1321		1													X	

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	FS	11/13/20	17:21
<u>[Signature]</u>	Isaac Lessing	FBI	11/13/20	17:41
Relinquished by:				
Received by:				
Relinquished by:				
Received by:		Samples received at	3	0



SAMPLE CHAIN OF CUSTODY ME

11-13-20

BJ4  
9

Report To See pg 1  
 Company Floyd/Sluder  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

Page # 10 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH Asstly Adv  
 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											Notes		
						NWTPH-Dx	NWTPH-Cx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive				
COMP6-A-0-0.5	49		1330		1													X	
COMP6-A-0.5-1	50		1331		1													X	
COMP6-B-0-0.5	51		1340		1													X	
COMP6-B-0.5-1	52		1341		1													X	
COMP6-C-0-0.5	53		1345		1													X	
COMP6-C-0.5-1	54		1346		1													X	
COMP6-C-0.5-1-D	55		1348		1													X	
COMP6-D-0-0.4	56		1350		1													X	
COMP6-D-0-0.4-D	57		1352		1													X	
COMP6-0-0.6.5	58		1355										X	X					

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Krishn Anderson	FS	11/13/20	1721
Received by: <u>[Signature]</u>	Isaac Lessig	FSI	11/13/20	1721
Relinquished by:				
Received by:			Samples received at	3 °C

**SAMPLE CHAIN OF CUSTODY** *ME* 11-13-20 BI4  
9

Report To See page 1  
 Company Floyd/Snyder  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) *[Signature]*

PROJECT NAME CANTERA-TOC PO # CANTERA-TOC

REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_

Project specific RLs? - Yes / No \_\_\_\_\_

Page # 7 of 9

**TURNAROUND TIME**  
 Standard turnaround  
 RUSH As early as possible  
 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											Notes		
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Ascaride				
COMP-6-0.5-1	59	11/13/20	1357	Soil	1													X	
COMP-6-0.5-1-D	60	}	1358	}	1													X	
COMP7-A-0-0.5	66		1405		1									✓				X	
COMP7-A-0.5-1	62		1406		1									◆					X
COMP7-B-0-0.5	63		1410		1									✓					X
COMP7-B-0.5-1	64		1411		1									◆					X
COMP7-C-0-0.5	65		1415		1									✓					X
COMP7-C-0.5-1	66		1416		1									●					X
COMP7-D-0-0.4	67		1420		1									✓					X
COMP-7-0-0.5	68	↓	1425	↓	1								X	X					

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Kristin Anderson	FS	11/13/20	17:21
Received by: <i>[Signature]</i>	Isaac Lassig	FBI	11/13/20	17:21
Relinquished by: _____				
Received by: _____		Samples received at	3	00

**SAMPLE CHAIN OF CUSTODY** *inc 11-13-20*

014

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) <i>C. Snider</i>	
PROJECT NAME <u>CANTERA-TOC</u>	PO # <u>CANTERA-TOC</u>
REMARKS <u>Project specific RLe? - Yes / No</u>	INVOICE TO

Page # 8 of 9

**TURNAROUND TIME**  
 Standard turnaround  
 RUSH As only 2 day  
 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											Notes					
						NWTFH-Dx	NWTFH-Gx	ETEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Asbestos	Cu, Cd, Pb, Ag, Zn	16, 17, Hg	Archive		TCLP As Pb				
COMP-7-0.5-1	69	11/13/20	1426	Soil	1																	
SW1-0.25-0.75	70	}	1430	}	1									X	✓	✓				X		
SW2-0.25-0.75	71		1432		1										X							
SW3-0.25-0.75	72		1448		1										X							
SW4-0.25-0.75	73		1450		1										X	✓	✓					
SW5-0.25-0.75	74		1458		1										X							
SW6-0.25-0.75	75		1500		1										X							
SW7-0.25-0.75	76		1502		1										X							
SW8-0.25-0.75	77		1504		1										X							
SW9-0.25-0.75	78		1515		1										X							

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	<u>Kristin Anderson</u>	<u>FS</u>	<u>11/13/20</u>	<u>1921</u>
Received by: <i>[Signature]</i>	<u>Isaac Leroy</u>	<u>FB1</u>	<u>11/13/20</u>	<u>17:24</u>
Relinquished by:				
Received by:			Samples received at <u>3</u> °C	

SAMPLE CHAIN OF CUSTODY ME

11-13-20

014

Report To Kristin Anderson <sup>011267</sup>  
 Company Floyd Smider  
 Address 601 Union Street Suite 600  
 City, State, ZIP Seattle, WA 98101  
 Phone 206-292-2588 Email Kristin.Anderson@FloydSmider.com

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA - TOC PO # \_\_\_\_\_  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

Page # 9 of 9  
**TURNAROUND TIME**  
 Standard turnaround  
 RUSH As only 2 day  
 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											Notes		
						NWTPH-Dx	NWTPH-Gx	ETEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	Cd, Cr, Pb, Ag, Zn	1631 Hg	Archive			
SW10-0.25-0.75	79	11/13/20	1517	Soil	1										X	✓	✓		
B1-1.0-1.25	80	}	1535	}	1										X	✓	✓		
B1-2.0-2.25	81		1536		1														X
B2-1.0-1.25	82		1545		1											X			
B2-2.0-2.25	83		1547		1														X
B3-1.0-1.25	84		1550		1											X			
B3-2.0-2.25	85		1552		1														X
B3-2.0-2.25-D	86		1554		1														X
B4-1.0-1.25	87		1610		1											X			
B4-2.0-2.25	88		1612		1											✓			X

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Kristin Anderson	FS	11/13/20	1721
Received by: <u>[Signature]</u>	Isaac Lessig	FBI	11/13/20	1724
Relinquished by:				
Received by:			Samples received at	<u>3</u> °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

February 2, 2021

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the additional results from the testing of material submitted on November 13, 2020 from the Cantera - TOC, F&BI 011267 project. There are 13 pages included in this report.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures

c: Kristin Anderson  
FDS0202R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 13, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera - TOC, F&BI 011267 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -01	Comp1-A-0-0.5
011267 -02	Comp1-A-0.5-1
011267 -03	Comp1-B-0-0.5
011267 -04	Comp1-B-0.5-1
011267 -05	Comp1-D-0-0.5
011267 -06	Comp1-D-0.5-1
011267 -07	Comp1-C-0-0.5
011267 -08	Comp1-C-0.5-1
011267 -09	Comp-1-0-0.5
011267 -10	Comp-1-0.5-1
011267 -11	Comp2-A-0-0.5
011267 -12	Comp2-A-0.5-1
011267 -13	Comp2-B-0-0.5
011267 -14	Comp2-B-0.5-1
011267 -15	Comp2-C-0-0.5
011267 -16	Comp2-C-0.5-1
011267 -17	Comp2-D-0-0.5
011267 -18	Comp2-D-0.5-1
011267 -19	Comp-2-0-0.5
011267 -20	Comp-2-0.5-1
011267 -21	Comp3-A-0-0.5
011267 -22	Comp3-A-0.5-1
011267 -23	Comp3-B-0-0.5
011267 -24	Comp3-B-0.5-1
011267 -25	Comp3-C-0-0.5
011267 -26	Comp3-C-0.5-1
011267 -27	Comp3-D-0-0.5
011267 -28	Comp3-D-0.5-1
011267 -29	Comp-3-0-0.5
011267 -30	Comp-3-0.5-1
011267 -31	Comp4-A-0-0.5
011267 -32	Comp4-A-0.5-1
011267 -33	Comp4-B-0-0.4
011267 -34	Comp4-C-0-0.5
011267 -35	Comp4-C-0.5-1

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (continued)

011267 -36	Comp4-D-0-0.5
011267 -37	Comp4-D-0.5-1
011267 -38	Comp-4-0-0.5
011267 -39	Comp-4-0.5-1
011267 -40	Comp5-A-0-0.5
011267 -41	Comp5-B-0-0.5
011267 -42	Comp5-B-0.5-1
011267 -43	Comp5-C-0-0.5
011267 -44	Comp5-C-0.5-1
011267 -45	Comp5-D-0-0.5
011267 -46	Comp5-D-0.5-1
011267 -47	Comp-5-0-0.5
011267 -48	Comp-5-0.5-1
011267 -49	Comp6-A-0-0.5
011267 -50	Comp6-A-0.5-1
011267 -51	Comp6-B-0-0.5
011267 -52	Comp6-B-0.5-1
011267 -53	Comp6-C-0-0.5
011267 -54	Comp6-C-0.5-1
011267 -55	Comp6-C-0.5-1-D
011267 -56	Comp6-D-0-0.4
011267 -57	Comp6-D-0-0.4-D
011267 -58	Comp-6-0-0.5
011267 -59	Comp-6-0.5-1
011267 -60	Comp-6-0.5-1-D
011267 -61	Comp7-A-0-0.5
011267 -62	Comp7-A-0.5-1
011267 -63	Comp7-B-0-0.5
011267 -64	Comp7-B-0.5-1
011267 -65	Comp7-C-0-0.5
011267 -66	Comp7-C-0.5-1
011267 -67	Comp7-D-0-0.4
011267 -68	Comp-7-0-0.5
011267 -69	Comp-7-0.5-1
011267 -70	SW1-0.25-0.75
011267 -71	SW2-0.25-0.75
011267 -72	SW3-0.25-0.75
011267 -73	SW4-0.25-0.75
011267 -74	SW5-0.25-0.75
011267 -75	SW6-0.25-0.75

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (continued)

011267 -76	SW7-0.25-0.75
011267 -77	SW8-0.25-0.75
011267 -78	SW9-0.25-0.75
011267 -79	SW10-0.25-0.75
011267 -80	B1-1.0-1.25
011267 -81	B1-2.0-2.25
011267 -82	B2-1.0-1.25
011267 -83	B2-2.0-2.25
011267 -84	B3-1.0-1.25
011267 -85	B3-2.0-2.25
011267 -86	B3-2.0-2.25-D
011267 -87	B4-1.0-1.25
011267 -88	B4-2.0-2.25

All quality control requirements were acceptable.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp1-B-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	011267-04
Date Analyzed:	01/28/21	Data File:	011267-04.053
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	11.5
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp1-C-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	011267-08
Date Analyzed:	01/28/21	Data File:	011267-08.054
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	6.41
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp2-A-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	011267-12
Date Analyzed:	01/28/21	Data File:	011267-12.057
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	3.54
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp3-A-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/21	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	011267-22
Date Analyzed:	01/28/21	Data File:	011267-22.060
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	4.59
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp3-B-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	011267-24
Date Analyzed:	01/28/21	Data File:	011267-24.061
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	3.43
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp5-B-0.5-1	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	011267-42
Date Analyzed:	01/28/21	Data File:	011267-42.062
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	8.68
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp6-D-0-0.4	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	011267-56
Date Analyzed:	01/28/21	Data File:	011267-56.063
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	1.07
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	01/28/21	Lab ID:	I1-53 mb
Date Analyzed:	01/28/21	Data File:	I1-53 mb.051
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	<1
---------	----



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/02/20

Date Received: 11/13/21

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 011267-12 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	<5	93	96	75-125	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	89	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.

