

CONTAMINATED MEDIA MANAGEMENT PLAN

NW Natural
Portland Resource Center Property
2600 SE 9th Avenue
Portland, Oregon

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HAI Project No. 9907

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1.0 CONTAMINATED MEDIA MANAGEMENT PLAN SUMMARY

This Contaminated Media Management Plan (CMMP) was prepared to address the management of areas of known and possible contaminated soil and groundwater at the former NW Natural Portland Resource Center Property located at 2600 SE 9th Avenue in Portland, Oregon (Figure 1).

This document updates the previous CMMP for this property to account for changes resulting from redevelopment that occurred at the property during 2021 and 2022. The previous CMMP, superseded by this document, was entitled *Contaminated Media Management Plan, former NW Natural Central Service Center Property, 2630 SE 9th Avenue, Portland, Oregon*, dated June 14, 2019.

As described herein, the key points and recommendations of the CMMP are summarized below.

- Areas of Known Contamination

Soil contaminated with petroleum hydrocarbons, arsenic, and associated constituents are present beneath portions of the property. The areas of soil contamination are heterogeneously distributed across the property and therefore, with exception of areas that were filled with clean, imported structural fill in 2021 and 2022, uppermost soils beneath the property have the presumption of contamination, as shown on Figure 4.

A small area of arsenic contaminated soil is present near the southwestern corner of the property at concentrations that, if exposed, may pose an unacceptable inhalation and dermal contact health risk to on-site occupational workers. The risk has been remediated by covering the arsenic-contaminated soil with a minimum 8-inch-thick cap of 1-inch minus crushed gravel. This cap area, as shown on Figure 4, must not be disturbed or removed.

The immediate area surrounding the location of a diesel UST discovered and decommissioned during 2021 site redevelopment activities contains a pocket of petroleum-impacted soil. The remaining pocket of contamination (diesel-range petroleum) does not pose a current or potential future unacceptable human health risk but would require special management if removed in the future. The petroleum impacts at the former UST area are like those as previously documented at other areas of the site and therefore can be managed in the same manner as soils from other areas of the site where residual levels of contamination remain. The location of the 2021 diesel UST cleanup area, with known residual contamination in-place, is shown on Figure 4 and fully documented within Appendix A.

A groundwater contaminant plume containing petroleum constituents (volatile organic compounds, or VOCs) originates at the property, and extends off-site approximately 300 to 350 feet to the west and southwest. The area of known groundwater contamination is shown as Areas A and B on Figure 5.

- General Recommendations

If left in-place undisturbed, no actions are necessary with respect to the above-identified contaminated soil and groundwater under current land use (i.e. non-residential property). However, if contaminated soil or groundwater is encountered during future subsurface work (including utility maintenance and repair, and redevelopment activities), appropriate management and disposal of the contaminated media will be necessary for removal and/or disposal purposes, as outlined in this CMMP.

- Construction/Excavation Worker Exposure Recommendations

Contaminated groundwater in Groundwater Management Area A may pose an unacceptable risk to *Construction and Excavation Workers* if encountered during future subsurface activities (Section 4.2). Groundwater Management Area A is located beneath the southern portion of the Site, extending beyond the property boundary approximately 250 feet to the southwest and west beneath and beyond the SE 9th Avenue right-of-way (ROW). Further, a limited area of the Parcel 1 Tri-Met ROW to the northeast is also designated as Groundwater Management Area A (Figure 5).

During any future subsurface work conducted within Groundwater Management Area A, steps will need to be taken to prevent worker exposure to groundwater and ensure that properly qualified and trained workers are utilized to perform work in these areas.

After the filling of the former low elevation portion of the property to bring it up to match the surrounding grade as part of the 2021 and 2022 redevelopment activities, there is no longer an area within the site where significant groundwater presence is likely to be encountered at depths shallower than 15 feet bgs. Because most foundation or utility excavations are less than 15 feet deep, it is unlikely that most subsurface work would encounter groundwater, however, it may be possible to encounter perched zones of water, especially near stormwater infiltration features. Perched groundwater encountered within Groundwater Management Areas A and B must be managed in accordance with procedures described herein.

- Unidentified/Unanticipated Contamination

The previous site investigation activities evaluated soil and groundwater

at areas where contamination would most likely be expected to occur based on an understanding of the Site history (Figures 2 and 3). However, the possibility of encountering unanticipated and previously unidentified areas of contamination beneath the property and surrounding areas cannot be ruled out. For this reason, the CMMP includes sections relating to the preliminary identification of contaminated soil (Section 6.2) and contaminated groundwater (Section 7.3) in the field so that appropriate actions can be taken if contamination is encountered in unexpected areas.

- Contaminated Soil Management (Section 6.0)

With exception of soils within areas where significant imported clean structural infill has been used to bring the property up to grade (former lower elevation area) as shown on Figure 4, all soils at the property should be assumed contaminated and managed in accordance with Section 6.0 of this document, unless testing is conducted to determine otherwise. Site workers should be made aware that if any soil exhibit signs of possible impacts, certain protective measures must be implemented, as described in Section 6.0.

In the former lower elevation portion of the property as shown on Figure 4, all soils beneath the structural infill placed in 2021 and 2022 should be assumed contaminated and managed in accordance with Section 6.0 of this document, unless testing is conducted to determine otherwise. Structural Fill emplaced in this area consist of crushed 1-inch minus rock provided by Knife River (Appendix B). Soils requiring special management in this area underlie the clean structural fill placed in 2021/2022 and are beneath the buried concrete holder pads or generally present at depths greater than 12 feet in the former Holder Pad #8 area and 18 feet in the former Holder Pad #7 area (Figure 4), though thicknesses of the clean structural fill may be less near the margins of this defined area. Deeper soils underlying the structural fill in this area must be characterized and profiled for disposal in an off-site permitted disposal facility unless characterization shows other uses are appropriate. Shallow soils (2021 and 2022-placed structural fill) can be assumed to meet DEQ Clean Fill Criteria unless it exhibits evidence of contamination as described in Section 6.2.1 of this CMMP.

For petroleum-contaminated soil (i.e., presumed non-hazardous waste), the default disposal location is a Resource Conservation and Recovery Act (RCRA) Subtitle D landfill, or other facility that is permitted to accept petroleum-contaminated soil (Section 6.5). Waste Management's Hillsboro Landfill in Hillsboro, Oregon is an example of such a facility.

- Contaminated Water Management (Section 7.0)
Groundwater from within the area of known groundwater contamination (Groundwater Management Areas A and B, Figure 5) should be assumed contaminated and managed in accordance with Section 7.0 of this document unless testing is conducted to determine otherwise.
Groundwater in other areas of the property can be assumed uncontaminated unless impacts are suspected or confirmed based on the criteria presented in Sections 7.3 and 7.4. Site workers should be made aware that any dewatered groundwater within Groundwater Management Area A will require certain protective measures be implemented, as described in Section 7.0.
- For contaminated groundwater, testing will be necessary to determine the actual disposal location. It may be possible to discharge groundwater with low-level contamination to the sanitary sewer system (POTW) with an approved agency issued permit (pre-treatment may be required). However, for groundwater with more elevated levels of contamination a discharge to the municipal sewer system may not be allowed without significant pre-treatment measures. In such cases; profiling, transporting, and disposing at a commercial off-site treatment facility may be a more cost and time effective option.

Below is a table summarizing the areas of contaminated media at the property that will require special management and will have restrictions on its end use.

TABLE 1 – SUMMARY OF MEDIA REQUIRING SPECIAL MANAGEMENT

Area	Media Affected	Depths Affected	Criteria for Determining Special Management	Disposal Location
Soil Management Area A	Soil	Surface to maximum depth of excavation	Any soil removed, unless testing determines otherwise.	RCRA Subtitle D Landfill
Soil Management Area B	Soil	Soils below clean structural fill (Appendix B), typically greater than 12 to 18 feet bgs.	Any soil removed from depths that underlie the structural fill (1-inch minus aggregate) placed in 2021 and 2022 to bring the lower elevation area up to surrounding grade, unless testing determines otherwise.	RCRA Subtitle D Landfill
Groundwater Management Area A	Groundwater	Any depth	Any water removed from excavations across any depth unless testing determines otherwise. Area A groundwater may pose an unacceptable risk to <i>Construction and Excavation Workers</i> . Proper worker exposure protection measures should be utilized.	Off-site treatment facility ¹

Area	Media Affected	Depths Affected	Criteria for Determining Special Management	Disposal Location
Groundwater Management Area B	Groundwater	Any depth	Any water removed from excavations across any depth unless testing determines otherwise.	Off-site treatment facility ¹

¹ Actual discharge location will depend on testing results and subject to authorization by the receiving entity (either Municipal or Commercial).

2.0 INTRODUCTION

This Contaminated Media Management Plan (CMMP) was prepared to address the management of areas of known and possible contaminated soil and groundwater at the NW Natural Portland Resource Center, located at 2600 SE 9th Avenue in Portland, Oregon (Figures 1 and 2). The Portland Resource Center was developed on the property of the former NW Natural Central Service Center property, which used the address of 2630 SE 9th Avenue in Portland, Oregon.

The former Central Service Center property underwent significant environmental investigation, risk assessment and remedial activities between 1991 and 2015 and redevelopment during 2020 and 2021. Environmental investigation activities have documented the presence of subsurface contaminated media beneath and adjacent to the property.

The purpose of the CMMP is to provide guidelines for appropriate management and disposal of contaminated media (soil and groundwater) that may be encountered during potential future subsurface work activities (additional redevelopment or utility repair or upgrades) at the property, or in the public Right-of-Ways (ROWs) surrounding the property to the northeast (TriMet ROW), to the west (SE 9th Avenue), to the south (SE Taggart Street ROW), and to the southeast (SE Clinton Street).

Where present, chemical levels in soil or groundwater at portions of the Site would disqualify them as “Uncontaminated” or “Clean Fill”. In addition, the levels of chemicals found in groundwater in Groundwater Management Area A of the Site poses an unacceptable risk to *Construction or Excavation Workers*. Accordingly, this CMMP also outlines the protective measures to be implemented to mitigate the potential risk of exposure to this contaminated groundwater.

3.0 BACKGROUND

3.1 Site Description

The approximate 5.2-acre NW Natural Portland Resource Center property (former NW Natural Central Service Center property) is located at 2600 SE 9th Avenue in Portland, Oregon. The NW Natural property contains Tax Lots 6900, 7000, 7100, and 7200 in the NW ¼ of the NE ¼ of Section 11, Township 1 South, Range 1 East, in Multnomah County. The Site location is shown on Figure 1 and 2.

The property is in an area of mixed commercial and light industrial use. The generally triangular-shaped property is bounded on the south by the SE Taggart Street right-of-way, on the southeast by SE Clinton Street, on the west by SE 9th Avenue, and on the northeast by the Union Pacific Railroad right-of-way (Figure 3). To the northeast the Site is occupied by an approximate 0.9-acre 60-foot-wide corridor of land, designated as “Parcel 1”, formerly owned by NW Natural but is now a right-of-way for TriMet’s Portland-Milwaukie light rail line. Properties located immediately beyond the right-of-ways identified above are all used for light industrial or commercial purposes. The nearest residential property uses are approximately 400 feet to the east of the Site.

The Site is the current location of the NW Natural Portland Resource Center, used for vehicle and company resource parking, staging, and related operations in the central downtown Portland area.

The property is the former location of the NW Natural Central Service Center (similar operations as the current Portland Resource Center) and a Portland Gas and Coke Company (PG&C) gas holder facility (referred to as Station E). The NW Natural Central Service Center was active until about 2010 after which, and until redevelopment as the Portland Resource Center, was generally used for temporary parking or short-term supply storage (i.e. steel plates, barricades, aggregate), and with a concrete crushing operation leasing a portion of the eastern and southern areas of the property between approximately 2016 and 2020.

NW Natural sold the Parcel 1 portion of the property (extreme northern end) to TriMet in 2011, with TriMet demolishing all the operational buildings within or extending onto Parcel 1 with the development of a light rail corridor (Figure 3).

Since 2022, and because of significant clean structural fill import and placement, the entirety of the Site is now at a relatively uniform grade, equivalent to the surrounding street level. However, historically only the northern approximate 65% of the Site (Former Upper Elevation Area) was at street level and was the location of three buildings (since demolished) associated with former Site operations as the Central Service Center.

From the margins of the Former Upper Elevation Area, and prior to the recent redevelopment, the Site sloped steeply downward 14 to 22 feet to a Former Lower Elevation Area on the southern approximate 35% of the Site (including the unpaved hillsides). Two large exposed circular concrete pads were exposed at the base of the former Lower Elevation Area, which were the bases for two former aboveground manufactured gas holder tanks (Figure 3). The westernmost of the two holder pads (approximately 180 feet in diameter) is referred to as Holder Pad No. 8, which is situated approximately 8 feet higher in elevation than Holder Pad No. 7 (approximately 150 feet in diameter). A third concrete holder pad (for Holder Pad No. 5) is located on the northern Former Upper Elevation Area but is presently overlain by asphalt and approximately 1.5 feet of fill (Figure 3).

