MONITORING WELL INSTALLATION REPORT WITH ADDITIONAL DELINEATION: MONITORING WELL EMW01

FUTURE KIDDIE ACADEMY PROPERTY (FMR TEXACO 211544)

8701 Greenwood Avenue North
Seattle, WA 98103

Prepared for:

KIDDIE ACADEMY EDUCATIONAL CHILD CARE

Attn: Maninder Singh
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Issued on:

July 18, 2022

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This

Monitoring Well Installation and Additional Delineation Report: Monitoring Well EMW01

Report for:

Future Kiddie Academy Property

8701 Greenwood Avenue North
Seattle, Washington 98103

Has been prepared for the sole benefit and use of our Client:

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EDUCATIONAL CHILD CARE

Attn: Maninder Singh
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Issued July 18, 2022 *by:*

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bgs	below ground surface
CAB	cellulose acetate butyrate
Client	Kiddie Academy
CULs	cleanup levels
DPT	direct-push technology
DRO	diesel range organics
DTW	depth to water
ENW	EVREN Northwest, Inc.
EPA	Environmental Protection Agency
EPH/VPH	Extractable Petroleum Hydrocarbons/Volatile Petroleum Hydrocarbons
F&BI	Friedman & Bruya, Inc.
FSDS	field sampling data sheet
GRO	gasoline-range organics
HASP	Health and Safety Plan
ID	inside diameter
LDPE	low-density polyethylene
mg/Kg	milligrams per kilogram
mL/min	milliliters per minute
MRLs	method reporting limits
MTCA	Model Toxics Control Act
cPAHs	carcinogenic polynuclear aromatic hydrocarbons
PID	photoionization detector
ppmv	parts per million by volume
PQL	practical quantitation limit
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RRO	residual (oil)-range organics
SAP	Sampling and Analysis Plan
SOW	Scope of Work
SWI	soil/water interface
TPH	total petroleum hydrocarbon
USCS	Unified Soil Classification System
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOA	volatile organic analysis
VOCs	volatile organic constituents
WAC	Washington Administrative Code

1.0 Introduction

At the request of Kiddie Academy (Client), EVREN Northwest, Inc. (ENW) prepared this report documenting installation of one monitoring well and two exploratory borings at the Former Texaco 211544 at 8701 Greenwood Avenue North in Seattle, Washington (the "subject property") (see Figures 1 and 2). This work was completed in response to Ecology's comments provided by electronic mail on April 25, 2022. The scope of work completed during this investigation further assesses the data gaps identified in Ecology's email pursuant to Client's plans to redevelop the property.

The owner of the site is seeking closure under Ecology's Model Toxics Control Act (MTCA). The site is currently enrolled in Ecology's Voluntary Cleanup Program (VCP) as Facility/Site 6416. This report summarizes pertinent background information and describes the investigation scope of work, findings, and conclusions. This work was authorized by Client on May 23, 2022.

1.1 Background

Site background and previous remedial actions are detailed in ENW's *Data Gap Investigation Work Plan*[Error! Bookmark not defined.] (Work Plan). As reported in ENW's *Work Plan*, in 1994, underground storage tank (UST) systems were removed, including concrete sumps/separators and a waste oil UST in the western portion of the site. Approximately 600 cubic yards of petroleum impacted soils were excavated from the former UST and dispenser island locations; the approximate boundaries of remedial excavations are presented on the Site Plan on Figure 2. Based on confirmation soil sampling (approximate previous sample locations shown on Figure 2), soil collected from the excavation sidewalls of the former waste oil/sump area contained analyte concentrations above MTCA Method A cleanup levels (CULs).

In 1996, additional soil removal was conducted at the site during construction of the current commercial building, including utility trenching in the southeastern portion of the site. Despite additional soil removal, residual petroleum impacts remained above MTCA Method A soil CUL in the southeast corner of the subject site (excavation areas 1A and 1B, see Figure 2).

During the same construction activities, plumbing trenches reportedly transected some of the excavated areas near the former waste oil excavation in the western portion of the site, penetrating some of the previous remedial excavations and reportedly removing additional soils. Additional confirmation soil sampling was not conducted at the limits of the new excavation boundaries; therefore, it is not known if additional soil removal in 1996 mitigated and/or displaced residual impacts documented in the former waste oil tank area.

1.2 Current Understanding of Data Gaps

Following review of recent investigation data, Ecology proposed next steps toward regulatory closure in an electronic mail dated April 25, 2022. Based on the low magnitude of the exceedances of total petroleum hydrocarbons (TPH) in soil and soil vapor, Ecology anticipates the site may qualify for closure using one of Ecology's Model Remedies.

To this end, Ecology developed the following proposed next steps to address remaining data gaps at the site:

- Establish a permanent ground water monitoring point in the southeast corner of the site to monitor ground water quality in the area of former excavations 1A and 1B and improve understanding of ground-water flow and gradient across the site.
- Further characterize residual soil west of the former at the former waste oil tank excavation in the western portion of the site, analyzing soil for compounds listed in Table 830.1 of the MTCA Rule and Table 7.2 of Ecology's *Remediation of Petroleum Contaminated Sites* Guidance.
- Further delineate the north and east extent of contaminated soil in the loading dock area reported during excavations in 1996 (sample EXE-5).
- Analyze appropriate soil samples for EPH and VPH to calculate a site-specific Method B cleanup level for total petroleum hydrocarbons; and,
- Continue regular quarterly sampling of site monitoring wells, to include analysis of appropriate constituents at WELL 12 to assess onflow of dissolved contaminants from the north-adjoining SMI Inc. Trust Cleanup Site.

In response to Ecology's recommendations, ENW developed a scope of work to address all of the above comments.

1.3 Scope of Work

ENW completed the following Scope of Work (SOW) for this project, consistent with the ODEQ-suggested tasks:

- Arranged for a private and public utility locate prior to any drilling to clear boring locations.
- Installed one ground water monitoring well (EMW01) with screened interval placed across the first-encountered (shallow) ground water table in the southeast portion of the site.
- Developed EMW01 through a process of surging and bailing.
- Surveyed EMW01 to establish x- and y-coordinates and top-of-casing elevation.
- Advanced two soil borings (EB04 and EB05) for collection of soil and reconnaissance ground water samples in locations suggested by Ecology.
- Logged soil lithology and documented well construction details on boring logs.
- Arranged for appropriate disposal of investigation-derived waste generated during the well installation.
- Prepared this report documenting the work conducted.

Field work was conducted in May 2022 and reported in the following sections.

2.0 Field Methods

2.1 Objectives

In addition to project-specific objectives, the following general objectives were developed for this project:

- To perform the work efficiently and cost-effectively, minimizing interference with site operation.
- To perform the work in a safe manner for technical personnel and site employees and visitors.
- To document information and data generated in a professional manner that is valid for the intended use.

In addition to the above general objectives, Table 2-1 below summarizes project objectives specific to each of the areas of interest, which are consistent with the goals and objectives expressed in Ecology's April 25, 2022 site status correspondence.

Table 2-1. Monitoring Well and Temporary Boring Sample Objectives

Well/Sample Location ID	Type Well	Location	Total Depth (feet)	Screened Interval (feet bgs)	Samples Analyzed	Rationale/Objectives
EMW01	Permanent Monitoring Well	Loading Dock at SE Corner of Site	19	9-19	(1)	Monitoring point close to area with residual impacts; additional ground-water flow direction and gradient information.
EB04	Exploratory Soil Boring	SE Property Boundary off Greenwood Ave	16	--	Soil Reconn GW	Characterize northern and eastern extent of residual soil and ground-water impacts at loading dock near former excavation 1A.
EB05	Exploratory Soil Boring	Former Waste Oil Tank	16	--	Soil	Characterize residual soil impacts west of former waste oil tank near former samples WOFM3-7 and WOWWH-3; analyze per Table 7.2

(1) = sampling of this well will be included as part of ongoing ground-water monitoring and will be reported in a subsequent monitoring report.

The remainder of this section describes the methods and procedures used for this investigation. A photographic log of all the field work is presented in Appendix A. Findings are presented in Section 3.

2.2 Preparation Activities

ENW performed or coordinated the following preparatory activities before initiating the field portion of this project.

Plan Preparation. Internal Sampling and Analysis Plan (SAP) and a Health and Safety Plan (HASP) were prepared for the project.

ROW Permitting. Obtained Right of Way Maintenance Permit No. SUMAINT0001392 from Seattle Department of Transportation to authorize work in the public ROW.

One Call Notification. Prior to any subsurface site work, a call was placed with One Call Utility Notification Service to identify and locate all public utilities near each of the proposed sampling locations.

Private Locate. ENW contracted with APS to conduct a private utility locate to clear all boring locations prior to any drilling. They performed the locate on May 31, 2022.

Photographs taken during the well installation are included as Appendix A.

2.3 Soil Borings

On May 31, 2022, ENW advanced three soil borings (EB04, EB05, and EMW01) using a track mounted direct-push technology (DPT) drill rig operated by Standard Probe of Seattle, Washington. The locations of EMW01, EB04 and EB05 are illustrated on the Sample Location Diagram on Figure 3.

Soil borings were advanced to a maximum depth of just over 19 feet below ground surface (bgs). Drill tooling utilized a four-foot-long core barrel lined with cellulose acetate butyrate (CAB) sleeves.

Soil Screening and Logging. Soil materials recovered from the DPT drill rods were inspected continuously for the presence of contamination by visual and olfactory inspection. Semi-quantitative headspace screening was also performed on each sample core by placing selected soil samples in a plastic sealed bag, breaking the soil core to expose surface area inside the bag, and inserting a photoionization detector (PID) tip into the top of the bag. Soils were classified using the Unified Soil Classification System (USCS) and complemented with descriptors such as grain size, moisture content, foreign clasts, and other physical properties to describe underlying stratigraphy. Soil lithology, field screening results, and other observations were recorded by an ENW Geologist onto push probe logs presented in Appendix B.