Report to: <sup>MM/15</sup> ~~Kristin Anderson~~ <sup>Krishna Grochak</sup> ~~011267~~ <sup>011267</sup>  
 Company: ~~Cloyd Smider~~  
 Address: ~~601 Union Street Suite 600~~  
 City, State, ZIP: ~~Seattle, WA 98101~~  
 Phone: ~~206-292-2070~~ Email: ~~Kristin.Anderson@claydsmider.com~~ <sup>krishna.grochak@claydsmider.com</sup>

SAMPLE CHAIN OF CUSTODY <sup>ME</sup> 11-13-20

DL4

SAMPLERS (signature) *Coli Jay*

PROJECT NAME: CANTERA-TOC PO #: CANTERA-TOC

REMARKS: \_\_\_\_\_ INVOICE TO: \_\_\_\_\_

Project specific RLs? - Yes / No

Page # 1 of 9

TURNAROUND TIME  
 Standard turnaround  
 RUSH As only 2 day  
 Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Archive samples  
 Other \_\_\_\_\_  
 Default: Dispose after 90 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED														
						NWTPH-DX	NWTPH-CX	ETEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive	Notes				
COMP1-A-0-0.5	01	11/13/20	9:45	Soil	1													24 hr TAT per KA 11/24/20 Notes per KA 11/24/20		
COMP2-A-0.5-1	02	}	9:40	}	1													for additional		
COMP2-B-0-0.5	03		9:55		1														metal analysis	
COMP2-B-0.5-1	04		9:56		1														⊗ per KA 11/24/20 MC	
<del>COMP2-C-0-0.5</del>	<del>05</del>																			1 per KA
<del>COMP2-C-0.5-1</del>	<del>06</del>																			11/18
COMP2-D-0-0.5	05				10:05		1													3-day TAT
COMP2-D-0.5-1	06				10:06		1													3-day TAT
COMP2-C-0-0.5	07				10:25		1													3-day TAT
COMP2-C-0.5-1	08		10:26		1													per KA 11/24/20		

Friedman & Bruza, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<i>[Signature]</i>	Krishna Anderson	FS	11/13/20	1721
<i>[Signature]</i>	Sara Lessig	FSI	11/13/20	1721
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Samples received at 3 °C

SAMPLE CHAIN OF CUSTODY <sup>MS</sup> 11-13-20

014

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

011267

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

Page # 2 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH As early as day  
 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											Notes	
						NWTPH-Dx	NWTPH-Cx	BTX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive			
COMP-1-0-0.5	09	11/13/20	10:30	soil	1										X	X		
COMP-1-0.5-1	10		10:31	}	1												X	
COMP2-A-0-0.5	11		1110		1										✓		X	
COMP2-A-0.5-1	12		1111		1										⊗		X	
COMP2-B-0-0.5	13		1035		1										✓		X	
COMP2-B-0.5-1	14		1036		1										●		X	
COMP2-C-0-0.5	15		1045		1										✓		X	
COMP2-C-0.5-1	16		1046		1										◆		X	
COMP2-D-0-0.5	17		1050		1										✓		X	
COMP2-D-0.5-1	18		1051		1												X	

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Kristin Anderson	FS	11/13/20	17:21
Received by: <u>[Signature]</u>	Isaac Leary	FSI	11/13/20	17:31
Relinquished by: _____				
Received by: _____		Samples received at	3 °C	

Report To See page 1  
 Company Floyd/Snyder  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

011267

SAMPLE CHAIN OF CUSTODY ME 11-13-20

DI4

SAMPLERS (signature) W. J. [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

Page # 3 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH See page 1  
 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										Notes			
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	AsRAIC	TBT	Archive				
COMP-2-0-0.5	19	11/13/20	1115	Soil	1											X	X		
COMP-2-0.5-1	20	}	1116	}	1													X	
COMP3-A-0-0.5	21		1140		1												✓		X
COMP3-A-0.5-1	22		1141		1												⊗		X
COMP3-B-0-0.5	23		1125		1												✓		X
COMP3-B-0.5-1	24		1126		1												⊗		X
COMP3-C-0-0.5	25		1130		1												✓		X
COMP3-C-0.5-1	26		1131		1														X
COMP3-D-0-0.5	27		1135		1												✓		X
COMP3-D-0.5-1	28		1136		1														X

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristen Andersen	FS	11/13/20	17:21
<u>[Signature]</u>	Leslie Lesbig	FSI	11/13/20	19:21
Relinquished by:			Samples received at <u>9</u> oc	

011267

SAMPLE CHAIN OF CUSTODY ME 11-13-20

BF4

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO # CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

Page # 4 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH only 2 day  
 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										Notes		
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Axenic	TBT	Archive			
COMP-3-0-0.5	29	11/13/20	1145	soil	1									X	X			
COMP-3-0.5-1	30	}	1146	}	1												X	
COMP4-A-0-0.5	31		1230		1													X
COMP4-A-0.5-1	32		1231		1													X
COMP4-B-0-0.5	33		1236		1													X
COMP4-C-0-0.5	34		1240		1													X
COMP4-C-0.5-1	35		1241		1													X
COMP4-D-0-0.5	36		1235		1													X
COMP4-D-0.5-1	37		1236		1													X
COMP-4-0-0.5	38	1240	1											X	X			

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	FS	11/13/20	1721
<u>[Signature]</u>	Grace Lashly	FSI	11/13/20	1721
Received by:			Samples received at	3 oc

824

SAMPLE CHAIN OF CUSTODY ME 11-13-20

011267

Page # 6 of 9

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

TURNAROUND TIME  
 Standard turnaround  
 RUSH AS ONLY 3 DAY  
 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										Notes		
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive			
COMP-4-0.5-1	39	11/13/20	1241	soil	1												X	
COMP5-A-0-0.5	40	}	1300	}	1												X	
COMP5-B-0-0.5	41		1305		1													X
COMP5-B-0.5-1	42		1306		1													X
COMP5-C-0-0.5	43		1310		1													X
COMP5-C-0.5-1	44		1311		1													X
COMP5-D-0-0.5	45		1315		1													X
COMP5-D-0.5-1	46		1316		1													X
COMP-5-0-0.5	47		1320		1													X
COMP-5-0.5-1	48	1321	1													X		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Adrison	FS	11/13/20	17:21
<u>[Signature]</u>	Carol Lesberg	FBI	11/18/20	17:01
Received by:		Samples received at 3:00		

SAMPLE CHAIN OF CUSTODY ME

11-13-20

BIQ  
9

Report To See pg 1  
 Company Floyd/Smider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

011267

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

Page # 6 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH As early as possible  
 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											Notes		
						NWTFH-Dx	NWTFH-Cx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive				
COMP6-A-D-0.5	49		1330		1													X	
COMP6-A-0.5-1	50		1331		1													X	
COMP6-B-D-0.5	51		1340		1													X	
COMP6-B-0.5-1	52		1341		1													X	
COMP6-C-0-0.5	53		1345		1													X	
COMP6-C-0.5-1	54		1346		1													X	
COMP6-C-0.5-1-D	55		1348		1													X	
COMP6-D-0-0.4	56		1350		1													X	
COMP6-D-0-0.4-D	57		1352		1													X	
COMP6-0-0.5	58		1355												X	X			

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	FS	11/13/20	1721
<u>[Signature]</u>	Isaac Lessig	FSI	11/13/20	1721
Received by:			Samples received at <u>3</u> °C	



SAMPLE CHAIN OF CUSTODY *W/E* 11-13-20

BEY 9

Report To See page 1  
 Company Floyd/Smider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

01267

SAMPLERS (signature) *Colin J...*  
 PROJECT NAME CANTERA-TOC PO # CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No

Page # 7 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH As early as possible  
 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											Notes	
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8032	Arsenic	TBT	Archive			
COMP-6-0.5-1	59	11/13/20	1357	Soil	1													X
COMP-6-0.5-1-D	60	}	1358	}	1													X
COMP7-A-0-0.5	66		1405		1									✓				X
COMP7-A-0.5-1	62		1406		1									◆				X
COMP7-B-0-0.5	63		1410		1									✓				X
COMP7-B-0.5-1	64		1411		1									◆				X
COMP7-C-0-0.5	65		1415		1									✓				X
COMP7-C-0.5-1	66		1416		1									●				X
COMP7-D-0-0.4	67		1420		1									✓				X
COMP7-0-0.5	68		1425		1									X	X			

Friedman & Bruya, Inc.  
 2012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<i>[Signature]</i>	Kristin Anderson	FS	11/13/20	17:21
<i>[Signature]</i>	Isaac Lessig	FBI	11/13/20	17:21
Received by:		Samples received at 3:00		



Report To Kristin Anderson <sup>011267</sup>  
 Company Playd/Smider  
 Address 600 Union Street Suite 600  
 City, State, ZIP Seattle, WA 98101  
 Phone 206-292-2988 Email Kristin.Anderson@Playd.com

SAMPLE CHAIN OF CUSTODY ME 11-13-20

Page # 9 of 9 DI4

SAMPLERS (signature) <u>[Signature]</u>	
PROJECT NAME <u>CANTERA-TCC</u>	PO #
REMARKS	INVOICE TO
Project specific RIs? - Yes / No	