The two concrete holder pads of the Former Lower Elevation Area remain in-place, but this portion of the Site was filled and brought to its existing grade in 2021 and 2022 through the import and placement of clean structural fill (1-inch minus aggregate) supplied by the Knife River Corporation. Specifications for the imported structural fill, emplaced under the direction of Bremik Construction, are included in Appendix B. After placement of the clean structural fill in 2021 and 2022, the holder pads in the Former Lower Elevation Area are now present at depths greater than 12 feet in the former Holder Pad #8 area and 18 feet in the former Holder Pad #7 area (Figure 4). The ground surface at this portion of the Site is now at the same grade as the surrounding areas and is fully paved and developed for vehicle parking, as well as for stormwater infiltration.

3.2 Site History

The Site was originally developed by NW Natural's predecessor, Portland Gas & Coke Company (PG&C) for above-ground manufactured gas storage. Manufactured gas was a predecessor of natural gas and was distributed for uses such as heating, lighting, and cooking. In 1914, PG&C began the construction on the first of three aboveground manufactured gas storage tanks (Holder Tank No. 5), with Holder Tanks No. 7 and 8 completed in the 1920s. The locations of the three gas holders, since removed, are depicted on Figures 2 and 3.

Holder Tank No. 5 was in the northeast portion of the Site. The remnant concrete pad for Holder Tank No. 5 (Upper Elevation Area of the Site) is presently overlain by 1 to 2 feet of fill and covered with asphaltic pavement. Holder Tank No. 7 was in the southeast portion of the Site (at the lowest elevation), now under approximately 18 feet of clean structural fill. Holder Tank No. 8 was in the southwestern portion of the Site, now under approximately 12 feet of clean structural fill.

In 1956, MGP operations (approximately 8 miles away in northwest Portland) at the plant feeding the gas holders were discontinued. The gas holders were subsequently dismantled and removed from the Site in 1974 (No. 5) and early 1980s (Holder Tank Nos. 7 and 8).

Following the dismantling of Holder Tank No. 5 and placement of fill over this area, the Site was converted to NW Natural's Central Service Center to support maintenance and operational activities related to natural gas operations. In the 1980s, the northern portion of the Site was developed with additional operational infrastructure related to fueling, vehicle maintenance, administrative offices, and supply storage. NW Natural's operational activities at the Site were discontinued and shifted to other locations in 2010 until redevelopment as the Portland Resource Center in 2021 and 2022.

3.3 Subsurface Conditions

Soil Types

Numerous borings placed within the Site boundary and in off-site areas to the west have confirmed near surface lithology consist primarily of silts, sandy silts, and silty sand zones to depths generally ranging between 4 and 24 feet bgs. Underlying these finer grained zones are silty sandy gravels and cobbles. The underlying predominately gravel and cobble lithology is well-graded, moderately dense, with a silt or sandy-silt matrix and well-rounded cobbles. Given the filling history of the Site, the fluvial nature of the native subsurface soil, and the lateral juxtaposition of geologic units at the Site, the soil types beneath the property are variable and complexly interlayered, making correlation of geologic and stratigraphic units across the area difficult.

Clean structural fill imported and placed in the Former Lower Elevation portion of the Site in 2021 and 2022 has resulted in between 12 to 18 feet of crushed quarry rock (1-inch minus) within this portion of the property. All this material was placed over the former ground surface (Holder Pad Nos. 7 and 8). All well and boring information from within the Former Lower Elevation portion of the Site are relative to depths below the former (pre-structural fill placement) ground surface.

Groundwater

Static groundwater levels have been measured in numerous on-site and off-site monitoring wells and range from approximately 3 feet below the former (pre-2021/2022 fill placement) ground surface beneath Holder Pad No.7 (from push probe data), to 10 feet beneath the former (pre-2021/2022 fill placement) underlying Holder Pad No. 8, and up to 44 feet bgs at off-site locations that are positioned topographically higher. Groundwater flow direction, as measured in the Site monitoring well network, generally varies between the southwest and west.

Because of the structural fill placed over top of former Holder Pad Nos. 7 and 8, depth to groundwater at former Lower Elevation portion of the Site is now (post-structural fill placement) anticipated to be greater than 20 feet bgs, although the presence of perched water within the structural fill should be expected, especially in areas proximate to stormwater infiltration features.

3.4 Prior Environmental Investigations and Risk Assessment

Remedial Investigation (RI) work activities conducted at the Site involved near-surface and subsurface investigations, land and water Beneficial Use Determination (BUD), human health and ecological risk assessment, preparation of a RI report. An RI Report¹ was submitted to DEQ in 2015, and based on comments and communications from DEQ, additional work activities were implemented, and a Revised RI Report² was prepared to document the additional work activities.

Investigatory activities were conducted during numerous phases for the collection of soil, soil gas, stormwater, and groundwater samples. In total 42 soil borings, 22 groundwater monitoring wells, and 5 soil gas probes were installed between 2008 and 2014, and multiple seasonal samples of groundwater and stormwater runoff have been collected. Samples of environmental media were collected and analyzed for Chemicals of Interest (COI), which based on the history of operations, as well as the chemicals that were previously detected in environmental media at the Site, include the following:

1. Total petroleum hydrocarbons (TPH) in the gasoline-, diesel-, and oil ranges

¹ Hahn and Associates, Inc. (HAI 2015). *Remedial Investigation and Risk-Based Closure Report, Former NW Natural Central Service Center Property, 2630 SE 9th Avenue, Portland, Oregon* (HAI Project No. 7123). April 27, 2015.

² Hahn and Associates, Inc. (HAI 2017). *Revised Remedial Investigation and Risk-Based Closure Report, Former NW Natural Central Service Center Property, 2630 SE 9th Avenue, Portland, Oregon* (HAI Project No. 7123). August 16, 2017.

2. Volatile organic compounds (VOCs)
3. Polynuclear aromatic hydrocarbons (PAHs)
4. Metals potentially associated with manufactured gas or otherwise previously identified at the Site (including arsenic, cadmium, chromium, copper, nickel, lead, vanadium, and zinc)
5. Cyanide

The human health risk assessment, as reported in the 2017 *Revised RI and Risk-Based Closure Report* (HAI 2017) identified only one scenario in which there was a potential unacceptable contamination risk related to soil under current conditions (i.e. exposure to arsenic in soil). Since this potential risk was solely due to the former soil pile in the southwest corner of the property, NW Natural, with approval from DEQ, chose to cap the area of elevated arsenic, as described in Section 3.5.

Accordingly, exposure to unacceptable levels of arsenic in soil has been addressed, and this is no longer a pathway of concern if the cap is maintained.

The other scenario in which potential unacceptable risk was identified, Excavation Workers exposure to naphthalene from groundwater, is not a current concern, but a hypothetical future concern if excavation were to intercept the water table at defined areas within the property and extending off-site to the SE 8th Avenue ROW. This pathway poses a potential risk that can be addressed through measures taken to protect workers during excavation in this area of concern, described herein as Groundwater Management Area A.

3.5 Capping of Arsenic-Contaminated Soil (2017)

To address the presence of elevated arsenic levels at the former soil pile area in the southwest corner of the site, with DEQ approval, NW Natural opted to move forward with remedial actions that involved removing the former stockpile and capping the affected area with a layer of clean imported gravel. The cap area was designed to cover any remaining soil areas that contained arsenic with concentrations greater than the default background level of 8.8 mg/kg.

An approximate 900-square-foot area was capped on June 16, 2017 with a minimum of 8 inches of imported 1-inch minus crushed gravel, which was underlain by a permeable geotextile fabric liner. The final cap area is shown on Figure 2.

3.6 Regulatory No Further Action Designation (October 2018)

On October 18, 2018, Oregon DEQ issued a Conditional No Further Action Determination for the NW Natural Central Service Center. DEQ determined that the remedial action to address environmental contamination at the NW Natural Central Service Center was complete, and that based on the available information at that time the site conditions were protective of public health and the environment. One condition of the NFA was preparation and maintenance of a Contaminated Media Management Plan (CMMP) to ensure that excavation or dewatering activities associated with future maintenance or development activities would properly address residual levels of contamination associated with the property.

3.7 UST Decommissioning

Prior to Site redevelopment in 2021 and 2022, four underground storage tanks (USTs) were known to be formerly present at the Site, consisting of:

- 1,000-gallon capacity waste oil UST
- 3,000-gallon capacity diesel UST
- 10,000-gallon capacity diesel UST
- 10,000-gallon capacity gasoline (later used for diesel) UST

All four of the known USTs had previously been decommissioned and removed from the Site. The locations of all (former) USTs on the property are shown on Figure 3. Two Leaking Underground Storage Tank (LUST) reports were generated with the Oregon Department of Environmental Quality (DEQ) in 1992 for the two diesel fuel tanks (File Nos. 26-92-0217 and 26-92-0344) and one LUST report was initiated in 1995 (File No. 26-95-0218) for the waste oil tank. No gasoline releases were reported. Leaks at each of the fuel tanks were discovered through completion of tightness testing, with leakage from one tank being related to piping and from the other tank being related to apparent loss of tank integrity. In both cases, contamination was limited to soil and cleanup consisted of decommissioning and soil removal. DEQ records show cleanup activities for both diesel tanks satisfied the criteria for a Soil Matrix Cleanup as set forth in Oregon Administrative Rules (OAR) 340-122-0320 through 340-122-0360, with the files closed on both releases by April 16, 1996. The leak as reported for the waste oil tank was discovered at the time of tank decommissioning in 1995 with the media affected being limited to soil. As with the cleanup activities related to the diesel fuel USTs, the cleanup at the waste oil tank consisted of decommissioning and soil removal. DEQ

records show that the soil removal satisfied the criteria for a Soil Matrix Cleanup, with the file for this release closed on August 12, 1996.

In addition to the preceding, a 1955 Site Plan described a fifth fuel tank proximate to the two 10,000-gallon USTs described above. This fifth UST was encountered during the 2021 re-development activities at the property. Visibly impacted soils were present surrounding the UST upon its discovery, with diesel and lead contamination confirmed through laboratory testing. A release from this UST was reported to DEQ, which was then assigned File No. 26–201–0510 by the agency. An estimated 100 tons of sand was removed from the UST and 652 tons of petroleum contaminated soil was subsequently removed from the excavation as part of the UST decommissioning and cleanup. As documented in an August 13, 2021 report prepared by Hydro Con, LLC, confirmation samples were subsequently collected to verify the petroleum contaminated soil had been adequately excavated/remediated. None of the post-removal confirmation samples detected petroleum concentrations above relevant risk-based concentrations and the excavation was backfilled. The highest remaining (in-place) petroleum concentration in soils at this area were detected beneath the eastern end of the UST (sample WXSWE-9.0, Figure 3), with 2,110 milligrams per kilogram of diesel-range petroleum remaining at depth. Soils with petroleum hydrocarbon (primarily diesel-range) and lead concentrations greater than DEQ clean fill criteria can be assumed present at this portion of the site. NW Natural is in the process of receiving a no further action designation for this release. The 2021 HydroCon report³ documenting decommissioning and clean-up activities related to this UST is included in Appendix A.

Like all other soils in Soil Management Area A, soils surrounding the former USTs may have low level petroleum impacts attributable to historical manufactured gas holder activities in addition to low-level petroleum UST-related impacts. Soils in the former UST areas (all within Soil Management Area A) should also be considered potentially contaminated and managed as in accordance with this CMMP.

³ ³ HydroCon, LLC (HydroCon 2021. *UST Removal and Risk-Based Closure Report, NW Natural Central Portland Service Center, 2600 SE 9th Avenue, Portland, Oregon* (Oregon LUST ID: 26-21-0519). August 13, 2021.

3.8 Residual Contamination

Petroleum-Related Contamination

Soil and groundwater contaminated with petroleum and petroleum-related chemicals of interest have been documented beneath the property, with the contaminated groundwater extending approximately 300 feet beyond the SE 9th Avenue ROW immediately west of the property (refer to Section 4).

If left in-place undisturbed, no actions are necessary with respect to this contaminated soil and groundwater under the current land use (non-residential property). However, if impacted soil or groundwater are encountered during future subsurface work activities, special management of the contaminated media will be necessary for removal and/or disposal purposes. This CMMP has been prepared to provide guidelines for appropriate management and disposal of contaminated soil and/or groundwater that may be encountered during potential future subsurface work at the property.

Arsenic-Contaminated Soil

Arsenic-contaminated soil remains in the southwest corner of the site that was capped with gravel and a geotextile liner. This cap area, as shown on Figure 4, must be maintained and cannot be disturbed or removed without prior DEQ approval.

