



REVISED DRAFT

Data Gaps Investigation Work Plan

Seattle DOT Dexter Parcel (615 Dexter Site)

**615 Dexter Avenue North
Seattle, Washington**

Prepared for
615 Dexter, LLC

January 23, 2020
19409-04



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Prepared by
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Seattle DOT Dexter Parcel (615 Dexter Site)

615 Dexter Avenue North

Seattle, Washington

1.0 INTRODUCTION

On behalf of 615 Dexter, LLC, Hart Crowser, Inc. (Hart Crowser) has prepared this work plan for the supplemental environmental investigation to address data gaps at the Seattle DOT Dexter Parcel site (referred to in this document as the 615 Dexter Avenue North property [Property]), located at 615 Dexter Avenue North in Seattle, Washington. The Property vicinity and surrounding properties is shown on Figure 1.

The 0.56-acre Property is currently owned by the City of Seattle. However, 615 Dexter, 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 #81735 and Cleanup Site ID #14785.

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 2019a). 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

A Phase I environmental site assessment (Phase I) and limited Phase II environmental site assessment (limited Phase II) 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, an area of petroleum and petroleum-related contamination and two areas of potential chlorinated solvent contamination were identified for further investigation. 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 separate 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 and within adjacent rights-of-way (alleyway). 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 (Hart Crowser 2019a) provides a more detailed history of the Property (and surrounding properties).

2.1 Historical and Current Property Uses

At the end of the 19th century and beginning of the 20th century, dwellings and residential units were present on the north and northwest portion of the Property. The dwellings were demolished between 1917 and 1936. The southern half of the existing building was constructed in 1926.

The building was previously occupied by Rix Sandpaper, Seattle Hardwood Floor Co., and a restaurant in 1935 and by Brown Bridge Mills in 1940. The 1940 Kroll map shows a service station in the northeast corner of the Property. The 1940 Kroll map also shows two other structures on the east half of the Property with no labels or addresses. A Puget Sound Regional Archive document with a photograph indicates a small gasoline station at 621 Dexter Avenue North with the building constructed in 1930 (Hart Crowser 2019b).

The northern and eastern buildings were built in approximately 1946. After the 1946 building additions, known occupants and uses of the building include:

- Colotyle Corporation (1950—northern portion)
- Seattle Hardwood Floor Co. (1950—southern portion)
- Plastic mixing, Masonite storage, and storage activities (1950—eastern portion)
- Parker Henry Glass Company (1951)
- Acme Restaurant Supply (1955)
- Pac Bowling and Billiard Company (1955)
- Jr Achievement of Seattle (1960)
- Contour Laminates Inc. Manufacturing, likely a woodworking business (1966 to 1969)
- Domestic Supply Whee (1980)
- Zig Zag (1992 to 1994)
- Dress for Success (2002)
- Copiers Northwest (2002 to present)

In 2005, a fire destroyed the eastern portion of the main building, which was then replaced with a surface parking lot.

The Property is currently occupied by a surface parking lot and a warehouse building, occupied by Copiers Northwest as a large-scale printing facility, storage warehouse, and offices.

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 and glacial deposits consistent with previous studies in the area (SES 2016; PES 2018). Brief summaries of the identified geological units are presented below.

Fill. Very little fill was observed in the borings at the Property. 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. Fill depths of up to 3 feet below ground surface (bgs), corresponding to approximately elevation 56 feet (all elevations in this report are referenced to the North American Vertical Datum of 1998 [NAVD88]), were observed in borings DGW-2 and DPP-1. No other deposits interpreted as fill were encountered in other borings at the Property.

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. All explorations at the Property were advanced in this material to the bottom of the borings—ranging from 10 to 51.5 feet bgs (approximately 11 to 56 feet elevation).