TURNAROUND TIME <input type="checkbox"/> Standard turnaround <input checked="" type="checkbox"/> RUSH As only 2 day Rush charges authorized by:
SAMPLE DISPOSAL <input checked="" type="checkbox"/> Archive samples <input type="checkbox"/> Other Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED											Notes		
						NWTPH-Dx	NWTPH-Gx	ETEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Americ	Cr, Cd, Pb, Ag, Zn	1621 1631	Archive			
SW10-0.25-0.75	79	11/13/20	1517	soil	1									X	✓	✓			
B1-1.0-1.25	80	}	1535	}	1									X	✓	✓			
B1-2.0-2.25	81		1536		1													X	
B2-1.0-1.25	82		1545		1										X				
B2-2.0-2.25	83		1547		1													X	
B3-1.0-1.25	84		1550		1										X				
B3-2.0-2.25	85		1552		1													X	
B3-2.0-2.25-D	86		1554		1													X	
B4-1.0-1.25	87		1610		1										X				
B4-2.0-2.25	88	1612	1										X	✓		X			

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Ph. (206) 285-8282	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
	Relinquished by: <u>[Signature]</u>	Kristin Anderson	FS	11/13/20	1721
	Received by: <u>[Signature]</u>	Isaac Lessig	FSI	11/13/20	1724
	Relinquished by:				
Received by:			Samples received at	3	0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

March 16, 2021

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the additional results from the testing of material submitted on November 13, 2020 from the Cantera - TOC, F&BI 011267 project. There are 7 pages included in this report.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures

c: Kristin Anderson  
FDS0316R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 13, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera - TOC, F&BI 011267 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -01	Comp1-A-0-0.5
011267 -02	Comp1-A-0.5-1
011267 -03	Comp1-B-0-0.5
011267 -04	Comp1-B-0.5-1
011267 -05	Comp1-D-0-0.5
011267 -06	Comp1-D-0.5-1
011267 -07	Comp1-C-0-0.5
011267 -08	Comp1-C-0.5-1
011267 -09	Comp-1-0-0.5
011267 -10	Comp-1-0.5-1
011267 -11	Comp2-A-0-0.5
011267 -12	Comp2-A-0.5-1
011267 -13	Comp2-B-0-0.5
011267 -14	Comp2-B-0.5-1
011267 -15	Comp2-C-0-0.5
011267 -16	Comp2-C-0.5-1
011267 -17	Comp2-D-0-0.5
011267 -18	Comp2-D-0.5-1
011267 -19	Comp-2-0-0.5
011267 -20	Comp-2-0.5-1
011267 -21	Comp3-A-0-0.5
011267 -22	Comp3-A-0.5-1
011267 -23	Comp3-B-0-0.5
011267 -24	Comp3-B-0.5-1
011267 -25	Comp3-C-0-0.5
011267 -26	Comp3-C-0.5-1
011267 -27	Comp3-D-0-0.5
011267 -28	Comp3-D-0.5-1
011267 -29	Comp-3-0-0.5
011267 -30	Comp-3-0.5-1
011267 -31	Comp4-A-0-0.5
011267 -32	Comp4-A-0.5-1
011267 -33	Comp4-B-0-0.4
011267 -34	Comp4-C-0-0.5
011267 -35	Comp4-C-0.5-1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (Continued)

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -36	Comp4-D-0-0.5
011267 -37	Comp4-D-0.5-1
011267 -38	Comp-4-0-0.5
011267 -39	Comp-4-0.5-1
011267 -40	Comp5-A-0-0.5
011267 -41	Comp5-B-0-0.5
011267 -42	Comp5-B-0.5-1
011267 -43	Comp5-C-0-0.5
011267 -44	Comp5-C-0.5-1
011267 -45	Comp5-D-0-0.5
011267 -46	Comp5-D-0.5-1
011267 -47	Comp-5-0-0.5
011267 -48	Comp-5-0.5-1
011267 -49	Comp6-A-0-0.5
011267 -50	Comp6-A-0.5-1
011267 -51	Comp6-B-0-0.5
011267 -52	Comp6-B-0.5-1
011267 -53	Comp6-C-0-0.5
011267 -54	Comp6-C-0.5-1
011267 -55	Comp6-C-0.5-1-D
011267 -56	Comp6-D-0-0.4
011267 -57	Comp6-D-0-0.4-D
011267 -58	Comp-6-0-0.5
011267 -59	Comp-6-0.5-1
011267 -60	Comp-6-0.5-1-D
011267 -61	Comp7-A-0-0.5
011267 -62	Comp7-A-0.5-1
011267 -63	Comp7-B-0-0.5
011267 -64	Comp7-B-0.5-1
011267 -65	Comp7-C-0-0.5
011267 -66	Comp7-C-0.5-1
011267 -67	Comp7-D-0-0.4
011267 -68	Comp-7-0-0.5
011267 -69	Comp-7-0.5-1
011267 -70	SW1-0.25-0.75

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE (Continued)

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011267 -71	SW2-0.25-0.75
011267 -72	SW3-0.25-0.75
011267 -73	SW4-0.25-0.75
011267 -74	SW5-0.25-0.75
011267 -75	SW6-0.25-0.75
011267 -76	SW7-0.25-0.75
011267 -77	SW8-0.25-0.75
011267 -78	SW9-0.25-0.75
011267 -79	SW10-0.25-0.75
011267 -80	B1-1.0-1.25
011267 -81	B1-2.0-2.25
011267 -82	B2-1.0-1.25
011267 -83	B2-2.0-2.25
011267 -84	B3-1.0-1.25
011267 -85	B3-2.0-2.25
011267 -86	B3-2.0-2.25-D
011267 -87	B4-1.0-1.25
011267 -88	B4-2.0-2.25

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Comp6-A-0-0.5	Client:	Floyd-Snider
Date Received:	11/13/20	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	03/12/21	Lab ID:	011267-49
Date Analyzed:	03/12/21	Data File:	011267-49.058
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	5.77
---------	------



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera - TOC, F&BI 011267
Date Extracted:	03/12/21	Lab ID:	I1-162 mb
Date Analyzed:	03/12/21	Data File:	I1-162 mb.035
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	<1
---------	----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/21

Date Received: 11/13/20

Project: Cantera - TOC, F&BI 011267

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

Laboratory Code: 103188-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	7.49	116 b	127 b	75-125	9 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	96	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.

Report to: <sup>NK/AS</sup> ~~Erin Anderson~~ <sup>Erin Anderson</sup> 011267  
 Company: ~~Erin Anderson~~ <sup>Clyde Snider</sup>  
 Address: ~~1212 Union Street Suite 600~~  
 City, State, ZIP: ~~Seattle, WA 98101~~  
 Phone: ~~206-292-2078~~ <sup>206-292-2078</sup> Email: ~~Erin.Anderson@fryman.com~~ <sup>Krisin.Anderson@fryman.com</sup>

SAMPLE CHAIN OF CUSTODY <sup>ME</sup> 11-13-20

P14

SAMPLERS (signature) *[Signature]*  
 PROJECT NAME: CANTERA-TOC PO #: CANTERA-TOC  
 REMARKS: \_\_\_\_\_ INVOICE TO: \_\_\_\_\_  
 Project specific RIs? - Yes / No

Page # 1 of 9  
**TURNAROUND TIME**  
 Standard turnaround  
 RUSH As only 2 day  
 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											
						NWTFH-Dx	NWTFH-Gx	BTX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive	Notes	
COMP1-A-0-0.5	01	11/13/20	9:45	Soil	1												
COMP1-A-0.5-1	02		9:46		1												
COMP1-B-0-0.5	03		9:55		1												
COMP1-B-0.5-1	04		9:56		1												
<del>COMP1-C-0-0.5</del>	<del>05</del>																
<del>COMP1-C-0.5-1</del>	<del>06</del>																
COMP1-D-0-0.5	05		10:05		1												
COMP1-D-0.5-1	06		10:06		1												
COMP1-C-0-0.5	07		10:25		1												
COMP1-C-0.5-1	08		10:26		1												

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-3232

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<i>[Signature]</i>	Krisin Anderson	FS	11/13/20	17:21
<i>[Signature]</i>	Sara Lesing	FSI	11/13/20	17:21
Received by:				
Received by:				

Samples received at 3 0

SAMPLE CHAIN OF CUSTODY <sup>011267</sup> 11-13-20

014  
9

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA - TOC PO# CANTERA - TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

Page # 2 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH As early as day  
 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										Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-EGID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8032	Arsenic	TBT	Archive		
COMP-1-0-0.5	09	11/13/20	10:30	soil	1									X	X		
COMP-1-0.5-1	10		10:31	}	1												X
COMP2-A-0-0.5	11		1110		1									✓			X
COMP2-A-0.5-1	12		1111		1									⊗			X
COMP2-B-0-0.5	13		1035		1									✓			X
COMP2-B-0.5-1	14		1036		1									●			X
COMP2-C-0-0.5	15		1045		1									✓			X
COMP2-C-0.5-1	16		1046		1									◆			X
COMP2-D-0-0.5	17		1050		1									✓			X
COMP2-D-0.5-1	18		1051		1									✓			X

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	RS	11/13/20	17:21
<u>[Signature]</u>	Loael Leary	RSI	11/17/20	17:44
Relinquished by:				
Received by:				
Relinquished by:				
Received by:		Samples received at	3 °C	

Report To See page 1  
 Company Elysd/Spider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

01267

SAMPLE CHAIN OF CUSTODY MVE 11-13-20

Page # 3 of 9

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

TURNAROUND TIME  
 Standard turnaround  
 RUSH See page 1  
 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										Notes	
						NWTPH-Dx	NWTPH-Gx	ETEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive		
COMP-2-0-0.5	19	11/13/20	1115	Soil	1									X	X		
COMP-2-0.5-1	20	}	1116	}	1											X	
COMP3-A-0-0.5	21		1146		1												X
COMP3-A-0.5-1	22		1141		1												X
COMP3-B-0-0.5	23		1125		1												X
COMP3-B-0.5-1	24		1126		1												X
COMP3-C-0-0.5	25		1130		1												X
COMP3-C-0.5-1	26		1131		1												X
COMP3-D-0-0.5	27		1135		1												X
COMP3-D-0.5-1	28		1136		1												X