4.0 AREAS OF CONTAMINATION

4.1 Chemicals of Interest

The chemicals of interest (COIs), i.e. those that have been detected in Site soil or groundwater and have the potential to be present at concentrations that would disqualify excavated soil as *Clean Fill*, or would require special management in dewatered groundwater, consist of the following:

- Total Petroleum Hydrocarbons (TPH)
 - Gasoline-range TPH
 - Diesel-range TPH
 - Oil-range TPH
- Volatile Organic Compounds (VOCs)
 - Benzene, toluene, ethylbenzene, xylenes (BTEX)
 - Naphthalene
 - Trimethylbenzenes (TMBs)
 - Propylbenzenes (PBs)
 - Butylbenzenes (BBs)
 - 4-Isopropyltoluene (4-IPT)
 - Acetone
 - Styrene
 - Methyl ethyl ketone (MEK)
 - Chlorinated solvent VOCs, including the chloroethenes tetrachloroethene (PCE), trichloroethene (TCE), and cis/trans-1,1-Dichloroethene (DCE) 1,1-Dichloroethane (1,1-DCA) 1,1,1-Trichloroethane (TCA), Vinyl Chloride
- Semi-Volatile Organic Compounds (SVOCs)
 - Acenaphthene
 - Acenaphthylene
 - Anthracene
 - Benzo(a)anthracene
 - Benzo(a)pyrene
 - Benzo(b)fluoranthene
 - Benzo(k)fluoranthene
 - Benzo[g,h,i]perylene
 - Carbazole
 - Chrysene
 - Dibenzo(a,h)anthracene
 - Dibenzofuran

- Fluoranthene
- Fluorene
- Indeno(1,2,3-cd)pyrene
- 1-Methyl naphthalene
- 2-Methyl naphthalene
- Naphthalene
- Phenanthrene
- Pyrene
- Metals and Inorganics
 - Arsenic
 - Cadmium
 - Copper
 - Lead
 - Zinc
 - Cyanide

4.2 Areas of Known Contamination

Definition of Areas of Contamination

Areas of soil contamination beneath the property are defined as areas where the soil contains any chemicals of interest at concentrations greater than *Clean Fill screening level values (SLVs)* (Section 5.0).

Areas of groundwater contamination are defined as areas where groundwater contains chemicals of interest at concentrations greater than Oregon Water Quality Criteria, which for some chemicals is any detectable amount. A concentration of 1.0 micrograms per liter (µg/L) for any given VOC, or 100 µg/L for total petroleum hydrocarbons (TPH), is used as a reasonable cutoff for defining contamination in groundwater that could require special management and disposal, and which are the typical laboratory method reporting limits (MRLs) for these chemicals.

The areas of soil and groundwater contamination, based on these standards, have been delineated during the previous investigation activities and are shown as Soil and Groundwater Management Areas in Figures 4 and 5, respectively. It is noted that these Soil and Groundwater Management Areas have been simplified for maximum protectiveness and simplicity of execution as related to this CMMP. See the *Revised Remedial Investigation and Risk-Based Closure Report* (HAI 2017) for a complete description and depiction of the full nature and extent of remaining contamination.

Soil Management Areas A and B (Entire Property)

Soil Management Areas A and B, which encompass the entire approximately 5.2-acre property are shown on Figure 4.

Soil Management Area A requires management of all soil and all depths at the Former Upper Elevation Area portion of the property as potentially contaminated, as shown on Figure 4.

Soil Management Area B requires management of all soil underlying the structural fill that was imported and placed in the Former Lower Elevation Area portion of the property in 2021 and 2022 as potentially contaminated, as shown on Figure 4.

Although contaminant concentrations in soil do not pose an unacceptable risk to human health given the non-residential use of the property, for soil management purposes it must be assumed that petroleum-related contaminants (including petroleum hydrocarbons, VOCs, PAHs, metals, or cyanide) are present at varying depths throughout Soil Management Area A and below the imported structural fill in Soil Management Area B (Figure 4) at concentrations that exceed Clean Fill SLVs. As such, reuse of the soil, even on-site, may not be permitted.

Protective Soil Cap Area – Do Not Disturb

A small area of arsenic contaminated soil is present near the southwestern corner of the property at concentrations that, if exposed, may pose an unacceptable inhalation and dermal contact health risk to on-site occupational workers.

This approximate 900-square-foot area was capped on June 16, 2017 with a minimum of 8 inches of imported 1-inch minus crushed gravel, which was underlain by a permeable geotextile fabric liner. This cap area, as shown on Figure 2, must not be disturbed or removed.

Groundwater Management Area

Testing of groundwater at 32 locations, including 22 monitoring well locations, has been used to characterize the contaminant plume beneath the property and adjacent areas. An aromatic VOC plume in groundwater originates at the property, extending off-site approximately 300 to 350 feet to the west and southwest. The area of known groundwater contamination, which encompasses approximately 4.8 acres, is shown as Areas A and B on Figure 5.

Groundwater Management Area A and B include all areas where one or more COI may be expected to be detected in groundwater (any depth) at a concentration greater than Oregon Water Quality Criteria. In addition, Groundwater Management Area A includes more highly impacted areas where contaminants, if encountered, may also be anticipated to pose an unacceptable risk to *Construction and Excavation Workers*.

Groundwater Management Area A consists of two areas. An area beneath the southern portion of the Site, extending beyond the property boundary approximately 250 feet to the southwest and west beneath and beyond the SE 9th Avenue ROW, and a limited area of the Parcel 1 Tri-Met ROW to the northeast. Both areas are depicted in Figure 5.

During any future subsurface work conducted within Groundwater Management Area A, steps will need to be taken to prevent worker exposure to groundwater and ensure that properly qualified and trained workers are utilized to perform work in these areas.

After the filling of the former low elevation portion of the property to bring it up to match the surrounding grade as part of the 2021 and 2022 redevelopment activities, there is no longer an area within the site where significant groundwater presence is likely to be encountered at depths shallower than 15 feet bgs. Because most foundation or utility excavations are less than 15 feet deep, it is unlikely that most subsurface work would encounter groundwater, however, it may be possible to encounter perched zones of water, especially near stormwater infiltration features. Perched groundwater encountered within Groundwater Management Areas A and B must be managed in accordance with procedures described herein for those areas unless testing determines the water is uncontaminated.

Tables 2 and 3 summarize the maximum detected concentration of COI within remaining in-place soil (Table 2) and groundwater (Table 3) as detected in one or more samples from beneath the property. These data are provided for general contaminant characterization purposes.

TABLE 2 – MAXIMUM DETECTED CONCENTRATION OF CONTAMINANTS IN SOIL MANAGEMENT AREA

Description	Chemical Group	Maximum Concentration of Primary COIs* (mg/kg)	Soil Management Area
Soil with COI greater than Clean Fill SLVs	TPH	Gasoline: 1,300 Diesel: 2,000 Oil: 2,070	Entire Property, Any Depth
	Metals / Inorganics	Arsenic: 19.2 Cadmium: 1.07 Copper: 58.4 Lead: 652 Zinc: 334 Cyanide: 866	
	PAHs	Benzo(a)anthracene: 6.06 Benzo(a)pyrene: 2.89 Benzo(b)fluoranthene: 3.73 Benzo(k)fluoranthene: 3.73 Dibenzo(a,h)anthracene: 0.266 Dibenzofuran: 0.38 1-methyl naphthalene: 0.958 Naphthalene: 14	
	VOCs	Benzene: 0.039 Ethylbenzene: 0.91 Xylenes: 3.3 Naphthalene: 15 1,2,4-Trimethylbenzene: 73	

* = Those detected in one or more samples at the Site above Clean Fill SLVs

TABLE 3 – MAXIMUM DETECTED CONCENTRATION OF CONTAMINANTS IN GROUNDWATER MANAGEMENT AREAS A AND B

Description	Chemical Group	Maximum Concentration of Primary COIs* (µg/L)	Groundwater Management Areas
Groundwater with COI greater than Oregon Water Quality Criteria	TPH	Diesel: 13,000 Oil: 3,800	Groundwater Management Areas A and B
	Metals / Inorganics	Arsenic: 49.4 Lead: 324 Cyanide 41	
	PAHs	Benzo(a)anthracene: 3.21 Benzo(a)pyrene: 3.8 Benzo(b)fluoranthene: 4.6 Benzo(k)fluoranthene: 2.78 Chrysene: 12 Dibenzo(a,h)anthracene: 0.32 1-Methyl naphthalene: 816 2-Methyl naphthalene: 647 Naphthalene: 10,000	
	VOCs	Benzene: 4,370 Ethylbenzene: 1,010 Total xylenes: 257 Naphthalene: 8,240 1,2,4-Trimethylbenzene: 360 1,1-Dichloroethane: 6.7 Tetrachloroethene: 11.7 Trichloroethylene: 8.13	

* = Those detected in one or more samples at the Site above the DEQ RBC for *Residential Tap Water Ingestion*

4.3 Construction/Excavation Worker Considerations

The identified area encompassed by Groundwater Management Area A represents an area of potential concern with respect to chemical exposure to *Construction Workers* or *Excavation Workers*.

If future redevelopment and/or utility or right-of-way renovation work conducted within Groundwater Management Area A has the potential for *Construction Workers* or *Excavation Workers* to come in contact with contaminated groundwater, then measures need to be taken to ensure workers are informed of this, and that protective measures are implemented to mitigate the potential risk of exposure to contaminated media. Additionally, work within these areas

should be supervised and conducted by workers with Hazardous Waste Operations and Emergency Response (HAZWOPER) training, and a Health and Safety Plan (HASP) should be prepared to specifically address hazardous substances (see Section 9.0).

4.4 Areas Where Unidentified Contamination Could Be Encountered

The prior subsurface investigations evaluated soil and groundwater at various areas of the property where *known and suspected* features of environmental concern were identified (e.g. the former USTs and other gas holder features). However, the possibility of encountering unanticipated and previously unidentified areas of contamination beneath the property and surrounding ROW areas exists. For this reason, the CMMP includes sections relating to the preliminary identification of contaminated soil (Section 6.2) and contaminated groundwater (Section 7.3) in the field so that appropriate actions can be taken if contamination is unexpectedly encountered at the property.

4.5 Areas/Zones That Can Be Assumed Uncontaminated

Groundwater removed from areas outside Groundwater Management Area A and B can be assumed uncontaminated, and would not have any management restrictions, as long as it does not display field evidence of contamination in the field (see Section 7.3). If groundwater from the above areas/zones displays field evidence of contamination, then special management would be required as outlined in Section 7.0.

5.0 CLEAN FILL SCREENING LEVELS FOR SOIL

The criteria used to determine whether soil removed from the Site in the future may require special management and/or have restrictions on its end use/disposal location are the 2019 DEQ *Clean Fill* Screening Levels⁴, as updated to reflect the most recent DEQ RBCs, where applicable. Table 4 below lists Clean Fill SLVs for chemicals detected at one or more location representative of in-place soil at the subject property.

TABLE 4 – CLEAN FILL SCREENING LEVELS FOR SOIL

Chemical Group	Chemical	Clean Fill Screening Level (mg/kg)
Total Petroleum Hydrocarbons (TPH)	TPH as Gasoline-range	31. ^a
	TPH as Diesel-range	100. ^b
	TPH as Oil-range	100. ^b
Volatile Organic Compounds (VOCs)	Benzene	0.023 ^a
	Ethylbenzene	0.22 ^a
	Xylenes	23. ^a
	Naphthalene	0.077 ^a
	1,2,4-TMB	10. ^a
Polynuclear Aromatic Hydrocarbons (PAHs)	Benzo(a)anthracene	1.1 ^a
	Benzo(a)pyrene	0.11 ^a
	Benzo(b)fluoranthene	1.1 ^a
	Benzo(k)fluoranthene	11. ^a
	Dibenzo(a,h)anthracene	0.11 ^a
	Dibenzofuran	0.002 ^c
	1-methylnaphthalene	0.36 ^c
	Naphthalene	0.077 ^a
Metals / Inorganics	Arsenic	8.8 ^{c,d}
	Cadmium	0.63 ^{c,d}
	Copper	34. ^{c,d}
	Lead	28. ^{c,d}
	Zinc	180. ^{c,d}
	Cyanide	47. ^a

^a Updated to reflect revised DEQ RBCs, May 2018

^b DEQ Level 1 Soil Matrix Cleanup Standard

^c DEQ *Clean Fill* Screening Level, February 2019

^d DEQ Default Background Concentrations for Metals in Soil
(Portland Basin Region), March 2013

⁴ Oregon Department of Environmental Quality (2014). *Internal Management Directive: Clean Fill Determinations*. February 21, 2019.

Note that DEQ *Clean Fill* Screening Levels are not established for TPH (gasoline, diesel, or oil). Instead, DEQ expects that soil will be characterized for the expected constituents of TPH to determine *Clean Fill* status. For gasoline, testing should be conducted for Risk-Based Decision Making (RBDM) VOCs and lead; for diesel, testing should be conducted for BTEX and PAHs; for oil, testing should be conducted for PAHs, PCBs, VOCs, and metals. Alternate *Clean Fill screening levels* have been listed in Table 4 for the TPH ranges, based on DEQ Level I Soil Matrix Cleanup Levels, which can be used in addition to the constituent testing results.

6.0 CONTAMINATED SOIL MANAGEMENT

This section of the CMMP describes how soil excavated as part of any potential future subsurface development, maintenance, or repair project should be managed. Below ground activities could include site grading, building construction and footings pile or boring installations, utility installation or repair, or any other subsurface excavation.

6.1 Areas/Zones of Soil Management

6.1.1 Areas of Soil Contamination

All soil within Soil Management Area A (as shown on Figure 4 and described in Section 4.2), should be assumed contaminated and managed in accordance with Section 6.0 of this document, unless testing is conducted to determine otherwise.