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, which serves as a leaky aquitard. The intermediate zone is further divided into an upper coarser zone (intermediate A, down to 50 feet bgs) and a lower 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 levels in deep wells installed on adjacent properties (17 to 19 feet) are similar to Lake Union water levels (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 Broad Block. Groundwater elevations are higher in shallow wells and lower in the corresponding deep wells suggesting that the 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).

- Gasoline-range petroleum hydrocarbon (GRO) was present in soil at a concentration (269 milligrams per kilogram [mg/kg]) exceeding the MTCA Method A cleanup level in boring 21417-GP4 at 15 feet bgs. This boring also had a concentration of GRO in a grab shallow groundwater sample (4,830 micrograms per liter [µg/L]) exceeding the MTCA Method A cleanup level.

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

- GRO was present in soil at a concentration (1,200 mg/kg) exceeding the MTCA Method A cleanup level in boring DMW-1S at 12.5 feet bgs (approximately 43 feet elevation).
- Total arsenic was present in shallow groundwater at a concentration (8.3 µg/L) slightly exceeding the MTCA Method A cleanup level in monitoring well DMW-1S.

A Phase II was conducted on the adjacent parcel to the south of the Property in 2019 (Hart Crowser 2019c).

- GRO was present in shallow groundwater at a concentration (6,900 µg/L) exceeding the MTCA Method A cleanup level in HC-1. GRO was also present in soil at a concentration (290 mg/kg) exceeding the MTCA Method A cleanup level in HC-1 at 25 feet bgs.

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

- Chlorinated solvent contamination (i.e., tetrachloroethene [PCE] and/or its degradation compounds trichloroethene [TCE], *cis*-1,2-dichloroethylene [cDCE], and vinyl chloride) were present in soil and shallow, intermediate, and deep groundwater at concentrations exceeding applicable MTCA Method A or B cleanup levels on the adjacent American Linen Site northeast of the Property and the Broad Block parcel east of the Property.
- In September and October 2019, PES installed one new well cluster in the sidewalk adjacent to Roy Street, near the northeast Property corner. 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)	GRO	30/100 ^a
	Benzene	0.03
	Toluene	7
	Ethylbenzene	6
	Xylenes	9
	PCE	0.05
	TCE	0.03
	cDCE	160
Groundwater (µg/L)	COC	Screening Level
	GRO	800/1,000 ^b
	Benzene	0.5
	Toluene	72
	Ethylbenzene	29
	Xylenes	10,000
	PCE	2.4
	TCE	1

Media	COC	Screening Level
	cDCE	16
	Vinyl chloride	0.2
	Arsenic	5

Notes:

- 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.
- 800 µg/L when benzene present in groundwater; 1,000 µg/L when no detectable benzene in groundwater.
- 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 nearby 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. Delineate the eastern and southern lateral extents of GRO and petroleum-related volatile organic compounds (VOCs) in soil in the southeast corner of the Property near borings 21417-GP4 and HC-1 and well DMW-1S;

Data Gap 2. Further assess whether chlorinated solvents are present in soil and/or groundwater near the east Property boundary and/or near the southwest area of the Property associated with the former underground storage tanks (USTs, not identified in soil or groundwater in previous investigations but suspected based on history of Property and impacts on surrounding sites); and

Data Gap 3. Delineate the eastern and southern lateral extents of arsenic in shallow groundwater in the southeast corner of the Property near well DMW-1S.

Data Gap 4. More fully characterize seasonal variation in groundwater elevation data and flow directions.

4.0 PROPOSED 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 four new monitoring wells proposed for the Property. Figure 2 shows the approximate proposed well locations. The monitoring well locations and the rationales for how the locations address the data gaps are presented in Table 4 and summarized below:

- **DMW-5IA.** This monitoring well will be installed in the west side of the alleyway south of the Property to verify there are no chlorinated solvents associated with the former USTs in the alleyway and to confirm the results of the previous groundwater sample collected from reconnaissance boring DGW-4. This well will address data gap numbers 2 and 4.

- **DMW-4S.** This monitoring well will be installed in the east side of the alleyway south of the Property to bound the southern lateral extent of known petroleum-contaminated soil and arsenic-contaminated shallow groundwater previously found in well DMW-1S. This well will address data gap numbers 1, 3, and 4.
- **DMW-3IA and DMW-2S.** Two wells will be installed within the parking lot (along the eastern boundary of the Property) to bound the eastern lateral extent of known petroleum-contaminated soil and arsenic-contaminated groundwater previously found in well DMW-1S and evaluate if chlorinated solvent impacts from the American Linen Site or other off-site sources have migrated on or impacted the Property. These wells will address data gap numbers 1 through 4.

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, 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 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 and wells in the Intermediate Shallow aquifer (IA) will be screened from depths of 35 to 45 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 monitoring well location. Soil samples will be collected from 5-, 10-, 15-, and 20-foot bgs, plus one additional sample from below 20-foot 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., DMW-4S-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; diesel- and heavy oil-range petroleum (DRO and HRO, respectively); halogenated VOCs and benzene, toluene, ethylbenzene, and xylenes (BTEX); and total metals (arsenic, cadmium, chromium, lead, and mercury). The five soil samples from DMW-4S will also be analyzed for polycyclic aromatic hydrocarbons (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 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.

4.4.2 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. 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.

4.4.3 Groundwater Sample Collection Locations and Procedures

One groundwater sample will be collected from each proposed monitoring well location. Groundwater samples will be collected at least 48 hours after development.

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 number (e.g., DMW-4S).

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 sample from DMW-4S 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 1 existing on-site well (DMW-1S) and 4 new wells (DMW-2S, DMW-3IA, DMW-4S, and DMW-5IA).

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., DMW-4S).

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 sample from DMW-4S 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 three new wells (DMW-3IA, DMW-4S, and DMW-5IA) 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 (4) 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:

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

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:

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

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 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 Dage will be the project manager for Hart Crowser. Mr. Dage 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. Dage will review data, reports, and other project-related documents prepared by Hart Crowser before their submittal to the Client or to Ecology. Mr. Dage 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 615 Dexter, LLC. No other warranty, express or implied, is made.

9.0 REFERENCES

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Table 1 - Summary of Historical Soil Analytical Data

Sample Location	Sampling Date	Depth in Feet	Sample Elevation	NWTPH in mg/kg			BTEX in mg/kg				Chlorinated Volatile Organic Compounds (cVOCs) in mg/kg					Metals in mg/kg			
				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-1	04/11/19	10	-	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	-	-	-	-	
MW-1	04/11/19	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	-	-	-	-	
MW-1	04/11/19	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	-	-	-	-	
HC-1	04/11/19	5	-	20 U	50 U	5 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-	
HC-1	04/11/19	7.5	-	-	-	-	-	-	-	-	-	-	-	-	1 U	-	1.2	1 U	
HC-1	04/11/19	10	-	-	-	5 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-	
HC-1	04/11/19	12.5	-	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	-	-	-	-	
HC-1	04/11/19	15	-	20 U	50 U	-	-	-	-	-	-	-	-	-	1 U	-	1 U	1 U	
HC-1	04/11/19	17.5	-	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	-	-	-	-	
HC-1	04/11/19	20	-	-	-	5 U	0.02 U	0.05 U	0.05 U	0.05 U	-	-	-	-	1 U	-	1 U	1 U	
HC-1	04/11/19	25	-	20 U	50 U	290	0.02 U	0.05 U	0.84	0.62	0.05 U	0.02 U	0.05 U	0.05 U	-	-	-	1.2 J	
HC-1	04/11/19	30	-	20 U	50 U	30	0.02 U	0.05 U	0.22	0.19	0.05 U	0.02 U	0.05 U	0.05 U	1 U	-	1 U	1 U	
HC-5	04/11/19	10	-	20 U	50 U	-	-	-	-	-	-	-	-	-	-	-	-	-	
HC-5	04/11/19	15	-	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	1 U	-	1 U	1 U	
HC-2	04/11/19	5	-	20 U	50 U	-	-	-	-	-	-	-	-	-	-	-	-	-	
HC-2	04/11/19	10	-	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	-	-	-	-	
HC-2	04/11/19	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	-	-	-	-	
HC-4	04/11/19	10	-	20 U	50 U	5 U	-	-	-	-	-	-	-	-	-	-	-	-	
HC-4	04/11/19	15	-	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	1 U	-	1 U	1 U	
HC-4	04/11/19	35	-	20 U	50 U	9.8	0.02 U	0.05 U	0.31	0.19	0.05 U	0.02 U	0.05 U	0.05 U	-	-	-	-	
HC-3	04/11/19	7.5	-	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	-	-	-	-	
HC-3	04/11/19	12.5	-	-	-	-	-	-	-	-	-	-	-	-	1 U	-	1 UJ	1 UJ	
HC-3	04/11/19	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	-	-	-	-	
HC-3	04/11/19	20	-	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	-	-	-	-	
HC-3	04/11/19	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	-	-	-	-	
DGW-1	03/06/19	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	11 U	47	34	5.8 U	
DGW-1	03/06/19	12.5	34.5	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	-	-	-	-	
DGW-1	03/06/19	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	-	-	-	-	
DGW-1	03/06/19	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	11 U	28	29	5.5 U	
DGW-1	03/06/19	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	-	-	-	-	
DGW-2	03/04/19	5	54	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	-	-	-	-	
DGW-2	03/04/19	10	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	11 U	44	37	5.5 U	
DGW-2	03/04/19	25	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	-	-	-	-	
DGW-2	03/04/19	30	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	-	-	-	-	
DGW-3	03/06/19	2.5	44.5	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	11 U	38	25	5.5 U	
DGW-3	03/06/19	12.5	34.5	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	11 U	43	30	5.6 U	
DGW-3	03/06/19	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	-	-	-	-	
DGW-3	03/06/19	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	-	-	-	-	
DGW-3	03/06/19	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	11 U	30	23	5.5 U	
DGW-4	03/04/19	5	60	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	12 U	45	34	5.8 U	
DGW-4	03/04/19	10	55	-	-	-	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.05 U	0.05 U	-	-	-	-	
DGW-4	03/04/19	15	50	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	11 U	58	47	27	
DGW-4	03/04/19	20	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	11 U	36	22	5.3 U	
DGW-4	03/04/19	35	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	12 U	89	67	6 U	
DGW-4	03/04/19	50	15	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	-	-	-	-	
DMW-1S	03/05/19	5	50.76	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	-	-	-	-	
DMW-1S	03/05/19	10	45.76	20 U	50 U	5 U	0.02 U	0.05 U	0.053	0.071	0.05 U	0.02 U	0.05 U	0.05 U	12 U	51	31	5.8 U	
DMW-1S	03/05/19	12.5	43.26	20 U	50 U	1200	0.02 U	0.05 U	2.1	4.4	0.05 U	0.02 U	0.05 U	0.05 U	-	-	-	-	

Table 1 - Summary of Historical Soil Analytical Data

Sample Location	Sampling Date	Depth in Feet	Sample Elevation	NWTPH in mg/kg			BTEX in mg/kg				Chlorinated Volatile Organic Compounds (cVOCs) in mg/kg					Metals in mg/kg			
				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
DMW-1S	03/05/19	15	40.76	-	-	67	0.02 U	0.05 U	0.12	0.2	0.05 U	0.02 U	0.05 U	0.05 U	0.05 U	11 U	32	23	5.4 U
DMW-1S	03/05/19	20	35.76	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	53	35	5.5 U
DPP-1	03/04/19	5	54.5	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	-	-	-	-
DPP-1	03/05/19	7.5	52	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	-	-	-	-
DPP-1	03/04/19	10	49.5	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	31	25	5.3 U
DPP-1	03/04/19	20	39.5	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	11 U	36	27	5.4 U
DPP-2	03/04/19	5	54	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	71	43	6 U
DPP-2	03/04/19	10	49	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	11 U	54	34	5.4 U
DPP-3	03/05/19	5	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	-	-	-	-
DPP-3	03/05/19	10	37	-	-	-	-	-	-	-	-	-	-	-	-	11 U	48	29	5.5 U
DPP-3	03/05/19	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	-	-	-	-
DPP-3	03/05/19	25	22	-	-	-	-	-	-	-	-	-	-	-	-	11 U	35	22	5.7 U
DPP-3	03/05/19	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	-	-	-	-
DPP-4	03/04/19	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	-	-	-	-
DPP-4	03/04/19	12.5	46.5	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	34	24	5.4 U
DPP-4	03/04/19	17.5	41.5	-	-	-	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	-	-	-	-
DPP-4	03/04/19	20	39	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	46	31	6 U
DPP-5	03/04/19	10	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	36	40	5.7 U
DPP-5	03/04/19	17.5	41.5	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	34	5.6 U
DPP-5	03/04/19	20	39	-	-	-	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	-	-	-	-
DPP-6	03/05/19	5	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	-	-	-	-
DPP-6	03/05/19	7.5	39.5	-	-	-	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	36	25	5.5 U
DPP-6	03/05/19	12.5	34.5	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	22	5.4 U
DPP-6	03/05/19	17.5	29.5	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	42	26	5.5 U
21417-GP1	04/21/17	25	-	21.8 U	54.5 U	4.58 U	-	-	0.0275 U	0.0366 U	-	-	-	-	-	-	-	-	-
21417-GP2	04/21/17	18	-	18.8 U	47 U	3.8 U	-	-	-	-	-	-	-	-	-	-	-	-	-
21417-GP3	04/21/17	15.5	-	-	-	-	ND	ND	0.0243 U	0.0324 U	-	-	-	-	-	-	-	-	-
21417-GP4	04/21/17	12	-	21.2 U	53 U	14.6	ND	-	0.0414	0.0607	-	-	-	-	-	-	-	-	-
21417-GP4	04/21/17	15	-	20.9 U	52.2 U	269	ND	-	0.456	0.551	-	-	-	-	-	-	-	-	-
21417-GP5	05/19/17	1	-	20.9 U	52.4 U	4.32 U	-	-	0.0259 U	0.0346 U	-	-	-	-	-	-	-	-	-
21417-GP5	05/19/17	14	-	20.4 U	50.9 U	3.71 U	-	-	0.0223 U	0.0296 U	-	-	-	-	-	-	-	-	-
21417-GP6	05/19/17	18	-	19 U	47.5 U	3.98 U	-	-	0.0239 U	0.0318 U	-	-	-	-	-	-	-	-	-
21417-GP7	05/19/17	2	-	22 U	99.2	4.74 U	-	-	0.0284 U	0.0378 U	-	-	-	-	-	-	-	-	-
21417-GP7	05/19/17	13	-	19.9 U	49.7 U	4.03 U	-	-	0.0242 U	0.0322 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 = milligrams 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)
				500	500	800/1000^a	0.5	72	29	10000	16	1	2.4	0.2	100
Shallow Zone															
21417-GP1	4/21/2017	20 - 25	-	50 U	100 U	50 U	1 U	1 U	1 U	2 U	1 U	0.5 U	1 U	0.2 U	1 U
21417-GP3	4/21/2017	10 - 20	-	49.8 U	99.6 U	50 U	1 U	1 U	1 U	2 U	1 U	0.5 U	1 U	0.2 U	1 U
21417-GP4	4/21/2017	10 - 15	-	-	-	4830	1 U	1.15	94.3	2 U	1 U	0.5 U	1 U	0.2 U	1 U
DGW-1	3/6/2019	-	-	200 U	500 U	340	1 U	1 U	8	14	1 U	1 U	1 U	0.2 U	1 U
DGW-2	3/7/2019	-	-	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
DMW-1S	3/25/2019	20 - 30	27 - 17	200 U	500 U	350	1.8	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U
DPP-3	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
HC-1-TMW	4/11/2019	-	-	200 U	500 U	6900	1 U	1 U	25	11	1 U	1 U	1 U	0.2 U	1 U
Intermediate A Zone															
DGW-3	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
DGW-4	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
HC-4	4/12/2019	-	-	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

Sample Location	Sampling Date	Screened Interval in Feet BGS	Screened Interval Elevation in Feet	Dissolved Metals in µg/L							Total Metals in µg/L						
				Arsenic	Barium	Chromium	Lead	Mercury	Selenium	Cadmium	Arsenic	Barium	Chromium	Lead	Mercury	Selenium	Cadmium
				5	3200	50	15	2	80	5	5	3200	50	15	2	80	5
Shallow Zone																	
21417-GP1	4/21/2017	20 - 25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21417-GP3	4/21/2017	10 - 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21417-GP4	4/21/2017	10 - 15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DGW-1	3/6/2019	-	-	3.1	25 U	10 U	1 U	0.5 UJ	5 U	4 U	88	1800	870	92	0.92	13	4.4 U
DGW-2	3/7/2019	-	-	3 U	25 U	10 U	1 U	0.5 UJ	5 U	4 U	12	240	77	11	0.5 U	11 U	4.4 U
DMW-1S	3/25/2019	20 - 30	27 - 17	-	-	-	-	-	-	-	8.1	38	11 U	1.1 U	0.5 U	11 U	4.4 U
DPP-3	3/6/2019	-	-	3 U	25 U	10 U	1 U	0.5 UJ	5 U	4 U	20	520	260	18	0.5 U	11 U	4.4 U
HC-1-TMW	4/11/2019	-	-	5 U	-	10 U	2 U	0.5 U	-	5 U	5 U	-	10 U	6	0.5 U	-	5 U
Intermediate A Zone																	
DGW-3	3/6/2019	-	-	3 U	55	10 U	1 U	0.5 UJ	5 U	4 U	100	3000	1400	120	1.3	12	5.1
DGW-4	3/4/2019	-	-	3 U	27	10 U	1 U	0.5 UJ	5 U	4 U	87	1900	590	65	0.75	6.7	4.4 U
HC-4	4/12/2019	-	-	-	-	-	-	-	-	-	5 U	-	10 U	2	0.5 U	-	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 - microgram 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
DMW-2S	To bound the eastern lateral extent of known petroleum-contaminated soil and arsenic-contaminated shallow groundwater previously found in well DMW-1S and evaluate if chlorinated solvent impacts from the American Linen Site or other off-site sources have migrated on or impacted the Property. This will address data gap numbers 1 through 4.	57	40	Soil	5	52	X	X	X		X
				Soil	10	47	X	X	X		X
				Soil	15	42	X	X	X		X
				Soil	20	37	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
	Water (well sample)	25 to 35	32 to 22	X	X	X		X			
DMW-3IA	To bound the eastern lateral extent of known petroleum-contaminated soil and arsenic-contaminated shallow groundwater previously found in well DMW-1S and evaluate if chlorinated solvent impacts from the American Linen Site or other off-site sources have migrated on or impacted the Property. This will address data gap numbers 1 through 4.	56	50	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)	35 to 45	21 to 11	X	X	X		X			
DMW-4S	To bound the southern lateral extent of known petroleum-contaminated soil and arsenic-contaminated shallow groundwater previously found in well DMW-1S. This will address data gap numbers 1, 3, and 4.	62	40	Soil	5	57	X	X	X	X	X
				Soil	10	52	X	X	X	X	X
				Soil	15	47	X	X	X	X	X
				Soil	20	42	X	X	X	X	X
				Soil	>20, above GWT	TBD	X	X	X	X	X
	Water (well sample)	25 to 35	37 to 27	X	X	X	X	X			
DMW-5IA	To verify there are no chlorinated solvents associated with the former USTs and to confirm the previous groundwater sample collected from reconnaissance boring DGW-4. This will address data gap numbers 2 and 4.	69	50	Soil	5	64	X	X	X		X
				Soil	10	59	X	X	X		X
				Soil	15	54	X	X	X		X
				Soil	20	49	X	X	X		X
				Soil	>20, above GWT	TBD	X	X	X		X
	Water (well sample)	35 to 45	34 to 24	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 volatile organic compounds 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
- UST = Underground storage tank
- 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 Limits

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	20
	Groundwater	HCl; Cool to 4°C		3 x 40 mL VOA vial	4
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	20
	Groundwater	HCl; Cool to 4°C		1 x 500 mL amber glass jar	4
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	20
	Groundwater	HCl; Cool to 4°C		3 x 40 mL VOA vial	4
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	20
	Groundwater	HNO ₃ ; Cool to 4°C		1 x 500 mL HDPE jar ^e	4
PAHs (EPA 8270D SIM)	Soil	Cool to 4°C	14 days to extraction; 40 days to analysis	1 x 4 ounce WMG jar ^d	5
	Groundwater		7 days to extraction; 40 days to analysis	1 x 500 mL amber glass jar	1

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

HNO₃ = Nitric Acid

HDPE = High Density Polyethylene

WMG = wide-mouth glass

VOA = Volatile Organic Analysis

mL = milliliter

NTU = Nephelometric Turbidity Unit

Table 7 - Screening Levels and Reporting Limit Goals

Method	Analyte	Screening Levels		Limit Goal	
		Soil [mg/kg] ^a	Groundwater [µg/L] ^b	Soil [mg/kg]	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 (cDC)	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
	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 6010/6020/200.8/7470/7 471/1631^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 ^d	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 $\leq 20\%$ 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/MD	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/MD 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% relative 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 undetected
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


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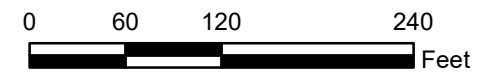
RPD = relative percent difference

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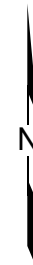


Legend

 Property Boundary



Note: Feature locations are approximate.



615 Dexter Ave N
Seattle, Washington

Surrounding Properties

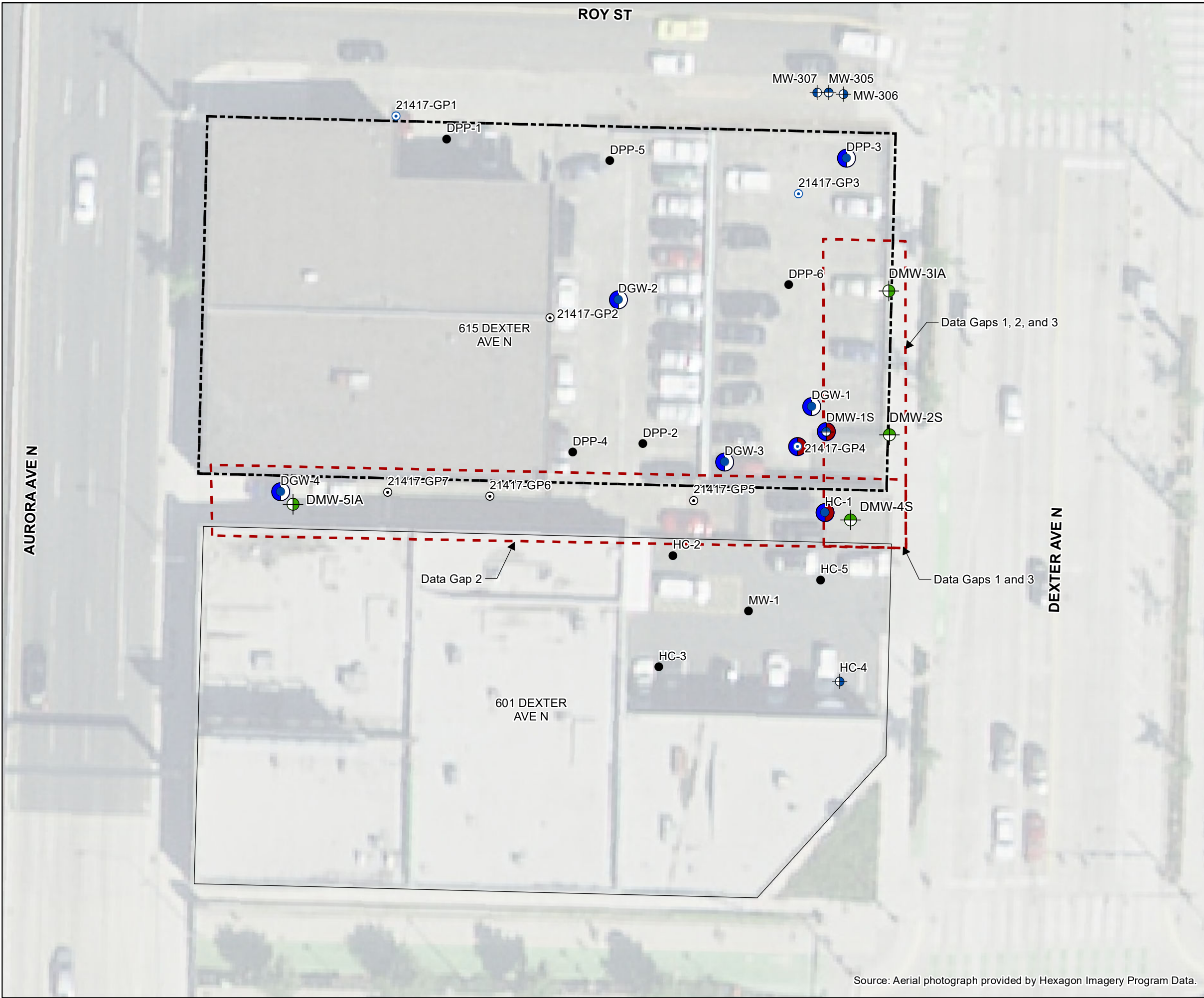
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Figure

1

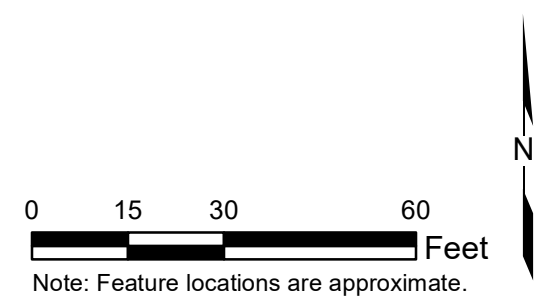


Legend

- 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 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
- Data Gap Area
- Property Boundary



615 Dexter Ave N
Seattle, Washington

Proposed Exploration Map

19409-04

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Figure

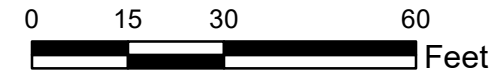
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Source: Aerial photograph provided by Hexagon Imagery Program Data.

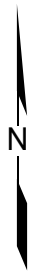


Legend

- 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 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



Note: Feature locations are approximate.



615 Dexter Ave N
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Proposed Groundwater Level Monitoring and Slug Testing Program

19409-04

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Figure

3

Source: Aerial photograph provided by Hexagon Imagery Program Data.