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	FS	11/13/20	17:21
<u>[Signature]</u>	Gene Leasing	FSI	11/13/20	19:01
Received by:		Samples received at <u>3</u> oc		

011267

SAMPLE CHAIN OF CUSTODY M8 11-13-20

BF4

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOC PO# CANTERA-TOC  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RIs? - Yes / No

Page # 4 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH 5 day  
 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										Notes
						NWTFH-Dx	NWTFH-Gx	BTEX EPA 8021	NWTFH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Archive	
COMP-3-0-0.5	29	11/13/20	1145	soil	1								X	X		
COMP-3-0.5-1	30		1146		1											X
COMP4-A-0-0.5	31		1230		1								✓			X
COMP4-A-0.5-1	32		1231		1								■			X
COMP4-B-0-0.5	33		1236		1								✓			X
COMP4-C-0-0.5	34		1240		1								✓			X
COMP4-C-0.5-1	35		1241		1											X
COMP4-D-0-0.5	36		1235		1								✓			X
COMP4-D-0.5-1	37		1236		1											X
COMP-4-0-0.5	38	✓	1240	↓	1								X	X		

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 235-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	FS	11/13/20	11:21
<u>[Signature]</u>	Jana Leary	FS	11/13/20	12:21
Received by:				Samples received at <u>3:00</u>

Report To See pg 1  
 Company Floyd Snider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

011267

SAMPLE CHAIN OF CUSTODY ME 11-13-20

024

Page # 5 of 9

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA-TOL PQ# CANTERA-TOL  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
 Project specific RLs? - Yes / No \_\_\_\_\_

TURNAROUND TIME  
 Standard turnaround  
 RUSH AS ONLY 1 DAY  
 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											Notes	
						NWTEL-DX	NWTEL-CX	BTEX EPA 8021	NWTEL-HO/D	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Asapic	TBT	Archive			
CAMP-4-0.5-1	39	11/13/20	1241	soil	1													X
COMPS-A-0-0.5	40	}	1300	}	1								✓				X	
COMPS-B-0-0.5	41		1305		1								✓					X
COMPS-B-0.5-1	42		1306		1								⊗					X
COMPS-C-0-0.5	43		1310		1								✓					X
COMPS-C-0.5-1	44		1311		1													X
COMPS-D-0-0.5	45		1315		1								✓					X
COMPS-D-0.5-1	46		1316		1													X
CAMP-5-0-0.5	47		1320		1									X	X			
CAMP-5-0.5-1	48	↓	1321	↓	1												X	

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Addison	FS	11/13/20	17:21
<u>[Signature]</u>	Isaac Lessing	FSI	11/13/20	17:41
Received by:				
Samples received at <u>3</u> <u>0</u>				





SAMPLE CHAIN OF CUSTODY *WBE* 11-13-20

524

Report To See page 1  
 Company Friedl/Smider  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) *John J...*  
 PROJECT NAME: CANTERA-TOC PO#: CANTERA-TOC  
 REMARKS: \_\_\_\_\_ INVOICE TO: \_\_\_\_\_  
 Project specific RLs? - Yes / No

Page # 7 of 9  
 TURNAROUND TIME  
 Standard turnaround  
 RUSH. No. 14 2004  
 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											Notes		
						NWTFH-DX	NWTFH-GX	BTX EPA 8081	NWTFH-ICID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic	TBT	Amidic				
COMP-6-0.5-1	59	11/13/20	1357	Soil	1													X	
COMP-6-0.5-2-D	60	}	1358	}	1													X	
COMP7-A-0.5	66		1405		1														X
COMP7-A-0.5-1	62		1406		1														X
COMP7-B-0.5	63		1410		1														X
COMP7-B-0.5-1	64		1411		1														X
COMP7-C-0.5	65		1415		1														X
COMP7-C-0.5-1	66		1416		1														X
COMP7-D-0.4	67		1426		1														X
COMP7-0-0.5	68		1425		1														X X

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<i>[Signature]</i>	Kristin Anderson	FS	11/13/20	17:21
<i>[Signature]</i>	Sara Loring	FSI	11/13/20	17:21
Received by:		Samples received at <u>3</u> o'clock		



Report To Kristin Anderson 011267  
 Company Floyd/Krohn  
 Address 601 Union Street Suite 600  
 City, State, ZIP Seattle, WA 98101  
 Phone 206-292-2988 mail Kristin.Anderson@floydandkrohn.com

**SAMPLE CHAIN OF CUSTODY ME** 11-13-20

SAMPLERS (signature) [Signature]  
 PROJECT NAME CANTERA - TDC PO #  
 REMARKS INVOICE TO  
 Project specific RLs? - Yes / No

Page 9 of 9

**TURNAROUND TIME**  
 Standard turnaround  
 RUSH As early as possible  
 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											Notes	
						NWTPH-DX	NWTPH-Ox	ETEX EPA 8081	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8092	Arsenic	Cd, Pb, Ag, Zn	1631 (19)	Archival		
SW10-0.25-0.75	79	11/13/20	1517	Soil	1									X	✓	✓		
B1-1.0-1.25	80	}	1535	}	1									X	✓	✓		
B1-2.0-2.25	81		1536		1													X
B2-1.0-1.25	82		1545		1										X			
B2-2.0-2.25	83		1547		1													X
B3-1.0-1.25	84		1550		1										X			
B3-2.0-2.25	85		1552		1													X
B3-2.0-2.25-D	86		1554		1													X
B4-1.0-1.25	87		1610		1										X			
B4-2.0-2.25	88	✓ 1612	✓ 1										✓			X		

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2099  
 Ph. (206) 285-3282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Kristin Anderson	FS	11/13/20	1721
<u>[Signature]</u>	Isaac Lessig	FBI	11/13/20	1723
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				
			Samples received at	<u>3</u> °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

December 4, 2020

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the results from the testing of material submitted on November 30, 2020 from the Cantera-TOC, F&BI 011484 project. There are 9 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Kristin Anderson  
FDS1204R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 30, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera-TOC, F&BI 011484 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011484 -01	COMP-1-E-0-0.5
011484 -02	COMP-2-E-0-0.5
011484 -03	COMP-7-E-0-0.5
011484 -04	COMP-7-G-0-0.5
011484 -05	COMP-7-F-0-0.5
011484 -06	COMP-7-B-1-2

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-1-E-0-0.5	Client:	Floyd-Snider
Date Received:	11/30/20	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/01/20	Lab ID:	011484-01
Date Analyzed:	12/01/20	Data File:	011484-01.127
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	24.1
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-2-E-0-0.5	Client:	Floyd-Snider
Date Received:	11/30/20	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/01/20	Lab ID:	011484-02
Date Analyzed:	12/01/20	Data File:	011484-02.128
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	9.51
---------	------



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-E-0-0.5	Client:	Floyd-Snider
Date Received:	11/30/20	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/01/20	Lab ID:	011484-03 x5
Date Analyzed:	12/02/20	Data File:	011484-03 x5.045
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	169
---------	-----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-G-0-0.5	Client:	Floyd-Snider
Date Received:	11/30/20	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/01/20	Lab ID:	011484-04 x5
Date Analyzed:	12/03/20	Data File:	011484-04 x5.035
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	227
---------	-----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-B-1-2	Client:	Floyd-Snider
Date Received:	11/30/20	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/01/20	Lab ID:	011484-06 x5
Date Analyzed:	12/03/20	Data File:	011484-06 x5.036
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	8.14
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/01/20	Lab ID:	I0-742 mb
Date Analyzed:	12/01/20	Data File:	I0-742 mb.097
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	<1
---------	----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/04/20

Date Received: 11/30/20

Project: Cantera-TOC, F&BI 011484

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

Laboratory Code: 011439-03 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	<5	93	90	75-125	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	99	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.

011484

Chain of Custody Record & Laboratory Analysis Request

ME 11-30-20

B13

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com



ARI Assigned Number: \_\_\_\_\_ Turn-around Requested: 72-hr  
 ARI Client Company: Floyd Snider Phone: \_\_\_\_\_  
 Client Contact: Lynn Grochala  
 Client Project Name: Cantwa - TOC

Page: 1 of 1  
 Date: 11/30/20 Ice Present?   
 No. of Coolers: \_\_\_\_\_ Cooler Temps: \_\_\_\_\_

Client Project #: 11 Samplers: L Waenter, K Anderson

Sample ID	Date	Time	Matrix	No. Containers
COMP-1-E-0-0.5	11/30/20	1130	soil	1
COMP-2-E-0-0.5		1135		1
COMP-7-E-0-0.5		1155		1
COMP-7-G-0-0.5		1215		1
COMP-7-F-0-0.5		1200		1
COMP-7-B-1-2		1225		1

Analysis Requested								Notes/Comments
AS	HOLD							L&ID
X								01
X								02
X								03
X								04
	X							05
X								06

Comments/Special Instructions: \_\_\_\_\_

Relinquished by: (Signature) <u>Lynn Waenter</u> Printed Name: <u>Lynn Waenter</u> Company: <u>Floyd Snider</u> Date & Time: <u>11/30/20 13:01</u>	Received by: (Signature) <u>Sham Pham</u> Printed Name: <u>Sham Pham</u> Company: <u>Fe BT</u> Date & Time: <u>11-30-20 1301</u>	Relinquished by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____	Received by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____
--	--	--	--

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Samples received at 4 °C

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

December 8, 2020

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the additional results from the testing of material submitted on November 30, 2020 from the Cantera-TOC, F&BI 011484 project. There are 5 pages included in this report.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures

c: Kristin Anderson  
FDS1208R.DOC



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 30, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera-TOC, F&BI 011484 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
011484 -01	COMP-1-E-0-0.5
011484 -02	COMP-2-E-0-0.5
011484 -03	COMP-7-E-0-0.5
011484 -04	COMP-7-G-0-0.5
011484 -05	COMP-7-F-0-0.5
011484 -06	COMP-7-B-1-2

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-F-0-0.5	Client:	Floyd-Snider
Date Received:	11/30/20	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/04/20	Lab ID:	011484-05
Date Analyzed:	12/04/20	Data File:	011484-05.121
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	38.5
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera-TOC, F&BI 011484
Date Extracted:	12/04/20	Lab ID:	I0-752 mb
Date Analyzed:	12/04/20	Data File:	I0-752 mb.107
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	<1
---------	----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/08/20

Date Received: 11/30/20

Project: Cantera-TOC, F&BI 011484

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

Laboratory Code: 012053-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	1.01	93	92	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	94	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.

011489

Chain of Custody Record & Laboratory Analysis Request

ME 11-30-20

BI3

ARI Assigned Number: \_\_\_\_\_ Turn-around Requested: **72-hr**

ARI Client Company: **Floyd Snider** Phone: \_\_\_\_\_

Client Contact: **Lynn Grochala**

Client Project Name: **Cantura - TOC**

Client Project #: " " Samplers: **L Waenter, K Anderson**

Page: 1 of 1

Date: **11/30/20** Ice Present? \_\_\_\_\_

No. of Coolers: \_\_\_\_\_ Cooler Temps: \_\_\_\_\_



Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested						Notes/Comments		
					AS	HOLD						LAB ID	
COMP-1-E-0-0.5	11/30/20	1130	soil	1	X							01	
COMP-2-E-0-0.5		1135		1	X							02	
COMP-7-E-0-0.5		1155		1	X							03	
COMP-7-G-0-0.5		1215		1	X							04	
COMP-7-F-0-0.5		1200		1	(X)	X						05	(X) Run per KA on 24hrTAT - EMS 12/4
COMP-7-B-1-2		1225		1	X							06	

Comments/Special Instructions: \_\_\_\_\_

Relinquished by: (Signature) <b>Lynn Waenter</b>	Received by: (Signature) <b>Pham Pham</b>	Relinquished by: (Signature) _____	Received by: (Signature) _____
Printed Name: <b>Lynn Waenter</b>	Printed Name: <b>Pham Pham</b>	Printed Name: _____	Printed Name: _____
Company: <b>Floyd Snider</b>	Company: <b>FCBI</b>	Company: _____	Company: _____
Date & Time: <b>11/30/20 13:01</b>	Date & Time: <b>11-30-20 1301</b>	Date & Time: _____	Date & Time: _____

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Samples received at 4 °C**

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

December 14, 2020

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the results from the testing of material submitted on December 10, 2020 from the Cantera-TOC, F&BI 012173 project. There are 8 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Kristin Anderson  
FDS1214R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 10, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera-TOC, F&BI 012173 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
012173 -01	COMP-7-H-0-0.1
012173 -02	COMP-7-I-0-0.5
012173 -03	COMP-7-I-0.5-1
012173 -04	COMP-7-J-0-0.5

All quality control requirements were acceptable.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-H-0-0.1	Client:	Floyd-Snider
Date Received:	12/10/20	Project:	Cantera-TOC, F&BI 012173
Date Extracted:	12/11/20	Lab ID:	012173-01
Date Analyzed:	12/11/20	Data File:	012173-01.036
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	90.6
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-I-0-0.5	Client:	Floyd-Snider
Date Received:	12/10/20	Project:	Cantera-TOC, F&BI 012173
Date Extracted:	12/11/20	Lab ID:	012173-02
Date Analyzed:	12/11/20	Data File:	012173-02.037
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	11.9
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-I-0.5-1	Client:	Floyd-Snider
Date Received:	12/10/20	Project:	Cantera-TOC, F&BI 012173
Date Extracted:	12/11/20	Lab ID:	012173-03
Date Analyzed:	12/11/20	Data File:	012173-03.038
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	10.6
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	COMP-7-J-0-0.5	Client:	Floyd-Snider
Date Received:	12/10/20	Project:	Cantera-TOC, F&BI 012173
Date Extracted:	12/11/20	Lab ID:	012173-04
Date Analyzed:	12/11/20	Data File:	012173-04.039
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	32.1
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera-TOC, F&BI 012173
Date Extracted:	12/11/20	Lab ID:	I0-766 mb2
Date Analyzed:	12/11/20	Data File:	I0-766 mb2.035
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	<1
---------	----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/14/20

Date Received: 12/10/20

Project: Cantera-TOC, F&BI 012173

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

Laboratory Code: 012066-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	6.18	106	92	75-125	14

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	88	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.

012173

SAMPLE CHAIN OF CUSTODY

ME 12/10/20

Page # 1 of 1 RT

Report To Lynn Grochala  
 Company Floyd/Snyder  
 Address 601 S Union St S  
 City, State, ZIP Seattle, WA 98101  
 Phone 206-297-2777 Email lynn.grochala@floydsnyder.com

SAMPLERS (signature) Layni Wauter & Tyler Scott  
 PROJECT NAME Cantara - TOL PO #  
 REMARKS Project Standard INVOICE TO  
 Project specific RLs? - Yes / No

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										Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	AS				
<del>COMP-7-A</del>																	
<del>COMP-7-B</del>																	
COMP-7-H-0-0.1	01	12/10/20	12:26	Soil	1									X			
COMP-7-I-0-0.5	02		12:30											X			
COMP-7-I-0.5-1	03		12:45											X			
COMP-7-J-0-0.5	04		12:50											X			

Samples received at 5 °C

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>Tyler Scott</u>	Tyler Scott	Floyd/Snyder	12.10.20	13:42
Received by: <u>Mhan Phan</u>	Mhan Phan	FBI	12/10/20	1342
Relinquished by:				
Received by:				



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

March 1, 2021

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the results from the testing of material submitted on February 22, 2021 from the Cantera-TOC, F&BI 102333 project. There are 24 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
FDS0301R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 22, 2020 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera-TOC, F&BI 102333 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
102333 -01	CAA7-S22-0-0.5
102333 -02	CAA7-S12-0-0.5
102333 -03	CAA7-S12-0.5-1
102333 -04	CAA7-S13-0-0.5
102333 -05	CAA7-S13-0.5-1
102333 -06	CAA7-S14-0-0.5
102333 -07	CAA7-S14-0.5-1
102333 -08	CAA7-S15-1-1.5
102333 -09	CAA7-S16-1-1.5
102333 -10	CAA7-S17-1-1.5
102333 -11	CAA7-S18-0-0.5
102333 -12	CAA7-S19-0-0.5
102333 -13	CAA7-S20-0-0.5
102333 -14	CAA7-S21-0-0.5
102333 -15	CAA7-B5-1-1.5
102333 -16	CAA7-B6-1-1.5
102333 -17	CAA7-B7-1-1.5
102333 -18	CAA7-B8-1-1.5
102333 -19	CAA7-S11-0-0.5
102333 -20	CAA7-S11-0.5-1

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S22-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-01
Date Analyzed:	02/25/21	Data File:	102333-01.172
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	36.5
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S12-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-02
Date Analyzed:	02/25/21	Data File:	102333-02.175
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	3.99
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S12-0.5-1	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-03
Date Analyzed:	02/25/21	Data File:	102333-03.176
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.01
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S13-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-04
Date Analyzed:	02/25/21	Data File:	102333-04.187
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	2.24
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S13-0.5-1	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-05
Date Analyzed:	02/25/21	Data File:	102333-05.188
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	2.04
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S14-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-06
Date Analyzed:	02/25/21	Data File:	102333-06.198
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	28.0
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S14-0.5-1	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-07
Date Analyzed:	02/25/21	Data File:	102333-07.199
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	6.02
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S15-1-1.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-08
Date Analyzed:	02/25/21	Data File:	102333-08.200
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	7.82
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S16-1-1.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-09
Date Analyzed:	02/25/21	Data File:	102333-09.201
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	30.2
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S17-1-1.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-10
Date Analyzed:	02/25/21	Data File:	102333-10.210
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	18.4
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S18-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-11
Date Analyzed:	02/25/21	Data File:	102333-11.211
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	5.40
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S19-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-12
Date Analyzed:	02/25/21	Data File:	102333-12.212
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	18.6
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S20-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-13
Date Analyzed:	02/25/21	Data File:	102333-13.213
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	5.01
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S21-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-14
Date Analyzed:	02/25/21	Data File:	102333-14.214
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.42
---------	------



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-B5-1-1.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-15
Date Analyzed:	02/26/21	Data File:	102333-15.221
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	9.24
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-B6-1-1.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-16
Date Analyzed:	02/26/21	Data File:	102333-16.222
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	7.90
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-B7-1-1.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-17
Date Analyzed:	02/26/21	Data File:	102333-17.223
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	5.83
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-B8-1-1.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-18
Date Analyzed:	02/26/21	Data File:	102333-18.224
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.85
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S11-0-0.5	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-19
Date Analyzed:	02/26/21	Data File:	102333-19.225
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	3.63
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-S11-0.5-1	Client:	Floyd-Snider
Date Received:	02/22/21	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	102333-20
Date Analyzed:	02/26/21	Data File:	102333-20.226
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	4.93
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera-TOC, F&BI 102333
Date Extracted:	02/23/21	Lab ID:	I1-133 mb
Date Analyzed:	02/23/21	Data File:	I1-133 mb.077
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/01/21

Date Received: 02/22/21

Project: Cantera-TOC, F&BI 102333

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

Laboratory Code: 102333-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	32.1	0 b	112 b	75-125	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	107	80-120



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.

102333

SAMPLE CHAIN OF CUSTODY ME 02/22/21

BI4

Page # 1 of 3

Report To Lynn Grzechala  
 Company Floyd/Snider  
 Address 601 S Union St  
 City, State, ZIP Edmond WA 98026  
 Phone ~~253-292-2678~~ Email  
206-292-2678

SAMPLERS (signature) L. Wachter + T. Scott  
 PROJECT NAME Cantera-TOC PO #  
 REMARKS Use previous INVOICE TO  
 Project specific RLs? - Yes / No

TURNAROUND TIME  
 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										Notes
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Tot Arsenic			
CAA7-S12-0-0.5	01	2/22	10:00	Soil	1										X	
<del>CAA7-S12-0.5-1</del>			10:05													
CAA7-S12-0-0.5	02		10:15												X	
CAA7-S12-0.5-1	03		10:20												X	
CAA7-S13-0-0.5	04		10:25												X	
CAA7-S13-0.5-1	05		10:35												X	
<del>CAA7-S14-0.5-1</del>			10:50													
CAA7-S14-0-0.5	06		10:50												X	
CAA7-S14-0.5-1	07		10:55												X	
CAA7-S15-1-1.5	08		11:35		4										X	

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Tyler Scott	FS	2/22/21	16:04
Received by:	HONG NGUYEN	FRZ	✓	✓
Relinquished by:				
Received by:		Samples received at <u>4</u> °C		

102333

SAMPLE CHAIN OF CUSTODY

ME 02/22/21

BIY

Page # 2 of 3

Report To

Company FIS

Address 601 Union St

City, State, ZIP Seattle WA 98001

Phone 206-292-2078 Email

SAMPLERS (signature) L. Wachten + T. Scott

PROJECT NAME Cantera - TOC PO #

REMARKS INVOICE TO

Project specific RLs? - Yes / No

TURNAROUND TIME

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										Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Tot Arsenic					
CAA7-S16-1-1.5	09	2/22	12:20	Soil	1									X				
CAA7-S17-1-1.5	10		12:30											X				
CAA7-S18-0-0.5	11		12:45											X				
CAA7-S19-0-0.5	12		12:55											X				
CAA7-S20-0-0.5	13		13:10											X				
CAA7-S21-0-0.5	14		13:15											X				
CAA7-B5-1-1.5	15		13:30											X				
CAA7-B6-1-1.5	16		13:35											X				
CAA7-B7-1-1.5	17		14:00											X				
CAA7-B8-1-1.5	18		14:30											X				

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>Tyler Scott</u>	Tyler Scott	FIS	2/22/21	16:04
Received by: <u>HONG</u>	HONG NGUYEN	FBI	✓	✓
Relinquished by:				
Received by:		Samples received at	4	°C

102333

SAMPLE CHAIN OF CUSTODY

ME 02/22/21

BT4  
Page # 3 of 3

Report To \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_

SAMPLERS (signature) LW+TS

PROJECT NAME Cantera-TOC PO # \_\_\_\_\_

REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_

Project specific RLs? - Yes / No

TURNAROUND TIME

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										Notes										
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Asenic													
CAA7-S11-0-0.5	19	2/22	1515	Soil	1																					
CAA7-S11-0.5-1	20	2/22	15:20	Soil	1																					

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
	Tyler Scott	FS	2/22/21	16:04
	HONZA NEUMEIER	FBI	✓	✓
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Samples received at 4 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

March 26, 2021

Lynn Grochala, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Ms Grochala:

Included are the results from the testing of material submitted on March 22, 2021 from the Cantera-TOC, F&BI 103414 project. There are 10 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
FDS0326R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 22, 2021 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera-TOC, F&BI 103414 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
103414 -01	CAA7-B12-2.0-2.25
103414 -02	CAA7-B11-2.0-2.25
103414 -03	CAA7-SW23-0.0-0.5
103414 -04	CAA7-SW24-0.0-0.5
103414 -05	CAA7-SW25-0.0-0.5
103414 -06	CAA7-SW26-0.0-0.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-B12-2.0-2.25	Client:	Floyd-Snider
Date Received:	03/22/21	Project:	Cantera-TOC, F&BI 103414
Date Extracted:	03/23/21	Lab ID:	103414-01
Date Analyzed:	03/24/21	Data File:	103414-01.059
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
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Arsenic	5.80
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-B11-2.0-2.25	Client:	Floyd-Snider
Date Received:	03/22/21	Project:	Cantera-TOC, F&BI 103414
Date Extracted:	03/23/21	Lab ID:	103414-02
Date Analyzed:	03/24/21	Data File:	103414-02.060
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	6.54
---------	------



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-SW23-0.0-0.5	Client:	Floyd-Snider
Date Received:	03/22/21	Project:	Cantera-TOC, F&BI 103414
Date Extracted:	03/23/21	Lab ID:	103414-03
Date Analyzed:	03/24/21	Data File:	103414-03.061
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	10.8
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-SW24-0.0-0.5	Client:	Floyd-Snider
Date Received:	03/22/21	Project:	Cantera-TOC, F&BI 103414
Date Extracted:	03/23/21	Lab ID:	103414-04
Date Analyzed:	03/24/21	Data File:	103414-04.093
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	13.3
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-SW25-0.0-0.5	Client:	Floyd-Snider
Date Received:	03/22/21	Project:	Cantera-TOC, F&BI 103414
Date Extracted:	03/23/21	Lab ID:	103414-05
Date Analyzed:	03/24/21	Data File:	103414-05.094
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	6.39
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	CAA7-SW26-0.0-0.5	Client:	Floyd-Snider
Date Received:	03/22/21	Project:	Cantera-TOC, F&BI 103414
Date Extracted:	03/23/21	Lab ID:	103414-06
Date Analyzed:	03/24/21	Data File:	103414-06.095
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	13.6
---------	------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera-TOC, F&BI 103414
Date Extracted:	03/23/21	Lab ID:	I1-182 mb2
Date Analyzed:	03/23/21	Data File:	I1-182 mb2.107
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
----------	------------------------------

Arsenic	<1
---------	----

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/26/21

Date Received: 03/22/21

Project: Cantera-TOC, F&BI 103414

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

Laboratory Code: 103386-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	11.3	111	116	75-125	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	109	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **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. 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 below the lowest calibration standard. 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.

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.

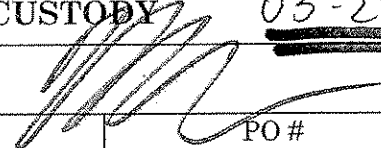
103414

SAMPLE CHAIN OF CUSTODY

03-22-21

BI21 of 1  
Page # 1 of 1

Report To Lynn Grochala  
Company Floyd Snider  
Address 601 Union St Ste 600  
City, State, ZIP Seattle, WA 98101  
Phone 206-292-2078 mail lynn.grochala

SAMPLERS (signature) 

PROJECT NAME Cantera - TOC PO # \_\_\_\_\_

REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_

Project specific RLs? - Yes / No

TURNAROUND TIME

Standard turnaround  
 RUSH  
Rush charges authorized by: \_\_\_\_\_


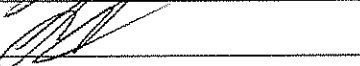
SAMPLE DISPOSAL

Archive samples  
 Other \_\_\_\_\_  
Default: Dispose after 30 days

@ floydsnider.com

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED										Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Arsenic				
CAA7-B12-20-225	01	3-22-21	1500	Soil	1											X	
CAA7-B11-20-225	02		1545													X	
CAA7-SW23-0.0-0.5	03		1610													X	
CAA7-SW24-0.0-0.5	04		1625													X	
CAA7-SW25-0.0-0.5	05		1640													X	
CAA7-SW26-0.0-0.5	06		1705													X	
Samples received at 2 °C																	

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Kristin Anderson	FS	3/22/21	1737
Received by: 	JOE MOHAMMED	FBI	3/22/21	1737
Relinquished by:				
Received by:				





18 December 2020

Kristin Anderson  
Floyd - Snider  
601 Union Street Two Union Square, Suite 600  
Seattle, WA 98101-2341

RE: Cantera - TOC

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)  
20K0398

Associated SDG ID(s)  
N/A

Amanda  
Volgardsen

Digitally signed by Amanda  
Volgardsen  
Date: 2020.12.18 09:58:20 -08'00'

-----  
I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



20K0398

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl  
 Company Friedman and Bruya, Inc.  
 Address 3012 16th Ave W  
 City, State, ZIP Seattle, WA 98119  
 Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER <b>ARI</b>	
PROJECT NAME/NO. <b>011267</b>	PO # <b>A-477</b>
REMARKS <b>F/S Deliverables</b> <b>Please Email Results</b> <b>samples for Kristin Anderson.</b>	

Page # 1 of 1

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										Notes	
						Dioxins/Furans	EPH	VPH	TBT								
COMP-1-0-0.5		11/13/20	1030	Soil	1				X								
COMP-2-0-0.5		11/13/20	1115	Soil	1				X								
COMP-3-0-0.5		11/13/20	1445 1145	Soil	1				X								
COMP-4-0-0.5		11/13/20	1145 1240	Soil	1				X								
COMP-5-0-0.5		11/13/20	1320	Soil	1				X								
COMP-6-0-0.5		11/13/20	1355	Soil	1				X								
COMP-7-0-0.5		11/13/20	1425	Soil	1				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	11/24/20	1750
Received by:	Kenny Dang	ARI	11/24/20	1612
Relinquished by:				
Received by:				



Batch: BIL0050

Prepared using: EPA 3546 (Microwave)

8270E-SIM Butyl Tins in Solid (Version: TBT Only)

Matrix: Solid

Date Prepared: 12/02/20

Balance ID: B 139298002

Set Up By: CTD 12/2/20

Analysis: 8270E-SIM Butyl Tins

Lab Number & Container	% Solids	Initial (g)		Actual Wet Wt (g)	Final Effective Vol (mL)	Vol (mL) to Lab	Extraction Comments
		Target Dry: 5 (Wet)	Actual				
20K0398-01 A	76.0	(6.58)		6.60	0.5	0.5	
20K0398-02 A	91.5	(5.46)		5.55	0.5	0.5	
20K0398-03 A	88.2	(5.67)		5.74	0.5	0.5	
20K0398-04 A	89.5	(5.59)		5.64	0.5	0.5	
20K0398-05 A	85.6	(5.84)		5.87	0.5	0.5	
20K0398-06 A	87.1	(5.74)		5.81	0.5	0.5	
20K0398-07 A	88.2	(5.67)		5.69	0.5	0.5	

Batch QC

Lab Number	% Solids	Initial (g)		Actual Wet Wt (g)	Final Effective Vol (mL)	Vol (mL) to Lab	Extraction Comments
		Target Dry: 5 (Wet)	Actual				
BIL0050-BLK1	100.0	(5.00)		5.00	0.5	0.5	
BIL0050-BS1	100.0	(5.00)		5.00	0.5	0.5	
BIL0050-BSD1	100.0	(5.00)		5.00	0.5	0.5	
BIL0050-MRL1	100.0	(5.00)		5.00	0.5	0.5	

Client ID verified By: DP

Date: 12/02/20

Preparation Reviewed By: MS Date: 12/11/20

Extraction Date and Time: 12/02/20 12:45



Batch: BIL0050

Prepared using: EPA 3546 (Microwave)

8270E-SIM Butyl Tins in Solid (Version: TBT Only)

Prep Steps	Reagents Used	Surrogates & Spike Standards Used
<b>Microwave</b> 1 2 3 Analyst/Date: <i>DR/CT 12/02/20</i>	<b>Station/Reagent</b> <b>Microwave</b> Analyst: <i>DR/CT</i> Date: <i>12/02/20</i> Anhydrous Sodium Sulfate <i>I010707</i>	<b>Type</b> <b>Surrogate</b> 2.5µg/mL <b>Spike</b> 2.5µg/mL <b>QLS Spike</b> 0.5µg/mL
<b>TurboVap Hexane Exchange (15 mL)</b> 1 2 3 4 5 Analyst/Date: <i>SH 12/2/20</i>	0.10% Tropolone in Methylene Chloride <i>I009773</i> Neutral Glass Wool <i>I0020379</i> Hexane <i>I009760</i>	<b>Vial ID / Standard ID</b> 1 <i>I008488</i> Exp: 12/10/2020 8 <i>I1012047</i> Exp: 12/12/2020 <b>BS1, BSD1 ONLY</b> QLS <i>I000317</i> 3 Exp: 12/12/2020 <b>MRL only</b>
<b>HexMgBr Addition Vortex 45min + Sit Overnight</b> 1 2 3 Analyst/Date: <i>SH 12/2/20</i>	<b>Vialing/HexMgBr Addition</b> Analyst: <i>SH</i> Date: <i>12/2/20</i> (Turbovap exchange): Hexane: <i>I009769</i> HexylMagnesiumBromide <i>H011730</i>	(V) indicates a virtual standard combining two or more physical standards. In these cases the Standard ID refers to the virtual standard, not the parent standards.  If a Standard ID is missing, but should be present, check the standard definition in Element LIMS to be sure Standard Info 6 has the correct letter or number designator matching the vial designator in the Standard ID column. If it is correct, check the batch and bench sheet in Element LIMS to be sure the correct standards are selected for surrogate(s) and spike(s).
<b>(REQ) Hydrolisys (4mL) Vortex</b> 1 2 3 Analyst/Date: <i>AS 12/11/20</i>	<b>Hydrolysis/Silica/Final Vialing</b> Analyst: <i>AS</i> Date: <i>12/11/20</i> 1:1 HCL/DI H2O <i>I006665</i> Anhydrous Sodium Sulfate <i>I011225</i>	
<b>(REQ) SPE (1mL)</b> Analyst/Date: <i>AS 12/11/20</i>	Silica Gel (SPE) Dart (EPI) <i>I006350</i> (Final Vialing):Hexane <i>I009769</i>	
<b>TurboVap Post SPE</b> 1 2 3 4 5 Analyst/Date: <i>AS 12/11/20</i>		
<b>Vialing</b> Analyst/Date: <i>AS 12/11/20</i>		



Batch: BIL0050

Prepared using: EPA 3546 (Microwave)

8270E-SIM Butyl Tins in Solid (Version:TBT Only)

Prep Instructions	
<p>SPECIAL INSTRUCTIONS: NOTE: TBT Extractions must be completed within 48 hours!</p> <ol style="list-style-type: none"><li>Blanks = Solvent Only (NO Sulfate).</li><li>Weigh samples into 100mL beakers-dry with Sodium Sulfate.</li><li>Pre-Rinse microwave vessel with 0.10% Troponone in DCM.</li><li>Transfer soil to microwave vessel.</li><li>Add 0.10% Troponone in DCM to vessel until solvent is 1" above soil layer after homogenization).</li><li>Add surr/spike.</li><li>Microwave on appropriate power setting determined by # of samples.</li><li>After microwave-Re-homogenize while hot then let cool 15 min. in cold water bath. Re-homogenize while cool.</li><li>Decant into 0.10% troplone rinsed turbo tube with small Funnel containing glass wool and 1" sodium sulfate.</li><li>Add (2) 10mL Hexane rinses to vessel and transfer to turbo tube.</li><li>TurboVap to 2mL and add 15mL Hexane (X1)-mix well.</li><li>TurboVap to 3mL-Transfer with Hexane to 40mL VOA vial.</li><li>Derivitize=1 pipet HexMgBr (Mix by hand) then Vortex. Let sit 45min (vortex every 10 min) Then let sit overnite.</li><li>Hydrolysis: Add (2) pipets of 1:1 HCL. Vortex for 30 sec. Draw off/discard HCL (bottom layer). Add 1 pipet of 1:1 HCL and 5mL DI H2O. Vortex for 30 sec. Draw off/discard H2O (bottom layer). Add 5mL DI H2O. Vortex for 30 sec. Draw off/discard H2O (bottom layer).</li><li>Add sodium sulfate and Let sit 15min.</li><li>Transfer to culture tube and TurboVap to 1mL.</li><li>SPE Clean with EPH darts</li><li>TurboVap</li><li>Vial in hexane.</li></ol> <p>20. NOTE: DERIVITIZATIONS MUST BE DONE IN THE HOOD TO PROTECT FROM POTENTIAL CHEMICAL REACTIONS, ODORS AND FUMES.</p> <p>A. Need Total Solids Y / <input type="checkbox"/> N</p> <p>B. Archive/Freeze <input checked="" type="checkbox"/> Y <input type="checkbox"/> N</p>	



Extraction Parameter: TBT Extraction Batch BI L0050

Total Solids Batch: BIK0840 Work Order(s): 20K0398

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
<input checked="" type="checkbox"/> No Anomalies (standard soil/wet sediment/sand/gravel)= $\phi 1$	<u>MB</u> 12/11/20
<input type="checkbox"/> Standing Water Decanted (Not shared)=	
<input type="checkbox"/> Standing Water Homogenized (Shared samples)=	
<input type="checkbox"/> Clay/Clumps (Difficult to homogenize)=	
<input checked="" type="checkbox"/> Rocks (%+size)? <sup>5.0%</sup> $\phi 11 = \phi 3, \phi 4, \phi 5, \phi 6, \phi 7$	<u>MB</u> 12/11/20
<input checked="" type="checkbox"/> Organics (Leaves/sticks/grass)= <sup>5.0%</sup> $= \phi 2$	<u>MB</u> 12/11/20
<input type="checkbox"/> Oily, obvious fuel/sulfur odors=	
<input type="checkbox"/> Received in 32oz jar(s)=Homogenized in Pyrex dish=	
<input checked="" type="checkbox"/> Previously Frozen = <u>all, pulled 12/1/20</u>	<u>CR</u> 12/2/20
<input checked="" type="checkbox"/> Other (Details)= <u>missed notes on % moisture, did % solids PSEP w/ low volume, #'s line up within 1-5%.</u>	<u>CR</u> 12/2/20
<b>Aqueous:</b>	
<input type="checkbox"/> No Anomalies	
<input type="checkbox"/> Turbid/Color=	
<input type="checkbox"/> Particulates(%)=(Note: >5%=Notify Supervisor/Lead)	
<input type="checkbox"/> Emulsions (%)=	
<input type="checkbox"/> Oily, obvious fuel/sulfur odors=	
<input type="checkbox"/> Other (Details)=	
<input type="checkbox"/> Received in 1.0L Bottle(s)=No Bottle Rinse=	
<input type="checkbox"/> Other Notes/Comments= (Note problems, concerns, corrective actions).	
<u>Thick emulsion on 318-4 during hydrolysis.</u>	<u>AS</u> 12/11/20
<input checked="" type="checkbox"/> Share Samples Y/N	<u>MB</u> 12/11/20
<input checked="" type="checkbox"/> Multiple Jars Y/N	<u>MB</u> 12/11/20
<input type="checkbox"/> Sample Pre-Screens indicate analyte activity=	
<input type="checkbox"/> Sample weights/volumes reduced based on Pre-Screen=	

Batch: BIL0050

Batch Comment: \*\*NONE\*\*

Project: Cantera - TOC

Project Comments: <E> LCSD Required </E>

Work Order: 20K0398

Work Order Comments: <E> LCSD Required </E>

Sample: 20K0398-01

Sample Comments: \*\*NONE\*\*

Sample: 20K0398-02

Sample Comments: \*\*NONE\*\*

Sample: 20K0398-03

Sample Comments: \*\*NONE\*\*

Sample: 20K0398-04

Sample Comments: \*\*NONE\*\*

Sample: 20K0398-05

Sample Comments: \*\*NONE\*\*

Sample: 20K0398-06

Sample Comments: \*\*NONE\*\*

Sample: 20K0398-07

Sample Comments: \*\*NONE\*\*



Floyd - Snider

601 Union Street Two Union Square, Suite 600  
Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267

Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
COMP-1-0-0.5	20K0398-01	Solid	13-Nov-2020 10:30	24-Nov-2020 16:12
COMP-2-0-0.5	20K0398-02	Solid	13-Nov-2020 11:15	24-Nov-2020 16:12
COMP-3-0-0.5	20K0398-03	Solid	13-Nov-2020 11:45	24-Nov-2020 16:12
COMP-4-0-0.5	20K0398-04	Solid	13-Nov-2020 12:40	24-Nov-2020 16:12
COMP-5-0-0.5	20K0398-05	Solid	13-Nov-2020 13:20	24-Nov-2020 16:12
COMP-6-0-0.5	20K0398-06	Solid	13-Nov-2020 13:55	24-Nov-2020 16:12
COMP-7-0-0.5	20K0398-07	Solid	13-Nov-2020 14:25	24-Nov-2020 16:12





Floyd - Snider

601 Union Street Two Union Square, Suite 600  
Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267

Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

## Work Order Case Narrative

### Sample receipt

Samples as listed on the preceding page were received 24-Nov-2020 16:12 under ARI work order 20K0398. For details regarding sample receipt, please refer to the Cooler Receipt Form.

### Butyl Tin(s) - EPA Method SW8270E-SIM

The samples were frozen in order to maintain holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits, with the exception of sample COMP-4-0-0.5 which has low surrogate percent recoveries. The sample was non-detect. No corrective action was taken.

The method blank was clean at the reporting limits.

The blank spike/blank spike duplicate (BS/LCS/BSD/LCSD) percent recoveries and RPD were within control limits.



# Cooler Receipt Form

ARI Client: Floyd Snider

Project Name: 011267

COC No(s): \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: 20K0398

Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES  NO

Were custody papers included with the cooler? YES  NO

Were custody papers properly filled out (ink, signed, etc.) YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1612 4.8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DOO 5206

Cooler Accepted by: KP Date: 11/24/20 Time: 1612

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES  NO

What kind of packing material was used? ... Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper  Other: card board box

Was sufficient ice used (if appropriate)? NA  YES  NO

How were bottles sealed in plastic bags? Individually  Grouped  Not

Did all bottles arrive in good condition (unbroken)? YES  NO

Were all bottle labels complete and legible? YES  NO

Did the number of containers listed on COC match with the number of containers received? YES  NO

Did all bottle labels and tags agree with custody papers? YES  NO

Were all bottles used correct for the requested analyses? YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA  YES  NO

Were all VOC vials free of air bubbles? NA  YES  NO

Was sufficient amount of sample sent in each bottle? YES  NO

Date VOC Trip Blank was made at ARI: NA

Were the sample(s) split by ARI? NA  YES  Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: JSn Date: 11/24/2020 Time: 1615 Labels checked by: JSn

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



Floyd - Snider

601 Union Street Two Union Square, Suite 600  
Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267  
Project Manager: Kristin Anderson

Reported:  
18-Dec-2020 09:56

**COMP-1-0-0.5**  
**20K0398-01 (Solid)**

**Butyl Tins**

Method: EPA 8270E-SIM		Sampled: 11/13/2020 10:30
Instrument: NT8 Analyst: JZ		Analyzed: 12/16/2020 15:28
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BIL0050 Prepared: 12/02/2020	Extract ID: 20K0398-01 A 01 Dry Weight: 5.02 g % Solids: 76.00
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CIL0137 Cleaned: 11-Dec-2020	Initial Volume: 0.5 mL Final Volume: 0.5 mL Extract ID: 20K0398-01 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.449	3.85	2.01	ug/kg	J
Surrogate: Tripentyltin				30-160 %	82.9	%	
Surrogate: Tripropyltin				30-160 %	61.0	%	



Floyd - Snider

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Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267

Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

**COMP-2-0-0.5**  
**20K0398-02 (Solid)**

**Butyl Tins**

Method: EPA 8270E-SIM

Sampled: 11/13/2020 11:15

Instrument: NT8 Analyst: JZ

Analyzed: 12/16/2020 15:44

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 20K0398-02 A 01

Preparation Batch: BIL0050

Sample Size: 5.55 g (wet)

Dry Weight: 5.08 g

Prepared: 12/02/2020

Final Volume: 0.5 mL

% Solids: 91.52

Sample Cleanup:

Cleanup Method: Silica Gel

Extract ID: 20K0398-02 A 01

Cleanup Batch: CIL0137

Initial Volume: 0.5 mL

Cleaned: 11-Dec-2020

Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.443	3.80	0.661	ug/kg	J
Surrogate: Tripentyltin				30-160 %	83.2	%	
Surrogate: Tripropyltin				30-160 %	60.2	%	



Floyd - Snider

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Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267  
Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

**COMP-3-0-0.5**  
**20K0398-03 (Solid)**

**Butyl Tins**

Method: EPA 8270E-SIM

Sampled: 11/13/2020 11:45

Instrument: NT8 Analyst: JZ

Analyzed: 12/16/2020 16:00

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 20K0398-03 A 01

Preparation Batch: BIL0050

Sample Size: 5.74 g (wet)

Dry Weight: 5.06 g

Prepared: 12/02/2020

Final Volume: 0.5 mL

% Solids: 88.16

Sample Cleanup:

Cleanup Method: Silica Gel

Extract ID: 20K0398-03 A 01

Cleanup Batch: CIL0137

Initial Volume: 0.5 mL

Cleaned: 11-Dec-2020

Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.445	3.81	ND	ug/kg	U
Surrogate: Tripentyltin				30-160 %	84.0	%	
Surrogate: Tripropyltin				30-160 %	59.2	%	



Floyd - Snider

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Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267  
Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

**COMP-4-0-0.5**  
**20K0398-04 (Solid)**

**Butyl Tins**

Method: EPA 8270E-SIM

Sampled: 11/13/2020 12:40

Instrument: NT8 Analyst: JZ

Analyzed: 12/16/2020 16:17

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 20K0398-04 A 01

Preparation Batch: BIL0050

Sample Size: 5.64 g (wet)

Dry Weight: 5.05 g

Prepared: 12/02/2020

Final Volume: 0.5 mL

% Solids: 89.47

Sample Cleanup:

Cleanup Method: Silica Gel

Extract ID: 20K0398-04 A 01

Cleanup Batch: CIL0137

Initial Volume: 0.5 mL

Cleaned: 11-Dec-2020

Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.446	3.82	ND	ug/kg	U
Surrogate: Tripentyltin				30-160 %	16.3	%	*
Surrogate: Tripropyltin				30-160 %	12.2	%	



Floyd - Snider

601 Union Street Two Union Square, Suite 600  
Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267  
Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

**COMP-5-0-0.5**  
**20K0398-05 (Solid)**

**Butyl Tins**

Method: EPA 8270E-SIM

Sampled: 11/13/2020 13:20

Instrument: NT8 Analyst: JZ

Analyzed: 12/16/2020 16:34

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 20K0398-05 A 01

Preparation Batch: BIL0050

Sample Size: 5.87 g (wet)

Dry Weight: 5.02 g

Prepared: 12/02/2020

Final Volume: 0.5 mL

% Solids: 85.58

Sample Cleanup:

Cleanup Method: Silica Gel

Extract ID: 20K0398-05 A 01

Cleanup Batch: CIL0137

Initial Volume: 0.5 mL

Cleaned: 11-Dec-2020

Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.448	3.84	1.08	ug/kg	J
Surrogate: Tripentyltin				30-160 %	87.4	%	
Surrogate: Tripropyltin				30-160 %	64.0	%	



Floyd - Snider

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Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267  
Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

**COMP-6-0-0.5**  
**20K0398-06 (Solid)**

**Butyl Tins**

Method: EPA 8270E-SIM

Sampled: 11/13/2020 13:55

Instrument: NT8 Analyst: JZ

Analyzed: 12/16/2020 16:50

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 20K0398-06 A 01

Preparation Batch: BIL0050

Sample Size: 5.81 g (wet)

Dry Weight: 5.06 g

Prepared: 12/02/2020

Final Volume: 0.5 mL

% Solids: 87.11

Sample Cleanup:

Cleanup Method: Silica Gel

Extract ID: 20K0398-06 A 01

Cleanup Batch: CIL0137

Initial Volume: 0.5 mL

Cleaned: 11-Dec-2020

Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.445	3.81	ND	ug/kg	U
Surrogate: Tripentyltin				30-160 %	73.0	%	
Surrogate: Tripropyltin				30-160 %	44.6	%	





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Seattle WA, 98101-2341

Project: Cantera - TOC

Project Number: 011267  
Project Manager: Kristin Anderson

Reported:

18-Dec-2020 09:56

**COMP-7-0-0.5**  
**20K0398-07 (Solid)**

**Butyl Tins**

Method: EPA 8270E-SIM

Sampled: 11/13/2020 14:25

Instrument: NT8 Analyst: JZ

Analyzed: 12/16/2020 17:07

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 20K0398-07 A 01

Preparation Batch: BIL0050

Sample Size: 5.69 g (wet)

Dry Weight: 5.02 g

Prepared: 12/02/2020

Final Volume: 0.5 mL

% Solids: 88.18

Sample Cleanup:

Cleanup Method: Silica Gel

Extract ID: 20K0398-07 A 01

Cleanup Batch: CIL0137

Initial Volume: 0.5 mL

Cleaned: 11-Dec-2020

Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.448	3.85	1.17	ug/kg	J
Surrogate: Tripentyltin				30-160 %	88.9	%	
Surrogate: Tripropyltin				30-160 %	62.1	%	



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**Butyl Tins - Quality Control**

**Batch BIL0050 - EPA 3546 (Microwave)**

Instrument: NT8 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BIL0050-BLK1)</b>					Prepared: 02-Dec-2020 Analyzed: 16-Dec-2020 14:21						
Tributyltin Ion	ND	0.450	3.86	ug/kg							U
Surrogate: Triphenyltin	51.7			ug/kg	45.2	114		30-160			
Surrogate: Tripropyltin	37.6			ug/kg	43.7	86.1		30-160			
<b>LCS (BIL0050-BS1)</b>					Prepared: 02-Dec-2020 Analyzed: 16-Dec-2020 14:38						
Tributyltin Ion	43.6	0.450	3.86	ug/kg	44.6	97.9		30-160			
Surrogate: Triphenyltin	52.2			ug/kg	45.2	116		30-160			
Surrogate: Tripropyltin	36.6			ug/kg	43.7	83.6		30-160			
<b>LCS Dup (BIL0050-BSD1)</b>					Prepared: 02-Dec-2020 Analyzed: 16-Dec-2020 14:54						
Tributyltin Ion	43.0	0.450	3.86	ug/kg	44.6	96.6		30-160	1.36	30	
Surrogate: Triphenyltin	51.3			ug/kg	45.2	114		30-160			
Surrogate: Tripropyltin	36.1			ug/kg	43.7	82.4		30-160			



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**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8270E-SIM in Solid</b>	
Tributyltin Ion	WADOE, DoD-ELAP
Tributyltin Ion	DoD-ELAP
Tributyltin Ion	WADOE, DoD-ELAP
Tributyltin Ion	WADOE, DoD-ELAP
Dibutyltin Ion	WADOE, DoD-ELAP
Dibutyltin Ion	DoD-ELAP
Dibutyltin Ion	WADOE, DoD-ELAP
Dibutyltin Ion	WADOE, DoD-ELAP
Butyltin Ion	WADOE
Butyltin Ion	
Butyltin Ion	WADOE
Butyltin Ion	WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021



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### Notes and Definitions

- \* Flagged value is not within established control limits.
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.