All soil encountered below emplaced structural fill within Soil Management Area B (as shown on Figure 4 and described in Section 4.2), should be assumed contaminated and managed in accordance with Section 6.0 of this document, unless testing is conducted to determine otherwise. The structural fill placed in 2021 and 2022 (1-inch minus crushed quarry rock) within Soil Management Area B was imported as Clean Fill and therefore will not require special management unless it exhibits evidence of contamination as described in Section 6.2 of this document. The structural Fill within Soil Management B is expected to be between 12 and 18 feet thick, though could be somewhat thinner toward the margins of that area.

It would be prudent to consult an Environmental Professional (EP) prior to, or at appropriate times during, subsurface work at the Site.

6.1.2 Off-Site Areas

It is also possible to encounter unexpected and previously unidentified areas of soil contamination in areas immediately beyond the limits of the Soil Management Area, in the peripheral areas surrounding the Site. In these areas soil contamination is not assumed, but workers should be made aware of this potential and be familiar with this CMMP so that if encountered any contaminated soil can be identified and managed.

6.2 Identification of Contaminated Soil

6.2.1 Field Characteristics of Soil Contamination

Site workers should be on the lookout for the following soil characteristics that may indicate the presence of contamination:

- Visual staining (typically gray, bluish, or greenish in color, or darkly stained relative to surrounding soil) or petroleum like sheen
- Unusual or chemical odors (petroleum-like or solvent-like)
- Soil produced a visible oily like sheen when placed water
- Unusual conditions or fill (e.g. soil containing foreign debris, in particular drums, transformers, or other chemical containers).

Soil staining can sometimes be difficult to discern and many times some of the other indicators are present as well. Based on DEQ *Clean Fill* guidance (DEQ 2014), if the material appears chemically stained or has a chemical odor, then the material is not considered *Clean Fill*. If in question, it is advisable to contact an EP or NW Natural Environmental Management staff so that a determination can be made.

In addition, not all stained soil is necessarily contaminated. Hydric soil is often confused with contaminated soil due to their gray coloration and organic odor.

6.2.2 If Soil Contamination is Suspected

If soil exhibits signs of possible contamination within areas which were unexpected and unplanned for it may be preferable to characterize the soil to determine if it is contaminated versus assuming it is contaminated. In those cases the following should occur:

- 1) Halt work, or if timelines do not allow work to halt, remove and stockpile the suspect soil;

- 2) Notify the designated EP;
- 3) The EP will sample and test the in-place or stockpiled soil so that a soil characterization and a disposal or reuse determination can be completed.

6.2.3 If Soil Contamination is Confirmed

If testing of the soil confirms the presence of soil contamination, the following measures should occur:

- 1) Determine disposal facility or suitable reuse location based on testing results (Section 6.5).
- 2) Conduct removal of soil to the extent necessary to prepare the Site for construction, and/or meet appropriate DEQ Risk-Based Concentrations (RBCs) or other cleanup goals (this would typically be conducted at the direction of the EP).
- 3) Following soil removal, collection of confirmation samples may be warranted to document chemical quality in remaining soil (Section 6.3.3). The EP may be conferred with as to the need for conducting confirmation sampling.
- 4) Photographs and measurements of the affected area, as well as landfill receipts, should be collected to document the soil removal activities.
- 5) If reuse of contaminated soil (i.e., concentrations greater than Clean Fill SLVs) is contemplated, then it is recommended the EP be consulted to determine the feasibility of this approach, and the steps necessary to implement it. A Solid Waste Letter of Authorization from DEQ will likely be necessary in these circumstances. The reuse location should be documented.

6.3 Soil Characterization (Sampling and Analysis)

Characterization of soil may be necessary for two primary purposes:

- 1) To profile known contaminated soil for disposal permitting. Although existing data may be adequate to profile Site soil, disposal facilities may not accept data that is more than one to two years old. Therefore, discussion with the disposal facility should occur prior to earthwork activities to determine whether existing data or new testing data will be necessary to permit soil for disposal. If existing data were adequate, pre-permitting of soil for disposal would be recommended.

- 2) To characterize soil that are outside the known areas and depths of contamination (e.g., within the adjacent ROW), but which exhibit signs of possible contamination. This testing is conducted to determine whether contamination is present, and if present, to profile the soil for proper disposal.

Characterization of soil may take place by sampling stockpiled soil or by sampling in-place soil, as discussed in Sections 6.3.1 and 6.3.2, respectively (this work is typically conducted by the EP).

6.3.1 Soil Characterized from Stockpiles

If soil is to be characterized from excavated soil piles, then the samples should be collected as discrete grab samples from at least 12 inches beneath the surface of the pile at frequencies shown on the following table:

TABLE 5 – NUMBER OF SOIL SAMPLES REQUIRED FROM STOCKPILES

Cubic Yards of Soil	Number of Soil Samples
Less than 100	3
101 – 500	5
501 – 1,000	7
1,001 – 2,000	10
Greater than 2,000	10 plus 1 for each additional 500 cubic yards

6.3.2 Soil Characterized In-Place

During construction activities, collection of soil samples directly from the excavation may be used to characterize zones of suspected soil contamination. Soil samples are collected from the zones exhibiting the possible contamination. Confirmation samples should be collected as discrete grab samples directly from the excavation pit using the excavator bucket, unless the excavation is less than 4 feet deep, in which case samples may be collected directly by hand. Additional soil samples may be collected to verify the extent of impact. Soil samples should be collected in accordance with the HAI Standard Operating Procedure (SOP) No. 260 (Appendix C).

If the volume of affected soil to be removed is known, then the number of sample locations can be determined using Table 5 in Section 6.3.1. Otherwise, the number and location of samples to be collected should be based on best judgment.

For linear zones of excavation displaying possible contamination, such as utility trenches, soil samples should be collected every 10 to 20 feet along the trench, or at whatever interval is appropriate to characterize the impacted zones. For small isolated zones of impact (i.e. less than 10 cubic yards), a single sample per zone may be appropriate.

To characterize the extent of contamination, excavation of test pits may be a method to quickly delineate the extent (vertically and laterally) of an unexpected zone of soil contamination. Installation of soil borings is another approach for characterizing extent if greater depths are needed or if limiting surface disturbances is an objective.

6.3.3 Confirmation Sampling Following Removal Activities

Following the removal of any soil contamination from the Site, confirmation sampling may be recommended to document remaining concentrations and/or to verify that they meet cleanup goals. Confirmation samples should be collected as discrete grab samples directly from the excavation pit using the excavator bucket, unless the excavation is less than 4 feet deep, in which case samples may be collected directly by hand.

Soil samples shall be collected at a rate of approximately one sample per 200 square feet of pit area. However, at least one soil sample should be collected from each wall of the pit and one from the floor of the pit (5 samples minimum).

All confirmation samples from excavation pits should be collected in accordance with the HAI Standard Operating Procedure (SOP) No. 260 (Appendix C).

6.3.4 Analytical Testing Parameters

6.3.4.1 Testing Parameters for Disposal Permitting

Soil samples to characterize or profile excavated soil for disposal will likely require testing by one or more of the following analytical methods (check with the disposal facility to verify appropriate testing parameters):

- Gasoline-range petroleum hydrocarbons by NW Method TPH-Gx
- Diesel- and oil-range petroleum hydrocarbons by NW Method TPH-Dx
- Volatile Organic Compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B
- Resource Conservation and Recovery (RCRA) 8 Metals by EPA Method 6020 (total or leachable basis).

- Polychlorinated Biphenyls (PCBs) by EPA Method 8082

In addition, if the soil samples are originating from below the holder pad areas or from around any of the historical infrastructure leading to/from those holder pads (i.e. gas inlet pits or low-pressure piping system) it may be necessary to further analyze the soil samples for a select list of semi-volatile organics (SVOCs) to ensure the data will be acceptable with the disposal facility.

6.3.4.2 *Testing Parameters for Clean Fill Determination*

Soil samples to determine whether soil meet *Clean Fill* criteria will likely require testing by one or more of the following analytical methods:

- Gasoline-range petroleum hydrocarbons by NW Method TPH-Gx
- Diesel- and oil-range petroleum hydrocarbons by NW Method TPH-Dx
- VOCs by EPA Method 8260B
- RCRA 8 Metals by EPA Method 6020 (total basis).
- Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8270 SIM
- Total Cyanide by EPA Method 335.4

6.4 **Management of Contaminated Soil/Site Controls**

Once the presence of contaminated soil is confirmed or suspected, the measures presented in this section should be implemented for the management and disposal of such soil, unless they are shown to be of acceptable quality by appropriate testing (Section 6.3).

Based on prior testing Resource Conservation and Recovery Act (RCRA) Hazardous Waste is not anticipated. But, if the analytical testing results indicate any of the waste soil may be RCRA Hazardous Waste, then there are many additional requirements and timelines than need to be strictly followed that are beyond those presented in this CMMP. If this is the case, it is advisable to retain an EP to present a best path forward and make sure RCRA requirements are met.

6.4.1 **Erosion Control**

In the event that future development activities occur at the site, it is possible that a National Pollutant Discharge Elimination System (NPDES) 1200-C Construction Stormwater General Permit would be required by DEQ. This is a required permit for all construction sites disturbing more than 1-acre of surface area. If construction activities are large enough to make this a requirement, then a project specific Erosion and Sediment Control Plan

(ESCP) should be prepared and all Best Management Practices (BMPs) outlined within that Plan should be implemented and strictly followed. BMPs include, but are not limited to, items such as; silt/sediment fencing, straw wattles and/or bio-bags, rocked construction entrances, wheel washes, catch basin protection.

6.4.2 Excavation, Loading, and Transport Measures

During any future excavation, loading, and transport of contaminated soil from the Site, the following measures are to be employed:

- 1) Trucks should be loaded in a manner that prevents spilling, tracking, or dispersal of soil.
- 2) On-site truck routes should be established to minimize on-site travel. Asphalt- and concrete-paved or well-graveled areas should be used to the maximum extent possible.
- 3) No track-off of excavated soil will be allowed. At the designated exit point, all vehicles must be inspected for adhered soil. If present, adhered soil must be removed. Additional detail is provided in Section 6.4.3 *Vehicle Track-Off* below.
- 4) Loads within all trucks are to be appropriately covered and secured before leaving the Site.
- 5) Soil with free water shall not be loaded into trucks. Soil must be unsaturated or must pass the paint-filter moisture test (Method 9095B) conducted by the receiving facility. Trucks may not leave the project area if liquids are draining from the load.

6.4.3 Vehicle Track-Off

Track-off of contaminated soil on vehicles and equipment is to be controlled by using limited entrances and exits for vehicles, specified on-site truck routes, the use of gravel pads and roadways whenever possible, and physical removal of soil from vehicles.

Before leaving the property, all vehicles will be inspected by their drivers and/or designated inspector for adhered soil. If present, adhered soil should be removed using hand tools and cleaned of loose soil with a broom. If this method of soil removal is found to be inefficient or ineffective, then a wheel wash area is to be established where vehicles and equipment can be cleaned by water and/or power washer. Collection and proper disposal of wheel wash water may be required.

Washing or cleaning of vehicles or equipment used only within the construction zone is not required.

The Contractor should inspect the off-site truck route for track-off during the soil removal activities. If any track-off is observed, soil removal activities should be halted immediately, and measures taken to clean up the track-off and prevent future track-off.

6.4.4 Dust Control

To prevent the off-site transport of contaminated soil in the form of dust, dust control measures are to be implemented if visible dust is observed. Wetting of soil with water or other approved dust control formulations may be used to prevent the generation of visible dust. Graveled roadways and limiting vehicle speeds are other dust control measures that should be implemented as needed.

6.4.5 Stockpiling

Excavated contaminated soil may be stored temporarily (less than 30 days) on-site prior to off-site transport or on-site placement (i.e. pre-approved for reuse as fill during site development).

Stockpiles of contaminated soil should not be placed directly on “clean” areas (e.g., clean soil areas or pavement) of the Site. Stockpiles may be placed in clean areas only if lined with heavy-duty (6-mil minimum) plastic sheeting. Stockpiles of contaminated soil may be placed directly on other areas of contaminated soil, provided the contamination is similar and the stockpile will not exacerbate the existing conditions below the stockpile.

Stockpiles should be covered daily using geomembrane or plastic liner to ensure that the soil cannot migrate during windy or wet periods, and to ensure that rainfall is not infiltrating the stockpile. Covers shall be securely anchored to ensure that the wind is not blowing the surface lining off and allowing the soil to be exposed to the conditions.

6.5 Soil Disposal Options

6.5.1 Soil Assumed to be Uncontaminated

This section is only applicable to soil generated within the site boundary that is clearly structural fill imported and placed within the Former Lower Elevation Area in 2021 and 2022 or used as shallow aggregate base placed elsewhere on the Site beneath the asphalt surface as part of site redevelopment (typically the upper 6 to 18-inches).

There is no restriction with respect to the future use or disposal location of soil that meet the following criteria:

1. Structural fill soils (typically 1-inch minus fractured quarry rock) that are within the upper 12 to 18 feet of current ground surface within Soil Management Area B (shown on Figure 4), and;
2. Do not exhibit physical signs of contamination (i.e. staining, odor, or sheen), as discussed in Section 6.2.1.

If there is any question with regard to the quality of such soil, then soil characterization should be conducted (Section 6.3). Based on DEQ *Clean Fill* guidance (DEQ 2014), if the material appears chemically stained or has a chemical odor, then the material is not considered *Clean Fill*. However, if soil exhibiting staining and/or odor of possible natural origin are shown by laboratory testing to be of acceptable chemical quality (i.e. below applicable *Clean Fill screening levels*), then such soil may be considered substantially uncontaminated (i.e. *Clean Fill*).

Although soil meeting the above criteria may be assumed uncontaminated (i.e. *Clean Fill*), off-site re-use in residential settings is not recommended in the absence of testing. Disposal of soil that meet the above-mentioned criteria at a designated fill site or demolition landfill will be acceptable in most circumstances, provided the locations are properly permitted. The disposal facility may have their own requirements for soil testing.

6.5.2 Soil Assumed to be Contaminated

Soil is assumed to be contaminated from the following areas:

1. Any soil from the previously identified areas and depths of known contamination (Soil Management Area A and B) as shown on Figure 4 and described in Section 4.2, or;
2. Any soil from beyond the limit of the Soil Management Area as shown on Figure 4 (e.g., surrounding ROW areas) that exhibit physical signs of contamination (i.e. chemical staining, odor, or sheen), as discussed in Section 6.2.1, unless testing demonstrates that the staining and/or odor are naturally occurring.
3. Any soil, regardless of origin, that upon testing exhibit concentrations above Clean Fill screening levels.

The disposal location for contaminated soil will depend on the analytical testing results and profiling of the waste.

6.5.2.1 Disposal Locations for Petroleum-Contaminated Soil

In the absence of testing, all soil removed from within the Soil Management Area A and at depth within Soil Management Area B (Figure 4), and any soil from off-site areas displaying field evidence of contamination, should be assumed contaminated by petroleum hydrocarbons, VOCs, PAHs, cyanide, and metals.

For any excavated soil that is assumed or found to be contaminated by petroleum hydrocarbons and associated chemicals, the default disposal location is a RCRA Subtitle D landfill, or other facility that is permitted to accept petroleum-contaminated soil. One example of a potentially appropriate Subtitle D landfill that would accept the petroleum-contaminated soil from the Site is Waste Management's Hillsboro Landfill in Hillsboro, Oregon.

6.5.2.2 Disposal Location for Hazardous Waste Soil

Although not expected at this Site, any soil from the Site that are deemed to be a RCRA Hazardous Waste will require disposal, and possibly treatment, at an approved RCRA Treatment, Storage, and Disposal (TSD) facility, typically a Subtitle C Hazardous Waste Landfill. The Chemical Waste Management Arlington Landfill in Arlington, Oregon is one example of a potentially appropriate off-site treatment/disposal facility for RCRA Hazardous Waste. If

soil is encountered that meets the definition of RCRA Hazardous Waste NW Natural Environmental Management should be contacted.

6.5.3 Summary of Soil Disposal Options

TABLE 6 – SUMMARY OF SOIL DISPOSAL OPTIONS

Disposal Option	Criteria
Default Option: RCRA Subtitle D Landfill (e.g., Hillsboro Landfill, Hillsboro, Oregon)	- Any soil excavated from any location / any depth at Soil Management Area A at the property, or from below structural fill placed within Soil Management Area B at the property (See Soil Management Areas - Figure 4). - Unanticipated contaminated soil from surrounding off-property ROW areas that display field evidence of contamination. - Unanticipated contaminated soil from surrounding ROW areas where chemical levels are greater than <i>Clean Fill screening levels</i> and are <u>not</u> RCRA Hazardous Waste.
RCRA Subtitle C Landfill (e.g., Arlington Landfill treatment/disposal facility)	Any soil from the Site or adjacent ROW areas where testing define such soil as a RCRA Hazardous Waste (not anticipated for this Site)
Unrestricted Use	- Structural fill soils placed in Soil Management Area B in 2021 and 2022 (Figure 4) that do not exhibit physical signs of contamination <u>and</u> do not contain foreign debris, <u>or</u>; - If soil is tested: (1) Chemical concentrations are below DEQ <i>Clean Fill screening levels</i>, <u>and</u> (2) Soil do not exhibit chemical staining, odors, or sheen, <u>and</u> do not contain foreign debris.

7.0 CONTAMINATED WATER MANAGEMENT

This section of the CMMP describes how water, either as surface water or groundwater, within designated areas of the Site should be managed if dewatering is conducted for any reason.

It should be noted that any type of water discharge, contaminated or not, which has the potential to enter a surface water body, regardless of the pathway (sewer, ditches, etc.), may require permitting through the appropriate regulatory agency. NW Natural's Environmental Management staff should be consulted prior to all off-site water discharges to ensure compliance with any applicable regulations.

7.1 Surface Water Management

The property has a new site wide stormwater management system that manages all stormwater on property via infiltration areas. Site stormwater is not expected to come into contact with contaminated soils since the property has been fully paved and developed.

Provided the surface water is not visually contaminated and has not come into contact with a contaminated source (e.g. contaminated soil or groundwater) this water can be managed wholly on-site using Stormwater Management Best Management Practices (BMPs) and should not require a special treatment method or off-site disposal. BMPs for on-site discharges of uncontaminated surface water generally include measures to control discharge velocity, turbidity (e.g. sediment filtration bags), and finding an acceptable location to allow for 100% on-site infiltration.

However, this assumes that the surface water runoff has not been contaminated and does not contain any volume of groundwater. Surface water can become contaminated if it comes into contact with contaminated soil or groundwater. This generally occurs when surface water flows over exposed contaminated soil (i.e. during grading), flows through stockpiles of contaminated soil, or flows into excavations which were placed within areas with contaminated soil or groundwater. If there is reason to believe that the surface water has come into contact with a source of contamination, either contaminated soil or any groundwater at the Site, then the measures described below for groundwater management should be followed (Sections 7.3 to 7.5).

Additionally, if any volume of potentially impacted surface water is containerized as a way to hold the water prior to treatment or disposal, then any sediment that collects within the holding tank should be properly characterized and managed (either demonstrated to be “clean fill” proven through analytical testing or disposed of as contaminated as per Section 6.5).

7.2 Areas/Zones of Groundwater Management

Groundwater in the vicinity of the Site has historically been measured between depths of approximately 3 feet bgs (Lower Elevation Area) and approximately 20 feet bgs (Upper Elevation Area). With the filling of the Lower Elevation Area in 2021 and 2022, depths to groundwater across the Site is now anticipated to be greater than 20 feet everywhere. However, it is also possible that groundwater could be encountered at shallower depths, especially during the wetter winter and spring months and in areas proximate to stormwater infiltration areas. The nature of any groundwater that may perch within the structural fill placed within the Former Lower Elevation Area at the Site has not been characterized, and if present should be assumed contaminated unless demonstrated otherwise as per this CMMP. Therefore, contingencies should be in place to manage groundwater as outlined in this section of the CMMP.

It may be prudent to have an EP on-site at appropriate times for subsurface work, particularly when working in areas of known or suspected groundwater contamination.

Areas Where Groundwater Contamination is Assumed

Dewatering of groundwater from within Groundwater Management Areas A and B (as shown on Figure 5) will require management as being potentially contaminated. Groundwater Management Area A encompasses the southern and central portions of the Site extending off-site approximately 250 to 350 feet to the west and southwest and an area in the northeast which extends approximately 50-feet into the neighboring TriMet parcel (light rail line). Groundwater Management Area B includes the peripheral areas around Groundwater Management Area A ranging from 50 to around 200 feet as shown in Figure 5.

If future redevelopment or utility work conducted within Groundwater Management Area A has the potential for construction or excavation Workers to come in contact with contaminated groundwater, then measures need to be taken to ensure workers are informed of this, and that protective measures (e.g. personal protective equipment, PPE) are implemented to mitigate the potential risk of exposure to contaminated media. Additionally, work within Groundwater Management Area A and B should be supervised and conducted by workers with Hazardous Waste Operations and Emergency

Response (HAZWOPER) training, and a Health and Safety Plan (HASP) should be prepared to specifically address hazardous substances (see Section 9.0).

The disposal of dewatered groundwater from within Groundwater Management Area A and B will require special management (see Section 7.5).

Areas Where Uncontaminated Groundwater Can Be Assumed

Dewatering of groundwater outside the area of known contamination (Groundwater Management Area A and B; as shown on Figure 5) can be assumed uncontaminated unless impacts are suspected or confirmed based on criteria presented in Sections 7.3 and 7.4. In these areas uncontaminated groundwater can be removed from the excavation and discharged to an adjacent area within the boundary of the Site.

As previously stated, any off-site discharge or off-site migration of discharged water, contaminated or not, *will* require permitting. If the discharging of uncontaminated groundwater has the potential to leave the site or enter a drainage feature (including sewers and/or drainage ditches) which could lead to a waterbody, contact NW Natural's Environmental Management prior to discharging.

7.3 Identification of Contaminated Groundwater

Typically, most types of dissolved groundwater contamination cannot be identified by field screening techniques. Laboratory testing of samples is typically the only method for identifying contamination in groundwater, particularly at low levels. In this case, groundwater testing at the Site has indicated that groundwater within Groundwater Management Area A and B may be assumed to contain elevated concentrations of petroleum hydrocarbons and associated constituents.

In addition, at all portions of the site and adjacent areas, site workers should be on the lookout for the following characteristics that may indicate the presence of contamination in groundwater:

- Visible sheen on water in the excavation
- Unusual or chemical (petroleum-like or solvent-like) odors
- Color (water should be colorless when not turbid).

It should be noted that this list is not all inclusive, and that on some occasions groundwater can be contaminated but not exhibit any of these indicators (as in the case with water generated from areas of Groundwater Management Area A).

If unexpected groundwater contamination is suspected by the field indicators presented above, the EP or NW Natural's Environmental Management staff should be notified.

7.4 Groundwater Characterization

7.4.1 *Reasons for Groundwater Characterization*

Although groundwater has been characterized in-place during the previous site investigations, additional testing and characterization of dewatered groundwater prior to disposal will probably be necessary and may be beneficial. In some cases the water produced during construction activities may have a lower contaminant load versus the "source" areas of the groundwater contamination used to define Groundwater Management Area A and B. Additionally, water that is passed through and held for a period of time in holding tanks generally has a reduced sediment load, which can help lower the concentration of contaminants in the water itself. Reductions in contaminant and sediment loads demonstrated by characterizing the water can many times lead to less costly disposal options.

Characterization of groundwater, either in a pit or in a storage tank, may be necessary for two primary purposes:

- 1) To profile groundwater dewatered from any portion of the property that requires discharge permitting. Although existing data may be adequate to profile groundwater, the city or disposal facilities may not accept data that they consider dated, or may have additional testing requirements. Therefore, if it is known that dewatering will be necessary at the property, then discussion with the City or disposal facility should occur prior to work activities to determine whether existing data or new testing data will be necessary to permit the water for disposal/discharge.
- 2) To characterize groundwater that is outside of the known area of groundwater impacts depicted on Figure 5, but which exhibits signs of possible contamination (Section 7.3). This testing would be conducted to determine whether contamination is present, and if present, to profile the groundwater for proper disposal.

If characterization of groundwater becomes necessary at this Site, it is advisable to contact an EP or NW Natural's Environmental Management staff.

7.4.2 Sampling of Groundwater

Characterization of groundwater to be dewatered may take place by sampling the water in an excavation, by sampling water that has been pumped into a storage tank, or by sampling groundwater directly from a boring.

If an area of unexpected groundwater contamination is encountered during work activities, discharge (or dewatering in the area) should be halted until the water can be characterized and a potential discharge volume estimated. If construction timelines or downtime costs do not justify halting work in the area, then the affected groundwater may be pumped to temporary storage tanks until it can be permitted for disposal.

Unfiltered water samples should be collected from the pit and/or storage tank with a peristaltic pump or disposable bailer. If necessary, the excavator operator may be directed to dig a sump in the base of the excavation pit to collect an adequate volume of pit water. The sample may then be collected by slowly lowering a new disposable bailer or disposable tubing into the sump or the storage tank. Care should be taken to avoid disturbing the water column in order to minimize sample turbidity.

Because metals testing is typically one of the parameters required for discharge permitting, every effort should be made to collect sediment-free samples with as little turbidity as possible that would be representative of the water to be discharged.

7.4.3 Analytical Testing Parameters

Groundwater samples to characterize or profile dewatered groundwater for disposal may require testing by the following analytical methods:

- NW Method TPH-Gx (gasoline-range petroleum hydrocarbons)
- NW Method TPH-Dx (diesel- and oil-range petroleum hydrocarbons)
- VOCs by EPA Method 8260B
- PAHs by EPA Method 8270SIM
- Total Cyanide by EPA Method 335.4
- Metals by EPA Method 6020 (unfiltered).
- Applicable Conventional Chemistry Parameters such as Total Suspended Solids (TSS).

It is highly advisable to contact any regulatory agencies and/or private disposal facility which may be receiving the water for disposal to confirm

their specific analytical method requirements. Many times the agencies and disposal facilities require analytical methods which are reflective of their own discharge permit requirements, and as such this list may need to be revised.

7.5 Management of Groundwater Discharges

Generally, there are three options for disposing of groundwater; on-site land application, disposal at a publicly owned treatment facility (POTW), and/or disposal at a privately owned water treatment facility. These are applicable options for non-hazardous wastewater, and these options cannot be used in a scenario where the water is determined to be “RCRA Hazardous Waste” without additional review/approvals. Based on prior testing at the Site, it is believed that groundwater would not be characterized as RCRA Hazardous Waste, but if testing of any water indicates that Hazardous Waste has been generated it is highly advisable to retain to consult with NW Natural Environmental Management staff. It is beyond the scope of this document to present all the possible contingencies and approaches to address water that may be classified as RCRA Hazardous Waste, and a case-by-case assessment would be more appropriate to determine the best solution.

7.5.1 Land Application

When working in areas outside of Groundwater Management Area A and B, land application of water may be a feasible option. Construction dewatering activities to land, including groundwater dewatering, are permitted discharges while working under a NPDES 1200-C (Stormwater Construction Discharge Permit) *provided the water is not contaminated (see Sections 7.3 and 7.4), meets the permit requirements for water quality, and does not leave the site boundary*. Provided the water meets these criteria it can then be pumped either to a nearby on-site land surface or into an on-site excavation created to receive the water. In these instances, no water or sediment can leave the site boundary. If the existing site conditions are insufficient to keep all the water and sediment within the site boundary, then the usage of BMPs will be required to eliminate all off-site migration. The usage of dewatering bags to pre-treat to reduce turbidity and to reduce the velocity of the discharge is generally a recommended practice at all times.

While it may be possible to discharge contaminated water in a similar way, the administrative costs and the lead in time to secure regulatory approval usually make this option not feasible for managing contaminated water. Discharging contaminated water to land areas is specifically prohibited while working under a NPDES 1200-C permit and would require a special review process and permitting through DEQ. It must be demonstrated, without question, that discharging contaminated water on-site will have no detrimental

effect to public health and the environment. In general, due to the high level of standards involved in making this demonstration, it is typically more effective, both with regard to timing and to cost, to consider other disposal options for contaminated water.

7.5.2 Disposal to Publicly Owned Treatment Works (POTW)

Most POTW sewer agencies have a process that allows the discharge of construction derived water into their system. Prior to any discharge into a POTW system, the POTW needs to be contacted and permission secured. Each agency will have a set of protocols which must be followed before a discharge is approved, and the discharged water generally needs to meet certain water quality standards as outlined by the POTW (generally based a federal NPDES discharge permit issued to the agency). The advantage of discharging to a POTW is that many times the POTW has a sewer “asset” (i.e. manhole) close to the construction site.

On some occasions the POTW may allow for a direct discharge into the system, but all of the conditions and water quality must be acceptable to the POTW. Usually it is necessary to temporarily hold the water on-site; either pending a laboratory determination of the water quality and contaminant load or while the sediment load is settling out (pre-treatment). Water can be held either in an excavation pit or within holding tanks/boxes, but many times holding tanks are more effective as they allow construction efforts in the excavation to continue (holding water in a pit with the intent to discharge the water generally requires that the pit holding the water not be part of the ongoing construction activities). Generally, once all the discharge criteria are met and reported the POTW will then specify the discharge location and parameters (timing, volumetric rate, etc.).

7.5.3 Disposal Using a Privately Owned Treatment Facility

Privately owned water treatment facilities will many times allow the discharge of construction derived water. These facilities are required to be operating with a current NPDES discharge permit which establishes the criteria and location which they can ultimately discharge their own treated water. Provided the facility is in compliance with their existing NPDES permit, discharging water at these facilities can be a cost-effective option to avoid downtime.

Similar to POTWs the water must be characterized, and the facility must agree to accept the wastewater by generating an approved waste profile before a discharge can occur. Discharging water to a privately owned facility requires that the water be trucked to the facility for the discharge, and this is generally done either using a vacuum truck or water tanker trucks. Many

times private facilities also have a pre-treatment system to reduce the water's sediment load before it enters their treatment facility. This process can be beneficial to construction timing, as it then allows the usage of vacuum trucks to remove water directly from the excavations where it can immediately be trucked to the treatment facility (vs. holding it on-site).

For groundwater that contains elevated levels of contaminants, disposal to an off-site treatment facility would likely be the most time and cost-efficient option, as discharge to the municipal sewer system would not likely be allowed without significant pre-treatment measures. If pre-treatment or off-site disposal proves necessary, it is advisable to retain an EP to assist with determining the options, costs, and best path forward.

7.6 Special Considerations for Utility Trenching

If utility trenches are to be installed through the known area of groundwater contamination (Groundwater Management Area A and B, Figure 5), and at depths that would intersect the groundwater, then the potential for these trenches to act as conduits for preferential migration of contaminated groundwater should be evaluated. It is advisable to retain an EP in this situation.

Utility trench dams, typically constructed with controlled density fill (CDF), may be recommended in this circumstance to mitigate the potential for contaminant migration through utility trenches. If utility trench dams are deemed necessary, then site-specific design can be conducted at that time.

8.0 DOCUMENTATION

8.1 Record Keeping

For contaminated soil and/or groundwater that is transported or discharged off-site for disposal, records should be kept as to the transport, weight/volume, and disposal/discharge location of the removed materials.

For soil; bills of lading or waste manifests, disposal permits, and disposal receipts or weight tickets from the disposal facility should be maintained for each removal event.

For groundwater; discharge permits, documentation of source control and/or treatment measures, meter readings for water discharges, and disposal receipts (if disposal at an off-site facility is necessary) should be maintained for each discharge event.

Photographs of soil removal areas should be taken that allow for some perspective of the locations and depths of the removal areas. Photographs of the locations of groundwater dewatering and discharge locations, storage tanks, and any source control or treatment measures should also be taken.

For all sampling activities (profile, characterization, and/or confirmation), sample locations and depths, as well as collection dates and times should be recorded. Additionally, chain-of-custody documentation should be maintained at all times, and all laboratory reports should be retained.

Scaled maps should be prepared showing any areas where contaminated soil was removed and/or re-used on-site.

8.2 Project Closeout Report

Upon completion of any project that involved the testing or removal of contaminated soil or groundwater at the property, a report or memorandum documenting the work activities should be prepared. The report should document any reuse locations and the off-site transport and disposal location(s) of any soil or groundwater that were removed from the Site, as well as any testing conducted. Scaled site maps showing the soil removal areas, soil reuse locations, and/or sample locations should be included in the report, as should all disposal receipts, laboratory reports, and chain-of-custody documentation. Additionally, the Closeout Report should document any deviations from this plan.

9.0 HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) should be prepared for any future excavation/earthwork activities that may result in encountering contaminated media (soil or groundwater). The HASP should comply with Occupational Safety and Health Administration (OSHA) requirements established under the Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard (29 CFR 1910.120). Requirements include the use of appropriately trained site workers, description of hazardous substances likely to be encountered, identification of and monitoring for the presence of contaminants in soil and groundwater, and site health and safety officer responsibilities and authority.

The HASP will require workers exposed to contaminated soil and/or groundwater to utilize a minimum level of Personal Protective Equipment (PPE), including protective clothing, gloves, steel-toed boots, hard hats, and safety glasses. If contact with groundwater within Groundwater Management Area A (as shown on Figure 4 and discussed in Section 4.2), is possible, then the HASP may prescribe the use of chemical resistant clothing and boots, and respiratory protection.

Personnel who perform excavation activities within Groundwater Management Area A must meet the training requirements specified in the OSHA HAZWOPER Standard [29 CFR 1910.120(e)].

The HASP should discuss when air monitoring would be employed, i.e. whenever a condition arises that could reasonably result in a hazardous atmosphere. Air monitoring must be conducted in accordance with The National Institute for Occupational Safety and Health (NIOSH), OSHA, or EPA methods.

10.0 LIMITATIONS AND SIGNATURES

The information presented in this report was collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This report and the conclusions and/or recommendations contained in it are based solely upon research and/or observations, and physical sampling and analytical activities, if any, that were conducted.

The information presented in this report is based only upon activities witnessed by HAI or its contractors, and/or upon information provided to HAI by the Client and/or its contractors.

Unless otherwise specified in writing, this report has been prepared solely for the use by the Client. Any other use by the Client or any use by any other person shall be at the user's sole risk, and HAI shall have neither liability nor responsibility with respect to such use.

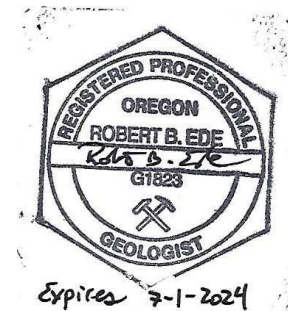
Hahn and Associates, Inc.

Prepared by:

Robert Ede

Robert Ede, R.G.
Principal

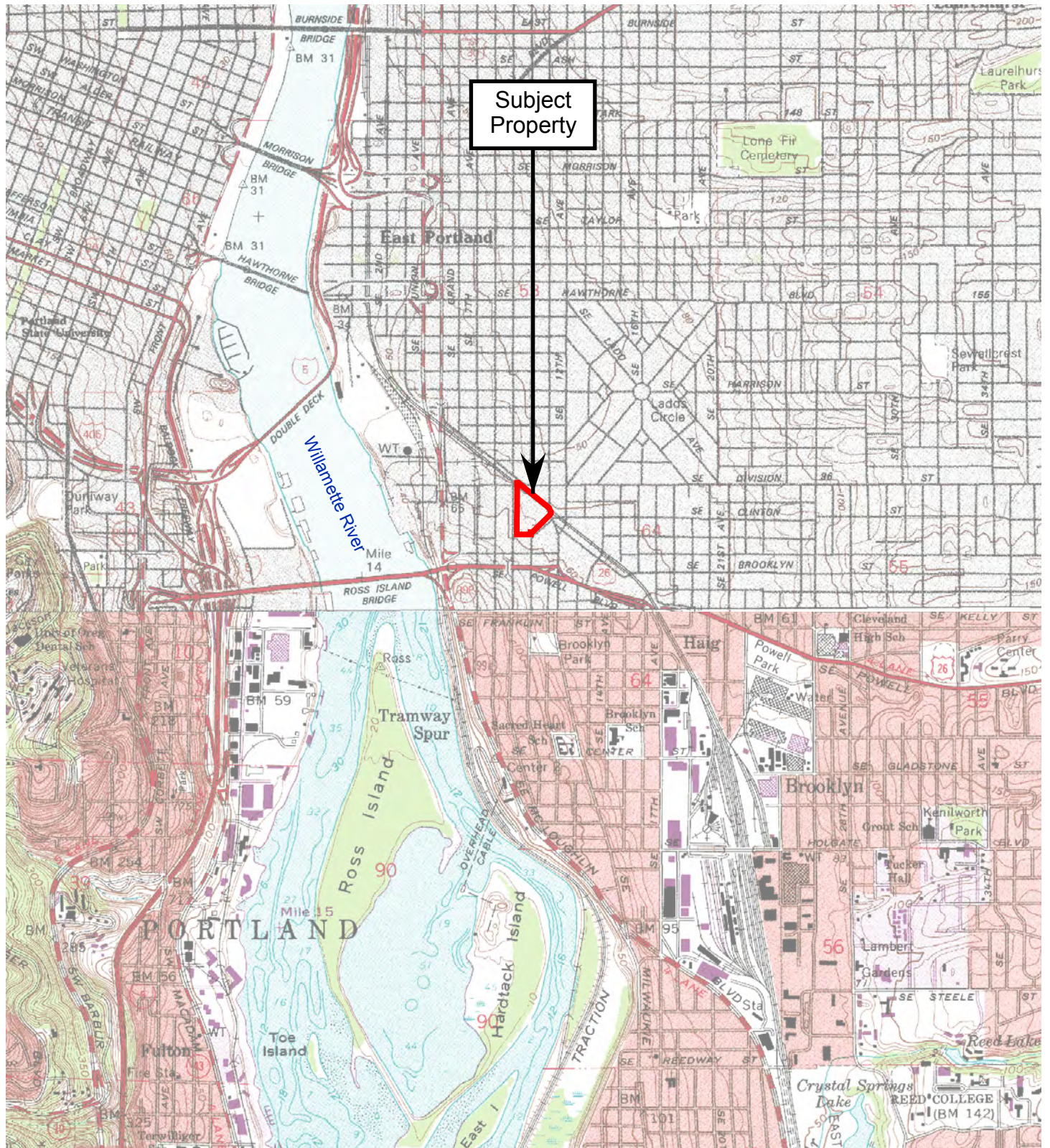
Date: June 10, 2024



11.0 GLOSSARY OF ABBREVIATIONS

bgs	below existing ground surface
BMP	best management practices
BTEX	benzene, toluene, ethylbenzene, xylenes
BUD	beneficial use determination
CDF	controlled density fill
CMMP	contaminated media management plan
COI	chemical of interest
DEQ	Oregon Department of Environmental Quality
EP	Environmental Professional
EPA	U. S. Environmental Protection Agency
HAI	Hahn and Associates, Inc.
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
mg/kg	milligrams per kilogram (parts per million)
MRLs	method reporting limits
NFA	No Further Action
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PAHs	polynuclear aromatic hydrocarbons
PG&C	Portland Gas & Coke Company
PCBs	polychlorinated biphenyls
PPE	personal protective equipment
RBC	DEQ Risk-Based Concentration
RBDM	DEQ Risk-Based Decision Making
RCRA	Resource Conservation and Recovery Act
R.G.	Registered Geologist
RI	Remedial Investigation
ROW	right-of-way
SLV	screening level value
SOP	standard operating procedure
TPH	total petroleum hydrocarbons
TSD	Treatment, Storage, and Disposal facility

TSS	total suspended solids
µg/L	micrograms per liter (part per billion)
UST	underground storage tank
VOCs	volatile organic compounds



Note: Base Map from the Portland (1990) and
Lake Oswego (1984), Oregon
USGS 7.5-Minute Quadrangles
Contour Interval: 10 Feet

FIGURE 1 Location Map

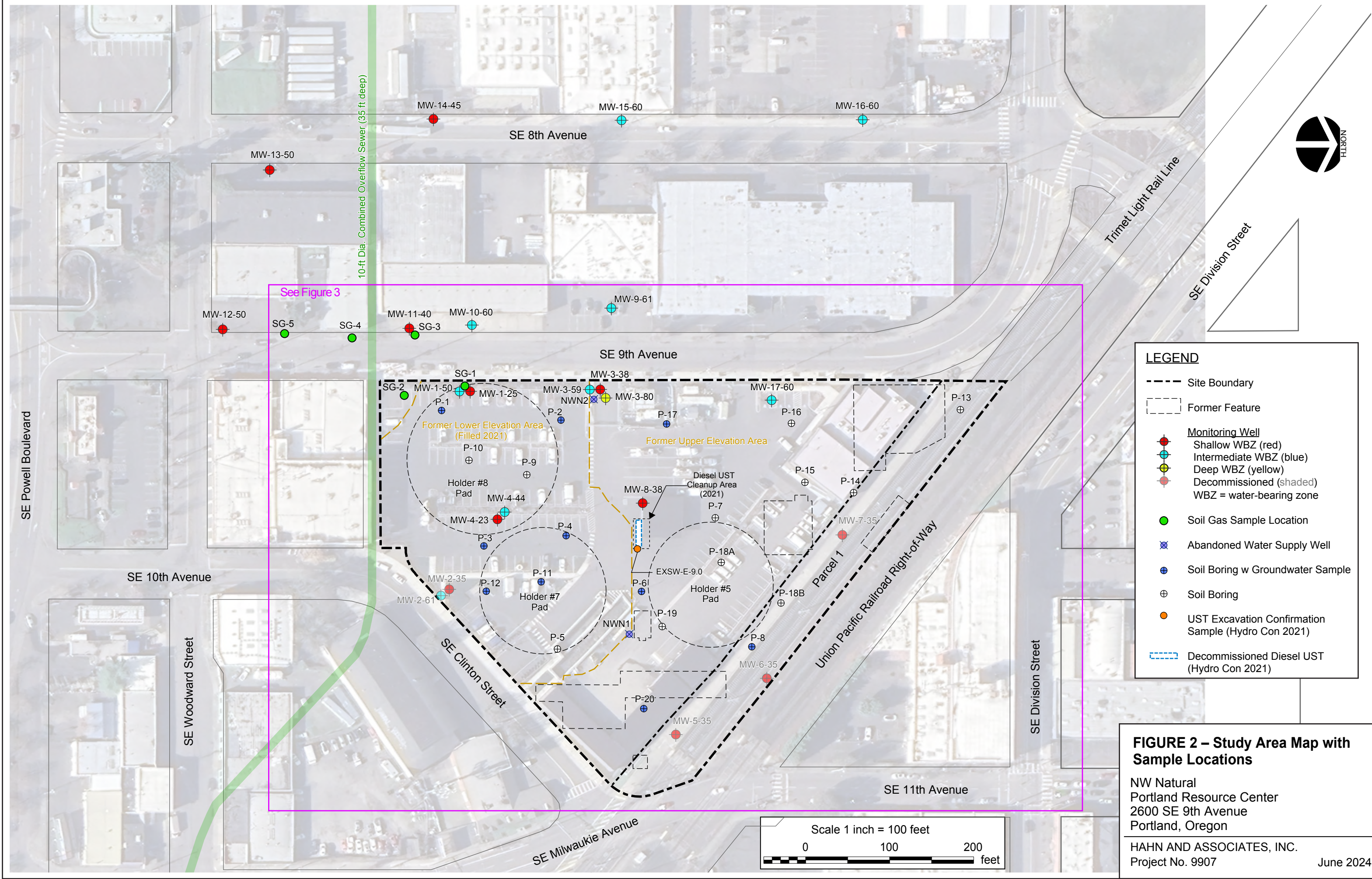
NW Natural
Portland Resource Center
2600 SE 9th Avenue
Portland, Oregon



0 1000 2000 4000
1"=2000'
Scale in Feet

HAHN AND ASSOCIATES, INC.
Project No. 9907

June 2024



LEGEND

--- Site Boundary

- - - Former Feature

Monitoring Well

- Shallow WBZ (red)
- Intermediate WBZ (blue)
- Deep WBZ (yellow)
- Decommissioned (shaded)
- WBZ = water-bearing zone

● Soil Gas Sample Location

⊗ Abandoned Water Supply Well

⊕ Soil Boring w Groundwater Sample

⊕ Soil Boring

● UST Excavation Confirmation Sample (Hydro Con 2021)

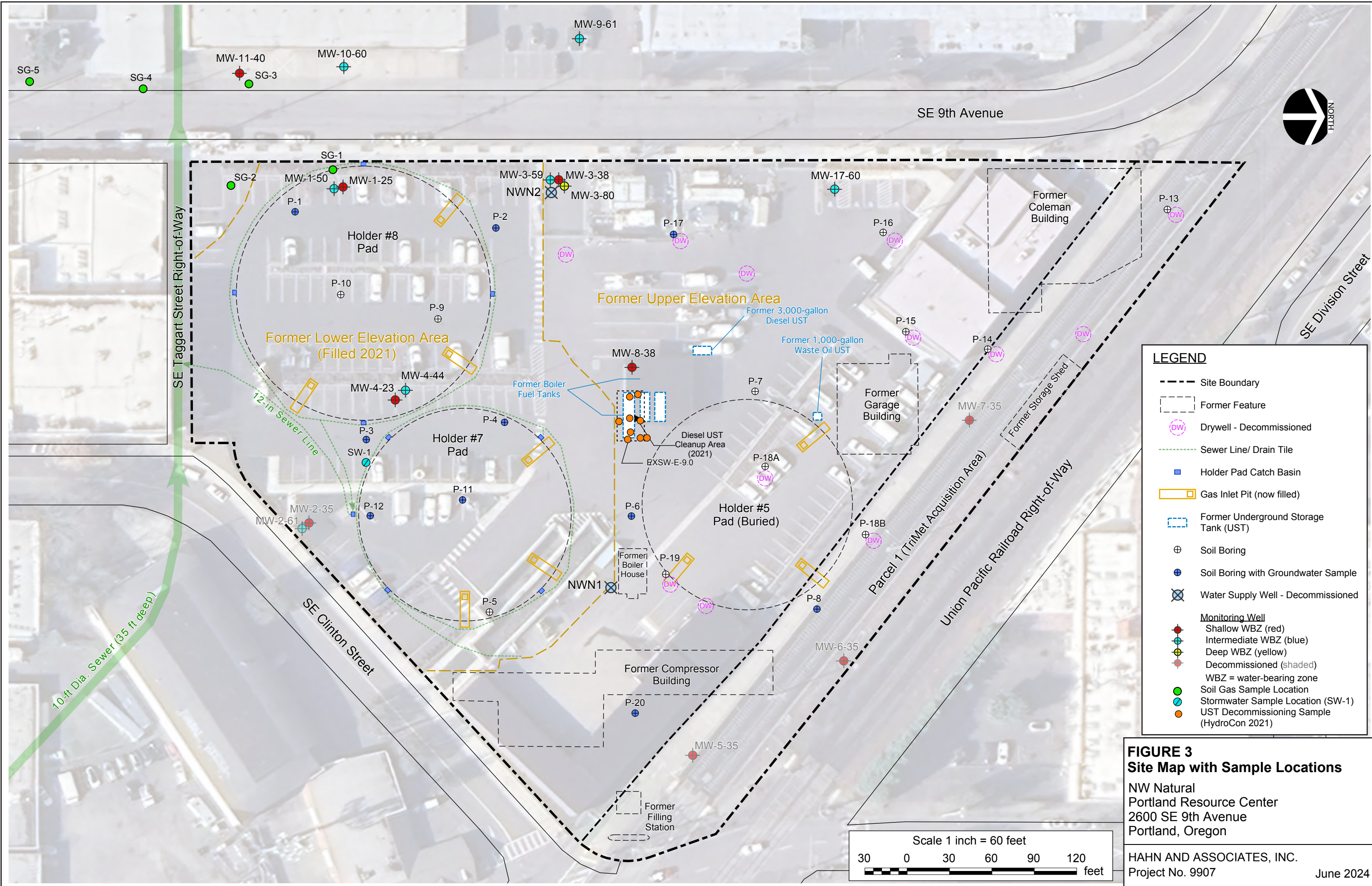
--- Decommissioned Diesel UST (Hydro Con 2021)

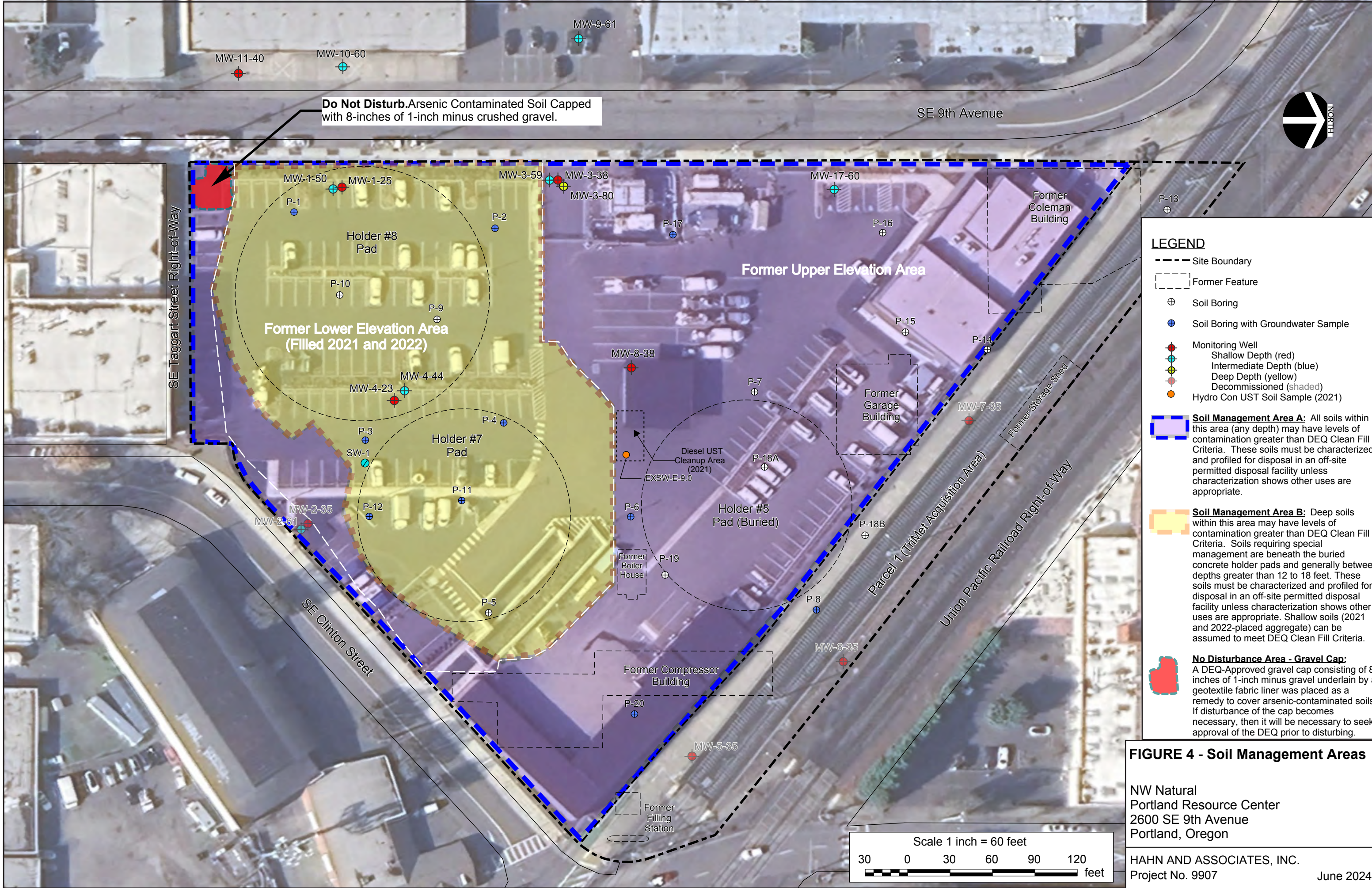
FIGURE 2 – Study Area Map with Sample Locations

NW Natural
Portland Resource Center
2600 SE 9th Avenue
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 9907

June 2024





Do Not Disturb. Arsenic Contaminated Soil Capped with 8-inches of 1-inch minus crushed gravel.

LEGEND

Site Boundary

Former Feature

⊕

Soil Boring

⊕

Soil Boring with Groundwater Sample

●

Monitoring Well

●

Shallow Depth (red)

●

Intermediate Depth (blue)

●

Deep Depth (yellow)

●

Decommissioned (shaded)

●

Hydro Con UST Soil Sample (2021)

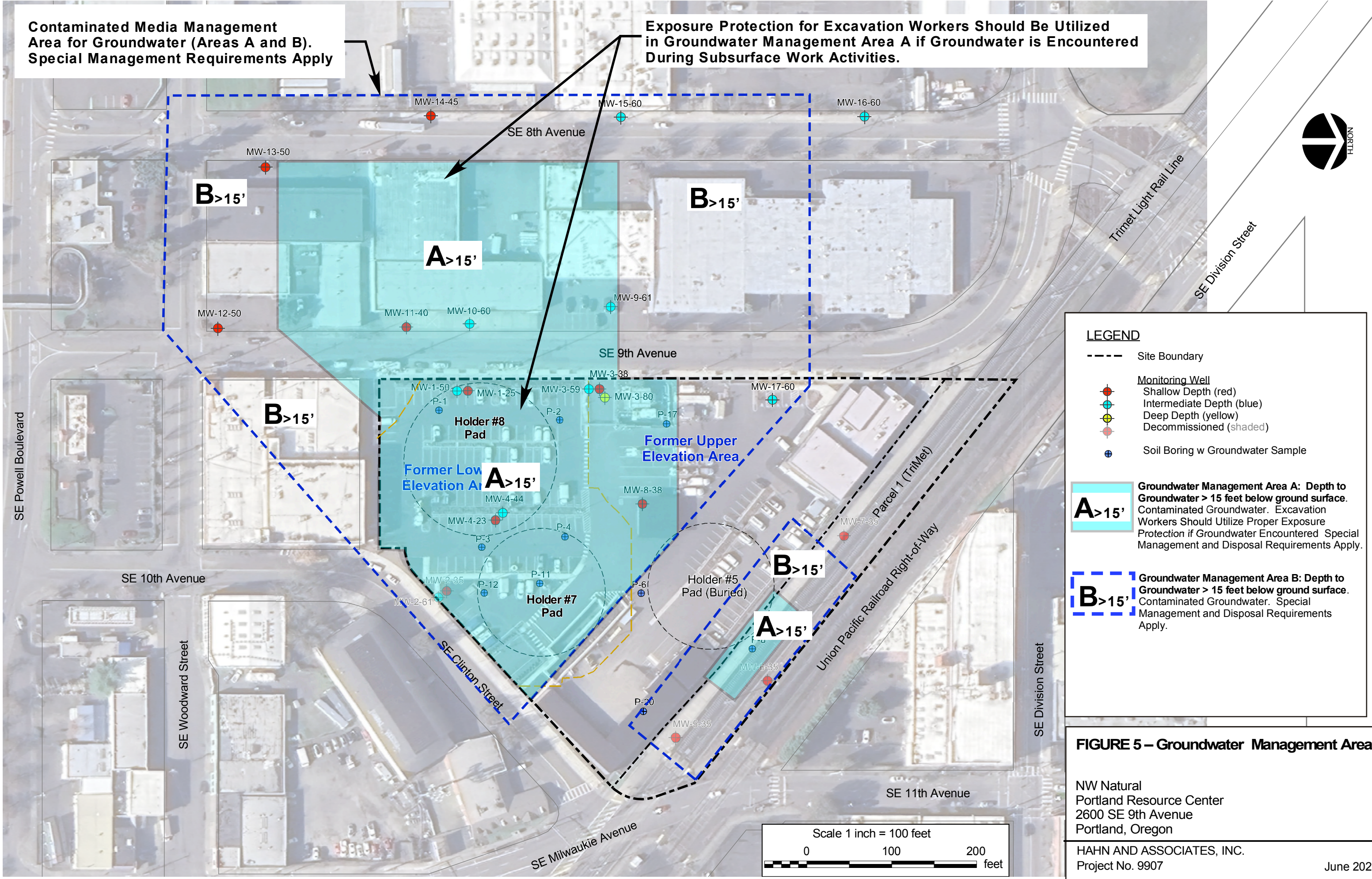
Soil Management Area A: All soils within this area (any depth) may have levels of contamination greater than DEQ Clean Fill Criteria. These soils must be characterized and profiled for disposal in an off-site permitted disposal facility unless characterization shows other uses are appropriate.

Soil Management Area B: Deep soils within this area may have levels of contamination greater than DEQ Clean Fill Criteria. Soils requiring special management are beneath the buried concrete holder pads and generally between depths greater than 12 to 18 feet. These soils must be characterized and profiled for disposal in an off-site permitted disposal facility unless characterization shows other uses are appropriate. Shallow soils (2021 and 2022-placed aggregate) can be assumed to meet DEQ Clean Fill Criteria.

No Disturbance Area - Gravel Cap: A DEQ-Approved gravel cap consisting of 8 inches of 1-inch minus gravel underlain by a geotextile fabric liner was placed as a remedy to cover arsenic-contaminated soils. If disturbance of the cap becomes necessary, then it will be necessary to seek approval of the DEQ prior to disturbing.

Contaminated Media Management Area for Groundwater (Areas A and B). Special Management Requirements Apply

Exposure Protection for Excavation Workers Should Be Utilized in Groundwater Management Area A if Groundwater is Encountered During Subsurface Work Activities.



LEGEND

- Site Boundary
- Monitoring Well**
 - Shallow Depth (red)
 - Intermediate Depth (blue)
 - Deep Depth (yellow)
 - Decommissioned (shaded)
- Soil Boring w Groundwater Sample

A>15' Groundwater Management Area A: Depth to Groundwater > 15 feet below ground surface. Contaminated Groundwater. Excavation Workers Should Utilize Proper Exposure Protection if Groundwater Encountered. Special Management and Disposal Requirements Apply.

B>15' Groundwater Management Area B: Depth to Groundwater > 15 feet below ground surface. Contaminated Groundwater. Special Management and Disposal Requirements Apply.

FIGURE 5 – Groundwater Management Areas

NW Natural
Portland Resource Center
2600 SE 9th Avenue
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 9907

APPENDICES

APPENDIX A

UST Removal and Risk-Based Closure Report, LUST UST ID: 26-21-0510,
Hydro Con, dated February 4, 2022

UST Removal and Risk-Based Closure Report

NW Natural Central Portland Service Center

2600 SE 9th Avenue, Portland, Oregon

Oregon LUST ID: 26-21-0510

HydroCon Project Number: 2021-061

Prepared for:

MEI Excavation, Inc.

5501 NE 223rd Avenue

Fairview, Oregon 97204

February 4, 2022

Prepared by:



HydroCon, LLC

314 W 15th Street, Suite 300 Vancouver, Washington 98660

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1.0 INTRODUCTION

MEI Excavation, Inc. (MEI) contracted HydroCon Environmental, LLC to document the removal of an underground storage tank (UST) at 2600/2630 SE 9th Avenue in southeast Portland (the Site; Figures 1 and 2). The Site is currently owned by NW Natural and is slated to be redeveloped for use as the NW Natural Portland Central Service Center. The UST had been historically emptied and decommissioned in place (by filling with sand) likely during the late 1970s or early 1980s.

This report presents the results of the UST removal, remedial excavation, and site assessment activities. A recommendation for no further action is provided at the conclusion of the report.

1.1 *Property Description and History*

The Site, located at 2600/2630 SE 9th Avenue in southeast Portland, is approximately 5.2 acres in size, is industrially zoned, and is owned by NW Natural. The Site is the former location of the NW Natural Central Service Center and the Portland Gas and Coke Company (PG&C) "Station E" gas holder facility and is currently undergoing development for use as the NW Natural Portland Resource Center.

The Site was historically used for manufactured gas storage (in aboveground tanks) and gas transmission (in underground lines) from 1921 until 1956 when plant operations were discontinued. Manufactured gas was a predecessor of natural gas and was distributed for uses such as heating, lighting, and cooking.

The Site included three large former above ground manufactured gas holding tanks that were constructed in the early to mid-1920s, operated by Portland Gas and Coke Company. The aboveground tanks (ASTs) are believed to have released condensate from the stored gas resulting in concentrations of petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), metals, and cyanide in soil and groundwater near the historical holding tanks.

Additionally, four USTs were known to be formerly present at the Site, consisting of:

- 1,000 gallon capacity waste oil UST
- 3,000 gallon capacity diesel UST
- 10,000 gallon capacity diesel UST
- 10,000 gallon capacity gasoline (later used for diesel) UST

In addition to the preceding, a 1955 Site Plan described a fifth fuel tank proximate to the two 10,000 gallon USTs (the subject of this report). All four of the previously known USTs had been decommissioned and removed from the Site. Two Leaking Underground Storage Tank (LUST) reports were generated with the Oregon Department of Environmental Quality (DEQ) in 1992 for the two diesel fuel tanks (File Nos. 26-92-0217 and 26-92-0344) and one LUST report was initiated in 1995 (File No. 26-95-0218) for the waste oil tank. No gasoline releases were reported. Leaks at each of the fuel tanks were discovered through completion of tightness testing, with leakage from one tank being related to piping and from the other tank being related to apparent loss of tank integrity. In both cases, contamination was limited to soil

and cleanup consisted of decommissioning and soil removal. DEQ records show cleanup activities for both diesel tanks satisfied the criteria for a Soil Matrix Cleanup as set forth in Oregon Administrative Rules (OAR) 340-122-0320 through 340-122-0360, with the files closed on both releases by April 16, 1996. The leak as reported for the waste oil tank was discovered at the time of tank decommissioning in 1995 with the media affected being limited to soil. As with the cleanup activities related to the diesel fuel USTs, the cleanup at the waste oil tank consisted of decommissioning and soil removal. DEQ records show that the soil removal satisfied the criteria for a Soil Matrix Cleanup, with the file for this release closed on August 12, 1996.

Remedial investigation (RI) and risk assessment activities were completed between 2008 and 2014 by Hahn and Associates, Inc. (HAI) at the property (DEQ ECSI No. 1488). The RI activities involved near-surface and subsurface investigations, land and water Beneficial Use Determination (BUD), human health and ecological risk assessments and were documented in a 2017 *Revised Remedial Investigation and Risk-Based Closure Report*. The DEQ completed a review of Site information, including the 2017 *Revised RI and Risk-Based Report*, and in correspondence dated October 18, 2018 provided their determination that remedial action to address environmental contamination at the Site was complete and that no further action (NFA), except as conditioned in the NFA determination, were required for the Site.

The conditional NFA requires several conditions including, but not limited to, maintaining a gravel cap over a small area of contaminated soil, implementation of a contaminated media management plan (CMMP), and periodic groundwater monitoring. The remaining UST was discovered subsequent to DEQ's issuance of the Site NFA and therefore had not been previously documented. The following sections describe activities recently conducted to remove the tank and assess environmental conditions near the former UST.

1.2 Site Geology and Hydrogeology

Soil observed during the UST removal generally consisted of silty sand from the surface to the maximum depth observed at approximately 13-feet below ground surface (bgs). Groundwater beneath the Site has been documented to flow to the southwest and south-southwest towards the Willamette River. Site monitoring well MW-8-38 is located immediately down-gradient from the removed UST, with depth to groundwater consistently measured at depths greater than 22 feet bgs.

2.0 PERMITTING AND HEALTH AND SAFETY

2.1 Health and Safety Plan

HydroCon prepared a site-specific health and safety plan (HASP) to govern health and safety protocols used during this investigation. Work was performed using Occupational Safety and Health Administration (OSHA) Level D work attire consisting of hard hats, safety glasses, protective gloves, and protective boots.

2.2 Underground Utility Locates

Prior to the commencement of subsurface activities, public utility notification was requested through the Oregon One Call service.

3.0 SITE ACTIVITIES

This section provides a discussion of field activities including UST removal and remedial soil excavation, and delineation test pitting. The DEQ *Risk-Based Decision Making (RBDM) for the Remediation of Petroleum-Contaminated Sites Guidance Document*, published September 2003 provided the regulatory framework for the site assessment activities.

3.1 UST Removal, Sampling, and Analysis

On May 28, 2021, Hydrocon arrived at the Site and observed that Anderson Environmental (AEC) and MEI Excavation, Inc. excavated, removed, and cut open the 32-foot long by 8-foot diameter UST from the subsurface. Upon initial discovery, the UST had been observed as having been previously ripped open and filled with sand. A sewer line was observed running through the east side of the excavation at a depth of approximately 4 to 5 feet bgs. The bottom of the tank was at 12 feet bgs. Soil samples were collected from beneath each end of the former tank (UST-E-13 and UST-W-13). Sample UST-E-13 and a third sample (UST-NE-11) were collected from visibly stained soil.

Based on the visibly impacted soil and results of initial sampling (see Section 3.2), a release was reported to DEQ. DEQ assigned the release a LUST file number of 26-21-0510. An estimated 100 tons of sand removed from the UST and 652 tons of petroleum containing soil (PCS) were subsequently removed from the excavation and confirmation sampling was conducted. Analytical results are described in Section 3.2.

Soil samples were collected into laboratory-provided sample jars and stored at approximately 4 degrees Celsius before being transferred to Apex Laboratories in Tigard, