REVISED DRAFT

Data Gaps Investigation Work Plan

Seattle DOT Mercer Parcels (Broad Block Site)

800 Mercer Street
Seattle, Washington

Prepared for

800 Mercer, LLC

January 23, 2020
19409-04

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Prepared by

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800 Mercer Street
Seattle, Washington

1.0 INTRODUCTION

On behalf of 800 Mercer, LLC, Hart Crowser, Inc. (Hart Crowser) has prepared this work plan for the supplemental environmental investigation to address data gaps at the Seattle DOT Mercer Parcels site (referred to in this document as the Broad Block property [Property]), located at 800 Mercer Street in Seattle, Washington. The Property vicinity and surrounding properties is shown on Figure 1.

The 2.8-acre Property is currently owned by the City of Seattle. However, 800 Mercer, LLC has been provided access to the Property as part of transactional due diligence and as part of pursuit of a Prospective Purchaser Consent Decree (PPCD) from the Washington State Department of Ecology (Ecology). This work plan is being submitted to Ecology for review as part of that process. Ecology has assigned the site Facility Site ID #27913 and Cleanup Site ID #14784.

The proposed additional site investigation will address data gaps identified following the first phase of investigations in a draft Site Investigation Summary Report (SISR, Hart Crowser 2019). The new data will be used along with current data to prepare a Remedial Investigation (RI) report for submittal to Ecology. The RI will evaluate the nature and extent of environmental contamination associated with the Property and distinguish contamination originating from historical uses at the Property from contamination originating from off-site and upgradient sources.

1.1 Project Background

Several site investigations were conducted on the Property by others prior to 2019. Based on a review of these investigations, historical activities on the Property, and the recent first phase of subsurface investigations, six areas of contamination were identified for further investigation (this includes six areas with chlorinated solvent impacts, three of which also contained petroleum-related impacts). The previous explorations are shown on Figure 2. Additional details on the background of the Property, a summary of previous investigations, and results from the recent first phase of subsurface investigation are presented in the SISR.

1.2 Regulatory Framework

The data gaps investigation results will be used to prepare an RI report for the Property and, subsequently, a Focused Feasibility Study/Cleanup Action Plan (FFS/CAP) consistent with guidance put forth in the Model Toxics Control Act (MTCA), Washington Administrative Code 173-340.

1.3 Purpose and Objectives

In this work plan, Hart Crowser proposes to conduct supplemental RI activities on the Property. The supplemental investigation activities proposed in this work plan will be conducted in support of the investigation and future selection and implementation of cleanup activities on the Property.

The purpose of this work plan is to provide a scope of work and methodology for conducting the supplemental RI activities. The activities outlined in this work plan are also designed to meet the following specific project objectives:

- Develop data quality objectives for field investigation as well as sample collection and laboratory analytical activities.

- Generate sufficient data to address data gaps and adequately characterize the nature and extent of environmental contamination on the Property for the following purposes:

    - Developing preliminary and final conceptual site model (CSM);

    - Evaluating potential risk to current and potential future human and ecological receptors from chemicals of concern (COCs) originating both on and off the Property; and

    - Defining the subsurface geochemical conditions on and beneath the Property to evaluate potential cleanup options to be incorporated during redevelopment.

2.0 SITE DESCRIPTION AND BACKGROUND

This section provides a brief summary of the Property and development history and the local geology and hydrogeology. The SISR provides a more detailed history of the Property (and surrounding properties).

2.1 Historical and Current Property Uses

Residential buildings were present on the Property as early as 1893, and Lake Union may have extended to the northeast corner of the Property. By 1917, commercial buildings were also present on the northeast quadrant of the Property, and the Lake Union shoreline no longer extended onto the Property. Vine Street (renamed Eighth Avenue North by 1905) ran north-south, bisecting the center of the Property and connecting Roy and Mercer Streets, from as early as 1893 through approximately the mid-1950s.

Historically, a variety of businesses and facilities occupied portions of the Property, including: paint, soap and chemical works facilities; a gasoline station; a junkyard; and auto service shops (wrecking, repair, and upholstery).

In 1958, Broad Street was expanded to an underpass which ran diagonally across the entire Property, (no longer just the western half) from the northeast to the southwest (History Link 2011). Capillary streets connecting to Roy Street and Ninth Avenue North were also constructed during this time. During construction of the underpass, most of the buildings on the Property were demolished, and Eighth Avenue North was vacated and no longer crossed the Property.

In the 1950s to 1960s, the 800 Mercer Street building (located on the southwest corner of the east half of the Property) had tenants including a costume shop, sign company, refrigerator sales and service, sign painting, and a hang-gliding shop. By 1974, the buildings in the northwest corner of the Property had been removed.

The 800 Mercer Street building was demolished in 2010 to facilitate Mercer Corridor improvements. In 2012 and 2013, aerial photographs show the Broad Street underpass was rerouted, and Mercer Street was widened to include the southern half of the former 800 Mercer Street building. Aerial photography from 2014 shows that the underpass was backfilled to match the existing grades of Mercer and Roy Streets, and all roadways within the Property had been removed.

The entire Property was used as a construction staging area until 2016, when sediment ponds for stormwater were installed on the east half of the Property. The west half of the Property continued to be used as a staging area by Shimmick Construction for construction equipment, parking, and stockpiles until 2019; it is currently vacant.

2.2 Site Geology and Hydrogeology

Our understanding of the subsurface geology and hydrogeology at the Property is based on our interpretation of the recent and historical borings completed on and in the area surrounding the Property.

2.2.1 Geology

Soil encountered beneath the Property consists of fill, glacial deposits, and non-glacial deposits consistent with previous studies in the area (SES 2016; PES 2018). Brief summaries of the identified geological units are presented below.

Fill. Fill is comprised of poorly graded sand with gravel, silty sand, silty sand with gravel, some silt, all with variable gravel and cobbles. Fill also contains brick, concrete, and glass debris. Varying fill depths were observed at the Property. Fill was used to fill the former Broad Street alignment which is likely to range from less than 2 feet to over 20 feet in thickness. Near borings MBGW-8 and HMW-3IA, fill depths of approximately 5 feet were observed, equivalent to approximately 42- and 50-feet elevation, respectively (all elevations in this report are referenced to the North American Vertical Datum of 1998 [NAVD88]). The thickest fill was observed in HMW-4IA at 22.5 feet below ground surface (bgs), equivalent to approximately 36 feet elevation, completed within the alignment of former Broad Street. Most borings encountered 12 to 18 feet of fill material.

Lake Deposits. Recent lake deposits associated with Lake Union consist of poorly graded sand, silty sand with gravel and sandy silty with gravel which contain varying amounts of organics, peat, and shell fragments. The lake deposits were formed in shoreline to lake bottom depositional environments. The lake deposits were observed in the eastern portion of the Property generally eastward from boring MBGW-2. Lake deposits seen in MBGW-2 from 14.5 feet bgs to 27 feet bgs (approximately 18 to 30.5 feet elevation) contained more sand representing shoreline deposits. Lake deposits in HMW-1IB were seen at depths of 17 feet bgs to 27 feet bgs (approximately 11.5 to 21.5 feet elevation) and from 17.5 feet bgs to 30 feet bgs (approximately 11 to 23.5 feet elevation) in boring MBGW-15. These lacustrine deposits represented shallow lake bottom sediments and are comprised of soft to medium stiff silt and clay with fine organics, shells, and peat.

Glacial Till Deposits. Glacial deposits comprised of glacial till and ice contact deposits were observed underlying the Property. The deposits are composed of very dense silty sand to silty sand with gravel. Interbedded in these deposits are layers of poorly graded sand, sandy silt, and silt. Varying degrees of gravel and cobbles were seen. Ice contact/till deposits were observed to a depth of 73 feet bgs (approximately -17 feet elevation) in exploration HMW-3D and to a depth of 60 feet bgs (approximately -13 feet elevation) in exploration HMW-2D. Boring MBGW-8 displayed ice contact deposits/till beginning from 20 feet bgs to 50 feet bgs (approximately -3 to 27 feet elevation). These deposits appear to be absent in borings MBGW-2, HMW-1IB, and HMW-1D.

Glacial Outwash Deposits. Glacial outwash deposits are seen across the Property. These deposits are composed of dense to very dense poorly graded sand with varying amounts of silt and gravel. In borings HMW-1IB and HMW-1D, outwash deposits were observed at depths of approximately 35 feet bgs to 45 feet bgs (approximately -6.5 to 3.5 feet elevation) and 35 feet bgs to 65 feet bgs (approximately -27 to 3 feet elevation), respectively. On the eastern side of the Property in boring HMW-4IA, outwash deposits were observed at a depth of 73 feet bgs to the bottom of the boring at 81.5 feet bgs (approximately -23 to -14.5 feet elevation). Older outwash deposits are characterized by poorly graded sand with silt and varying degrees of gravel and are observed from 80 feet bgs to the bottom of the boring at 90 feet (approximately -43 to -33 feet elevation) in HMW-2D. In HMW-1D, these outwash deposits are encountered from 70 feet bgs to the bottom of the boring at 90 feet bgs (approximately -52 to -32 feet elevation). The bottom of the glacial outwash was not encountered in any of the explorations completed for the first phase of site investigations.

2.2.2 Hydrogeology

The hydrogeology of the Property consists of discontinuous water-bearing zones in the glacial till deposits, and a deeper water-bearing zone in the glacial outwash deposits. The water-bearing deposits have been subdivided historically (SES 2013; PES 2018) into four zones (shallow, intermediate “A” and “B,” and deep) based on soil type and depth.

The uppermost zone is the shallow zone (generally found to depths of approximately 40 feet bgs) is an unconfined water-bearing zone in the fill and upper portion of the glacial till/ice-contact deposits. The intermediate zone is a dense to very dense, semi-confined to confined water-bearing zone in the glacial till/ice-contact deposits. The intermediate zone is further divided into an upper coarser zone (intermediate A, down to 50 feet bgs) and a lower, typically finer zone (intermediate B, down to 70 feet bgs). The deep zone is a deeper (down to approximately 90 feet bgs), very dense, confined water-bearing zone in the glacial outwash deposits.

Groundwater flow based on measurements from shallow and intermediate wells on March 26, 2019 was generally towards the east at an average gradient of 0.02 foot/foot. Groundwater elevation in the deep wells (17 to 19 feet) are similar to Lake Union elevations (16 to 18 feet) and historically groundwater flow direction has been to the east, towards Lake Union; however, in the recent investigations, groundwater elevations in the deep wells were variable with the highest water levels observed in the central portion of the Property. Groundwater elevations are higher in shallow wells and lower in the corresponding deep wells suggesting that the potential vertical gradient is downward.

3.0 SITE CONDITIONS AND ENVIRONMENTAL CONCERNS

The following sections provide a brief summary of the previous environmental investigations conducted at the Property.

3.1 Summary of Previous Investigations and Findings

Previous investigations and reports for the Property were reviewed, and the most relevant information is summarized below. Additional details are presented in the separate SISR. Historical soil and groundwater data are summarized in Tables 1 and 2, respectively.

A limited Phase II was conducted on the Property in 2017 and 2018 (Shannon & Wilson 2018). All groundwater samples were collected directly from the shallow borings through a temporary well inserted into the boring.

- Heavy oil-range petroleum hydrocarbon (HRO) was detected in shallow groundwater at a concentration (970 micrograms per liter [µg/L]) exceeding the MTCA Method A cleanup level in boring 21417-MB10.

- Total arsenic concentrations in shallow groundwater exceeded MTCA Method A cleanup levels in borings 21417-MB10 and 21417-MB11. Total lead concentrations in shallow groundwater exceeded MTCA Method A cleanup levels in borings 21417-MB9, 21417-MB10, and 21417-MB11. However, dissolved metal concentrations in these same groundwater samples were below MTCA Method A cleanup levels.

- Lead was detected in a soil sample at a concentration (279 milligrams per kilogram [mg/kg]) exceeding the MTCA Method A cleanup level in boring 21417-MB9 at 22 feet bgs.

The first phase of additional subsurface investigations began in 2019 (Hart Crowser 2019).

- Gasoline-range petroleum hydrocarbon (GRO) was detected in a soil sample at a concentration (730 mg/kg) exceeding the MTCA Method A cleanup level in boring MBGW-13 at 10 feet bgs (44 feet elevation).

- Chlorinated solvent volatile organic compound (VOC) constituents (i.e., tetrachloroethene [PCE] and/or its degradation compounds trichloroethene [TCE], *cis*-1,2-dichloroethylene [cDCE], and vinyl chloride) were detected in soil samples at 26 to 50 feet bgs (-12 to 22 feet elevation) at concentrations exceeding applicable MTCA Method A or B cleanup levels in MBGW-3, MBGW-5, HMW-1IB, and HMW-2IB.

- PCE and/or related degradation products were detected in groundwater at concentrations exceeding applicable MTCA Method A or B cleanup levels in MBGW-1, MBGW-3, MBGW-12, and MBGW-15 (shallow groundwater); HMW-1IB, HMW-2IA, and HMW-4IA (intermediate groundwater); and HMW-1D (deep groundwater).

- Arsenic was detected in shallow groundwater at concentrations exceeding the MTCA Method A cleanup level in MBGW-11 (dissolved at 6.9 µg/L) and HMW-1S (total at 14 µg/L).
- Total carcinogenic polycyclic aromatic hydrocarbons (PAHs, normalized using toxicity equivalency factors) were detected in a soil sample at a concentration (0.29 mg/kg) exceeding the MTCA Method A cleanup level in HMW-4IA at 7.5 feet bgs (48.5 feet elevation).

Additional data has been collected at the adjacent American Linen Supply Co. Dexter Avenue Site (American Linen Site), which is being performed by PES Environmental, Inc. (PES) and others.

- PCE and/or related degradation products were detected in groundwater at concentrations exceeding applicable MTCA Method A or B cleanup levels in the following wells on and immediately adjacent to the Property: MW-154 and MW-155 (shallow); MW-114, MW-119, MW-146, MW-147, and MW-148 (intermediate); and MW-153 and FM-129 (deep).
- PCE and/or related degradation products were detected in soil samples at 35 to 50 feet bgs at concentrations exceeding applicable MTCA Method A or B cleanup levels in the following borings on and immediately adjacent to the Property: MW-114 and MW-106.
- In September 2019, PES installed two new well clusters in the sidewalk adjacent to Mercer Street. Hart Crowser has not yet received any data from these new wells but will coordinate with PES to obtain their most recent data when it is available.

3.2 Compounds of Concern and Screening Levels

Based on the previous site characterization efforts, the COCs for each medium of concern on the Property are listed in Table 3 along with their associated screening levels.

Table 3 – Summary of Chemicals of Concern and Screening Levels

Media	COC	Screening Level
Soil (mg/kg)	Lead	250
	GRO	30/100[a]
	Benzene	0.03
	Toluene	7
	Ethylbenzene	6
	Xylenes	9
	PCE	0.05
	TCE	0.03
	cDCE	160
	PAHs	0.1

Groundwater (µg/L)	COC	Screening Level
	HRO	500
	PCE	2.4
	TCE	1
	cDCE	16
	Vinyl chloride	0.2
	Arsenic	5
	Lead	15
	PAHs	0.1

Notes:

a. 100 mg/kg for gasoline mixtures without benzene and the total of ethylbenzene, toluene, and xylenes are less than 1 percent of the gasoline mixture; 30 mg/kg for other gasoline mixtures.

b. Screening levels for soil are based on MTCA Method A soil cleanup levels for unrestricted land use. Screening levels for groundwater are based on those used on the upgradient American Linen Site (PES 2019), which take into account the groundwater-to-surface-water pathway.

3.3 Remaining Data Gaps

The data gaps remaining after the investigations that have occurred to date are:

Data Gap 1. Further delineate the northern, eastern, southern, and western lateral extents of known GRO and potential petroleum-related VOCs in soil in the northwest corner of the Property near boring MBGW-13.

Data Gap 2. Further delineate the southern lateral and vertical extents of known chlorinated solvents in shallow, intermediate, and deep groundwater in the northwest corner of the Property.

Data Gap 3. Further assess whether chlorinated solvents are present in soil above the water table in the northwest corner of the Property.

Data Gap 4. Further assess and delineate the eastern, southern, and western lateral and vertical extents of known PCE and related degradation compounds in soil in the central-northern area of the Property near borings MBGW-3, MBGW-5, and HMW-2IB.

Data Gap 5. Further assess if the source of chlorinated solvent detections in soil (MBGW-3, MBGW-5, and HMW-2IB) and shallow and intermediate A groundwater (MBGW-3 and HMW-2IA) in the central-northern area of the Property is attributed to migration of contaminated groundwater from the American Linen Site.

Data Gap 6. Further delineate the eastern and southern lateral and vertical extents of known chlorinated solvents in shallow groundwater in the southeast corner of the Property near boring MBGW-15.

Data Gap 7. Further assess if chlorinated solvents are present in soils above the water table in the southeast corner of the Property near boring MBGW-15.

Data Gap 8. Further delineate the southern lateral and vertical extents of known chlorinated solvents in soil and shallow and intermediate A and B groundwater in wells HMW-2IA and HMW-2IB and boring MBGW-3.

Data Gap 9. Further delineate the northern, eastern, southern, and western lateral and vertical extents of known vinyl chloride in intermediate A groundwater and PAHs in soil in the southwest corner of the Property near well HMW-4IA.

Data Gap 10. Assess if PAHs are present in groundwater in the southwest corner of the Property near well HMW-4IA based on soil exceedance in that boring.

Data Gap 11. Investigate the northern and western lateral and vertical extents of known arsenic in shallow groundwater in the southwest corner of the Property near boring MBGW-11.

Data Gap 12. Further delineate the southern lateral and vertical extents of known chlorinated solvents in intermediate groundwater in wells MW-146 and MW-147.

Data Gap 13. More fully characterize seasonal variation in groundwater elevation data and flow directions.

4.0 SAMPLING AND ANALYSIS PLAN

Hart Crowser will conduct a supplemental subsurface investigation at and adjacent to the Property to address the data gaps identified in Section 3.3. Investigation activities will be completed in accordance with this work plan.

4.1 Proposed Sampling Locations

Soil and groundwater samples will be collected from 14 new monitoring wells and 10 new borings proposed for the Property. Figure 2 shows the approximate proposed exploration locations. The exploration locations and the rationales for how the locations address the data gaps are presented in Table 4 and summarized below:

- **MBB-1 through MBB-4.** These borings will be advanced in the northwest area of the Property north, west, south, and east of MBGW-13, respectively, to further delineate the lateral extents of known GRO-contaminated soil previously found in boring MBGW-13. These borings will also further assess the southern lateral and vertical extents of known chlorinated solvent-contaminated groundwater and determine whether chlorinated solvents are present in soil above the water table in the northwest area of the Property or if the chlorinated solvents in this area are attributed to the migration of contaminated groundwater from the American Linen Site. These borings will address data gap numbers 1, 2, and 3.

- **MBB-5 through MBB-10.** These borings will be advanced in the central-northern area of the Property to delineate the eastern, southern, and western lateral and vertical extents of known PCE and related degradation compound contamination in soil previously found in borings MBGW-3, MBGW-5, and HMW-2IB. These new borings will also confirm that previous detections of chlorinated solvents in soil (MBGW-3, MBGW-5, and HMW-2IB) and groundwater (MBGW-3 and HMW-2IA) in the central-northern area are attributed to migration of contaminated groundwater from the American Linen Site. These borings will address data gap numbers 4 and 5.

- **HMW-11S and HMW-11IB.** These monitoring wells will be advanced in the southeast area of the Property to further characterize the eastern lateral and vertical extents of known chlorinated solvent contamination in shallow groundwater previously found in boring MBGW-15. These new wells will also assess whether or not chlorinated solvents are present in soil above the water table in this area or if the chlorinated solvents in this area are attributed to the migration of contaminated groundwater from the American Linen Site. These new monitoring wells will address data gap numbers 6 and 7. It is assumed that PES will provide data from the new IA and D wells they recently installed in this vicinity.

- **HMW-10S and HMW-10D.** These monitoring wells will be advanced in the central area of the southern Property boundary to further delineate the southern lateral and vertical extents of known chlorinated solvent contamination in soil and shallow and intermediate A and B groundwater previously found in wells HMW-2IA and HMW-2IB and boring MBGW-3. These wells will also help us determine if the chlorinated solvents in this area are attributed to the migration of contaminated groundwater from the American Linen Site. These new groundwater monitoring wells will address data gap number 8. It is assumed that PES will provide data from the new IA and IB wells they recently installed in this vicinity.

- **HMW-5IB, HMW-6IA, HMW-6IB, HMW-6D, HMW-7IB, and HMW-8IB.** These monitoring wells will be advanced in the southwest area of the Property to delineate the northern, eastern, southern, and western lateral and vertical extents of known vinyl chloride contamination in intermediate A groundwater and PAH contamination in soil previously found in well HMW-4IA. These monitoring wells will also confirm whether or not PAHs are present in groundwater in this area. These monitoring wells will also further delineate the northern and western lateral and vertical extents of known arsenic contamination in shallow groundwater previously found in boring MBGW-11. These new monitoring wells will address data gap numbers 9, 10, and 11.

- **HMW-9S, HMW-9IA, HMW-9IB, and HMW-9D.** These monitoring wells will be advanced in the central area of the western third of the Property to assess the southern lateral and vertical extents of known chlorinated solvent contamination in intermediate groundwater previously found in wells MW-146 and MW-147. These wells will also help us determine if the chlorinated solvents in this area are attributed to the migration of contaminated groundwater from the American Linen Site. These new monitoring wells will address data gap number 12.

- **Quarterly groundwater monitoring will be completed at complete well network.** This will allow us to further evaluate the seasonal variation in groundwater levels and address data gap number 13.

4.2 Drilling and Well Installation

4.2.1 Utility Location

Before subsurface field sampling programs begin at the Property, public and private utility-locating services will be used to check for underground utilities and pipelines near the proposed sampling locations.

4.2.2 Soil Boring Advancement

Borings will be advanced using a sonic drilling rig. Boring locations will be determined using a handheld global positioning system device with sub-meter accuracy. All boring and monitoring well installation will be conducted by a driller licensed in the State of Washington.

4.2.3 Monitoring Well Construction and Development

Monitoring wells will be installed similarly to those from previous investigations at the Property. Monitoring wells will be constructed according to the Washington State well construction standards (Chapter 173-160 WAC) and as described below:

- Monitoring wells will be constructed with 2-inch-diameter PVC riser pipe and screened sections. The well screens will consist of 0.010-inch machine slots. The monitoring wells may be constructed with prepacked well screen with 10 x 20 washed silica sand or by placing materials downhole, following the WAC regulation listed above.

- Additional filter pack may be placed around the prepacked screen (if used). The additional filter pack will consist of graded 10 x 20 washed silica sand and will extend a maximum of 1 foot below the bottom of the screen and 3 feet above the top of the screen. A weighted line will be used to monitor the level of the filter pack during installation. The filter pack may be surged during installation.

- Bentonite grout or hydrated chips (e.g., 0.75-inch minus) will be used to seal the annulus above the filter pack. A weighted line will be used to measure the top of the bentonite chips as they are poured into place. Potable water will be used to prepare the bentonite grout (if used) or hydrate the bentonite chips after they are poured into place.

- At least 24 hours after installation of a well, the well will be developed by surging, bailing, and/or pumping to remove sediment that may have accumulated during installation and to improve the hydraulic connection with the water-bearing zone.

- Water quality field parameters such as pH, temperature, and turbidity, will be measured during well development. The wells will be developed until the turbidity measurements are 10 nephelometric turbidity units (NTUs) or less, until there is no noticeable decrease in turbidity, or until 10 casing volumes have been purged, whichever is less. To the extent practical, water quality field parameters will be considered stable when the specific conductance is within 10 percent of the previous reading, pH is within 0.1 standard unit of the previous reading, and temperature is within 0.1 degree Celsius of the previous reading.

Ten-foot-long well screens will be installed. Wells in the shallow aquifer (denoted by ‘S’ in figures) will be screened from 20 to 35 feet bgs, wells in the Intermediate Shallow aquifer (IA) will be screened from depths of 35 to 45 feet bgs, wells in the Intermediate Deep aquifer (IB) will be screened from depths of 50 to 65 feet bgs, and wells in the deep aquifer (D) will be screened from depths of 80 to 90 feet bgs. Approximate elevations of the proposed well screens are shown on Table 4.

Top-of-monument and top-of-casing elevations and horizontal locations for the new monitoring wells will be surveyed by a licensed surveyor. The horizontal datum will be referenced to the Washington State Plane North (NAD 83/91) coordinate system and the vertical datum will be referenced to mean sea level (NAVD 88). Horizontal and vertical measurements are accurate within 0.01 foot.

4.2.4 Decontamination Procedures

Nondisposable sampling equipment and reusable materials that contact the soil or water will be decontaminated on site before and after use at each sampling location. Decontamination will consist of the following:

- Tap-water rinse (may consist of an equivalent high-pressure or hot-water rinse). Visible soil to be removed by scrubbing.
- Non-phosphate detergent wash, consisting of a dilute mixture of Liqui-Nox® (or equivalent) and tap water.
- Distilled-water rinse.

Decontamination fluids will be transferred to drums for management as described below in Section 4.7.

4.2.5 Documentation

Soil and other observations at each boring location will be documented on a boring log and in field notes by a geologist or hydrogeologist licensed by the State of Washington or by a person working under the direct supervision of a Washington State-licensed geologist or hydrogeologist. Boring logs will include information such as the project name and location, the name of the drilling contractor, the drilling method, the sampling method, sample depths, a description of soil encountered, and screened intervals. Soils will be described using American Society for Testing and Materials designation D2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures). The information will be recorded on a Hart Crowser boring log form or in field notes.

We will also document our observations during well development activities in our field notes and forms. Observations will include, but are not limited to, groundwater levels, development water characteristics (e.g., color, turbidity, sheen), and development purge volumes.

4.3 Soil Sampling and Analyses

Proposed soil sample depths, elevations, and laboratory analyses are summarized in Table 4 and in the following sections.

4.3.1 Field Screening Techniques

Samples will be evaluated in the field using visual and olfactory observations, headspace vapor screening, and water sheen testing for potential soil contamination.

Observation. For soil with relatively higher petroleum concentrations there will likely be observable indicators of contamination. Soil may be stained or discolored so that it is visibly noticeable compared to typical soil colors. Sheens may also cause the soil to have a shiny or glossy appearance. Odors may also be present ranging from very faint to strong and from sweet smelling to pungent. Odors are usually detected inadvertently during field activities and are usually noticeably different than typical odors in air.

Sheen Tests. A sheen test is a visual test to assess if a sheen is produced on water by the soil. A small volume of soil is placed in a pan partially filled with water and the water surface is observed for signs of sheen. Sheens are classified as described below.

Table 5 – Sheen Classification

Classification	Description
No sheen (NS)	No visible sheen on water surface.
Slight sheen (SS)	Light colorless film, spotty to globular; spread is irregular, not rapid, areas of no sheen remain, film dissipates rapidly.
Moderate sheen (MS)	Light to heavy film, may have some color or iridescence, globular to stringy, spread is irregular to flowing; few remaining areas of no sheen on water surface.
Heavy sheen (HS)	Heavy colorful film with iridescence; stringy, spread is rapid; sheen flows off the sample; most of the water surface may be covered with sheen.

Headspace Vapor Measurements. Headspace vapor measurements will be made on soil using a photoionization detector (PID) with 10.4 eV lamp to assess the possible presence of VOCs. The PID is not compound-specific and only provides a semi-quantitative indication of the presence of VOCs. The PID measures concentrations in parts per million (ppm) and is calibrated to isobutylene. Soil is placed in a Ziploc® bag (filled less than half full), sealed with some air, and allowed to warm to ambient temperatures. PID measurements are made within 30 minutes of collection by opening the bag slightly and inserting the probe into the air space in the bag. The highest PID measurement for each sample is recorded on the field logs.

4.3.2 Soil Sample Collection Locations and Procedures

Five soil samples will be collected from each proposed exploration location. Soil samples will be collected from 5-, 10-, 15-, and 20-feet bgs, plus one additional sample from below 20-feet bgs, but above the shallow water table. Sample depths in each boring will be adjusted in the field as needed to characterize specific zones of impacted soil that may be encountered.

Pre-cleaned sample containers will be provided by the analytical laboratory ready for sample collection, including preservative, if required. Specific container requirements for samples that will undergo multiple analyses will be discussed with the analytical laboratory prior to sample collection. Field staff will put on clean nitrile gloves (or equivalent) for each sample. Soil samples for VOC analysis will be collected first using EPA Method 5035 procedures, by placing a 5-gram soil plug in a laboratory-supplied 40-milliliter volatile organic analysis (VOA) bottle. Soil samples for non-VOC analysis will then be transferred to labeled, pre-cleaned glassware provided by the sample receiving laboratory. Each soil sample will be transferred using a stainless-steel sampling spoon or disposal sampling equipment.

4.3.3 Sample Management

A sample label will be affixed to each container before sample collection. All containers will be marked with the project number, a sample number, date and time of collection, sampler's initials, and preservation type. Each sample will have a unique identification number that will be referenced by entry into our notes. Soil samples will be labeled according to the boring number and the order the sample was collected (e.g., HMW-5IB-S1).

Chain of custody forms will be used to document the collection, custody, and transfer of samples from their initial collection location to the laboratory. Each sample will be entered on the custody form immediately after it is collected.

Sample custody procedures will be followed to provide a record that can accompany a sample as it passes from collection through analysis. A sample is considered to be in custody if it meets at least one of the following conditions:

- It is in someone's physical possession or view;
- It is secured to prevent tampering (i.e., custody seals); and/or
- It is locked or secured in an area restricted to authorized personnel.

A chain of custody form will be completed in the field as samples are packaged. At a minimum, the information on the custody form will include the sample number, date and time of sample collection, sampler, analysis, and number of containers. A copy of the custody form will be placed in the cooler with its respective samples before the container is sealed for delivery to the laboratory. Another copy will be retained and placed in the project files after review by the project manager. Custody seals will be placed on each cooler containing samples, so the cooler cannot be opened without breaking the seals.

After sample containers have been filled, they will be stored in a cooler cooled with ice or blue ice to approximately 4°C. The coolers will be transferred to the analytical laboratory for chemical analysis. Chain of custody procedures will be maintained and documented at all times, from commencement in the field until delivery of the samples to the analytical laboratory, as discussed previously. Specific procedures are:

- Individual sample containers will be packed to prevent breakage;
- Custody forms will be enclosed in a plastic bag and taped to the inside lid of the cooler;
- Signed and dated custody seals will be placed on all coolers before shipping;
- Samples will be hand-delivered to the analytical laboratory by Hart Crowser personnel or courier;
- When sample possession is transferred to the laboratory, the custody form will be signed by the persons transferring custody of the coolers; and
- Upon receipt of samples at the laboratory, the shipping container custody seal will be broken, and the sample-receiving custodian will compare samples with information on the chain of custody form and record the condition of the samples received.

4.3.4 Laboratory Analyses

Soil samples will be analyzed by Friedman and Bruya, Inc. (Friedman and Bruya) or another environmental laboratory accredited by Ecology for GRO; HRO; diesel-range petroleum (DRO); halogenated VOCs and benzene, toluene, ethylbenzene, and xylenes (BTEX); and total metals (arsenic, cadmium, chromium, lead, and mercury). The five soil samples from MBB-1 through MBB-4, HMW-5IB, HMW-6IA, HMW-6IB, HMW-6D, HMW-7IB, and HMW-8IB will also be analyzed for PAHs. Samples will be analyzed on a standard turnaround time.

4.3.5 Decontamination Procedures

Nondisposable sampling equipment and reusable materials that contact the soil or water will be decontaminated on site before and after use at each sampling location. Decontamination will consist of the following:

- Tap-water rinse (may consist of an equivalent high-pressure or hot-water rinse). Visible soil to be removed by scrubbing.
- Non-phosphate detergent wash, consisting of a dilute mixture of Liqui-Nox® (or equivalent) and tap water.
- Distilled-water rinse.

Decontamination fluids will be transferred to drums for management as described below in Section 4.7.

4.3.6 Documentation

We will document our observations, field screening results, sampling activities, and sample identification numbers and collection times in our field notes and forms.

4.4 Groundwater Sampling and Analyses

4.4.1 Measurement of Groundwater Levels

Prior to purging, groundwater levels in the wells will be measured to the nearest 0.01 foot using an electronic water-level probe. The permanent monitoring wells will be opened and allowed to equilibrate for up to a half hour before measurements are taken. The temporary wells will be allowed to equilibrate for a minimum of 12 hours before measurements are taken. If any free product is encountered, we will measure the thickness of the product using an electronic interface probe.

4.4.2 Purging

After groundwater levels are measured, each well will be purged at a low flow rate using a peristaltic or submersible pump fitted with clean, disposable tubing. The tubing inlet will be placed approximately at the middle of the well screen. Tubing will be used one time and disposed of as described in Section 4.7. To assess the effectiveness of purging, dissolved oxygen, turbidity, temperature, electrical conductivity, oxidation-reduction potential, and pH will be measured (e.g., by means of a flow-through cell). Results of these measurements will be included on a well observation form.

For permanent monitoring wells, purging will be considered complete when three casing volumes of water have been removed, the well purges dry, or field parameters stabilize to within 10 percent for three consecutive readings (whichever is less). For temporary wells, at least one casing volume of water will be removed. Purging will continue to reduce turbidity as much as practicable before water samples are collected from the temporary wells. If a well is purged dry, it will be allowed to recover before sampling is performed. Purge water will be handled in accordance with Section 4.7.

4.4.3 Groundwater Sample Collection Locations and Procedures

One groundwater sample will be collected from each proposed monitoring well location and from each proposed boring MBB-1 through MBB-10. Groundwater samples will be collected from permanent monitoring wells at least 48 hours after development. Groundwater samples will be collected from temporary wells at least 12 hours after setting the five-foot-long, 0.010-inch machine slot screen with PVC riser into the boreholes. The screen interval of the temporary wells will be selected in the field to span the shallow water table surface in order to collect groundwater from the top of the water table.

After purging of a well is complete, a groundwater sample will be collected using the same equipment for purging and low-flow sampling techniques. Field staff will put on a clean pair of nitrile gloves (or equivalent) for each sample. The laboratory-supplied, pre-cleaned sample bottles will be filled directly from the polyethylene tubing. For dissolved metals testing, the water will be field-filtered using a new dedicated 0.45-micron filter for each sample collected, and the groundwater will be filtered directly into the appropriate preserved sample container. VOA containers will be collected first and filled leaving no headspace.

4.4.4 Sample Management

A sample label will be affixed to each container before sample collection. All containers will be marked with the project number, a sample number, date and time of collection, sampler’s initials, and preservation type. Each sample will have a unique identification number that will be referenced by entry into our notes. Groundwater samples will be labeled according to the monitoring well or boring number (e.g., HMW-5IB).

Chain of custody forms will be used to document the collection, custody, and transfer of samples from their initial collection location to the laboratory. Each sample will be entered on the custody form immediately after it is collected.

Sample custody procedures will be followed to provide a record that can accompany a sample as it passes from collection through analysis. A sample is considered to be in custody if it meets at least one of the following conditions:

- It is in someone’s physical possession or view;
- It is secured to prevent tampering (i.e., custody seals); and/or

- It is locked or secured in an area restricted to authorized personnel.

A chain of custody form will be completed in the field as samples are packaged. At a minimum, the information on the custody form will include the sample number, date and time of sample collection, sampler, analysis, and number of containers. A copy of the custody form will be placed in the cooler with its respective samples before the container is sealed for delivery to the laboratory. Another copy will be retained and placed in the project files after review by the project manager. Custody seals will be placed on each cooler containing samples, so the cooler cannot be opened without breaking the seals.

After sample containers have been filled, they will be stored in a cooler cooled with ice or blue ice to approximately 4°C. The coolers will be transferred to the analytical laboratory for chemical analysis. Chain of custody procedures will be maintained and documented at all times, from commencement in the field until delivery of the samples to the analytical laboratory, as discussed previously. Specific procedures are:

- Individual sample containers will be packed to prevent breakage;
- Custody forms will be enclosed in a plastic bag and taped to the inside lid of the cooler;
- Signed and dated custody seals will be placed on all coolers before shipping;
- Samples will be hand-delivered to the analytical laboratory by Hart Crowser personnel or courier;
- When sample possession is transferred to the laboratory, the custody form will be signed by the persons transferring custody of the coolers; and
- Upon receipt of samples at the laboratory, the shipping container custody seal will be broken, and the sample-receiving custodian will compare samples with information on the chain of custody form and record the condition of the samples received.

4.4.5 Laboratory Analyses

Groundwater samples will be analyzed by Friedman and Bruya or another environmental laboratory accredited by Ecology for GRO, DRO, and HRO; halogenated VOCs and BTEX; and total metals (arsenic, cadmium, chromium, lead, and mercury). If a non-turbid groundwater sample (e.g., turbidity less than 25 NTUs) cannot be obtained, we will also analyze the sample for dissolved metals (arsenic, cadmium, chromium, lead, and mercury). The groundwater samples from MBB-1 through MBB-4, HMW-6IA, HMW-6IB, HMW-6D, HMW-7IB, and HMW-8IB will also be analyzed for PAHs. Samples will be analyzed on a standard turnaround time.

4.4.6 Decontamination Procedures

Nondisposable sampling equipment and reusable materials that contact the soil or water will be decontaminated on site before and after use at each sampling location. Decontamination will consist of the following:

- Tap-water rinse (may consist of an equivalent high-pressure or hot-water rinse). Visible soil to be removed by scrubbing.
- Non-phosphate detergent wash, consisting of a dilute mixture of Liqui-Nox® (or equivalent) and tap water.
- Distilled-water rinse.

Decontamination fluids will be transferred to drums for management as described below in Section 4.7.

4.4.7 Documentation

Observations made during groundwater sampling activities will be documented in field notes. Observations will include, but are not limited to, groundwater levels, purge water characteristics (e.g., color, turbidity, sheens), purge volumes, field parameter measurements, and sampling time.

4.5 Quarterly Groundwater Monitoring

4.5.1 Measurement of Groundwater Levels

Prior to purging, groundwater levels in the wells will be measured to the nearest 0.01 foot using an electronic water-level probe. The wells will be opened and allowed to equilibrate for up to a half hour before measurements are taken. If any free product is encountered, we will measure the thickness of the product using an electronic interface probe.

4.5.2 Purging

After groundwater levels are measured, each well will be purged at a low flow rate using a peristaltic or submersible pump fitted with clean, disposable tubing. The tubing inlet will be placed approximately at the middle of the well screen. Tubing will be used one time and disposed of as described in Section 4.7. To assess the effectiveness of purging, dissolved oxygen, turbidity, temperature, electrical conductivity, oxidation-reduction potential, and pH will be measured (e.g., by means of a flow-through cell). Results of these measurements will be included on a well observation form. Purging will be considered complete when three casing volumes of water have been removed, the well purges dry, or field parameters stabilize to within 10 percent for three consecutive readings (whichever is less). If the well is purged dry, it will be allowed to recover before sampling is performed. Purge water will be handled in accordance with Section 4.7.

4.5.3 Groundwater Sample Collection Locations and Procedures

Four rounds of groundwater sampling will be conducted from the on-site groundwater monitoring well network (including all proposed new wells and previously monitored wells) to monitor any potential seasonal variability. This sampling will begin immediately after the monitoring wells are installed at the Property and will continue every three months. The proposed monitoring network consists of the 10 existing on-site wells (HMW-1S, HMW-1IB, HMW-1D, HMW-2S, HMW-2IA, HMW-2IB, HMW-2D, HMW-3IA, HMW-3D, and HMW-4IA) and 14 new wells (HMW-5IB, HMW-6IA, HMW-6IB, HMW-6D, HMW-7IB, HMW-8IB, HMW-9S, HMW-9IA, HMW-9IB, HMW-9D, HMW-10S, HMW-10D, HMW-11S, and HMW-11IB).

After purging of a well is complete, a groundwater sample will be collected using the same equipment for purging and low-flow sampling techniques. Field staff will put on a clean pair of nitrile gloves (or equivalent) for each sample. The laboratory-supplied, pre-cleaned sample bottles will be filled directly from the polyethylene tubing. For dissolved metals testing, the water will be field-filtered using a new dedicated 0.45-micron filter for each sample collected, and the groundwater will be filtered directly into the appropriate preserved sample container. VOA containers will be collected first and filled leaving no headspace.

4.5.4 Sample Management

A sample label will be affixed to each container before sample collection. All containers will be marked with the project number, a sample number, date and time of collection, sampler's initials, and preservation type. Each sample will have a unique identification number that will be referenced by entry into our notes. Groundwater samples will be labeled according to the monitoring well number (e.g., HMW-1S).

Chain of custody forms will be used to document the collection, custody, and transfer of samples from their initial collection location to the laboratory. Each sample will be entered on the custody form immediately after it is collected.

Sample custody procedures will be followed to provide a record that can accompany a sample as it passes from collection through analysis. A sample is considered to be in custody if it meets at least one of the following conditions:

- It is in someone's physical possession or view;
- It is secured to prevent tampering (i.e., custody seals); and/or
- It is locked or secured in an area restricted to authorized personnel.

A chain of custody form will be completed in the field as samples are packaged. At a minimum, the information on the custody form will include the sample number, date and time of sample collection, sampler, analysis, and number of containers. A copy of the custody form will be placed in the cooler with its respective samples before the container is sealed for delivery to the laboratory. Another copy will be retained and placed in the project files after review by the project manager. Custody seals will be placed on each cooler containing samples, so the cooler cannot be opened without breaking the seals.

After sample containers have been filled, they will be stored in a cooler cooled with ice or blue ice to approximately 4°C. The coolers will be transferred to the analytical laboratory for chemical analysis. Chain of custody procedures will be maintained and documented at all times, from commencement in the field until delivery of the samples to the analytical laboratory, as discussed previously. Specific procedures are:

- Individual sample containers will be packed to prevent breakage;
- Custody forms will be enclosed in a plastic bag and taped to the inside lid of the cooler;

- Signed and dated custody seals will be placed on all coolers before shipping;
- Samples will be hand-delivered to the analytical laboratory by Hart Crowser personnel or courier;
- When sample possession is transferred to the laboratory, the custody form will be signed by the persons transferring custody of the coolers; and
- Upon receipt of samples at the laboratory, the shipping container custody seal will be broken, and the sample-receiving custodian will compare samples with information on the chain of custody form and record the condition of the samples received.

4.5.5 Laboratory Analyses

Groundwater samples will be analyzed by Friedman and Bruya or another environmental laboratory accredited by Ecology for GRO, DRO, and HRO; halogenated VOCs and BTEX; and total metals (arsenic, cadmium, chromium, lead, and mercury). If a non-turbid groundwater sample (e.g., turbidity less than 25 NTUs) cannot be obtained, we will also analyze the sample for dissolved metals (arsenic, cadmium, chromium, lead, and mercury). The groundwater samples from HMW-4IA, HMW-5IB, HMW-6IA, HMW-6IB, HMW-6D, HMW-7IB, and HMW-8IB will also be analyzed for PAHs. Samples will be analyzed on a standard turnaround time.

4.5.6 Decontamination Procedures

Nondisposable sampling equipment and reusable materials that contact the soil or water will be decontaminated on site before and after use at each sampling location. Decontamination will consist of the following:

- Tap-water rinse (may consist of an equivalent high-pressure or hot-water rinse). Visible soil to be removed by scrubbing.
- Non-phosphate detergent wash, consisting of a dilute mixture of Liqui-Nox® (or equivalent) and tap water.
- Distilled-water rinse.

Decontamination fluids will be transferred to drums for management as described below in Section 4.7.

4.5.7 Documentation

Observations made during groundwater sampling activities will be documented in field notes. Observations will include, but are not limited to, groundwater levels, purge water characteristics (e.g., color, turbidity, sheens), purge volumes, field parameter measurements, and sampling time.

4.6 Additional Aquifer Characterization

Groundwater level monitoring of selected new wells will be completed in order to more completely characterize groundwater levels and flow patterns, including seasonal and shorter-term variations.

Seasonal groundwater levels of the previously identified wells and the new selected wells will be monitored using pressure transducers and through manual groundwater level measurement during the quarterly groundwater monitoring events.

4.6.1 Groundwater Level Monitoring

Pressure transducers will be installed in six new wells (HMW-6IB, HMW-6D, HMW-9IB, HMW-9D, HMW-10D, and HMW-11IB) which will monitor water levels for at least 12 months. The proposed transducer locations are shown on Figure 3. The pressure transducers deployed will be non-vented In-Situ Rugged Troll 100 with a range of 30 pounds per square inch (PSI). To enable barometric corrections, an In-Situ BAROTroll transducer will be used to monitor continuous atmospheric pressure at the Property.

The data from the transducers will be downloaded on a quarterly basis. During installation and when accessing the transducers, the depth to water levels will be measured for calibrating the transducer water level data. During the quarterly groundwater sampling event, the depth to water levels will be measured in the monitoring well network.

Manual groundwater levels measurements will be collected using the following procedure:

- Open the well monument and remove any standing water and debris prior to removing the well cap.
- Remove the well cap and allow the well casing to reach equilibrium with the atmosphere.
- Measure the depth to water level to the nearest 0.01 foot from the surveyed measuring point on the top of well casing, using an electronic water level indicator.
- Duplicate the water level measurement in each well to ensure that the reading is reproducible. Record all results (times, measured values, etc.) on the Water Level Data Form.
- Replace the well cap and surface monuments.
- Decontaminate the water level probe with distilled water between each well to avoid cross contamination.

The groundwater level data will be used in preparing well-specific hydrographs of water levels over time and groundwater elevation contour maps.

4.6.2 Slug Testing

Falling and rising head slug tests will be conducted on the new (14) monitoring wells after construction, development, and initial groundwater sampling. The proposed slug testing locations are shown on Figure 3. The purpose of the slug tests is to provide additional estimates of the hydraulic conductivity of the formation. Hydraulic conductivity is a measure of the ability of an aquifer to transmit groundwater. Slug tests will be performed by rapidly inserting or removing a solid PVC rod in a well and measuring the recovery of the water levels during the test.

The slug testing will be conducted following the procedure provided below.

- The initial depth to water in the well is measured with an electric water level indicator.
- A pressure transducer is lowered into the well casing to collect water level data. The transducer is programmed to record water levels and connected to a computer to allowing monitoring of water levels during testing.
- The slug test is performed by inserting a solid PVC cylinder (slug) into the well to cause a sudden rise in water level. The recovery of the water level is recorded with the transducer until the water level inside the well is within 90 percent of pretest water levels.
- Once equilibration water level has been reached, a rising head test is conducted by rapidly removing the slug and recording the recovery of water levels. The test is complete when the water level has recovered within 90 percent of the starting measurement.
- A minimum of two slug test cycles is conducted in each well to provide a measure of test variability. Field measurements will be recorded on a Slug Test Data Form. Following completion of testing, water level data is downloaded from the transducer for analysis.
- All downhole equipment is decontaminated using the procedures described in Section 4.4.6.

The water level data collected during the slug tests will analyzed for hydraulic conductivity using the Bouwer and Rice method (1976) for unconfined aquifer and Cooper, Bredehoeft and Papadopulos method (1967) for a confined aquifer.

4.7 Management of Investigation-Derived Waste

Investigation-derived waste (IDW) will be generated during drilling activities, decontamination procedures, well development, and purging and sampling during quarterly groundwater monitoring events. Soil and water IDW will be contained in separate, labeled, 55-gallon steel drums to be temporarily stored on the Property in a secured area provided by the Property owner or stockpiled and stored on site for future off-site disposal. Associated samples from the site investigation activities will be used to profile the soil and water IDW for disposal. Upon receipt of the chemical analysis, the IDW will be appropriately disposed of at a permitted disposal or treatment facility.

Disposable sampling equipment (e.g., sample tubing) and personal protective equipment (e.g., nitrile gloves) will be placed in plastic trash bags after use and disposed of as solid waste.

5.0 QUALITY ASSURANCE PROJECT PLAN

The laboratory reports will be reviewed by a Hart Crowser technical specialist to ensure conformance with project standards, provide additional data qualifications as appropriate, and verify that the data are acceptable for the purposes of the project. This includes reviewing holding times, reporting limits, method blanks, surrogate recoveries, laboratory duplicate relative percent differences (RPDs), calibration criteria (as provided), spike blank/spike blank duplicate (SB/SBD) recoveries, and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Table 6 presents the analytical methods, sample containers, preservation, and holding times. The reporting limits listed in Table 7 are the expected reporting limits, based upon laboratory calculations and experience. Tables 8 through 12 summarize the quality control criteria for each analyte.

Duplicate soil and groundwater samples will be collected to serve as a check on laboratory quality as well as on potential variability in the sampling method and the sample matrix. The field duplicate results will be compared to the primary sample to assess the precision of the sampling and analytical methods, expressed as the RPD between the original and duplicate samples. Containers for the primary and duplicate samples will be alternately filled. A minimum of one duplicate sample for every 20 samples will be analyzed (i.e., 5 percent frequency). The duplicate soil and groundwater samples will be analyzed for GRO, DRO, HRO, halogenated VOCs, BTEX, and total metals (arsenic, cadmium, chromium, lead, and mercury).

A trip blank will be prepared by the laboratory and accompany the sample containers to serve as a check that the containers and their contents had not been contaminated during the course of sampling and transportation to and from the laboratory. A trip blank will be analyzed with each cooler of soil and groundwater samples and analyzed for halogenated VOCs and BTEX.

5.1 Data Quality Indicators

The overall quality assurance objectives for field sampling, field measurements, and laboratory analysis are to produce data of known and appropriate quality. The procedures and quality control checks specified herein will be used so that known and acceptable levels of accuracy and precision are maintained for each data set. This section defines the objectives for accuracy and precision for measurement data. These goals are primarily expressed in terms of acceptance criteria for the quality control checks performed.

5.1.1 Precision

Precision is the degree of reproducibility or agreement between independent or repeated measurements. Analytical variability will be expressed as the RPD between laboratory replicates and between MS and MSD analyses. RPD will be used to measure precision for this investigation and is defined as follows:

$$RPD = \frac{(D_1 - D_2)}{(D_1 + D_2)/2} \times 100$$

Where

D_1 = sample value
D_2 = duplicate sample value

5.1.2 Accuracy

Accuracy is the agreement between a measured value and its true or accepted value. While it is not possible to determine absolute accuracy for environmental samples, analysis of standards and spiked samples provides an indirect assessment of accuracy.

Laboratory accuracy will be assessed as the percent recovery of MSs, MSDs, surrogate spiked compounds (for organic analyses), and laboratory control samples. Accuracy will be defined as the percentage recovery compared with the true or accepted value and is defined as follows:

$$\%\ Recovery = \frac{(SSR - SR)}{SA} \times 100$$

Where

SSR = spiked sample result
SR = sample results (not applicable for surrogate recovery)
SA = amount of spike added

5.1.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. The sampling program will be designed carefully to see that sample locations are selected properly, sufficient numbers of samples are collected to accurately reflect conditions at the site, and samples are representative of sample locations. A sufficient sample volume will be collected at each sampling point to minimize bias or errors associated with sample particle size and heterogeneity.

5.1.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. So that results are comparable, samples will be analyzed using standard EPA methods and protocols as described in Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods (EPA 1986). Data will also be reviewed to verify that precision and accuracy criteria have been achieved and, if not, that data have been appropriately qualified.

Field personnel will collect samples in a consistent manner at all sampling locations so that all data collected as part of this study are comparable. Comparability is attained by careful adherence to standardized sampling and analytical procedures, based on rigorous documentation of sample locations (including depth, time, and date).

5.1.5 Completeness

Completeness is the percentage of measurements made that are judged to be valid. Completeness will be calculated separately for each analytical group (e.g., TPHs and VOCs). For results to be considered complete, all quality control check analyses required to verify precision and accuracy must have been performed. Data qualified as estimated during the validation process will be considered complete. Results that are rejected during the validation review or samples for which no analytical results were obtained will be considered non-valid measurements. Completeness will be calculated for each analysis using the following equation:

$$Completeness = \frac{valid\ data\ points\ obtained}{total\ data\ points\ planned} \times 100$$

The target goal for completeness is a minimum of 95 percent. Completeness will be monitored on an on-going basis so that archived sample extracts can be reanalyzed, if required, without remobilization.

5.2 Data Quality Assurance Review

Hart Crowser will independently review the quality of the chemical analytical results provided by the laboratory. The data quality report will assess the adequacy of the reported detection limits in achieving the project screening levels; the precision, accuracy, representativeness, and completeness of the data; and the usability of the analytical data for project objectives. Exceedances of analytical control limits will be summarized and evaluated.

A data evaluation review will be performed on an all results using quality control summary sheet results provided by the laboratory for each report. Data evaluation reviews are based on the quality control requirements previously described and follow the format of the EPA National Functional Guidelines for Organic Superfund Methods Data Review (EPA 2017), modified to include specific criteria of individual analytical methods. The laboratory will be contacted to obtain raw data (instrument tuning, calibrations, instrument printouts, bench sheets, and laboratory worksheets) if any problems or discrepancies are discovered during the routine evaluation. The results of the quality assurance review will be presented in an appendix to the RI report.

The data evaluation review will verify:

- That sample numbers and analyses match the chain of custody request;
- Sample preservation and holding times;
- That instrument tuning, calibration, and performance criteria were achieved;
- That laboratory blanks were analyzed at the proper frequency and that no analytes were present in the blanks;
- That laboratory duplicates, MSs, surrogate compounds, and laboratory control samples were run at the proper frequency and that control limits were met; and
- That required detection limits were achieved, unless raised due to high analyte concentrations in the sample or matrix effects.

Data qualifier flags, beyond any applied by the laboratory, will be added to sample results that fall outside the quality control acceptance criteria. Typical data qualifiers are:

U The compound was analyzed for but was not detected above the reporting limit. The associated numerical value is the sample reporting limit.

J The associated numerical value is an estimated quantity because quality control criteria were slightly exceeded.

UJ The compound was analyzed for, but not detected. The associated numerical value is an estimated reporting limit because quality control criteria were not met.

T The associated numerical value is an estimated quantity because reported concentrations were less than the practical quantitation limit (lowest calibration standard).

R Data are not usable because of significant exceedance of quality control criteria. The analyte may or may not be present; resampling and/or reanalysis is necessary for verification.

6.0 DATA ANALYSIS AND REPORTING

6.1 Laboratory Reports

The laboratory data reports will consist of summary data packages that will include:

- Case narrative identifying the laboratory analytical batch number, matrix and number of samples included, analyses performed and analytical methods used, and description of any problems or exceedance of quality control criteria and corrective action taken. The laboratory manager or a designee must sign the narrative.
- Copy of chain of custody forms for all samples included in the analytical batch.
- Tabulated sample analytical results with units, data qualifiers, percent solids, sample weight or volume, dilution factor, laboratory batch and sample number, Hart Crowser sample number, and dates sampled, received, extracted, and analyzed all clearly specified.
- Summary of calibration results.
- Blank summary results indicating samples associated with each blank.
- MS/MSD result summaries with calculated percent recovery and relative percent differences.
- Laboratory control sample results, when applicable, with calculated percent recovery.
- Electronically formatted data deliverable results in Ecology Environmental Information Management System (EIM) format.

6.2 Data Evaluation and Analysis

After the planned fieldwork, sample analysis, and data quality review, results will be compared with project screening levels (Table 7). We will present our findings from our field observations and analytical results and our recommendations in a summary report (see Section 6.3). Figures and cross sections will be provided with areas of contamination and elevations.

6.3 Hart Crowser Report

Hart Crowser will prepare the RI report, which will summarize the sampling procedures, laboratory testing results, and provide an updated CSM. The report will include a map with sampling locations, tabulated analytical testing data compared with project screening levels with sample depths clearly documented, a chemical data quality review, boring logs, and laboratory analytical reports. The report will include statements on any limitations on the data use that are the result of adverse QC exceedances, as identified in Section 5.2, Data Quality Assurance Review. A final report will be completed after incorporating comments from the client.

7.0 PROJECT TEAM AND RESPONSIBILITIES

Julie Wukelic will be the project director for Hart Crowser. Ms. Wukelic will be kept informed of the status of the project and of project activities. She will be provided with data, reports, and other project-related documents prepared by Hart Crowser before their submittal to the Client and/or Ecology. She will be responsible for communicating with the property owner, participate in discussions with Ecology, and coordinate on-site activities with the property owner and Hart Crowser.

Mark Dagel will be the project manager for Hart Crowser. Mr. Dagel will coordinate with project task leaders and will communicate with Ms. Wukelic. He will be responsible for allocating the resources necessary to ensure that the objectives of the site assessment are met. Mr. Dagel will review data, reports, and other project-related documents prepared by Hart Crowser before their submittal to the Client or to Ecology. Mr. Dagel will also assist project staff with technical issues.

Roy Jensen will be the senior hydrogeologist and will be responsible for implementing the data gaps investigation and for communication of project status to the project manager. Mr. Jensen will also be responsible for technical assistance to assigned staff, as appropriate; assistance with resolution of technical or logistical challenges that may be encountered during the investigation; and assistance with field activities and report writing and review and will participate in discussions with Ecology at the request of the Client.

Andrew Kaparos will serve as the project engineer and will assist with the data gaps investigation, data analysis, and reporting. He will be responsible for communication of project status to the project manager and project director. Mr. Kaparos will assist with field activities, write and review reports, and participate in discussions with Ecology at the request of the Client.

Becca Dozier will provide laboratory coordination and oversight, assist with field activities, and write and review reports.

Jessica Blanchette will provide health and safety management and support.

8.0 LIMITATIONS

Work for this project and report preparation was performed in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time that the work was performed. This report is for the specific application to the referenced project and for the exclusive use of 800 Mercer, LLC. No other warranty, express or implied, is made.

9.0 REFERENCES

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Table 1 - Summary of Historical Soil Analytical Data

				NWTPH in mg/kg			BTEX in mg/kg				Chlorinated Volatile Organic Compounds (cVOCs) in mg/kg					Metals in mg/kg			
Sample Location	Sampling Date	Depth in Feet	Sample Elevation	DRO	HRO	GRO	Benzene	Toluene	Ethylbenzene	Xylenes	cis-1,2-Dichloroethene (cDCE)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Vinyl Chloride (VC)	trans-1,2-Dichloroethene (tDCE)	Arsenic	Barium	Chromium	Lead
Screening criteria:				**2000**	**2000**	**30/100 [a]**	**0.03**	**7**	**6**	**9**	**720**	**0.03**	**0.05**	**0.67**	**720**	**20**	**16000**	**-**	**250**
21417-MB1	5/12/2017	9	-	22.2 U	55.4 U	4.04 U	-	0.0162 U	-	-	-	-	0.0162 U	-	-	-	-	-	-
21417-MB2	5/12/2017	10	-	22.6 U	56.2 U	4.69 U	-	0.0187 U	-	-	-	-	0.0187 U	-	-	-	-	-	-
21417-MB3	5/12/2017	20	-	20.9 U	**120**	4.06 U	-	0.0162 U	-	-	-	-	0.0162 U	-	-	-	-	-	-
21417-MB4	5/12/2017	24	-	23.2 U	57.9 U	3.43 U	-	0.0137 U	-	-	-	-	0.0137 U	-	-	-	-	-	-
21417-MB5	5/12/2017	9	-	20.9 U	52.3 U	3.29 U	-	0.0132 U	-	-	-	-	0.0132 U	-	-	-	-	-	-
21417-MB6	5/11/2017	9	-	19.4 U	48.4 U	3.4 U	-	0.0136 U	-	-	-	-	0.0136 U	-	-	-	-	-	-
21417-MB7	5/11/2017	11	-	18.7 U	46.8 U	4.09 U	-	0.0163 U	-	-	-	-	0.0163 U	-	-	-	-	-	-
21417-MB8	5/11/2017	27	-	20.9 U	52.3 U	3.81 U	-	0.0152 U	-	-	-	-	**0.0238**	-	-	-	-	-	-
21417-MB9	5/11/2017	13	-	25.3 U	**206**	5.91 U	-	0.0237 U	-	-	-	-	0.0237 U	-	-	-	-	-	-
21417-MB9	5/11/2017	22	-	21.3 U	**74.3**	4.64 U	-	0.0186 U	-	-	-	-	0.0186 U	-	-	-	-	-	-
21417-MB10	5/11/2017	28	-	22.2 U	55.4 U	4.33 U	-	0.0173 U	-	-	-	-	0.0173 U	-	-	-	-	-	-
21417-MB11	5/11/2017	23	-	25.7 U	64.3 U	6.43 U	-	**0.0348**	-	-	-	-	0.0257 U	-	-	-	-	-	-
HMW-1IB	3/12/2019	7.5	31	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-1IB	3/12/2019	15	23	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-1IB	3/12/2019	20.5	18	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-1IB	3/12/2019	27.5	11	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-1IB	3/12/2019	50	-12	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	**0.024** J	**0.12** J	0.05 U	0.05 U	-	-	-	-
HMW-1IB	3/12/2019	65	-27	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-2IB	3/12/2019	7.5	40	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**72**	**33**	**10**
HMW-2IB	3/12/2019	15	32	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-2IB	3/12/2019	22.5	25	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-2IB	3/12/2019	30	17	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-2IB	3/12/2019	45	2	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	**0.12** J	0.05 U	0.05 U	-	-	-	-
HMW-2IB	3/12/2019	65	-18	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-3IA	3/15/2019	15	40	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-3IA	3/15/2019	20	35	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-3IA	3/15/2019	22.5	32	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	12 U	**50**	**39**	5.9 U
HMW-3IA	3/15/2019	25	30	20 U	50 U		0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-4IA	3/7/2019	5	54	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-4IA	3/7/2019	7.5	51	**160**	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-4IA	3/7/2019	10	49	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
HMW-4IA	3/7/2019	25	34	20 U	50 U		0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-1	3/6/2019	5	40	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**49**	**25**	**43**
MBGW-1	3/6/2019	12.5	33	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-1	3/6/2019	17.5	28	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**45**	**43**	5.7 U
MBGW-1	3/6/2019	25	20	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-1	3/6/2019	30	15	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-2	3/4/2019	5	40	20 U	50 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBGW-2	3/4/2019	10	35	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-2	3/4/2019	12.5	33	20 U	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	10 U	**47**	**24**	**8.5**
MBGW-2	3/4/2019	25	20	20 U	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	14 U	**130**	**34**	**23**
MBGW-2	3/4/2019	30	15	20 U	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	12 U	**46**	**42**	6.1 U
MBGW-3	3/7/2019	5	43	20 U	50 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBGW-3	3/7/2019	7.5	41	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**43**	**32**	5.4 U
MBGW-3	3/7/2019	10	38	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-3	3/7/2019	12.5	36	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**61**	**40**	5.5 U
MBGW-3	3/7/2019	25	23	20 U	50 U		0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	12 U	**42**	**33**	6.2 U
MBGW-3	3/7/2019	26	22	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	**0.074**	0.05 U	0.05 U	-	-	-	-
MBGW-4	3/6/2019	2.5	45	-	-	-	-	-	-	-	-	-	-	-	-	11 U	**50**	**32**	5.6 U
MBGW-4	3/6/2019	5	42	20 U	50 U		-	-	-	-	-	-	-	-	-	12 U	**65**	**22**	**12**
MBGW-4	3/6/2019	7.5	40	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**46**	**26**	5.4 U

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				NWTPH in mg/kg			BTEX in mg/kg				Chlorinated Volatile Organic Compounds (cVOCs) in mg/kg					Metals in mg/kg			
Sample Location	Sampling Date	Depth in Feet	Sample Elevation	DRO	HRO	GRO	Benzene	Toluene	Ethylbenzene	Xylenes	cis-1,2-Dichloroethene (cDCE)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Vinyl Chloride (VC)	trans-1,2-Dichloroethene (tDCE)	Arsenic	Barium	Chromium	Lead
Screening criteria:				**2000**	**2000**	**30/100** [a]	**0.03**	**7**	**6**	**9**	**720**	**0.03**	**0.05**	**0.67**	**720**	**20**	**16000**	**-**	**250**
MBGW-4	3/6/2019	10	37	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-4	3/6/2019	12.5	35	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-4	3/6/2019	25	22	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	12 U	**54**	**36**	6 U
MBGW-5	3/11/2019	10	40	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-5	3/11/2019	15	35	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-5	3/11/2019	20	30	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-5	3/11/2019	27.5	23	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**39**	**25**	5.6 U
MBGW-5	3/11/2019	45	5	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	**0.26**	**0.47**	**3.4**	0.05 U	0.05 U	-	-	-	-
MBGW-6	3/14/2019	10	42	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**32**	**21**	5.4 U
MBGW-6	3/14/2019	15	37	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-6	3/14/2019	20	32	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-6	3/14/2019	30	22	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-7	3/6/2019	10	29	-	-	-	-	-	-	-	-	-	-	-	-	11 U	**33**	**21**	5.4 U
MBGW-7	3/6/2019	17.5	22	-	-	-	-	-	-	-	-	-	-	-	-	11 U	**37**	**34**	5.3 U
MBGW-7	3/6/2019	30	9	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-7	3/6/2019	40	-1	-	-	-	-	-	-	-	-	-	-	-	-	11 U	**42**	**36**	5.6 U
MBGW-8	3/15/2019	10	37	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-8	3/15/2019	15	32	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-8	3/15/2019	25	22	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**40**	**36**	5.5 U
MBGW-8	3/15/2019	35	12	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-9	3/13/2019	10	47	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**43**	**42**	5.3 U
MBGW-9	3/13/2019	15	42	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-9	3/13/2019	20	37	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-9	3/13/2019	25	32	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-9	3/13/2019	30	27	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-10	3/13/2019	10	37	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**48**	**44**	5.4 U
MBGW-10	3/13/2019	15	32	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-10	3/13/2019	20	27	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-10	3/13/2019	25	22	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-10	3/13/2019	30	17	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-11	3/12/2019	5	52	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**68**	**38**	**10**
MBGW-11	3/12/2019	10	47	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-12	3/15/2019	5	49	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**56**	**42**	5.7 U
MBGW-12	3/15/2019	20	34	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-12	3/15/2019	25	29	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-12	3/15/2019	30	24	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-13	3/14/2019	5	49	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-13	3/14/2019	7.5	47	-	-	-	0.02 U	0.05 U	**0.17** J	**0.19** J	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-13	3/14/2019	10	44	20 U	50 U	**730** J	0.02 U	**0.14**	**3.9**	**7**	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-13	3/14/2019	12.5	42	-	-	-	0.02 U	0.05 U	**0.5** J	**0.63** J	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-13	3/14/2019	15	39	20 U	50 U	**16**	0.02 U	0.05 U	**0.11**	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-13	3/14/2019	20	34	-	-	5 U	0.02 U	0.05 U	**0.06** J	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-14	3/6/2019	10	36	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-14	3/6/2019	15	31	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-14	3/6/2019	20	26	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-14	3/6/2019	30	16	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-15	3/8/2019	20	21	-	-	-	-	-	-	-	-	-	-	-	-	13 U	**170**	**18**	6.6 U
MBGW-16	3/8/2019	10	43	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-16	3/8/2019	15	38	20 U	50 U	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBGW-16	3/8/2019	20	33	-	-	5 U	-	-	-	-	-	-	-	-	-	-	-	-	-
MBGW-16	3/8/2019	30	23	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-

Table 1 - Summary of Historical Soil Analytical Data

				NWTPH in mg/kg			BTEX in mg/kg				Chlorinated Volatile Organic Compounds (cVOCs) in mg/kg					Metals in mg/kg			
Sample Location	Sampling Date	Depth in Feet	Sample Elevation	DRO	HRO	GRO	Benzene	Toluene	Ethylbenzene	Xylenes	cis-1,2-Dichloroethene (cDCE)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Vinyl Chloride (VC)	trans-1,2-Dichloroethene (tDCE)	Arsenic	Barium	Chromium	Lead
Screening criteria:				**2000**	**2000**	**30/100 [a]**	**0.03**	**7**	**6**	**9**	**720**	**0.03**	**0.05**	**0.67**	**720**	**20**	**16000**	**-**	**250**
MBPP-1	3/5/2019	7.5	36	-	-	-	-	-	-	-	-	-	-	-	-	11 U	**81**	**46**	**93**
MBPP-1	3/5/2019	20	24	20 U	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-1	3/5/2019	25	19	20 U	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-2	3/5/2019	10	34	20 U	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	12 U	**100**	**45**	**21**
MBPP-2	3/5/2019	20	24	20 U	50 U	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-2	3/5/2019	27.5	17	-	-	5 UJ	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-3	3/6/2019	10	36	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-3	3/6/2019	20	26	20 U	50 U	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-3	3/6/2019	25	21	-	-	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**35**	**26**	5.5 U
MBPP-4	3/7/2019	2.5	45	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-4	3/7/2019	10	37	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**48**	**29**	**5.6**
MBPP-4	3/7/2019	15	32	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-4	3/7/2019	17	30	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-4	3/7/2019	18	29	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-5	3/7/2019	10	35	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-5	3/7/2019	15	30	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-5	3/7/2019	17.5	28	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-5	3/7/2019	20	25	-	-	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-5	3/7/2019	25	20	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	**49**	**34**	5.6 U
MBPP-6	3/8/2019	7.5	45	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-6	3/8/2019	10	42	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-6	3/8/2019	12.5	40	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-6	3/8/2019	15	37	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-6	3/8/2019	17.5	35	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-6	3/8/2019	20	32	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-6	3/8/2019	25	27	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-6	3/8/2019	30	22	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-7	3/8/2019	5	47	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	12 U	**200**	**38**	**6.6**
MBPP-7	3/8/2019	15	37	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-7	3/8/2019	23	29	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-8	3/8/2019	10	47	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-8	3/8/2019	15	42	20 U	**150**	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	**16**	**80**	**30**	**16**
MBPP-8	3/8/2019	22.5	35	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MBPP-8	3/8/2019	30	27	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/14/2012	10	42	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/14/2012	20	32	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/14/2012	30	22	-	-	-	-	-	-	-	0.05 U	0.03 U	**0.038**	0.05 U	0.05 U	-	-	-	-
MW-106	8/14/2012	40	12	-	-	-	-	-	-	-	0.05 U	**0.15**	**3.1**	0.05 U	0.05 U	-	-	-	-
MW-106	8/14/2012	50	2	-	-	-	-	-	-	-	**0.11**	**0.17**	**0.73**	0.05 U	0.05 U	-	-	-	-
MW-106	8/14/2012	60	-8	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	70	-18	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	80	-28	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	90	-38	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	100	-48	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	110	-58	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	120	-68	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	130	-78	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-106	8/15/2012	140	-88	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-114	12/10/2012	15	31	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-114	12/10/2012	25	21	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-114	12/10/2012	35	11	-	-	-	-	-	-	-	**0.11**	**0.45**	**8.8**	0.05 U	0.05 U	-	-	-	-

Table 1 - Summary of Historical Soil Analytical Data

				NWTPH in mg/kg			BTEX in mg/kg				Chlorinated Volatile Organic Compounds (cVOCs) in mg/kg					Metals in mg/kg			
Sample Location	Sampling Date	Depth in Feet	Sample Elevation	DRO	HRO	GRO	Benzene	Toluene	Ethylbenzene	Xylenes	cis-1,2-Dichloroethene (cDCE)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Vinyl Chloride (VC)	trans-1,2-Dichloroethene (tDCE)	Arsenic	Barium	Chromium	Lead
Screening criteria:				**2000**	**2000**	**30/100 [a]**	**0.03**	**7**	**6**	**9**	**720**	**0.03**	**0.05**	**0.67**	**720**	**20**	**16000**	**-**	**250**
MW-114	12/10/2012	40	6	-	-	-	-	-	-	-	0.05 U	**0.071**	**0.59**	0.05 U	0.05 U	-	-	-	-
MW-114	12/10/2012	45	1	-	-	-	-	-	-	-	0.05 U	0.03 U	**0.25**	0.05 U	0.05 U	-	-	-	-
MW-119	3/21/2013	10	28	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-119	3/21/2013	20	18	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-119	3/21/2013	30	8	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-119	3/21/2013	40	-2	-	-	-	-	-	-	-	0.05 U	0.03 U	0.025 U	0.05 U	0.05 U	-	-	-	-
MW-147	4/2/2018	10	42	-	-	-	**0.000566** J	0.0054 U	0.0011 U	0.0033 U	0.00109 U	0.00109 U	**0.0007** J	0.00109 U	0.00109 U	-	-	-	-
MW-147	4/2/2018	20	32	-	-	-	0.00108 U	0.0054 U	0.0011 U	0.0032 U	0.00108 U	0.00108 U	**0.00076** J	0.00108 U	0.00108 U	-	-	-	-
MW-147	4/2/2018	30	22	-	-	-	0.00112 U	0.0056 U	0.0011 U	0.0034 U	**0.00239**	**0.0033**	**0.0238**	0.00112 U	0.00112 U	-	-	-	-
MW-147	4/2/2018	40	12	-	-	-	0.0011 U	0.0055 U	0.0011 U	0.0033 U	**0.00488**	**0.00118**	**0.0146**	**0.0615**	0.0011 U	-	-	-	-
MW-147	4/2/2018	50	2	-	-	-	0.00111 U	0.0055 U	0.0011 U	0.0033 U	**0.00432**	**0.00105** J	**0.00175**	**0.00322**	0.00111 U	-	-	-	-
MW-147	4/2/2018	60	-8	-	-	-	0.00108 U	0.0054 U	0.0011 U	0.0032 U	**0.0007** J	0.00108 U	**0.00061** J	0.00108 U	0.00108 U	-	-	-	-
MW-147	4/2/2018	70	-18	-	-	-	0.00112 U	0.0056 U	0.0011 U	0.0034 U	0.00112 U	0.00112 U	0.00112 U	**0.0005** J	0.00112 U	-	-	-	-
MW-147	4/2/2018	80	-28	-	-	-	0.00116 U	0.0058 U	0.0012 U	0.0035 U	0.00116 U	0.00116 U	0.00116 U	0.00116 U	0.00116 U	-	-	-	-
MW-148	4/9/2018	11	33	-	-	-	**0.000728** J	0.0058 U	0.0012 U	0.0035 U	0.00115 U	0.00115 U	0.00115 U	0.00115 U	0.00115 U	-	-	-	-
MW-148	4/9/2018	20	24	-	-	-	0.00108 U	0.0054 U	0.0011 U	0.0033 U	0.00108 U	0.00108 U	**0.00188**	0.00108 U	0.00108 U	-	-	-	-
MW-148	4/9/2018	30	14	-	-	-	0.00112 U	0.0056 U	0.0011 U	0.0034 U	**0.00364**	0.00112 U	0.00112 U	**0.0144**	0.00112 U	-	-	-	-
MW-148	4/9/2018	40	4	-	-	-	0.00109 U	0.0054 U	0.0011 U	0.0033 U	**0.00113**	**0.00055** J	**0.0008** J	0.00109 U	0.00109 U	-	-	-	-
MW-148	4/9/2018	50	-6	-	-	-	0.0011 U	0.0055 U	0.0011 U	0.0033 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	-	-	-	-
MW-148	4/9/2018	60	-16	-	-	-	0.00126 U	0.0063 U	0.0013 U	0.0038 U	0.00126 U	0.00126 U	0.00126 U	0.00126 U	0.00126 U	-	-	-	-
MW-148	4/9/2018	70	-26	-	-	-	0.00126 U	0.0063 U	0.0013 U	0.0038 U	**0.00038** J	0.00126 U	**0.00062** J	0.00126 U	0.00126 U	-	-	-	-
MW-148	4/9/2018	80	-36	-	-	-	0.00118 U	0.0059 U	0.0012 U	0.0035 U	**0.00031** J	0.00118 U	**0.00059** J	0.00118 U	0.00118 U	-	-	-	-
MW-153	3/27/2018	10	45	-	-	-	0.00113 U	0.0057 U	0.0011 U	0.0034 U	0.00113 U	0.00113 U	0.00113 U	0.00113 U	0.00113 U	-	-	-	-
MW-153	3/27/2018	20	35	-	-	-	0.00109 U	0.0055 U	0.0011 U	0.0033 U	0.00109 U	0.00109 U	**0.00056** J	0.00109 U	0.00109 U	-	-	-	-
MW-153	3/27/2018	30	25	-	-	-	0.00107 U	0.0054 U	0.0011 U	0.0032 U	0.00107 U	0.00107 U	0.00107 U	0.00107 U	0.00107 U	-	-	-	-
MW-153	3/27/2018	40	15	-	-	-	0.00113 U	0.0057 U	0.0011 U	0.0034 U	**0.00421**	**0.00049** J	0.00113 U	0.00113 U	0.00113 U	-	-	-	-
MW-153	3/27/2018	50	5	-	-	-	0.00111 U	0.0056 U	0.0011 U	0.0033 U	0.00111 U	0.00111 U	0.00111 U	**0.00767**	0.00111 U	-	-	-	-
MW-153	3/27/2018	61	-6	-	-	-	0.00114 U	0.0057 U	0.0011 U	0.0034 U	0.00114 U	0.00114 U	0.00114 U	**0.00034** J	0.00114 U	-	-	-	-
MW-153	3/27/2018	70	-15	-	-	-	0.00111 U	0.0056 U	0.0011 U	0.0033 U	0.00111 U	0.00111 U	0.00111 U	**0.0009** J	0.00111 U	-	-	-	-
MW-153	3/28/2018	80	-25	-	-	-	0.0011 U	0.0055 U	0.0011 U	0.0033 U	**0.00035** J	0.0011 U	0.0011 U	**0.00148**	0.0011 U	-	-	-	-
MW-153	3/28/2018	90	-35	-	-	-	0.0012 U	0.006 U	0.0012 U	0.0036 U	**0.0006** J	0.0012 U	**0.0008** J	**0.00176**	0.0012 U	-	-	-	-
MW-153	3/28/2018	110	-55	-	-	-	0.00118 U	0.0059 U	0.0012 U	0.0035 U	**0.00077** J	0.00118 U	**0.00254**	**0.00311**	0.00118 U	-	-	-	-
MW-153	3/29/2018	130	-75	-	-	-	0.00115 U	0.0057 U	0.0012 U	0.0035 U	0.00115 U	0.00115 U	**0.00065** J	0.00115 U	0.00115 U	-	-	-	-

Notes:
a. 100 mg/kg for gasoline mixtures without benzene and the total of ethylbenzene, toluene, and xylene are less than 1% of the gasoline mixture; 30 mg/kg for other gasoline mixtures.
Vertical Elevation in NAVD88
- = not applicable or unavailable
bold = detection
shaded = detection above screening levels
DRO = diesel-range organics
HRO = heavy oil-range organics
GRO = gasoline-range organics
mg/kg = milogram per kilogram

Table 2 - Summary of Historical Groundwater Analytical Data

Sample Location	Sampling Date	Screened Interval in Feet BGS	Screened Interval Elevation in Feet	NWTPH in µg/L			BTEX in µg/L				Chlorinated Volatile Organic Compounds (cVOCs) in µg/L				
				DRO	HRO	GRO	Benzene	Toluene	Ethylbenzene	Xylenes	cis-1,2-Dichloroethene (cDCE)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Vinyl Chloride (VC)	trans-1,2-Dichloroethene (tDCE)
Screening criteria:				**500**	**500**	**800/1000 [a]**	**0.5**	**72**	**29**	**10000**	**16**	**1**	**2.4**	**0.2**	**100**
Shallow Zone															
21417-MB4	5/12/2017	15 - 25	-	**281**	**226**	50 U	1 U	**2.99**	1 U	2 U	1 U	0.5 U	1 U	0.2 U	1 U
21417-MB9	5/11/2017	15 - 25	-	50 U	**146**	50 U	1 U	1 U	1 U	2 U	1 U	0.5 U	1 U	0.2 U	1 U
21417-MB10	5/11/2017	-	-	50 U	**970**	50 U	1 U	**1.85**	1 U	2 U	1 U	0.5 U	1 U	0.2 U	1 U
21417-MB11	5/11/2017	-	-	50.1 U	**238**	50 U	1 U	1 U	1 U	2 U	1 U	0.5 U	1 U	0.2 U	1 U
HMW-1S	3/25/2019	20 - 30	17.5 - 7.5	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
HMW-2S	3/25/2019	19.8 - 29.8	27.2 - 17.2	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBGW-1	3/6/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	**19**	**3.9**	**9.5**	0.2 U	1 U
MBGW-2	3/4/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBGW-3	3/7/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	**4.8**	**7.4**	**35**	0.2 U	1 U
MBGW-5	3/15/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	**2.1**	1 U	1 U	0.2 U	1 U
MBGW-6	3/15/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	**1**	**1.1**	**4.3**	0.2 U	1 U
MBGW-7	3/6/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBGW-8	3/19/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBGW-9	3/15/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBPP-5	3/7/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	**2.9**	0.2 U	1 U
MBGW-10	3/15/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBGW-11	3/15/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBGW-12	3/19/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	**1**	**5.1**	0.2 U	1 U
MBGW-13	3/15/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MBGW-14	3/6/2019	-	-	200 U	500 U	100 U	-	-	-	-	-	-	-	-	-
MBGW-15	3/15/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	**35**	0.2 U	1 U
MBGW-16	3/8/2019	-	-	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MW-154	4/30/2018	-	-	-	-	32.1 U	0.0896 U	0.412 U	0.158 U	0.316 U	**1.77**	**0.23** J	**4.46**	**7.48**	0.152 U
MW-155	4/27/2018	25 - 30	-	-	-	60.9 U	0.0896 U	0.412 U	0.158 U	0.316 U	**0.466** J	**0.334**	**3.48**	**0.447** J	0.152 U
MW-155	1/21/2019	25 - 30	-	-	-	100 U	0.5 U	0.5 U	0.5 U	1.5 U	**0.274** J	**0.581**	**3.72**	0.5 U	0.5 U
MW-155	4/23/2019	25 - 30	-	-	-	100 U	0.5 U	0.5 U	0.5 U	1.5 U	**71.9**	**4.75**	**14.6**	**6.54** K	0.5 U
Intermediate A Zone															
HMW-2IA	3/25/2019	34.8 - 44.8	12.2 - 2.2	200 U	500 U	100 U	1 U	1 U	1 U	1 U	**120**	**74**	**240**	**1.2**	1 U
HMW-3IA	3/25/2019	34.8 - 44.8	20.7 - 10.7	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
HMW-4IA	3/25/2019	50 - 60	6 - -4	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**3.6**	1 U
MW-114	12/21/2012	35 - 45	-	-	-	-	-	-	-	-	**260**	**290**	**1400**	**14**	1 U
MW-114	12/18/2013	35 - 45	-	-	-	-	17 U	50 U	50 U	150 U	**640**	**1300**	**8400**	**22**	50 U
MW-119	3/25/2013	35 - 45	-	-	-	-	-	-	-	-	**3.3**	1 U	1 U	0.2 U	1 U
MW-119	12/19/2013	35 - 45	-	-	-	-	0.35 U	1 U	1 U	3 U	**2.5**	1 U	1 U	**0.76**	1 U
MW-119	4/21/2015	35 - 45	-	-	-	-	-	-	-	-	**50**	**42**	**34**	**3.1**	1 U
MW-119	6/17/2015	35 - 45	-	-	-	-	-	-	-	-	**52**	**7.1**	**4.9**	**2.7**	1 U
MW-119	10/20/2015	35 - 45	-	-	-	-	-	-	-	-	**74**	**22**	**15**	**0.45**	1 U
MW-119	2/2/2016	35 - 45	-	-	-	-	-	-	-	-	**100**	**24**	**7.3**	**0.45**	1 U
MW-119	3/29/2017	35 - 45	-	-	-	-	**0.139**	0.412 U	0.158 U	0.316 U	**42.9**	**10.7**	**5.47**	**0.272** J	**0.334** J
MW-119	6/28/2017	35 - 45	-	-	-	-	0.0896 U	**0.726**	0.158 U	**0.562** J	**5.99**	**12.4**	**19**	0.118 U	**0.167** J
MW-119	4/5/2018	35 - 45	-	-	-	-	0.0896 U	0.412 U	0.158 U	0.316 U	**18.3**	**3.02**	**2.14**	0.118 U	**0.203** J
MW-119	1/21/2019	35 - 45	-	-	-	-	0.5 U	0.5 U	0.5 U	1.5 U	0.5 U	0.5 U	**1.24**	0.5 U	0.5 U
MW-119	4/29/2019	35 - 45	-	-	-	-	0.5 U	0.5 U	0.5 U	1.5 U	**10.9**	**1.12**	**0.224** J	0.5 UJ	**0.161** J
MW-146	4/30/2018	39.8 - 49.8	-	-	-	**597**	0.0896 U	0.412 U	0.158 U	0.316 U	**900**	**48.4**	**3.56**	**2100**	**6.12**
MW-146	1/22/2019	39.8 - 49.8	-	-	-	**509** J	0.5 U	0.5 U	0.5 U	1.5 U	**1080**	**21.6**	**2.29**	**1370**	**7.25**
MW-146	4/24/2019	39.8 - 49.8	-	-	-	**88** J	0.5 U	0.5 U	0.5 U	1.5 U	**257**	**12.4**	**1.5**	**383**	**1.94**

Table 2 - Summary of Historical Groundwater Analytical Data

				NWTPH in µg/L			BTEX in µg/L				Chlorinated Volatile Organic Compounds (cVOCs) in µg/L				
Sample Location	Sampling Date	Screened Interval in Feet BGS	Screened Interval Elevation in Feet	DRO	HRO	GRO	Benzene	Toluene	Ethylbenzene	Xylenes	cis-1,2-Dichloroethene (cDCE)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Vinyl Chloride (VC)	trans-1,2-Dichloroethene (tDCE)
Screening criteria:				**500**	**500**	**800/1000 [a]**	**0.5**	**72**	**29**	**10000**	**16**	**1**	**2.4**	**0.2**	**100**
Intermediate B Zone															
HMW-1IB	3/25/2019	54.3 - 64.3	-16.3 - -26.3	200 U	500 U	100 U	1 U	1 U	1 U	1 U	**22**	**6.7**	**20**	0.2 U	1 U
HMW-2IB	3/25/2019	52.8 - 62.8	-5.8 - -15.8	200 U	500 U	100 U	1 U	**3.4**	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
MW-147	5/1/2018	39.8 - 49.8	-	-	-	**484**	0.0896 U	0.412 U	0.158 U	0.316 U	**399**	**83.4**	**19.8**	**1150**	**2.09**
MW-147	1/22/2019	39.8 - 49.8	-	-	-	**663** J	0.5 U	0.5 U	0.5 U	1.5 U	**1230**	**179**	**98.2**	**738**	**2.88**
MW-147	4/23/2019	39.8 - 49.8	-	-	-	**139**	0.5 U	0.5 U	0.5 U	1.5 UJ	**322**	**5.13**	0.5 U	**499**	**1.47**
MW-148	5/1/2018	70 - 80	-	-	-	31.6 U	0.0896 U	0.412 U	0.158 U	0.316 U	0.0933 UJ	0.153 U	0.199 U	0.118 U	0.152 U
MW-148	1/23/2019	70 - 80	-	-	-	100 U	0.5 U	0.5 U	0.5 U	1.5 U	0.5 U	**0.347** J	**1.24**	0.5 U	0.5 U
MW-148	4/26/2019	70 - 80	-	-	-	100 U	0.5 U	0.5 U	0.5 U	1.5 U	0.5 U	0.5 U	0.5 U	**0.277** J	0.5 U
Deep Zone															
HMW-1D	3/25/2019	80 - 90	-41 - -51	200 U	500 U	100 U	1 U	1 U	1 U	1 U	**410**	**27**	**3.4**	**4**	**1.2**
HMW-2D	3/25/2019	80 - 90	-33 - -43	200 U	500 U	100 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
HMW-3D	3/25/2019	80 - 90	-24 - -34	200 U	500 U	100 U	1 U	**1.1**	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
FMW-129	5/23/2014	84.2 - 89.2	-	-	-	-	-	-	-	-	**17**	**0.57**	**0.4**	**7.6**	-
FMW-129	10/20/2015	84.2 - 89.2	-	-	-	-	-	-	-	-	**250**	**39**	**25**	0.2 U	1 U
FMW-129	2/2/2016	84.2 - 89.2	-	-	-	-	-	-	-	-	**240**	**61**	**13**	**0.33**	1 U
FMW-129	4/10/2017	84.2 - 89.2	-	-	-	-	0.448 U	2.06 U	0.79 U	1.58 U	**1420**	**492**	**194**	**0.885** J	**5.05**
FMW-129	6/23/2017	84.2 - 89.2	-	-	-	-	0.0896 U	0.412 U	0.158 U	0.316 U	**474**	**182**	**81.1**	**0.413**	**1.21**
FMW-129	5/1/2019	84.2 - 89.2	-	-	-	-	-	0.412 U	-	-	**372**	**166**	**101**	0.59 U	**1.22**
FMW-129	7/16/2019	84.2 - 89.2	-	-	-	-	-	0.412 U	-	-	**272**	**84.1**	**159**	**0.296** J	**1.61**
MW-106	8/22/2012	130 - 140	-	-	-	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U
MW-106	9/5/2012	130 - 140	-	-	-	-	0.35 U	1 U	1 U	3 U	1 U	1 U	1 U	0.2 U	1 U
MW-106	12/17/2013	130 - 140	-	-	-	-	0.35 U	1 U	1 U	3 U	1 U	1 U	1 U	0.2 U	1 U
MW-106	10/27/2015	130 - 140	-	-	-	-	-	-	-	-	1 U	1 U	1 U	0.2 U	1 U
MW-106	2/2/2016	130 - 140	-	-	-	-	-	-	-	-	1 U	1 U	1 U	0.2 U	1 U
MW-106	4/14/2017	130 - 140	-	-	-	-	0.0896 U	0.412 U	0.158 U	0.316 U	0.0933 U	0.153 U	0.199 U	0.118 U	0.152 U
MW-106	6/30/2017	130 - 140	-	-	-	-	0.0896 U	**0.419** J	0.158 U	0.316 U	0.0933 U	0.153 U	0.199 U	0.118 U	0.152 U
MW-106	5/4/2018	130 - 140	-	-	-	31.6 U	0.0896 U	0.412 U	0.158 U	0.316 U	0.0933 U	0.153 U	0.199 U	0.118 U	0.152 U
MW-106	4/26/2019	130 - 140	-	-	-	-	0.0896 U	0.412 U	0.158 U	0.316 U	0.0933 U	0.153 U	0.199 U	0.118 UJ	0.152 U
MW-106	7/19/2019	130 - 140	-	-	-	-	0.0896 U	0.412 U	0.158 U	0.316 U	0.0933 U	0.153 U	0.199 U	0.118 U	0.152 U
MW-153	5/1/2018	50 - 60	-	-	-	**31.6** J	0.0896 U	0.412 U	0.158 U	0.316 U	**0.612**	0.153 U	**0.756**	**9.56**	0.152 U
MW-153	1/22/2019	50 - 60	-	-	-	100 U	0.5 U	0.5 U	0.5 U	1.5 U	**1.41**	0.5 U	0.5 U	**15.9**	0.5 U
MW-153	4/24/2019	50 - 60	-	-	-	100 U	0.5 U	0.5 U	0.5 U	1.5 U	**1.07**	0.5 U	0.5 U	**2.69**	0.5 U

Notes:
a. 800 µg/L when benzene present in groundwater; 1,000 µg/L when no detectable benzene in groundwater
Vertical elevation in NAVD88
Feet BGS = feet below ground surface
- = not applicable or unavailable
bold = detection
shaded = detection above screening levels
DRO = diesel-range organics
HRO = heavy oil-range organics
GRO = gasoline-range organics
µg/L = micrograms per liter

Table 2 - Summary of Historical Groundwater Analytical Data

Sample Location	Sampling Date	Screened Interval in Feet BGS	Screened Interval Elevation in Feet	Dissolved Metals in µg/L Arsenic	Barium	Chromium	Lead	Mercury	Selenium	Cadmium	Total Metals in µg/L Arsenic	Barium	Chromium	Lead	Mercury	Selenium	Cadmium
Screening criteria:				**5**	**3200**	**50**	**15**	**2**	**80**	**5**	**5**	**3200**	**50**	**15**	**2**	**80**	**5**
Shallow Zone																	
21417-MB4	5/12/2017	15 - 25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21417-MB9	5/11/2017	15 - 25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21417-MB10	5/11/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21417-MB11	5/11/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HMW-1S	3/25/2019	20 - 30	17.5 - 7.5	-	-	-	-	-	-	-	**14**	**83**	11 U	**2.7**	0.5 U	11 U	4.4 U
HMW-2S	3/25/2019	19.8 - 29.8	27.2 - 17.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBGW-1	3/6/2019	-	-	3 U	25 U	10 U	1 U	0.5 UJ	5 U	4 U	3.3 U	**65**	**12**	**1.7**	0.5 U	11 U	4.4 U
MBGW-2	3/4/2019	-	-	3 U	**44**	10 U	1 U	0.5 U	5 U	4 U	-	-	-	-	-	-	-
MBGW-3	3/7/2019	-	-	3 U	25 U	10 U	1 U	0.5 UJ	5 U	4 U	**5.9**	**140**	**61**	**5.1**	0.5 U	11 U	4.4 U
MBGW-5	3/15/2019	-	-	3 U	25 U	10 U	1 U	0.5 U	5 U	4 U	**130**	**3200**	**1500**	**140**	**2.2**	**25**	**5.8**
MBGW-6	3/15/2019	-	-	3 U	25 U	10 U	1 U	0.5 U	5 U	4 U	**15**	**200**	**74**	**10**	0.5 U	11 U	4.4 U
MBGW-7	3/6/2019	-	-	3 U	**28**	10 U	1 U	0.5 UJ	5 U	4 U	**130**	**3500**	**1700**	**190**	**2.2**	**18**	**7.5**
MBGW-8	3/19/2019	-	-	3 U	**45**	10 U	1 U	0.5 U	5 U	4 U	**37**	**800**	**360**	**30**	0.5 U	11 U	4.4 U
MBGW-9	3/15/2019	-	-	3 U	25 U	10 U	1 U	0.5 U	5 U	4 U	**71**	**1900**	**930**	**89**	**0.88**	**7.9**	4.4 U
MBPP-5	3/7/2019	-	-	3 U	**26**	10 U	1 U	0.5 UJ	5 U	4 U	**15**	**230**	**93**	**9.3**	0.5 U	11 U	4.4 U
MBGW-10	3/15/2019	-	-	3 U	**26**	10 U	1 U	0.5 U	5 U	4 U	**180**	**4200**	**2300**	**200**	**2.3**	**20**	**6.1**
MBGW-11	3/15/2019	-	-	**6.9**	**32**	10 U	1 U	0.5 U	5 U	4 U	**14**	**240**	**86**	**8.9**	0.5 U	11 U	4.4 U
MBGW-12	3/19/2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBGW-13	3/15/2019	-	-	**3.3**	25 U	10 U	1 U	0.5 U	5 U	4 U	**110**	**1600**	**910**	**110**	**1.8**	**9.5**	4.4 U
MBGW-14	3/6/2019	-	-	3 U	**40**	10 U	1 U	0.5 UJ	5 U	4 U	**6.1**	**130**	**38**	**16**	0.5 U	11 U	4.4 U
MBGW-15	3/15/2019	-	-	3 U	**95**	10 U	1 U	0.5 UJ	5 U	4 U	**35**	**390**	**170**	**20**	0.5 U	11 U	4.4 U
MBGW-16	3/8/2019	-	-	3 U	**25**	10 U	1 U	0.5 UJ	5 U	4 U	**210**	**4600**	**2400**	**190**	**1.8**	**31**	**5.3**
MW-154	4/30/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-155	4/27/2018	25 - 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-155	1/21/2019	25 - 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-155	4/23/2019	25 - 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intermediate A Zone																	
HMW-2IA	3/25/2019	34.8 - 44.8	12.2 - 2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HMW-3IA	3/25/2019	34.8 - 44.8	20.7 - 10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HMW-4IA	3/25/2019	50 - 60	6 - -4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-114	12/21/2012	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-114	12/18/2013	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	3/25/2013	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	12/19/2013	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	4/21/2015	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	6/17/2015	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	10/20/2015	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	2/2/2016	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	3/29/2017	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	6/28/2017	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	4/5/2018	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	1/21/2019	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-119	4/29/2019	35 - 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-146	4/30/2018	39.8 - 49.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-146	1/22/2019	39.8 - 49.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-146	4/24/2019	39.8 - 49.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2 - Summary of Historical Groundwater Analytical Data

				Dissolved Metals in µg/L							Total Metals in µg/L						
Sample Location	Sampling Date	Screened Interval in Feet BGS	Screened Interval Elevation in Feet	Arsenic	Barium	Chromium	Lead	Mercury	Selenium	Cadmium	Arsenic	Barium	Chromium	Lead	Mercury	Selenium	Cadmium
Screening criteria:				**5**	**3200**	**50**	**15**	**2**	**80**	**5**	**5**	**3200**	**50**	**15**	**2**	**80**	**5**
Intermediate B Zone																	
HMW-1IB	3/25/2019	54.3 - 64.3	-16.3 - -26.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HMW-2IB	3/25/2019	52.8 - 62.8	-5.8 - -15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-147	5/1/2018	39.8 - 49.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-147	1/22/2019	39.8 - 49.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-147	4/23/2019	39.8 - 49.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-148	5/1/2018	70 - 80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-148	1/23/2019	70 - 80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-148	4/26/2019	70 - 80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deep Zone																	
HMW-1D	3/25/2019	80 - 90	-41 - -51	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HMW-2D	3/25/2019	80 - 90	-33 - -43	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HMW-3D	3/25/2019	80 - 90	-24 - -34	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FMW-129	5/23/2014	84.2 - 89.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FMW-129	10/20/2015	84.2 - 89.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FMW-129	2/2/2016	84.2 - 89.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FMW-129	4/10/2017	84.2 - 89.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FMW-129	6/23/2017	84.2 - 89.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FMW-129	5/1/2019	84.2 - 89.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FMW-129	7/16/2019	84.2 - 89.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	8/22/2012	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	9/5/2012	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	12/17/2013	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	10/27/2015	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	2/2/2016	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	4/14/2017	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	6/30/2017	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	5/4/2018	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	4/26/2019	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-106	7/19/2019	130 - 140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-153	5/1/2018	50 - 60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-153	1/22/2019	50 - 60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-153	4/24/2019	50 - 60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
a. 800 µg/L when benzene present in groundwater; 1,000 µg/L \
Vertical elevation in NAVD88
Feet BGS = feet below ground surface
- = not applicable or unavailable
bold = detection
shaded = detection above screening levels
DRO = diesel-range organics
HRO = heavy oil-range organics
GRO = gasoline-range organics
µg/L = micrograms per liter

Table 4 - Proposed Soil and Groundwater Sampling Plan

Location ID	Rationale	Estimated Ground Surface Elevation (ft AMSL)	Total Depth (ft bgs)	Sample Matrix	Sample Depth or Screened Interval for Water Samples (ft bgs)	Sample Elevation (ft AMSL)	Proposed Analyses				
							GRO	DRO and HRO	HVOCs and BTEX	PAHs	MTCA Metals [1]
MBB-1	To define the northern lateral extent of known GRO-contaminated soil previously found in boring MBGW-13, to define the southern lateral and vertical extents of known chlorinated sovlent-contaminated groundwater previously found in the northwest corner of the Property, and to determine whether chlorinated solvents are present in soil above the water table in the northwest area of the Property. This will address data gap numbers 1, 2, and 3.	55	40	Soil	5	50	X	X	X	X	X
				Soil	10	45	X	X	X	X	X
				Soil	15	40	X	X	X	X	X
				Soil	20	35	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (grab sample)	27 to 32	28 to 23	X	X	X	X	X
MBB-2	To define the western lateral extent of known GRO-contaminated soil previously found in boring MBGW-13, to define the southern lateral and vertical extents of known chlorinated solvent-contamianted groundwater previously found in the northwest corner of the Property, and to determine whether chlorinated solvents are present in soil above the water table in the northwest area of the Property. This will address data gap numbers 1, 2, and 3.	55	40	Soil	5	50	X	X	X	X	X
				Soil	10	45	X	X	X	X	X
				Soil	15	40	X	X	X	X	X
				Soil	20	35	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (grab sample)	27 to 32	28 to 23	X	X	X	X	X
MBB-3	To define the southern lateral extent of known GRO-contaminated soil previously found in boring MBGW-13, to define the southern lateral and vertical extents of known chlorinated solvent-contaminated groundwater previously found in the northwest corner of the Property, and to determine whether chlorinated solvents are present in soil above the water table in the northwest area of the Property. This will address data gap numbers 1, 2, and 3.	54.5	40	Soil	5	49.5	X	X	X	X	X
				Soil	10	44.5	X	X	X	X	X
				Soil	15	39.5	X	X	X	X	X
				Soil	20	34.5	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (grab sample)	27 to 32	27.5 to 22.5	X	X	X	X	X
MBB-4	To define the eastern lateral extent of known GRO-contaminated soil previously found in boring MBGW-13, to define the southern lateral and vertical extents of known chlorinated solvent-contaminated groundwater previously found in the northwest corner of the Property, and to determine whether chlorinated solvents are present in soil above the water table in the northwest area of the Property. This will address data gap numbers 1, 2, and 3.	54	40	Soil	5	49	X	X	X	X	X
				Soil	10	44	X	X	X	X	X
				Soil	15	39	X	X	X	X	X
				Soil	20	34	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (grab sample)	27 to 32	27 to 22	X	X	X	X	X
MBB-5	To delineate the western lateral and vertical extents of known PCE and related degradation compound contamination in soil previously found in borings MBGW-3, MBGW-5, and HMW-2IB, and to confirm that previous detections of chlorinated solvents in soil (MBGW-3, MBGW-5, and HMW-2IB) and groundwater (MBGW-3 and HMW-2IA) in the central-northern area are attributed to migration of contaminated groundwater from the American Linen Site. This will address data gap numbers 4 and 5.	51	40	Soil	5	46	X	X	X		X
				Soil	10	41	X	X	X		X
				Soil	15	36	X	X	X		X
				Soil	20	31	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (grab sample)	27 to 32	24 to 19	X	X	X		X

Table 4 - Proposed Soil and Groundwater Sampling Plan

Location ID	Rationale	Estimated Ground Surface Elevation (ft AMSL)	Total Depth (ft bgs)	Sample Matrix	Sample Depth or Screened Interval for Water Samples (ft bgs)	Sample Elevation (ft AMSL)	Proposed Analyses: GRO	DRO and HRO	HVOCs and BTEX	PAHs	MTCA Metals [1]
MBB-6	To delineate the southern and western lateral and vertical extents of known PCE and related degradation compound contamination in soil previously found in borings MBGW-3, MBGW-5, and HMW-2IB and to confirm that previous detections of chlorinated solvents in soil (MBGW-3, MBGW-5, and HMW-2IB) and groundwater (MBGW-3 and HMW-2IA) in the central-northern area are attributed to migration of contaminated groundwater from the American Linen Site. This will address data gap numbers 4 and 5.	50	40	Soil	5	45	X	X	X		X
				Soil	10	40	X	X	X		X
				Soil	15	35	X	X	X		X
				Soil	20	30	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (grab sample)	27 to 32	23 to 18	X	X	X		X
MBB-7	To delineate the vertical extent of known PCE and related degradation compound contamination in soil previously found in borings MBGW-3, MBGW-5, and HMW-2IB and to confirm that previous detections of chlorinated solvents in soil (MBGW-3, MBGW-5, and HMW-2IB) and groundwater (MBGW-3 and HMW-2IA) in the central-northern area are attributed to migration of contaminated groundwater from the American Linen Site. This will address data gap numbers 4 and 5.	51	40	Soil	5	46	X	X	X		X
				Soil	10	41	X	X	X		X
				Soil	15	36	X	X	X		X
				Soil	20	31	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (grab sample)	27 to 32	24 to 19	X	X	X		X
MBB-8	To delineate the southern and western lateral and vertical extents of known PCE and related degradation compound contamination in soil previously found in borings MBGW-3, MBGW-5, and HMW-2IB and to confirm that previous detections of chlorinated solvents in soil (MBGW-3, MBGW-5, and HMW-2IB) and groundwater (MBGW-3 and HMW-2IA) in the central-northern area are attributed to migration of contaminated groundwater from the American Linen Site. This will address data gap numbers 4 and 5.	50	40	Soil	5	45	X	X	X		X
				Soil	10	40	X	X	X		X
				Soil	15	35	X	X	X		X
				Soil	20	30	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (grab sample)	27 to 32	23 to 18	X	X	X		X
MBB-9	To delineate the southern and western lateral and vertical extents of known PCE and related degradation compound contamination in soil previously found in borings MBGW-3, MBGW-5, and HMW-2IB and to confirm that previous detections of chlorinated solvents in soil (MBGW-3, MBGW-5, and HMW-2IB) and groundwater (MBGW-3 and HMW-2IA) in the central-northern area are attributed to migration of contaminated groundwater from the American Linen Site. This will address data gap numbers 4 and 5.	48	40	Soil	5	43	X	X	X		X
				Soil	10	38	X	X	X		X
				Soil	15	33	X	X	X		X
				Soil	20	28	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (grab sample)	27 to 32	21 to 16	X	X	X		X
MBB-10	To delineate the eastern lateral and vertical extents of known PCE and related degradation compound contamination in soil previously found in borings MBGW-3, MBGW-5, and HMW-2IB and to confirm that previous detections of chlorinated solvents in soil (MBGW-3, MBGW-5, and HMW-2IB) and groundwater (MBGW-3 and HMW-2IA) in the central-northern area are attributed to migration of contaminated groundwater from the American Linen Site. This will address data gap numbers 4 and 5.	47	40	Soil	5	42	X	X	X		X
				Soil	10	37	X	X	X		X
				Soil	15	32	X	X	X		X
				Soil	20	27	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (grab sample)	27 to 32	20 to 15	X	X	X		X

Table 4 - Proposed Soil and Groundwater Sampling Plan

Location ID	Rationale	Estimated Ground Surface Elevation (ft AMSL)	Total Depth (ft bgs)	Sample Matrix	Sample Depth or Screened Interval for Water Samples (ft bgs)	Sample Elevation (ft AMSL)	Proposed Analyses: GRO	DRO and HRO	HVOCs and BTEX	PAHs	MTCA Metals [1]
HMW-5IB	To delineate the northern lateral and vertical extents of known vinyl chloride-contaminated intermediate A groundwater and PAH-contaminated soil previously found in well HMW-4IA. This will also determine whether PAHs are present in groundwater in the southwest area of the Property. This will address data gap numbers 9 and 10.	58	70	Soil	5	53	X	X	X	X	X
				Soil	10	48	X	X	X	X	X
				Soil	15	43	X	X	X	X	X
				Soil	20	38	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (well sample)	50 to 60	8 to -2	X	X	X	X	X
HMW-6IA	To delineate the western lateral and vertical extents of known vinyl chloride-contaminated intermediate A groundwater and PAH-contaminated soil previously found in well HMW-4IA. This will also determine whether PAHs are present in groundwater in the southwest area of the Property. This will address data gap numbers 9 and 10.	58	50	Soil	5	53	X	X	X	X	X
				Soil	10	48	X	X	X	X	X
				Soil	15	43	X	X	X	X	X
				Soil	20	38	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (well sample)	35 to 45	23 to 13	X	X	X	X	X
HMW-6IB	To delineate the western lateral and vertical extents of known vinyl chloride-contaminated intermediate A groundwater and PAH-contaminated soil previously found in well HMW-4IA. This will also determine whether PAHs are present in groundwater in the southwest area of the Property. This will address data gap numbers 9 and 10.	58	70	Soil	5	53	X	X	X	X	X
				Soil	10	48	X	X	X	X	X
				Soil	15	43	X	X	X	X	X
				Soil	20	38	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (well sample)	50 to 60	8 to -2	X	X	X	X	X
HMW-6D	To delineate the western lateral and vertical extents of known vinyl chloride-contaminated intermediate A groundwater and PAH-contaminated soil previously found in well HMW-4IA. This will also determine whether PAHs are present in groundwater in the southwest area of the Property. This will address data gap numbers 9 and 10.	58.5	90	Soil	5	53.5	X	X	X	X	X
				Soil	10	48.5	X	X	X	X	X
				Soil	15	43.5	X	X	X	X	X
				Soil	20	38.5	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (well sample)	80 to 90	-21.5 to -31.5	X	X	X	X	X
HMW-7IB	To delineate the southern lateral and vertical extents of known vinyl chloride-contaminated intermediate A groundwater and PAH-contaminated soil previously found in well HMW-4IA and the western extent of known arsenic-contaminated shallow groundwater previously found in boring MBGW-11. This will also determine whether PAHs are present in groundwater in the southwest area of the Property. This will address data gap numbers 9, 10, and 11.	58	70	Soil	5	53	X	X	X	X	X
				Soil	10	48	X	X	X	X	X
				Soil	15	43	X	X	X	X	X
				Soil	20	38	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (well sample)	50 to 60	8 to -2	X	X	X	X	X

Table 4 - Proposed Soil and Groundwater Sampling Plan

Location ID	Rationale	Estimated Ground Surface Elevation (ft AMSL)	Total Depth (ft bgs)	Sample Matrix	Sample Depth or Screened Interval for Water Samples (ft bgs)	Sample Elevation (ft AMSL)	Proposed Analyses: GRO	DRO and HRO	HVOCs and BTEX	PAHs	MTCA Metals [1]
HMW-8IB	To delineate the eastern lateral and vertical extents of known vinyl chloride-contaminated intermediate A groundwater and PAH-contaminated soil previously found in well HMW-4IA and the northern extent of known arsenic-contaminated shallow groundwater previously found in boring MBGW-11. This will also determine whether PAHs are present in groundwater in the southwest area of the Property. This will address data gap numbers 9, 10, and 11.	58	70	Soil	5	53	X	X	X	X	X
				Soil	10	48	X	X	X	X	X
				Soil	15	43	X	X	X	X	X
				Soil	20	38	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
				Water (well sample)	50 to 60	8 to -2	X	X	X	X	X
HMW-9S	To delineate the southern lateral and vertical extents of known chlorinated solvent-contaminated intermediate groundwater previously found in wells MW-146 and MW-147. This will address data gap number 12.	56	40	Soil	5	51	X	X	X		X
				Soil	10	46	X	X	X		X
				Soil	15	41	X	X	X		X
				Soil	20	36	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	25 to 35	31 to 21	X	X	X		X
HMW-9IA	To delineate the southern lateral and vertical extents of known chlorinated solvent-contaminated intermediate groundwater previously found in wells MW-146 and MW-147. This will address data gap number 12.	54	50	Soil	5	49	X	X	X		X
				Soil	10	44	X	X	X		X
				Soil	15	39	X	X	X		X
				Soil	20	34	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	35 to 45	19 to 9	X	X	X		X
HMW-9IB	To delineate the southern lateral and vertical extents of known chlorinated solvent-contaminated intermediate groundwater previously found in wells MW-146 and MW-147. This will address data gap number 12.	56	70	Soil	5	51	X	X	X		X
				Soil	10	46	X	X	X		X
				Soil	15	41	X	X	X		X
				Soil	20	36	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	55 to 65	1 to -9	X	X	X		X
HMW-9D	To delineate the southern lateral and vertical extents of known chlorinated solvent-contaminated intermediate groundwater previously found in wells MW-146 and MW-147. This will address data gap number 12.	55	90	Soil	5	50	X	X	X		X
				Soil	10	45	X	X	X		X
				Soil	15	40	X	X	X		X
				Soil	20	35	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	80 to 90	-25 to -35	X	X	X		X
HMW-10S	To delineate the southern lateral and vertical extents of known chlorinated solvent contamination in soil and shallow and intermediate A and B groundwater previously found in wells HMW-2IA and HMW-2IB and boring MBGW-3. This will address data gap number 8.	48	40	Soil	5	43	X	X	X		X
				Soil	10	38	X	X	X		X
				Soil	15	33	X	X	X		X
				Soil	20	28	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	25 to 35	23 to 13	X	X	X		X

Table 4 - Proposed Soil and Groundwater Sampling Plan

Location ID	Rationale	Estimated Ground Surface Elevation (ft AMSL)	Total Depth (ft bgs)	Sample Matrix	Sample Depth or Screened Interval for Water Samples (ft bgs)	Sample Elevation (ft AMSL)	Proposed Analyses: GRO	DRO and HRO	HVOCs and BTEX	PAHs	MTCA Metals [1]
HMW-10D	To delineate the southern lateral and vertical extents of known chlorinated solvent contamination in soil and shallow and intermediate A and B groundwater previously found in wells HMW-2IA and HMW-2IB and boring MBGW-3. This will address data gap number 8.	47	90	Soil	5	42	X	X	X		X
				Soil	10	37	X	X	X		X
				Soil	15	32	X	X	X		X
				Soil	20	27	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	80 to 90	-33 to -43	X	X	X		X
HMW-11S	To delineate the eastern lateral and vertical extents of known chlorinated solvent-contaminated shallow groundwater previously found in boring MBGW-15 and to determine whether chlorinated solvents are present in soil above the water table in the southeast area of the Property. This will address data gap numbers 6 and 7.	42	40	Soil	5	37	X	X	X		X
				Soil	10	32	X	X	X		X
				Soil	15	27	X	X	X		X
				Soil	20	22	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	25 to 35	17 to 7	X	X	X		X
HMW-11IB	To delineate the eastern lateral and vertical extents of known chlorinated solvent-contaminated shallow groundwater previously found in boring MBGW-15 and to determine whether chlorinated solvents are present in soil above the water table in the southeast area of the Property. This will address data gap numbers 6 and 7.	39	70	Soil	5	34	X	X	X		X
				Soil	10	29	X	X	X		X
				Soil	15	24	X	X	X		X
				Soil	20	19	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
				Water (well sample)	50 to 60	-21 to -11	X	X	X		X

Notes:

ft = Feet

AMSL = Above mean sea level

bgs = Below ground surface

GRO = Gasoline-range organics analysis by Northwest Total Petroleum Hydrocarbons - Gasoline-Range Organics Method NWTPH-Gx

DRO and HRO = Diesel-range organics and heavy oil-range organics analysis by Northwest Total Petroleum Hydrocarbons - Diesel- and Heavy-Oil-Range Organics Method NWTPH-Dx

HVOCs = Halogenated volatiles analysis by USEPA Method 8260C

BTEX = Benzene, Toluene, Ethylbenzene, and Xylene analysis by USEPA Method 8260C

PAHs = Polycyclic aromatic hydrocarbons analysis by USEPA Method 8270 selective ion monitoring (SIM)

MTCA Metals = Arsenic, cadmium, chromium, mercury, and lead analysis by USEPA Methods 6010D/6020B/200.7/200.8/245.1/7470A/7471B

GWT = Groundwater table

TBD = To be determined

NTU = nephelometric turbidity units

[1] Groundwater samples will be analyzed for total metals. If a non-turbid groundwater sample (e.g., turbidity less than 25 NTUs) cannot be obtained, we will also analyze the groundwater sample for dissolved metals, which will be filtered in the field.

Table 6 - Sample Containers, Preservation, and Holding Times

Analysis	Sample Matrix	Preservation and Storage	Holding Time[a]	Container	Estimated Number of Samples[b]
Gasoline-range Petroleum Hydrocarbons (NWTPH-Gx)	Soil	Cool to 4°C for up to 48 hours; freeze to -7 °C	14 days	5035 Kit - 4 x pre-tared 40 mL VOA vial[c]	120
	Groundwater	HCl; Cool to 4°C		3 x 40 mL VOA vial	24
Diesel- and Heavy Oil-Range Petroleum Hydrocarbons (NWTPH-Dx)	Soil	Cool to 4°C	14 days to extraction; 40 days to analysis	1 x 4 ounce WMG jar[d]	120
	Groundwater	HCl; Cool to 4°C		1 x 500 mL amber glass jar	24
BTEX and HVOCs (EPA 8260C)	Soil	Cool to 4°C for up to 48 hours; freeze to -7 °C	14 days	5035 Kit - 4 x pre-tared 40 mL VOA vial[c]	120
	Groundwater	HCl; Cool to 4°C		3 x 40 mL VOA vial	24
Total metals (arsenic, cadmium, chromium, lead, and mercury by EPA 6010/6020/200.8/7470/7471/1631)	Soil	Cool to 4°C	6 months; 28 days for Hg	1 x 4 ounce WMG jar[d]	120
	Groundwater	HNO_3; Cool to 4°C		1 x 500 mL HDPE jar[e]	24
PAHs (EPA 8270D SIM)	Soil	Cool to 4°C	14 days to extraction; 40 days to analysis	1 x 4 ounce WMG jar[d]	50
	Groundwater		7 days to extraction; 40 days to analysis	1 x 500 mL amber glass jar	10

Notes:

The methods and number and type of required sample containers will be determined and supplied by the analytical laboratory.

a. Holding times are from date of sample collection.

b. These are estimated number of samples for analyses and are subject to change based on field observations. This excludes QA/QC, quarterly groundwater monitoring, and any dissolved metals (analyzed if turbidity greater than 25 NTUs) samples.

c. BTEX, HVOCs, and gasoline-range hydrocarbons can be combined into 4 x pre-tared VOA vials with a 5 to 10 gram soil core in each.

d. Diesel- and heavy oil-range hydrocarbons, metals, and PAHs can be combined into one 4-ounce glass jar.

e. A field-filtered sample will be collected in an additional 500 mL HDPE jar if analyzing for dissolved metals (in groundwater samples with turbidity greater than 25 NTUs).

BTEX = Benzene, toluene, ethylbenzene, xylenes

HVOCs = Halogenated Volatile Organic Compounds

PAHs = Polycyclic Aromatic Hydrocarbons

EPA = Environmental Protection Agency

HCl = Hydrochloric Acid

HNO_3 = Nitric Acid

HDPE = High Density Polyethylene

VOA = Volatile Organic Analysis

WMG = wide-mouth glass

mL = millilter

NTU = Nephelometric Turbidity Unit

Table 7 - Screening Levels and Reporting Limit Goals

Method	Analyte	Screening Levels Soil [mg/kg][a]	Screening Levels Groundwater [µg/L][b]	Limit Goal Soil [mg/kg]	Limit Goal Groundwater [µg/L]
BTEX and HVOCs by EPA 8260C	Benzene	0.03	0.5	0.005	0.35
	Toluene	7	72	0.005	1
	Ethylbenzene	6	29	0.005	1
	m,p-Xylene	16,000[c]	--	0.01	2
	o-Xylene	16,000[c]	--	0.005	1
	Xylenes	9	10,000	0.06	3
	Chloromethane	--	--	0.005	10
	Vinyl chloride	0.67[c]	0.2	0.005	0.2
	Chloroethane	--	--	0.005	1
	Trichlorofluoromethane	24,000[c]	2,400[d]	0.005	1
	1,1-Dichloroethene	4,000[c]	7	0.005	1
	Methylene Chloride	0.02	5	0.02	5
	trans-1,2-Dichloroethene	720[c]	100	0.005	1
	1,1-Dichloroethane	180[c]	7.7	0.005	1
	2,2-Dichloropropane	--	--	0.005	1
	cis-1,2-Dichloroethene (cDCE)	160[c]	16	0.005	1
	Chloroform	32[c]	80	0.005	1
	1,1,1-Trichloroethane	2	200	0.005	1
	Carbon tetrachloride	14[c]	0.63[d]	0.005	1
	1,1-Dichloropropene	--	--	0.005	1
	Trichloroethene (TCE)	0.03	1	0.005	1
	1,2-Dichloropropane	27[c]	0.71	0.005	1
	Bromodichloromethane	16[c]	0.71[d]	0.005	1
	1,1,2-Trichloroethane	18	0.77[d]	0.005	1
	Tetrachloroethene (PCE)	0.05	2.4	0.005	1
	1,3-Dichloropropane	--	--	0.005	1
	Dibromochloromethane	12[c]	0.52[d]	0.005	1
	Chlorobenzene	1,600[c]	100	0.005	1
	1,1,1,2-Tetrachloroethane	38[c]	1.7[d]	0.005	1
	1,2,3-Trichloropropane	0.033[c]	0.0015[d]	0.005	1
	1,1,2,2-Tetrachloroethane	5[c]	0.22[d]	0.005	1
	2-Chlorotoluene	1,600[c]	160[d]	0.005	1
	4-Chlorotoluene	--	--	0.005	1
	1,3-Dichlorobenzene	--	--	0.005	1
	1,4-Dichlorobenzene	190[c]	75	0.005	1
	1,2-Dichlorobenzene	7,200[c]	600	0.005	1
	1,2-Dibromo-3-Chloropropane	1.3[c]	0.055[d]	0.005	1
	1,2,4-Trichlorobenzene	34[c]	1.5[d]	0.005	1
	Hexachloro-1,3-butadiene	13[c]	0.56[d]	0.005	1
	1,2,3-Trichlorobenzene	--	--	0.005	1
Gasoline-Range Petroleum Hydrocarbons by NWTPH-Gx	Gasoline-range Petroleum Hydrocarbons	30/100[e]	800/1,000[f]	5	100
Diesel- and Heavy Oil-Range Petroleum Hydrocarbons by NWTPH-Dx	Diesel-range Petroleum Hydrocarbons	2,000	500	50	50
	Heavy Oil-range Petroleum Hydrocarbons	2,000	500	250	250
PAHs by EPA 8270 SIM	1-Methylnaphthalene	34[c]	1.5[d]	0.01	0.4
	2-Methylnaphthalene	320[c]	32[d]	0.01	0.4
	Naphthalene	5	160	0.01	0.4
	Acenaphthylene	--	--	0.01	0.04
	Acenaphthene	4,800[c]	960[d]	0.01	0.04
	Fluorene	3,200[c]	640[d]	0.01	0.04
	Phenanthrene	--	--	0.01	0.04
	Anthracene	24,000[c]	4,800[d]	0.01	0.04
	Fluoranthene	3,200[c]	640[d]	0.01	0.04
	Pyrene	2,400[c]	480[d]	0.01	0.04
	Benzo(a)anthracene	--	--	0.01	0.04
	Chrysene	--	--	0.01	0.04
	Benzo(b)fluoranthene	--	--	0.01	0.04
	Benzo(k)fluoranthene	--	--	0.01	0.04
	Benzo(a)pyrene	0.1	0.1[d]	0.01	0.04
	Indeno(1,2,3-cd)pyrene	--	--	0.01	0.04
	Dibenzo(ah)anthracene	--	--	0.01	0.04
	Benzo(ghi)perylene	--	--	0.01	0.04
Total Metals by EPA 6010/6020/200.8/7470/7471/1631[g]	Arsenic	20	5[d]	1	1
	Cadmium	2	5[d]	1	1
	Chromium	--	50[d]	1	1
	Lead	250	15[d]	1	1
	Mercury	2	2[a]	1	0.1

Notes:

mg/kg = milligram per kilogram

µg/L = microgram per liter

Actual reporting limits may be above the laboratory reporting limit goals due to high analyte concentrations in the sample or matrix effects.

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

HVOCs = Halogenated Volatile Organic Compounds

PAHs = Polycyclic Aromatic Hydrocarbons

EPA = Environmental Protection Agency

NTU = Nephelometric Turbidity Unit

-- = not available

a. Screening levels for soil are MTCA Method A Cleanup Levels, unless otherwise noted.

b. Groundwater screening levels are based on PES Final Remedial Investigation/Feasibility Study Work Plan, American Linen Supply Co-Dexter Avenue Site (2019), unless otherwise noted.

c. MTCA Method B Cleanup Level given when there is no MTCA Method A Cleanup Level for soils.

d. MTCA Method A Cleanup Level (or MTCA Method B Cleanup Level if no MTCA Method A Cleanup Level available) given when there is no groundwater screening level from PES Final Remedial Investigation/Feasibility Study Work Plan, American Linen Supply Co-Dexter Avenue Site (2019).

e. 100 mg/kg for gasoline mixtures without benzene and the total of ethylbenzene, toluene, and xylene are less than 1% of the gasoline mixture; 30 mg/kg for other gasoline mixtures.

f. 800 µg/L when benzene present in groundwater; 1,000 µg/L when no detectable benzene in groundwater

g. Groundwater samples will also be analyzed for dissolved metals if turbidity is greater than 25 NTUs.

Table 8 - Laboratory Quality Control Procedures, Criteria, and Corrective Actions for Gasoline Analysis

Laboratory Quality Control: NWTPH-Gx (GC/FID)			
Quality Control Check	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method blank	1 per batch of every 10 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 5 x blank level
Initial calibration	5-point external calibration before sample analysis	< 20% difference from true value, correlation coefficient ≥ 0.99	Recalibrate instrument
Continuing calibration	Beginning and end of instrument run	NWTPH-Gx ≤ 20% difference from initial calibration.	Recalibrate instrument and re-analyze affected samples
Surrogates	Every lab and field sample	Laboratory control chart limits, no less than 50% or greater than 150% recovery	Evaluate data for usability
Laboratory duplicate	1 per batch of 10 or fewer samples if no MS/MSD	RPD <30%	Evaluate data for usability
Field duplicate	1 for every 20 or fewer samples	RPD <30%	Evaluate data for usability
Laboratory control sample	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Laboratory control sample duplicate; if no MS/MSD or sample duplicate	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Matrix spike (MS) sample	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability
Matrix spike duplicate (MSD)	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability

Note:
RPD = relative percent difference

Table 9 - Laboratory Quality Control Procedures, Criteria, and Corrective Actions for Diesel- and Heavy-Oil Analysis

Laboratory Quality Control: NWTPH-Dx (GC/FID)			
Quality Control Check	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method blank	1 per batch of every 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 5 x blank level
Initial calibration	5-point external calibration prior to sample analysis	< 20% difference from true value, correlation coefficient > 0.99	Recalibrate instrument
Continuing calibration	Beginning, end, and every 10 samples with mid-range standard	% difference < 20% of initial calibration	Recalibrate instrument and re-analyze affected samples
Surrogates	Every lab and field sample	Laboratory control chart limits, no less than 50% or greater than 150% recovery	Evaluate data for usability
Laboratory duplicate	1 per batch of 10 or fewer samples if no MS/MSD	RPD <30%	Evaluate data for usability
Field duplicate	1 per 20 or fewer samples	RPD <30%	Evaluate data for usability
Laboratory control sample	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Laboratory control sample duplicate; if no MS/MSD or sample duplicate	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Matrix spike (MS) sample	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability
Matrix spike duplicate (MSD)	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability

Note:
RPD = relative percent difference

Table 10 - Laboratory Quality Control Procedures, Criteria, and Corrective Actions for Metals Analysis

Laboratory Quality Control: Total and Dissolved Metals – EPA 200/6000/7000 Series			
Quality Control Check	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial calibration verification	Daily or each time instrument is set up	90 to 110% of initial calibration	Recalibrate instrument
Initial calibration blank	After each instrument calibration	All analytes < reporting limit	Correct source of contamination
Continuing calibration verification	Every 10 analytical samples and at the beginning and end of each run	90 to 110% of initial calibration	Correct instrument calibration and re-analyze affected samples
Continuing calibration blank	After each continuing calibration verification	All analytes < reporting limit	Correct source of contamination
Method blank	1 per batch of 20 or fewer samples	All analytes < reporting limit	Re-extract and re-analyze associated samples unless concentrations are > 3 times the blank level
Matrix spike (MS)	1 per batch of 20 or fewer samples if sufficient sample	75 to 125% recovery	Evaluate data for usability
Matrix spike duplicate (MSD)	1 per batch of 20 or fewer samples if sufficient sample	75 to 125% recovery	Evaluate data for usability
Laboratory duplicate	1 per batch of 20 or fewer samples if no MS/MSD	< 20% RPD	Evaluate data for usability
Field duplicate	1 per 20 or fewer samples	< 20% RPD	Evaluate data for usability
Laboratory control sample	1 per batch of 20 or fewer samples	80 to 120% recovery	Evaluate data for usability
Laboratory control sample duplicate	1 per batch of 20 or fewer samples if no MS/MSD	80 to 120% recovery	Evaluate data for usability

Note:
RPD = relative percent difference

Table 11 - Laboratory Quality Control Procedures, Criteria, and Corrective Actions for Polycyclic Aromatic Hydrocarbon Analysis

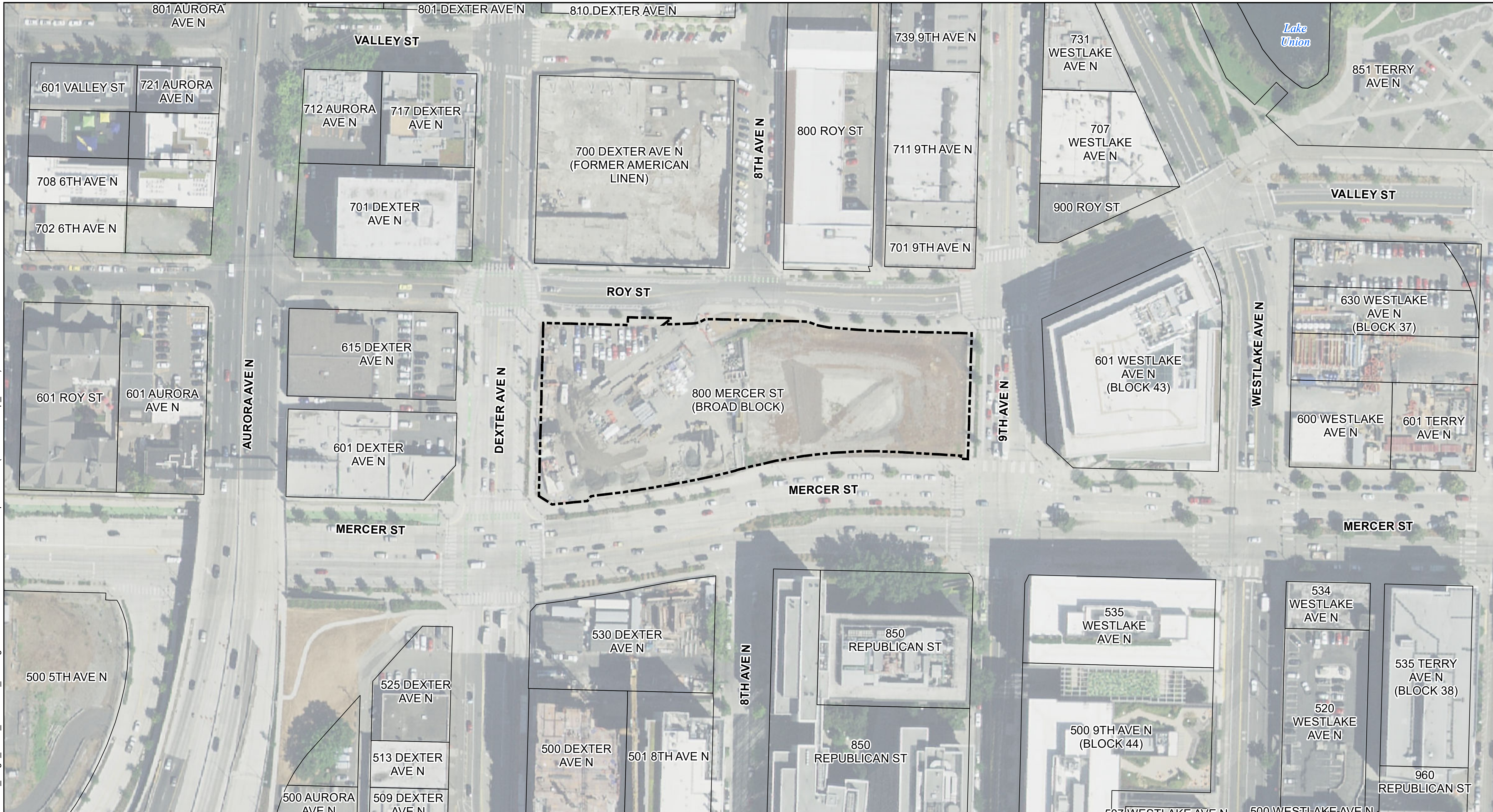
Laboratory Quality Control: Polycyclic Aromatic Hydrocarbons (PAHs) – EPA 8270-SIM			
Quality Control Check	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Instrument tuning	DFTPP; Before initial calibration and every 12 hours	See EPA Method 8270	Retune and recalibrate instrument; reanalyze affected samples
Initial calibration	See EPA Method 8270	≤ 20% relative percent difference	Laboratory to recalibrate and re-analyze affected samples
Continuing calibration verification	Every 12 hours	See EPA Method 8270 ≤ 20% percent difference	Recalibrate instrument and reanalyze affected samples
Method blank	1 per batch of 20 or fewer samples	All analytes < reporting limit	Re-extract and reanalyze associated samples unless sample concentrations are >5x blank level or are
Internal Standards	Every sample and calibration standard mix	Areas with -50% to +100% of initial calibration	Reanalyze affected samples
Laboratory duplicate	1 per batch of 20 or fewer samples if no MS/MSD	RPD <20%	Evaluate data for usability
Laboratory control sample	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Laboratory control sample duplicate; if no MS/MSD or sample duplicate	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Matrix spike (MS) sample	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability
Matrix spike duplicate (MSD)	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability
Surrogates	Added to every lab and field sample	Laboratory control chart limits	Evaluate data for useability

Note:
RPD = relative percent difference

Table 12 - Laboratory Quality Control Procedures, Criteria, and Corrective Actions for Volatile Organic Compound Analysis

Laboratory Quality Control: VOCs – EPA 8260			
Quality Control Check	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Instrument tuning	Before initial calibration and every 12 hours	See EPA Method 8260	Retune and recalibrate instrument
Initial calibration	See EPA Method 8260	< 20% relative percent difference	Laboratory to recalibrate and re-analyze affected samples
Continuing calibration verification	Every 12 hours	See EPA Method 8260 < 20% percent difference	Laboratory to recalibrate if correlation coefficient or response factor does not meet method requirements
Method blank	1 per batch of 20 or fewer samples	All analytes < reporting limit	Laboratory to eliminate or greatly reduce laboratory contamination due to glassware or reagents or analytical system; re-analyze affected samples
Laboratory duplicate	1 per batch of 20 or fewer samples if no MS/MSD	RPD <30%	Evaluate data for usability
Field duplicate	1 for every 20 or fewer samples	RPD <30%	Evaluate data for usability
Laboratory control sample	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Laboratory control sample duplicate; if no MS/MSD or sample duplicate	1 per batch of 20 or fewer samples	Laboratory control chart limits	Evaluate data for usability
Matrix spike (MS) sample	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability
Matrix spike duplicate (MSD)	1 per batch of 20 or fewer samples if sufficient sample	Laboratory control chart limits	Evaluate data for usability
Surrogates	Added to every lab and field sample	Laboratory control chart limits	Evaluate data for useability

Note:
RPD = relative percent difference



Legend

Property Boundary

Note: Feature locations are approximate.

Sourced: Aerial photograph provided by Hexagon Imagery Program Data. Address information obtained from King County GIS Open Data portal's Parcel Address Area shapefile, published April 4, 2019.

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Surrounding Properties

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Figure 1

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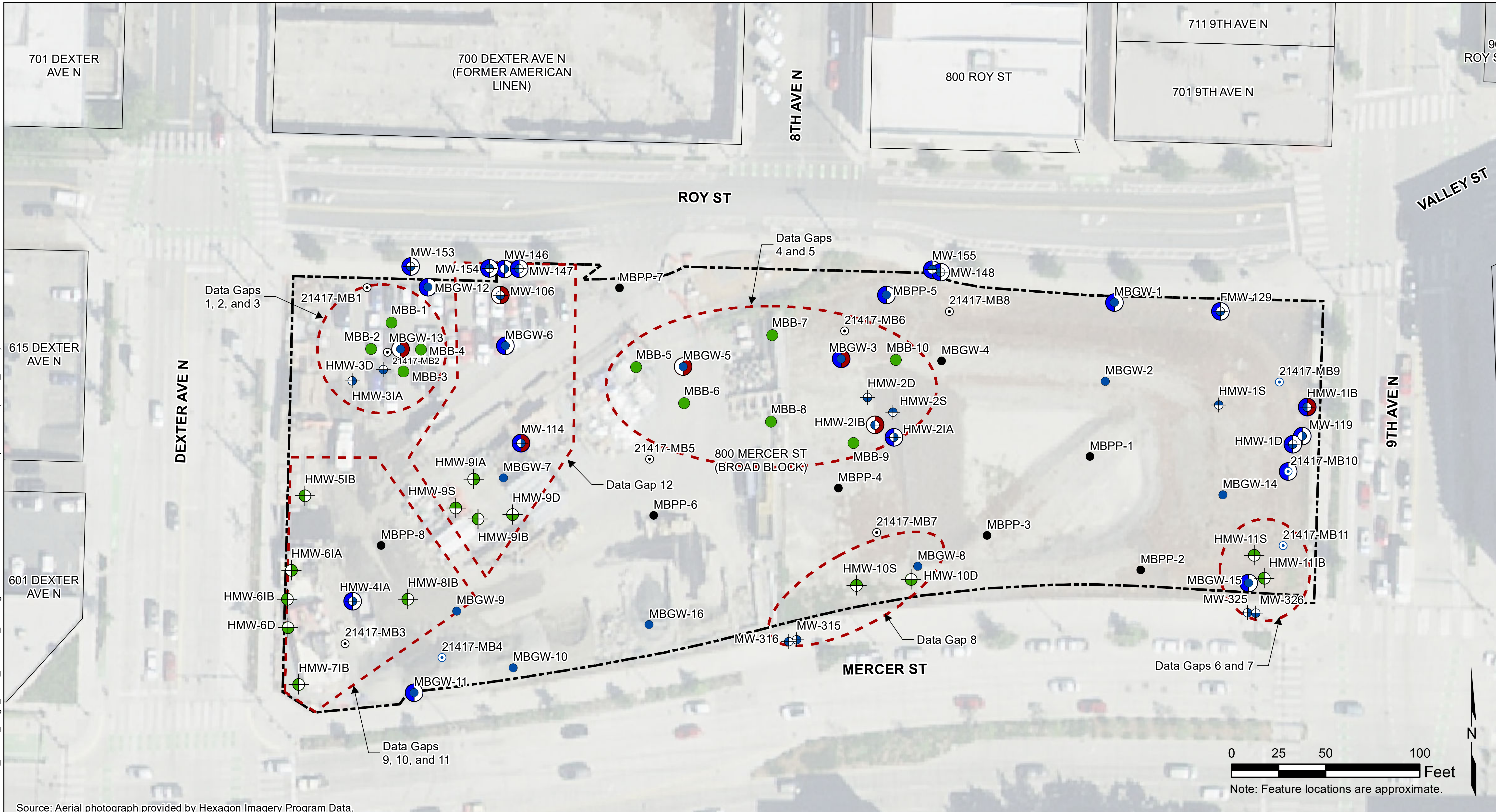

Legend

- Boring with Soil Sample
- Boring with Water Sample
- Historical Boring with Soil Sample
- Historical Boring with Water Sample
- Data Gap Area
- Property Boundary
- Shallow Zone Monitoring Well
- Intermediate A Zone Monitoring Well
- Intermediate B Zone Monitoring Well
- Deep Zone Monitoring Well
- Proposed Boring
- Proposed Shallow Zone Monitoring Well
- Proposed Intermediate A Zone Monitoring Well
- Proposed Intermediate B Zone Monitoring Well
- Proposed Deep Zone Monitoring Well

Soil and Groundwater Detections

- Soil Sample with Exceedance
- Groundwater Sample with Exceedance
- Soil and Groundwater Sample with Exceedance

Mercer Megablock
Seattle, Washington

Proposed Exploration Map

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Figure 2

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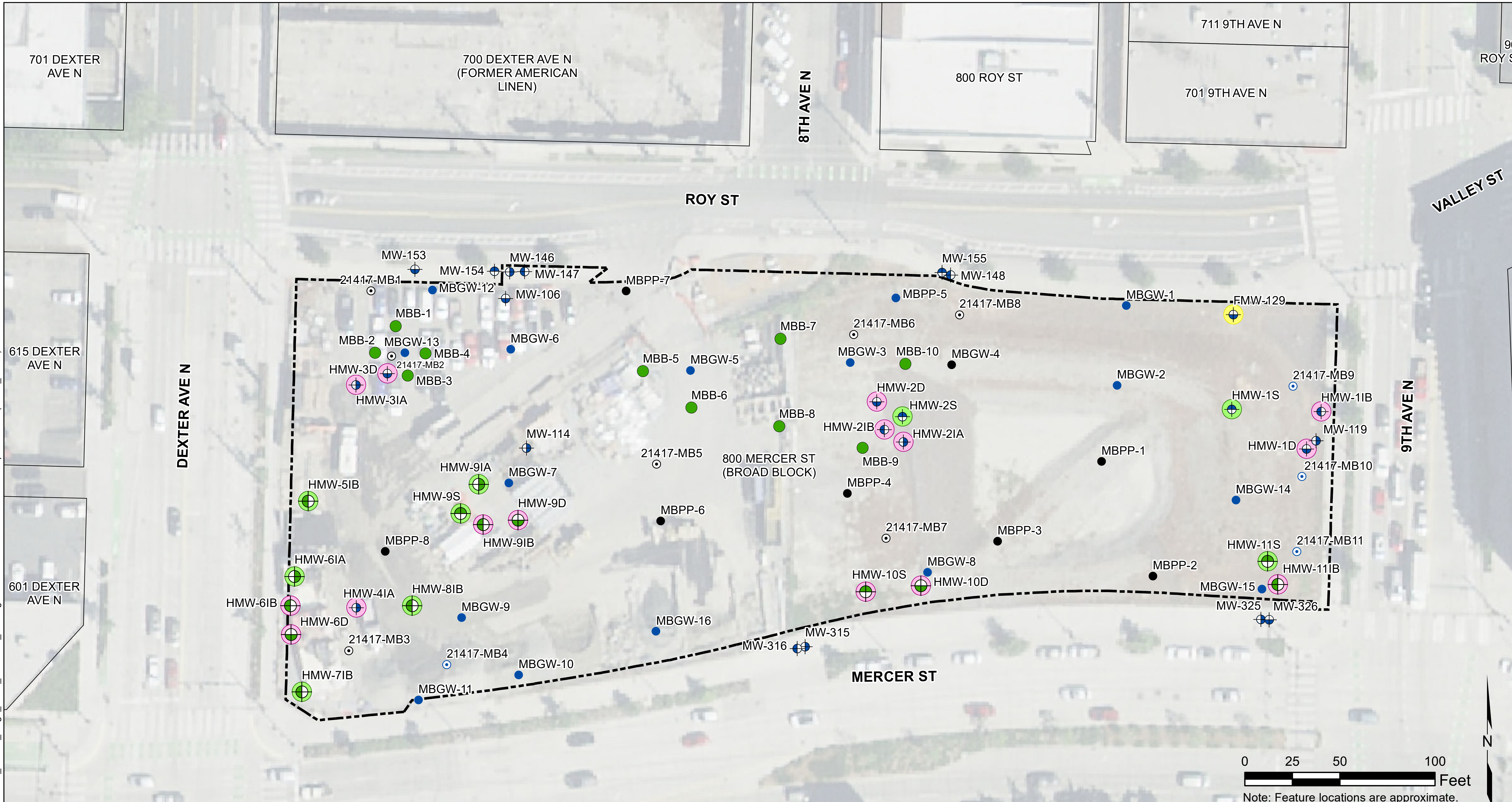

Source: Aerial photograph provided by Hexagon Imagery Program Data.

Legend

- Boring with Soil Sample
- Boring with Water Sample
- Historical Boring with Soil Sample
- Historical Boring with Water Sample
- Shallow Zone Monitoring Well
- Intermediate A Zone Monitoring Well
- Intermediate B Zone Monitoring Well
- Deep Zone Monitoring Well
- Proposed Boring
- Proposed Shallow Zone Monitoring Well
- Proposed Intermediate A Zone Monitoring Well
- Proposed Intermediate B Zone Monitoring Well
- Proposed Deep Zone Monitoring Well
- Slug Test
- Transducer
- Transducer and Slug Test
- Property Boundary

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Proposed Groundwater Level Monitoring and Slug Testing Program

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Figure 3