Soil Sampling. Grab samples were collected from each boring for laboratory analysis from zones indicated to be impacted. In all borings, soil samples were collected from immediately above the soil/water interface (SWI). Individual soil samples are designated with the sample's depth appended to the boring number (e.g., EB04/13 would indicate a sample collected from 13 feet bgs in boring EB04). Soil samples collected from the SWI were further designated with the letters "SWI" (e.g., EB04-SWI-13 would indicate a sample collected from the SWI in boring EB04).

Soil samples were transferred with fresh Nitrile gloves into sample containers provided by the laboratory. The containers were filled to minimize headspace before immediate sealing. The samples were immediately labeled and placed in cooled storage until they were delivered to the laboratory following chain-of-custody protocols.

Reconnaissance Ground Water Sampling (EB04). This boring was completed approximately five feet below the observed ground water table. Upon reaching the total depth of boring EB04, the drill tooling was removed, and a temporary well casing was installed in the open borehole in preparation for ground water sampling. Approximately 12 liters of ground water were purged from the boring using a low-flow peristaltic pump and new dedicated low-density polyethylene (LDPE) tubing to purge the standing water from the borehole, and to draw representative ground water into the temporary well. Following purging, a ground water sample was collected from clean, dedicated LDPE tubing connected to a peristaltic pump set at its lowest setting (approximately 200 milliliters per minute [mL/min]). The flow rate was minimized to reduce off gassing of volatile contaminants. The sample was transferred into laboratory-supplied containers with appropriate preservative. The sample was labeled to indicate the boring number and depth to bottom of screened interval. Ground water monitoring and sampling results were recorded onto Field Sampling Data Sheets included as Appendix C.

Boring Completion. Temporary borings were backfilled with hydrated bentonite chips to just below ground surface, and the asphalt pavement surface was restored.

2.4 Monitoring Well Installation

Monitoring well EMW01 was constructed by a Washington-licensed driller, and details of the construction were recorded by an ENW geologist. Screened interval placement was based on field observations of subsurface lithology and depth to water (DTW) measurements. The well was screened within a water-bearing sand and silt and was constructed of the following materials:

- 3/4-inch inside diameter (ID) Schedule 40 polyvinyl chloride (PVC) blank casing, 20-slot (0.020-inch) well screen.
- #2/12 silica Gillibrand silica sand pack
- Annular seal composed of hydrated 3/8" bentonite chips
- 8-inch, traffic-rated, flush monument was set in concrete

Well construction details are present on the well log included in Appendix B. Push probe construction notices (i.e., start cards) and reports (i.e., resource protection well logs) were prepared by the driller and submitted to Ecology.

2.5 Monitoring Well Design Objective

Shallow monitoring well EMW01 (see Figure 3 for location) was sited to assess ground water flow direction and to target impacts to ground water discovered during previous investigations (Table 2-2).

Table 2-2. Monitoring Well Location and Design

Monitoring Well Identification	Date Installed	Location	Well Inside Dia. (inches)	Total Depth Drilled (feet bgs)	Slot Size (inches)	Slotted PVC Screen Interval (feet bgs)
EMW01	5/31/2022	Loading Dock at SE Corner of Site	0.75	19	0.020	9-19

bgs = below ground surface

2.6 Monitoring Well Development

On July 15, 2022, monitoring well EMW01 was developed through a process of surging and pumping until development water was clear of sediment and monitored ground-water parameters had stabilized. Development water and recovered sediment were placed in a Department of Transportation (DOT) approved drum.

Prior to developing monitoring well, the following characteristics were noted:

- Recorded depth to water and well depth to the nearest 0.01 foot.
- Based on the above information, the height of the water column and well volume were calculated to determine minimum purge volume.

Development of the well was completed using a Waterra Hydrolift electric pump discharging at a rate of 1.5 to 4 gallons per minute. During pumping, water quality parameters were measured regularly to track the progress of development.

The following water quality parameters were monitored using a Horiba U-52 water quality probe:

- pH
- Temperature
- Conductivity
- ORP (oxygen-reduction potential)
- DO (dissolved oxygen)
- Turbidity

The well was surged before pumping using a surge block. Additional surging was conducted throughout development by the nature of the pump action and by moving the intake up and down the well screen within the water column. This resulted in additional sediment being suspended and pumped to the surface.

At total of 8.5 gallons (approximately 14 well volumes) was purged from the well. All purge water was contained in a 55-gallon drum. Once the water cleared substantially with pumping and surging, development ceased, and the pump was removed from the well. Water levels in monitor well EMW01 were noted to return to the original elevation slowly after removing the pump from the well and the well pumped dry several times during development activities.

Development data was recorded on a Well Development Measurements form, and included purge volumes, time of beginning and termination of purging, and observations regarding color and water quality parameters. A copy of the completed form for well EMW01 is included in Appendix C.

2.7 Laboratory Analysis

Soil and ground water samples were analyzed by Friedman and Bruya, Inc. (F&BI) of Seattle, Washington. Analysis for EPH/VPH were subcontracted by F&BI to Fremont Analytical of Seattle, Washington. Samples were analyzed according to the analytical plan presented in Table 2-3. Laboratory analytical reports, including quality assurance/quality control procedures and results are included in Appendix E.

Table 2-3. Analytical Methods Used

Analytical Method	Constituents	Soil	Water
NWTPH-Gx	Northwest Total Petroleum Hydrocarbons – Gasoline-Range Organics (GRO)	All samples	All samples
NWTPH-Dx	Northwest Total Petroleum Hydrocarbons – Diesel-Range Organics (DRO) and Residual-(Oil)-Range Organics (RRO)	All samples	All samples
EPA 8260D	GRO-Related Volatile Organic Constituents (VOCs)	All samples	All samples
EPA 8270E SIM	Carcinogenic Polynuclear Aromatic Hydrocarbons (cPAHs)	All soil samples	All samples
NWEPH/NWVPH	Extractable Petroleum Hydrocarbons by NWEPH and Volatile Petroleum Hydrocarbons by NWVPH	Select soil sample	--
NWTPH-Dx following silica gel cleanup	Extracts Passed through Silica Gel Column Prior to Analysis	--	Water samples with indication of matrix interference based on communication with laboratory

EPA = US Environmental Protection Agency

2.8 Cleanup Standards

The State of Washington MTCA Regulations (Chapter 173-340 WAC) sets numeric cleanup levels for "routine cleanup actions". "Routine cleanup actions" are defined as those sites where: 1) cleanup standards for each hazardous substance are obvious and undisputed, allowing for an adequate margin of safety for protection of human health and the environment; 2) does not require preparation of an environmental impact statement, and 3) qualifies for an exclusion from conducting a terrestrial ecological evaluation. CULs are defined as the concentration of a hazardous substance in soil, water, air, or sediment that is determined to be protective of human health and the environment under specified exposure conditions. MTCA's three (3) methods for establishing cleanup levels are briefly described below.

Method A: Method A provides tables of cleanup levels for relatively simple cleanup sites in Washington. Cleanup levels under Method A must be at least as stringent as the table values and standards from other applicable law (applicable or relevant and appropriate requirements, or ARARs). If neither the Method A table value nor applicable state and federal laws provide an appropriate cleanup level, then natural background concentration or the practical quantitation limit (PQL) may be used as the cleanup level. Method A is the simplest, most streamlined approach to cleanup, but is meant to be applied with sites that have releases of only a few, common, hazardous substances.

Method B: Method B provides cleanup levels using risk assessment equations developed for various exposure pathways, as well as by using standards specified by applicable state and federal laws. Standard Method B uses generic default assumptions; Modified Method B uses chemical-specific and/or site-specific parameters in calculating the cleanup levels. Natural background concentrations and PQLs are also considered in this method. Method B is considered the universal approach to site closure and is the method most commonly used.

Site-Specific Method B Total Petroleum Hydrocarbon Cleanup Levels: In accordance with Ecology guidance[1], site-specific Method B cleanup levels for total petroleum hydrocarbons were calculated using Ecology's MTCATPH workbooks. MTCA regulation allows for modification of Methods B specified default assumptions based on site-specific or chemical-specific data. The Ecology-provided workbook provides the necessary tools for calculating protective soil and ground water concentrations under modified Method B. The Ecology-provided workbook provides the tools to calculate the risk under current site conditions (forward calculation) following entry of measured soil or ground water concentrations. The workbook then executes a "forward" calculation using the equations in the regulation and solving for risk and generates protective soil and ground-water cleanup levels based on the site-specific conditions.

2.9 Investigation Derived Waste Disposal

Investigation-derived waste (soil cuttings, purge water, decontamination fluids) were temporarily placed inside Department of Transportation approved 55-gallon drums and stored on site pending receipt of analytical results.

The drums and their contents will be disposed of at an appropriate disposal facility after a disposal profile has been approved.

3.0 Findings

This section presents the findings of the field investigation activities. The results of laboratory analysis of the soil and reconnaissance ground water samples are summarized in Tables 1 and 2, respectively (following the Tables Tab after text). Copies of the Laboratory Reports are included in Appendix E.

3.1 Subsurface Conditions

ENW advanced three soil borings on May 31, 2022. Boring locations are presented on Figure 3.

Borings EB04 and EMW01 in the southeast portion of the site encountered unsaturated silts, sands, and gravels to a depth of approximately five feet bgs below which was a compositionally distinct layer dark brown to black organic-rich soils containing up to approximately 50 percent peat fibers. Organic soils transitioned to nearly 100 percent fibrous peat starting from 7.5 feet bgs exhibiting a reddish brown to black color, moist to wet, and a sulfurous odor. The bottom of the peat layer at 13 feet bgs laid unconformably over a saturated, grey, moderately dense silty sand to sandy silt with prolific shallow ground water flow.

Boring EB05 was advanced on the west side of the building and penetrated pea gravel (fill) from 4 feet to 12 feet bgs, interpreted as backfill material from a previous remedial excavation. Below the pea gravel was organic rich soil and peat extending to 13.5 feet bgs, then gray, saturated silt to the maximum depth drilled of 16 feet bgs.

First-encountered ground water was encountered in borings at between 6.97 feet bgs and 15.5 feet bgs. Field headspace readings using a PID did not register above 0.0 parts per million by volume (ppmv) in any

[1] Ecology. August 2006. Workbook Tools for Calculating Soil and Ground Water Cleanup Levels under the Model Toxics Control Act Cleanup Regulation

of the borings, indicating low prevalence of VOCs in the vadose zone. Continuous visual inspection of soil cores did not reveal any odors or soil staining indicative of subsurface contamination.

3.2 Sampling Summary

Based on absence of obvious impacts, one soil/water interface sample was collected from exploratory soil borings EB04 and EB05, and as Ecology suggested, a reconnaissance ground water sample was collected from EB04. A summary of sampling is provided in Table 3-1.

Table 3-1. Summary of Sampling

Borehole Location Identification	Date Sampled	Depth Sampled (feet bgs)	Sampled by:	Location and Comments
Soil				
EB04	5/31/2022	13	ENW	East of Loading Dock (and former excavation 1A)
EB05	5/31/2022	14	ENW	West of Building (and former used oil tank)
Reconnaissance Ground Water				
EB04	6/1/2022	15	ENW	East of Loading Dock (and former excavation 1A)

3.3 Deviations from Scope of Work

Field work was performed in accordance with the proposed scope of work except for the following:

- Due to the presence of pea gravel in boring EB05, the backfill material of the former excavation was not sampled as requested by Ecology. Since pea gravel did not appear to be impacted (i.e., no elevated PID readings, soil staining or odors), the deviation is not expected to alter the findings of this investigation.

3.4 Laboratory Results

3.4.1 Soil

SWI samples from EB04 and EB05 were analyzed for total petroleum hydrocarbons, total lead, cPAHs, and petroleum fuel-related VOCs. Laboratory results of soil samples are compared to soil cleanup levels on Table 1. A copy of the laboratory report is provided in Appendix D.

Petroleum hydrocarbons. DRO was detected in the soil/water interface sample in EB04 (sample EB04-SWI-13) at 110 milligrams per kilogram (mg/Kg). The concentration of DRO does not exceed the site-specific (modified) MTCA Method B soil CUL of 1,706 mg/Kg. DRO was not detected in boring EB05 (EB05-SWI-14). GRO and RRO were below their respective laboratory method reporting limits (MRLs) in the SWI samples from both borings.

As proposed, sample EB04-SWI-13 was further analyzed for EPH/VPH analysis to determine the petroleum mixture released at the site and to evaluate whether calculating a site-specific TPH cleanup level would be appropriate for the site. As indicated in Table 1, EPH and VPH were not detected above their respective laboratory MRL. EPH/VPH analysis for other samples are discussed in Section 4.0.

Total Lead. Total lead detections were below the MTCA Method A soil CUL in both samples analyzed.

Carcinogenic PAHs. The laboratory detected naphthalene in EB05-SWI-14 using EPA Method 8270SIM and 8260D at concentrations well below the MTCA Method A soil CUL of 5 mg/Kg.

VOCs. Besides naphthalene (see PAHs above), no motor fuel-related VOCs were detected above laboratory MRLs in either of the soil samples analyzed.

3.4.2 Reconnaissance Ground Water

Laboratory results for reconnaissance ground water sample EB04-GW-15 are presented on Table 2, behind the Tables Tab following the text. A review of the laboratory report indicates that samples were analyzed within appropriate QA/QC limits and hold times. A copy of the F&BI laboratory report is included in Appendix E.

Petroleum Hydrocarbons. The reconnaissance ground water sample from EB04 was analyzed for GRO, DRO and RRO and results are provided in Table 2.

- GRO was below the laboratory MRL.
- DRO was detected at a laboratory-flagged concentration of 120 micrograms per liter (µg/L). The "x" qualifier is used by the laboratory to indicate a chromatographic signature not typical of the petroleum product being analyzed. The reported DRO concentration is below the site-specific MTCA Method B ground water CUL of 500 µg/L.
- RRO was not detected above laboratory MRLs in any of the samples.

As it is possible for degraded wood residue to affect concentrations of heavier petroleum analysis, the ground water sample from EB04 was re-analyzed with a silica gel filter to screen out biogenic material. Results of further analysis indicated the following:

- Following sample extract cleanup, DRO concentrations reduced from a maximum of 120 µg/L to below laboratory MRL of 75 µg/L in the sample, supporting the labs observation that some of the detection concentration of DRO was related to matrix interference.
- RRO remained below the laboratory MRL in the sample.

Polynuclear Aromatic Hydrocarbons and Volatile Organic Compounds. cPAHs and VOCs were not detected in the sample above laboratory MRLs.

Total Lead. Total lead was detected at 7.74 micrograms per liter (µg/L), which is less than the MTCA Method A ground water CUL of 15 µg/L.

4.0 Summary/Conclusions

The findings of this investigation have led ENW to reach the following conclusions.

- One monitoring well was installed (EMW01) in a 19-foot-deep 2.25-inch diameter drilled borehole at the subject site. The well was located to further assess ground-water flow direction and to monitor residual petroleum impacts to ground water in this portion of the site. The well is planned for surveying the top of casing elevation relative to the existing well network during the next ground-water monitoring event, at which time this new well will be sampled along with other select monitoring wells.

- Two exploratory soil borings were advanced, and soil and/or reconnaissance ground water samples were collected in accordance with a scope of work provided in an Ecology electronic mail dated April 25, 2022.
    - Contaminants of interest in soil and reconnaissance ground water from EB04 were either not detected or were below their respective CUL. The data at EB04 suggest that the lateral extent of residual impacts previously detected at former excavation 1A has been delineated and significant ground-water impacts do not migrate off-site at the southeastern site boundary.
    - Contaminants of interest in soil from EB05 were either not detected or were below their respective CUL. Results from EB05 provide additional data for documenting soil conditions at the previous remedial excavation boundaries for a former used oil tank removed from the site in the early 1990s. Data from EB05 identified no significant impacts in native soil below the floor of the previous excavation.
- Additional analysis for EPH and VPH was conducted on the soil sample from EB04, and results were entered into Ecology's MTCATPH model to calculate a TPH CUL in soil protective of a ground water cleanup level of 500 µg/L. The model-calculated concentration of TPH in soil was greater than 100 percent of non-aqueous phase liquid (NAPL) saturation in soil, so the model defaulted to the NAPL saturation limit. Based on these results, ENW will use the previously calculated total petroleum hydrocarbon concentration of 1,706 mg/Kg for soil and the 500 µg/L for ground water.

5.0 Limitations

The scope of this report is limited to observations made during on-site work; interviews with knowledgeable sources; and review of readily available published and unpublished reports and literature. As a result, these conclusions are based on information supplied by others as well as interpretations by qualified parties.

The focus of the work does not extend to the presence of the following conditions:

1. Naturally occurring toxic or hazardous substances in the subsurface soils, geology and water,
2. Toxicity of substances common in current habitable environments, such as stored chemicals, products, building materials and consumables,
3. Contaminants or contaminant concentrations that are not a concern now but may be under future regulatory standards,
4. Unpredictable events that may occur after ENW's site work, such as illegal dumping or accidental spillage.

There is no practice that is thorough enough to absolutely identify the presence of all hazardous substances that may be present at a given site. ENW's investigation has been focused only on the potential for contamination that was specifically identified in the Scope of Work. Therefore, if contamination other than that specifically mentioned is present and not identified as part of a limited Scope of Work, ENW's environmental investigation shall not be construed as a guaranteed absence of such materials. ENW has endeavored to collect representative analytical samples for the locations and

depths indicated in this report. However, no sampling program can thoroughly identify all variations in contaminant distribution.

We have performed our services for this project in accordance with our agreement and understanding with the client. This document and the information contained herein have been prepared solely for the use of the client.

ENW performed this study under a limited scope of services per our agreement. ENW assumes no responsibility for conditions that we did not specifically evaluate or conditions that were not generally recognized as environmentally unacceptable at the time this report was prepared.

Table

Table 1 - Summary of Analytical Data, Soil

Sample ID		EB04-SWI-13	EB05-SWI-14	Maximum Residual Soil Concentration (detected)	MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses [1]	MTCA Method B Soil Cleanup Levels (if Method A not available) [1]	MTCA Method B Soil Cleanup Levels (iProtectiveness of Ground Water - vadose zone soil)[1]	MTCA Site-Specific Calculated Soil Cleanup Level	Constituent of Potential Concern (COPC, exceeds Method A or B CULs)?
Date Sampled		5/31/2022	5/31/2022						
Depth Sampled (feet)		13	14						
Sampled by:		ENW	ENW						
Location		East of Loading Dock	West of Building						
Constituent of Interest	Note	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	Y / N
Volatile Organic Constituents (VOCs)									
Benzene	c, v	<0.03 (ND)	<0.03 (ND)	<0.03 (ND)	0.03	18	0.027	---	N
Ethylene dibromide (EDB)	c, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	0.005	0.5	0.00027	---	(Y)
Dichloroethane;1,2-	c, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	NE	11	0.023	---	N
Ethylbenzene	nc, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	6	8000	5.9	---	N
Hexane;n-	nc, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	NE	4800	NE	---	N
Methyl tert-butyl ether	c, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	0.1	560	0.1	---	N
Naphthalene	c, v	<0.05 (ND)	0.057	0.057	5	1600	4.5	---	N
Toluene	nc, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	7	6400	4.5	---	N
Trimethylbenzene;1,2,4-	nc, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	NE	800	1.3	---	N
Trimethylbenzene;1,3,5-	nc, v	<0.05 (ND)	<0.05 (ND)	<0.05 (ND)	NE	800	1.3	---	N
Xylenes	nc, v	<0.15 (ND)	<0.15 (ND)	<0.15 (ND)	9	16000	14	---	N
Polyaromatic Hydrocarbons									
Benzo[a]anthracene	c, nv	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	**	**	**	---	---
Benzo[a]pyrene	c, nv	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	0.1 (**)	0.19 (**)	3.9 (**)	---	N
Benzo[b]fluoranthene	c, nv	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	**	**	**	---	---
Benzo[k]fluoranthene	c, nv	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	**	**	**	---	---
Chrysene	c, nv	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	**	**	**	---	---
Dibenz[a,h]anthracene	c, nv	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	**	**	**	---	---
Indeno[1,2,3-cd]pyrene	c, nv	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	**	**	**	---	---
Naphthalene	nc, v	<0.01 (ND)	0.019	0.019	5	1600	4.5	---	N
Methyl naphthalene;1-	nc, v	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	NE	34	NE	---	N
Methyl naphthalene;2-	nc, v	<0.01 (ND)	<0.01 (ND)	<0.01 (ND)	NE	320	NE	---	N
Metals									
Lead	NA, nv	1.08	2.24	2.24	250	NE	400	---	N
Total Petroleum Hydrocarbons									
TPH: gasoline range organics, benzene present	nc, v	<5 (ND)	<5 (ND)	<5 (ND)	100	NE	NE	1706	N
TPH, diesel range organics	nc, nv	110	<50 (ND)	110	2000	NE	NE		
TPH, heavy oils	nc, nv	<250 (ND)	<250 (ND)	<250 (ND)					

Notes:

ND = not detected at or above laboratory method reporting limits

(Y) indicates analyte not detected, but detection limit is above screening concentration.

— = not analyzed or not applicable.

< = not detected at or above the method reporting limit shown.

NE = not established.

mg/Kg = milligram per kilogram.

c = carcinogenic

nc = noncarcinogenic

v = volatile

nv = nonvolatile

GRO = gasoline-range organics.

DRO = diesel-range organics.

RRO = residual-range organics.

Bolded concentrations exceed either MTCA Cleanup Levels.

** Cleanup level of carcinogenic PAHs based on the quotient of their Toxicity Equivalency with respect to Benzo(a)pyrene

TEQ = Toxicity Equivalency Quotient per Ecology[1]

TEF = Toxicity Equivalency Factor per Ecology[1]

1. Ecology, April 20, 2015. Evaluating the Human Health Toxicity of Carcionogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs): Implementation Memorandum #10.

Table 2 - Summary of Analytical Data, Reconnaissance Ground Water

Location ID		EB04	Maximum Ground Water Concentration	MTCA Method A Cleanup Levels for Ground Water (Unrestricted Land Use)	MTCA Method B Cleanup Levels for Ground Water (lowest of Eq 720-1 and 720-2)	MTCA Site-Specific Calculated Ground Water Cleanup Level	Constituent of Potential Concern (COPC)?[3]
Sample ID		EB04-GW-15					
Date Sampled		6/1/2022					
Sampler		ENW					
Depth Sampled (feet)		15					
Location		East Property Boundary near SE Corner of Site					
Constituent of Interest	Note	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	Y/N
Volatile Organic Constituents (VOCs)							
Benzene	c, v	<0.35 (ND)	<0.35 (ND)	5	0.8	---	N
Ethylene dibromide (EDB)	c, v	<1 (ND)	<1 (ND)	0.01	0.022	---	(Y)
Dichloroethane;1,2- (EDC)	c, v	<0.2 (ND)	<0.2 (ND)	5	0.48	---	N
Ethylbenzene	c, v	<1 (ND)	<1 (ND)	700	800	---	N
Methyl tert-butyl ether (MTBE)	c, v	<1 (ND)	<1 (ND)	20	24	---	N
Naphthalene	nc, v	<1 (ND)	<1 (ND)	160	160	---	N
Toluene	nc, v	<1 (ND)	<1 (ND)	1000	640	---	N
Xylenes	nc, v	<1 (ND)	<3 (ND)	1000	1600	---	N
Polyaromatic Hydrocarbons (Carcinogenic)							
Benz[a]anthracene	c, nv	<0.04 (ND)	<0.04 (ND)	**	**	---	---
Benzo[a]pyrene	c, nv	<0.04 (ND)	<0.04 (ND)	0.1 (**)	0.023 (**)	---	---
Benzo[b]fluoranthene	c, nv	<0.04 (ND)	<0.04 (ND)	**	**	---	---
Benzo[k]fluoranthene	c, nv	<0.04 (ND)	<0.04 (ND)	**	**	---	---
Chrysene	c, nv	<0.04 (ND)	<0.04 (ND)	**	**	---	---
Dibenz[a,h]anthracene	c, nv	<0.04 (ND)	<0.04 (ND)	**	**	---	---
Indeno[1,2,3-cd]pyrene	c, nv	<0.04 (ND) ca	<0.04 (ND) ca	**	**	---	---
Naphthalene	c, v	<0.4 (ND)	<0.4 (ND)	160	160	---	(Y)
1-Methylnaphthalene	nc, v	<0.4 (ND)	<0.4 (ND)	NE	1.5	---	(Y)
2-Methylnaphthalene	nc, v	<0.4 (ND)	<0.4 (ND)	NE	32	---	(Y)
Total Metals							
Lead	NA, nv	7.74	7.74	15	---	---	(Y)
Total Petroleum Hydrocarbons							
GRO	nc, v	<100 (ND)	<100 (ND)	---	---	500	N
DRO	nc, nv	<60 (ND) *	<60 (ND) *	---	---		
RRO	nc, nv	<300 (ND) *	<300 (ND) *				

Notes:

— = not analyzed or not applicable.

ND = not detected at or above the method reporting limit (MRL) or practical quantitation limit (PQL) shown.

NE = not established.

(Y) indicates analyte not detected, but detection limit is above screening concentration.

µg/L = micrograms per Liter

c = carcinogenic

nc = noncarcinogenic

v = volatile

nv = nonvolatile

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

GRO = gasoline-range organics.

DRO = diesel-range organics.

RRO = residual (oil)-range organics.

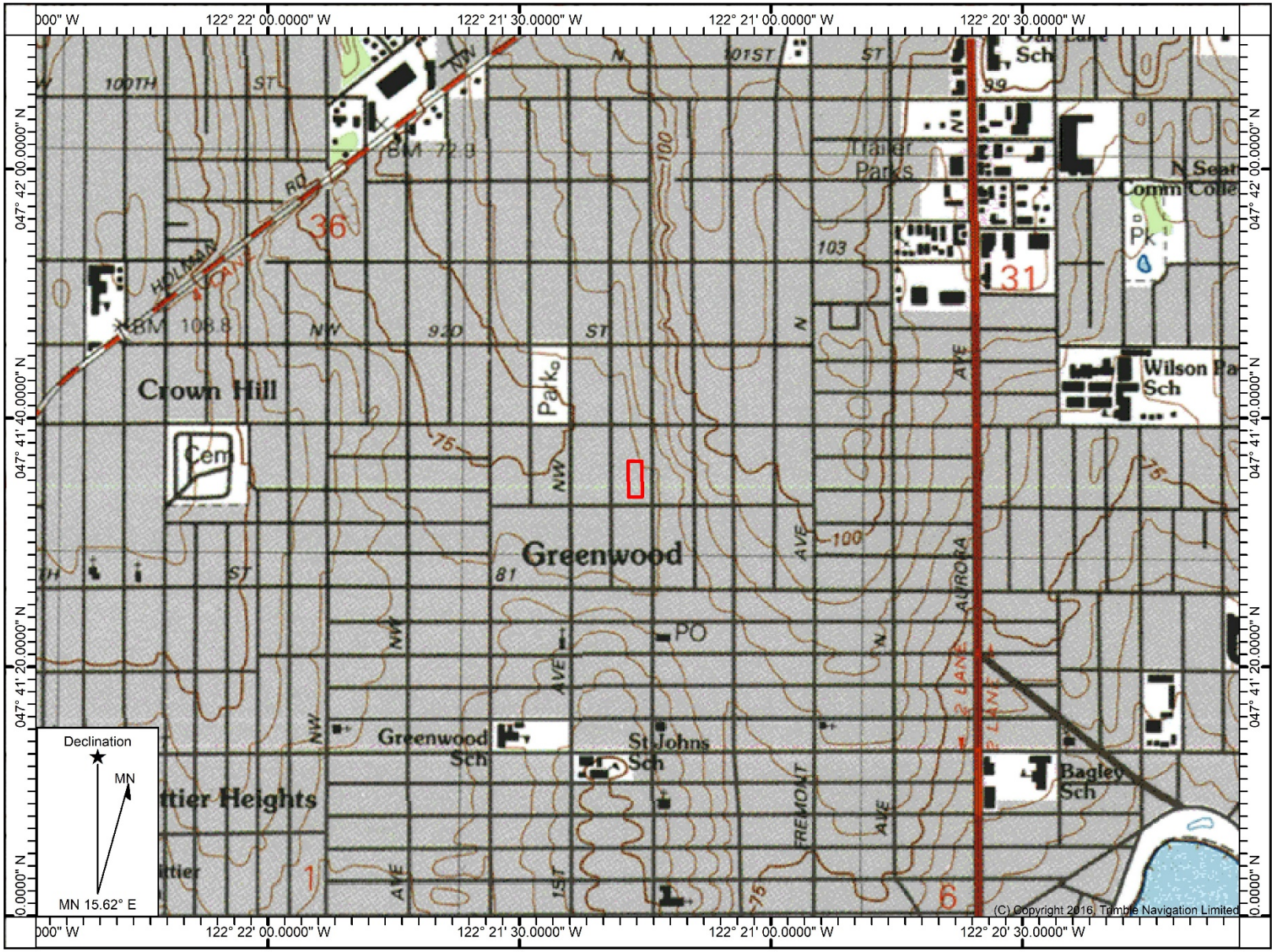
* Sample Extract passed throuhg a silica gel column prior to analysis.

** Cleanup level of carcinogenic PAHs based on the quotient of their Toxicity Equivalency with respect to Benzo(a)pyrene

TEF = Toxicity Equivalency Factor per Ecology[1]

TEQ = Toxicity Equivalency Quotient per Ecology[1]

1. Ecology, April 20, 2015. Evaluating the Human Health Toxicity of Carcionogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs): Implementation Memorandum #10.



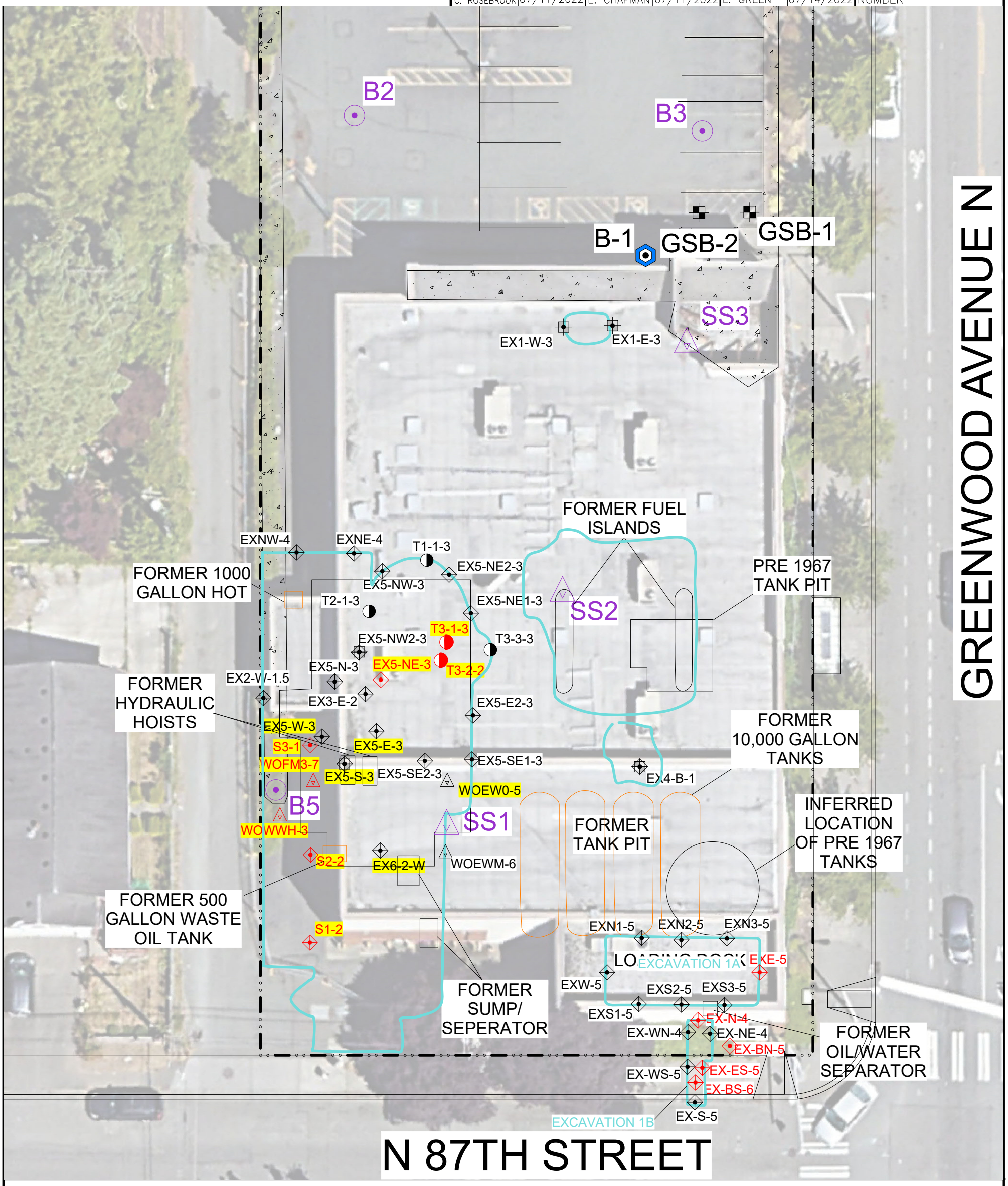
Name: SEATTLE NORTH
Date: 09/20/21

0 1000 2000 3000
Feet

Location: 047° 41' 35.3419" N, 122° 21' 15.9186" W
Contour Interval: 16 ft

EVREN NORTHWEST INC environmental, natural resource consultants	Date Drawn: 9/20/2021 CAD File Name: 1581-21001-01_fig1sv_map Drawn By: CLR Approved By: LDG	Commercial Property 8701 Greenwood Avenue N Seattle, Washington	**Site Vicinity Map**	Project No. 1581-21001 Figure No. **1**

DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
C. ROSEBROOK	07/11/2022	E. CHAPMAN	07/11/2022	L. GREEN	07/14/2022	1581-21001(v01)



LEGEND:

- PROPOSED STRUCTURE LOCATION
- SUBJECT PROPERTY BOUNDARIES
- ENVIRONMENTAL ASSOCIATES, INC SOIL BORING LOCATION APRIL 1997
- EXE-5 LABELS IN RED EXCEED MTCA METHOD A CLEANUP LEVELS
- PARTNER SOIL BORING LOCATION MARCH 2021
- PARTNER SUB-SLAB SOIL GAS PROBE LOCATION MARCH 2021
- ENVIRO. RESOLUTION INC. SOIL SAMPLE LOCATION REMAINING FOLLOWING EXCAVATION 1996
- PRIOR PCS EXCAVATION MARGINS
- SP-0217 YELLOW INDICATES SOIL WHERE SAMPLE WAS COLLECTED HAS BEEN REMOVED
- LEFT COAST SERVICES LLC SOIL BORING LOCATION NOVEMBER 2020

NOTES:

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2019 AND ENW FIELD NOTES.
2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.
3. SYMBOLS REPRESENT LOCATION AND DO NOT ALWAYS REPRESENT EXACT SHAPE, SIZE, OR ORIENTATION.

APPROXIMATE SCALE

0 20 40 FEET

N

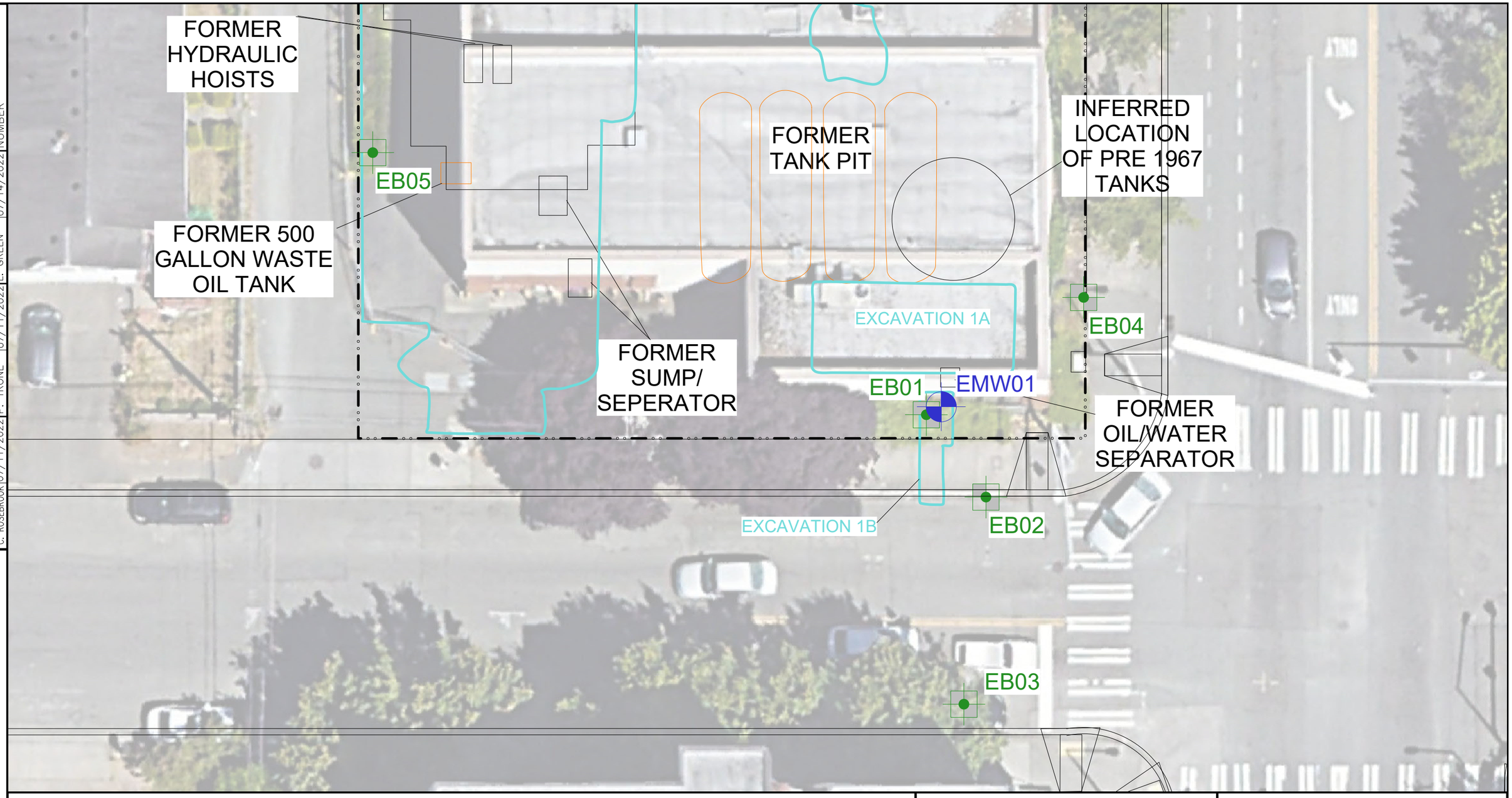
EVREN NORTHWEST INC.
environmental / natural resource consultants
PO BOX 14488, PORTLAND, OREGON 97293
P: (503)452-5561, E: ENW@EVREN-NW.COM

FIGURE 2

SITE PLAN

COMMERCIAL PROPERTY
8701 GREENWOOD AVENUE N
SEATTLE, WASHINGTON

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
C. ROSEBROOK 07/11/2022	P. TRONE 07/11/2022	L. GREEN 07/14/2022	1581-21001(v01)



LEGEND:

- SUBJECT BUILDINGS
- SUBJECT PROPERTY BOUNDARIES
- EB01 ENW ASSESSMENT BORING SAMPLE LOCATION
- PRIOR PCS EXCAVATION MARGINS
- EMW01 MONITORING WELL INSTALLED BY ENW

NOTES:

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2019 AND ENW FIELD NOTES.
2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.
3. SYMBOLS REPRESENT LOCATION AND DO NOT ALWAYS REPRESENT EXACT. SHAPE, SIZE, OR ORIENTATION

APPROXIMATE SCALE

0 15 30 FEET

N

EVREN NORTHWEST INC.
environmental & natural resource consultants
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FIGURE 3

SAMPLE LOCATION DIAGRAM

COMMERCIAL PROPERTY
8701 GREENWOOD AVENUE N
SEATTLE, WASHINGTON

Appendix A

Site Photographs

View west of drill rig set up on first attempt at EMW01.

EMW01 was moved 2 feet north after encountering a PVC pipe at the first location.

Soil cores retrieved inside 4-foot-long plastic sleeves were accessed to perform field screening and collect soil samples.

Close-up view of poorly-graded sand with gravel encountered in upper 4 feet at EMW01.

EVREN NORTHWEST INC. environmental / natural resource consultants	Future Kiddie Academy Property 8701 Greenwood Avenue N Seattle, Washington	**Site Photographs**	Project No. 1581-21001-02 Appendix **A**

Close-up view of organics (wood fragments and peat) encountered below a depth of 4 feet at EMW01.

EMW01 was completed as a permanent monitoring well with 1.25-inch PVC casing and 10 feet of well screen from 9.5 ft to 19.5 ft.

View south of drill rig set up on EB04 in landscaping next to Greenwood Avenue right-of-way.

View north while an ENW geologist collects a reconnaissance ground water sample from EB04.

EVREN NORTHWEST INC. environmental / natural resource consultants	Future Kiddie Academy Property 8701 Greenwood Avenue N Seattle, Washington	**Site Photographs**	Project No. 1581-21001-02 Appendix **A**

View north of drill rig set up on EB05 on west side of building.

Pea gravel encountered in EB05 is likely backfill from previous remedial excavations. Fill and underlying native soils were sampled.

About 15 inches of peat was encountered beneath the pea gravel fill.

The peat layer was underlain by about 2.5 feet of saturated sandy silt extending to the termination depth of 16'.

EVREN NORTHWEST INC. environmental / natural resource consultants	Future Kiddie Academy Property 8701 Greenwood Avenue N Seattle, Washington	**Site Photographs**	Project No. 1581-21001-02 Appendix **A**

Following sampling activities, temporary reconnaissance borings were backfilled and sealed at the surface.

Investigation derived waste (soil and water) was placed in drums and left on site pending receipt of laboratory results.

Appendix B

Well Logs

EVREN Northwest, Inc.

DRILL LOG	PROJECT	PROJECT NO.	BORING NO.
	Focused Subsurface Investigation	1581-21001-02	**EMW01**

SITE	BEGUN	COMPLETED	HOLE SIZE	ANGLE FROM HORIZ.
8701 Greenwood Ave N., Seattle, WA	5-31-22	5-31-22		

COORDINATES	DEPTH GROUND WATER	DATE SL	STATIC LEVEL	FIRST WATER	GROUND ELEVATION

DRILLER	CORE RECOVERY (%)	# SAMPLES	# CORE BOXES	DEPTH TOP OF ROCK
Standard Environmental Probe				

DRILL MAKE AND MODEL	LOGGED BY:	DEPTH BOTTOM OF HOLE
DPT 54LT	Jordan Morris	19.5

DEPTH	STRATA ELEVATION/ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA: SAMPLE NO.	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CORE RECOVERY	SAMPLE DATA: MW Const./ Completion	PID/OVM	REMARKS: NOTES ON WATER LEVELS, LOSSES, CAVING, CASING, DEPTH & DRILLING CONDITIONS.
0			Dry concrete						1.25"
			Poorly-graded sand with gravel. Slightly damp. Olive-gray. Poor recovery.			20			
4			Medium-plasticity organic soil, very damp. All fines, no visible sand. Non-micaceous. Dark brown. Poor recovery.			80			
8			Silty sand with gravel. Slightly damp. Dark olive-brown. 0.5-inch clasts of concrete mixed in.						
			Organic soil, very damp. All fines, no visible sand. Dark brown with light brown strands of peat.			40			
12			Organic soil with sand. Heterogeneous, 15% sand. Sand is yellowish-0tan, soil is dark brown. Peat fibers present. Organic soil, sand is no longer present. Dark brown, slightly sulfurous odor. Peat fibers present.			50			
			Soil-water interface.	ENW01 SWI-15.5					soil- water int erface , 15.5'
16			Silt with sand. Wet, grading to damp at bottom of drill case. Low plasticity. Light gray. High recovery.			100			
20			Bottom of well.						
24									
28									

EVREN Northwest, Inc.

DRILL LOG	PROJECT	PROJECT NO.	BORING NO.
	Focused Subsurface Investigation	1581-21001-02	**EB04**

SITE	BEGUN	COMPLETED	HOLE SIZE	ANGLE FROM HORIZ.
8701 Greenwood Ave N., Seattle, WA	5/31/22	5/31/22		

COORDINATES	DEPTH GROUND WATER	DATE SL	STATIC LEVEL	FIRST WATER	GROUND ELEVATION

DRILLER	CORE RECOVERY (%)	# SAMPLES	# CORE BOXES	DEPTH TOP OF ROCK
Standard Environmental Probe				

DRILL MAKE AND MODEL	LOGGED BY:	DEPTH BOTTOM OF HOLE
DPT 54LT	Jordan Morris	16

DEPTH	STRATA ELEVATION/ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA: SAMPLE NO.	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CORE RECOVERY	SAMPLE DATA: MW Const./ Completion	PID/OVM	REMARKS: NOTES ON WATER LEVELS, LOSSES, CAVING, CASING, DEPTH & DRILLING CONDITIONS.
0			Topsoil						
			Gravelly silt with sand. Rounded clasts. Brown and gray. Medium plasticity.			60			
4			Sandy silt, gravel almost absent. High plasticity. Slightly wetter than above. Gray.					0.0	
			Organic soil. Medium plasticity. Less than 10% sand. Dark brown.			60			
			Organic soil. Low plasticity. No sand. 50% peat. Dark brown.						
8			Organic peat, can hardly even call soil. Very wet. Brown to dark brown.					0.0	
						60			
12									
			Medium plasticity silty sand. Wet. Gray.	EB04-swi-13		70			Soil-water interface
16			Bottom of boring.						
20									
24									
28									

EVREN Northwest, Inc.

DRILL LOG

PROJECT: Focused Subsurface Investigation			PROJECT NO.: 1581-21001-02	BORING NO.: **EB05**
SITE: 8701 Greenwood Ave N., Seattle, WA	BEGUN: 5-31-22	COMPLETED: 5-31-22	HOLE SIZE:	ANGLE FROM HORIZ.:
COORDINATES	DEPTH GROUND WATER:	DATE SL:	STATIC LEVEL:	FIRST WATER: / GROUND ELEVATION:
DRILLER: Standard Environmental Probe	CORE RECOVERY (%):	# SAMPLES:	# CORE BOXES:	DEPTH TOP OF ROCK:
DRILL MAKE AND MODEL: DPT 54LT	LOGGED BY: Jordan Morris			DEPTH BOTTOM OF HOLE: 16

DEPTH	STRATA ELEVATION/ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA: SAMPLE NO.	SAMPLE TYPE	CORE RECOVERY	MW Const./ Completion	PID/OVM	REMARKS: NOTES ON WATER LEVELS, LOSSES, CAVING, CASING, DEPTH & DRILLING CONDITIONS.
0			Concrete			40			
			Dry, angular gravel. 50% fines.						
4			Very wet rounded pea gravel. <15% fines.			30			
8			Interval sample			30			
12			Organic soil and peat. Wet. Dark brown.	EB05/8-12					Interval sample
			Grades from sandy silt to silty sand. Very wet. Gray.	EB05/12-13.5 EB-SWI-14		90			Soil-water interface
16			Bottom of core.					0.0	
20									
24									
28									

Appendix C

Field Sample Data Sheets and Well Development Forms

EVREN Northwest **GROUND WATER FIELD SAMPLING DATA FORM (FIELD)**

PROJECT NAME: **8701 Greenwood Avenue N. Seattle** PROJECT NUMBER: **1581-21001-01**

Event: Ground Monitoring Date: 05/31/22

Field Personnel: Dan S. and Jordan M. Monitoring Well ID: EB04

Weather Conditions: Sunny Start Time: 14:20

DTW (prior to purging): 6.97'

WELL PURGING INFORMATION

Time	DTW During Purging (feet)	Pumping Rate (L/min)	Temperature (degree C)	Specific Conductivity (mS/cm), ±3%	Dissolved Oxygen (mg/L) , ±10%	Water pH (S.U.), , ±0.1%	ORP (mV), , ±10 mV	Turbidity (NTU), , ±10%	Total Quantity Purged (gallons/liters)
14:29			Dark brown very turbid						0.0
14:34			Brown - turbid / fine sands						0.75
14:37			Lower intake / running dry						1.15
14:40			run dry						1.90
			— turn off pump —						
14:54									
			Slow to recharge will return						
			06/01/22						
			Sample collect over 2 day						

Total Purged:

Tubing: 1/4" LDPE

Purge Pumping Rate (approx. L/m): 150 ml/min

Well casing (in. diam): 1" PVC

Decontamination method:

Approx. Pump/Intake Depth: ~ 12.5

Well Conversion Factors: 2" = 0.17 gal / foot; 5/8" = 0.02 gal/foot

WELL CONDITION

Recommended Well Repairs/Additional Notes:

QA/QC Sample: ☐ Duplicate ☐ Lab QA/QC ☐ Equipment Blank ☒ None

Sampling Method: ☐ Grundfos Pump ☒ Peristaltic Pump ☐ Bladder Pump ☐ Dual Valve

SAMPLE INFORMATION

Analytical Parameters	Destination Laboratory	Preservative	Bottle Size	Number of bottles	Sample ID	Time Sampled
Gx, MTCA VOCs,	F + B	HCl	40ml	6		
Dx	"	none	500 ml	1	EB04-GW-15	0.50
cPAHs	"	none	1L	2		
Naphthalenes	"	none	1L	1		
Total Lead	"	HNO3	250mL	1		

Method of Transportation of samples: FedEx Courier

All samples were immediately placed into a cooler and packed with ice or "blue Ice" ☒ Yes ☐ No

Field Observations/Notes of sampling event:

Signature of Field Personnel:

EVRENNORTHWEST INC.
environmental natural resource consultants

Well Development Measurements

Site: 8701 N. Greenwood Ave. Project No.: 1581-2100-01

Monitoring Well: EMW01 Date: 7/15/22

Well Information

Depth to Water: 2.9 ft

Depth to Bottom of Well: 18.2 ft.

Height of Water Column: ~~18.2~~ 15.3 ft.

Vol. of Water in Well: 0.612 gal.

1" ID of Casing

Conversion Factor: 2" - 0.164 gal/ft.

Added water during installation? How much?

Weather: Sunny 68° F

Water Quality Parameters During Development

Time	Volume of Water Removed	Temperature (°C)	pH	Conductivity (mS/cm)	ORP (± mv)	Dissolved Oxygen (mg/L)	Appearance of Water
10:54			Began cuttera				
10:56	0.5 gal		issue with footvalve replace w/ ss footvalve				
10:57			Begin again				
11:02	1.0		run dry after				Dark brown/sands
11:06	1.5	17.71	6.46	0.301	87	10.82	>1000 Brown
11:13			start pump				
11:15	2.0	16.29	6.62	0.298	78	11.96	>1000 gray brown turbid
			run dry				
11:18							
11:20	~2.75		run dry				gray brown / turbid
11:23			begin again				
11:27	3.5	15.65	7.13	.303	-1	11.28	light gray / brown > 1000
11:30			start pump				
11:33	~4.25		slow down / run dry				over 1000 NTUs
11:37			start				
11:40	~5.0		run dry				>1000 NTUs
11:43		14.02	7.15	0.303	-14	11.71	>1000 NTUs —
11:45	5.5		↓ ↓	looks improved			
1152	7.25	pump still going					mostly clear but over 1000

Meter Calibration

Meter Number:

Parameter	Date & Time Calibrated	Calibration Results
pH		
Conductivity		
ORP		
DO		

Notes: (well condition, nearby activities or changes in land use, odors, problems, deviations from plan, etc.)

Develop by pumping 5 to 10 well volumes out - or until water clears after surging.

Stop Pump @ 11:57 ~ 8.5 gallons out

mostly clear yet over 1000 NTUs

Appendix E

Laboratory Analytical Report

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

June 27, 2022

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

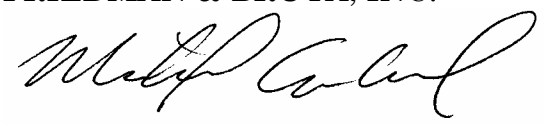
Dear Mr Green:

Included are the results from the testing of material submitted on June 1, 2022 from the 1581-21001-02, F&BI 206013 project. There are 33 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Neil Woller, Paul Trone, Evan Bruggeman
ENW0627R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 1, 2022 by Friedman & Bruya, Inc. from the Evren Northwest 1581-21001-02, F&BI 206013 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Evren Northwest
206013 -01	EB04-SWI-13
206013 -02	EB05-SWI-14
206013 -03	EB04-GW-15
206013 -04	EMW01-SWI-15.5
206013 -05	EB05/8-12
206013 -06	EB05/12-13.5

Sample EB04-SWI-13 was sent to Fremont Analytical for EPH and VPH analyses. The report is enclosed.

The 8270E water calibration standard failed the acceptance criteria for indeno(1,2,3-cd)pyrene. The data were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013
Date Extracted: 06/02/22
Date Analyzed: 06/02/22

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)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 58-139)
EB04-SWI-13 206013-01	<5	112
EB05-SWI-14 206013-02	<5	114
Method Blank 02-1139 MB2	<5	101

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013
Date Extracted: 06/06/22
Date Analyzed: 06/06/22

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
EB04-GW-15 206013-03	<100	132
Method Blank 02-1144 MB	<100	142

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013
Date Extracted: 06/02/22
Date Analyzed: 06/10/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND RESIDUAL RANGE USING METHOD NWTPH-Dx
Sample Extracts Passed Through a Silica Gel Column Prior to Analysis
Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Residual Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
EB04-GW-15 206013-03 1/1.2	<60	<300	77
Method Blank 02-1330 MB	<50	<250	137

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013
Date Extracted: 06/02/22
Date Analyzed: 06/02/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND RESIDUAL RANGE USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Residual Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
EB04-GW-15 206013-03 1/1.2	120 x	<300	83
Method Blank 02-1330 MB	<50	<250	130

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013
Date Extracted: 06/02/22
Date Analyzed: 06/02/22

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND RESIDUAL RANGE USING METHOD NWTPH-Dx

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

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Residual Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 48-168)
EB04-SWI-13 206013-01	110	<250	107
EB05-SWI-14 206013-02	<50	<250	101
Method Blank 02-1326 MB2	<50	<250	103

Analysis For Total Metals By EPA Method 6020B

Client ID:	EB04-SWI-13	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	206013-01
Date Analyzed:	06/03/22	Data File:	206013-01.106
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	1.08

Analysis For Total Metals By EPA Method 6020B

Client ID:	EB05-SWI-14	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	206013-02
Date Analyzed:	06/03/22	Data File:	206013-02.107
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	2.24

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Evren Northwest
Date Received:	NA	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	I2-395 mb
Date Analyzed:	06/03/22	Data File:	I2-395 mb.055
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	EB04-GW-15	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	206013-03
Date Analyzed:	06/03/22	Data File:	206013-03.072
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	7.74

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Evren Northwest
Date Received:	NA	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	I2-396 mb
Date Analyzed:	06/03/22	Data File:	I2-396 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	EB04-SWI-13	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	206013-01
Date Analyzed:	06/03/22	Data File:	060317.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	115 vo	90	109
Toluene-d8	96	89	112
4-Bromofluorobenzene	95	84	115

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	<0.05
m,p-Xylene	<0.1
o-Xylene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,2-Dibromoethane (EDB)	<0.05
Hexane	<0.25
1,3,5-Trimethylbenzene	<0.05
1,2,4-Trimethylbenzene	<0.05
Naphthalene	<0.05

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	EB05-SWI-14	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	206013-02
Date Analyzed:	06/03/22	Data File:	060318.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	90	109
Toluene-d8	99	89	112
4-Bromofluorobenzene	99	84	115

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	<0.05
m,p-Xylene	<0.1
o-Xylene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,2-Dibromoethane (EDB)	<0.05
Hexane	<0.25
1,3,5-Trimethylbenzene	<0.05
1,2,4-Trimethylbenzene	<0.05
Naphthalene	0.057

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	02-1311 mb
Date Analyzed:	06/03/22	Data File:	060305.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	90	109
Toluene-d8	99	89	112
4-Bromofluorobenzene	89	84	115

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	<0.05
m,p-Xylene	<0.1
o-Xylene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,2-Dibromoethane (EDB)	<0.05
Hexane	<0.25
1,3,5-Trimethylbenzene	<0.05
1,2,4-Trimethylbenzene	<0.05
Naphthalene	<0.05

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	EB04-GW-15	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	206013-03
Date Analyzed:	06/03/22	Data File:	060328.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	111	78	126
Toluene-d8	101	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Hexane	<5
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<0.2
Benzene	<0.35
Toluene	<1
1,2-Dibromoethane (EDB)	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/03/22	Lab ID:	02-1309 mb
Date Analyzed:	06/03/22	Data File:	060307.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	107	84	115
4-Bromofluorobenzene	107	72	130

Compounds:	Concentration ug/L (ppb)
Hexane	<5
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<0.2
Benzene	<0.35
Toluene	<1
1,2-Dibromoethane (EDB)	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	EB04-SWI-13	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/02/22	Lab ID:	206013-01 1/5
Date Analyzed:	06/03/22	Data File:	060241.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	58	24	111
Phenol-d6	66	37	116
Nitrobenzene-d5	65	38	117
2-Fluorobiphenyl	78	45	117
2,4,6-Tribromophenol	77	11	158
Terphenyl-d14	92	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	EB05-SWI-14	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/02/22	Lab ID:	206013-02 1/5
Date Analyzed:	06/03/22	Data File:	060242.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	72	24	111
Phenol-d6	79	37	116
Nitrobenzene-d5	77	38	117
2-Fluorobiphenyl	84	45	117
2,4,6-Tribromophenol	75	11	158
Terphenyl-d14	89	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.019
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/02/22	Lab ID:	02-1334 mb 1/5
Date Analyzed:	06/03/22	Data File:	060231.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	67	24	111
Phenol-d6	75	37	116
Nitrobenzene-d5	72	38	117
2-Fluorobiphenyl	85	45	117
2,4,6-Tribromophenol	67	11	158
Terphenyl-d14	85	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	EB04-GW-15	Client:	Evren Northwest
Date Received:	06/01/22	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/02/22	Lab ID:	206013-03 1/2
Date Analyzed:	06/02/22	Data File:	060208.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	38	11	65
Phenol-d6	26	11	65
Nitrobenzene-d5	72	50	150
2-Fluorobiphenyl	71	44	108
2,4,6-Tribromophenol	62 ca	10	140
Terphenyl-d14	79	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04 ca
Dibenz(a,h)anthracene	<0.04

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	1581-21001-02, F&BI 206013
Date Extracted:	06/02/22	Lab ID:	02-1325 mb2
Date Analyzed:	06/02/22	Data File:	060207.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	21	11	65
Phenol-d6	13	11	65
Nitrobenzene-d5	82	50	150
2-Fluorobiphenyl	79	44	108
2,4,6-Tribromophenol	64 ca	10	140
Terphenyl-d14	91	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.2
2-Methylnaphthalene	<0.2
1-Methylnaphthalene	<0.2
Benz(a)anthracene	<0.02
Chrysene	<0.02
Benzo(a)pyrene	<0.02
Benzo(b)fluoranthene	<0.02
Benzo(k)fluoranthene	<0.02
Indeno(1,2,3-cd)pyrene	<0.02 ca
Dibenz(a,h)anthracene	<0.02

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: 205490-02 (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	105	71-131

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: 206013-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	104	69-134

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 206001-01 (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	3,400	70 b	112 b	73-135	46 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	102	74-139

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	128	132	63-142	3

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

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	124	136	63-142	9

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: 206021-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	mg/kg (ppm)	50	5.82	97	92	75-125	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	mg/kg (ppm)	50	98	80-120

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: 205464-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	95	100	75-125	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	80-120

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: 206062-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Hexane	mg/kg (ppm)	1	<0.25	61	52	10-137	16
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	<0.05	95	84	21-145	12
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	<0.05	81	87	12-160	7
Benzene	mg/kg (ppm)	1	<0.03	80	85	29-129	6
Toluene	mg/kg (ppm)	1	<0.05	86	98	35-130	13
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	<0.05	85	91	28-142	7
Ethylbenzene	mg/kg (ppm)	1	<0.05	88	92	32-137	4
m,p-Xylene	mg/kg (ppm)	2	<0.1	88	91	34-136	3
o-Xylene	mg/kg (ppm)	1	<0.05	89	90	33-134	1
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	<0.05	85	85	18-149	0
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	<0.05	88	88	10-182	0
Naphthalene	mg/kg (ppm)	1	<0.05	87	81	14-157	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Hexane	mg/kg (ppm)	1	93	43-142
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	101	60-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	98	56-135
Benzene	mg/kg (ppm)	1	95	71-118
Toluene	mg/kg (ppm)	1	95	66-126
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	100	74-132
Ethylbenzene	mg/kg (ppm)	1	101	64-123
m,p-Xylene	mg/kg (ppm)	2	98	78-122
o-Xylene	mg/kg (ppm)	1	92	77-124
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	95	76-126
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	92	76-125
Naphthalene	mg/kg (ppm)	1	88	63-140

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: 206013-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Hexane	ug/L (ppb)	10	<5	92	50-150
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	<1	102	50-150
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	<0.2	99	50-150
Benzene	ug/L (ppb)	10	<0.35	98	50-150
Toluene	ug/L (ppb)	10	<1	99	50-150
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	<1	103	50-150
Ethylbenzene	ug/L (ppb)	10	<1	96	50-150
m,p-Xylene	ug/L (ppb)	20	<2	94	50-150
o-Xylene	ug/L (ppb)	10	<1	95	50-150
Naphthalene	ug/L (ppb)	10	<1	94	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Hexane	ug/L (ppb)	10	93	102	54-136	9
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	99	109	70-130	10
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	95	106	70-130	11
Benzene	ug/L (ppb)	10	95	105	70-130	10
Toluene	ug/L (ppb)	10	108	104	70-130	4
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	105	101	70-130	4
Ethylbenzene	ug/L (ppb)	10	100	98	70-130	2
m,p-Xylene	ug/L (ppb)	20	99	97	70-130	2
o-Xylene	ug/L (ppb)	10	97	95	70-130	2
Naphthalene	ug/L (ppb)	10	90	90	70-130	0

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: 206021-01 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.83	<0.01	80	67	34-118	18
2-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	80	67	29-130	18
1-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	80	67	37-119	18
Benz(a)anthracene	mg/kg (ppm)	0.83	<0.01	90	83	50-150	8
Chrysene	mg/kg (ppm)	0.83	<0.01	85	81	50-150	5
Benzo(a)pyrene	mg/kg (ppm)	0.83	<0.01	91	82	50-150	10
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	<0.01	93	82	50-150	13
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	<0.01	91	81	50-150	12
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	<0.01	88	79	41-134	11
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	<0.01	89	80	44-130	11

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.83	80	58-108
2-Methylnaphthalene	mg/kg (ppm)	0.83	80	67-108
1-Methylnaphthalene	mg/kg (ppm)	0.83	79	66-107
Benz(a)anthracene	mg/kg (ppm)	0.83	91	70-130
Chrysene	mg/kg (ppm)	0.83	88	70-130
Benzo(a)pyrene	mg/kg (ppm)	0.83	90	68-120
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	95	69-125
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	92	70-130
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	80	67-129
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	83	67-128

Date of Report: 06/27/22
Date Received: 06/01/22
Project: 1581-21001-02, F&BI 206013

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	85	82	62-90	4
2-Methylnaphthalene	ug/L (ppb)	5	86	82	64-93	5
1-Methylnaphthalene	ug/L (ppb)	5	85	81	64-93	5
Benz(a)anthracene	ug/L (ppb)	5	96	93	70-130	3
Chrysene	ug/L (ppb)	5	97	94	70-130	3
Benzo(a)pyrene	ug/L (ppb)	5	103	98	70-130	5
Benzo(b)fluoranthene	ug/L (ppb)	5	97	93	70-130	4
Benzo(k)fluoranthene	ug/L (ppb)	5	106	98	70-130	8
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	82	86	70-130	5
Dibenz(a,h)anthracene	ug/L (ppb)	5	88	89	70-130	1

Data Qualifiers & Definitions

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

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

ca - The calibration results for the analyte were outside of acceptance criteria. 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.

206013

SAMPLE CHAIN OF CUSTODY

06/01/22

CI3/~~AE~~/E04 Page # 1 of 1 VW1

Report To Lynn Green
Company Evren Northwest
Address PO Box 14488
City, State, ZIP Portland OR 97293
Phone 503 452-5561 Email lynng@evren-nw.com

SAMPLERS (*signature*)

PROJECT NAME: 1581-21001-02

PO #

REMARKS: ~~Rush~~ Poss. future analysis Total Cd, Cr, N., ZN PCB EPH/VPH Project specific RLs? - Yes / No

INVOICE TO: Cu, Pb

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	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	MTCA VOCs EPA 8260	cPAHs EPA 8270	PCBs EPA 8082	naphthalenes (Apl 3)	total Pb			Notes
EB04-SWI-13	01 A-E	05/31/22	14:20	Soil	5	X	X			X	X		X	X			
EB05-SWI-14	02	05/31/22	15:50	Soil	5	X	X			X	X		X	X			
EB04-GW-15	03 A-K	06/01/22	8:56	GW	11	X	X			X	X		X	X			** see notes
EMW01-SWI-15.5	04 A-E	05/31/22	12:24	Soil	5												HOLD
EB05/8-12	05	05/31/22	15:40	Soil	1												HOLD
EB05/12-13.5	~~06~~ 06 A-E	05/31/22	15:45	Soil	5												HOLD

Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Dan Sipko	DNW	6/1/22	12:23
Received by:	Michael Erdahl	FIB	6/1/22	1223
Relinquished by:				
Received by:				

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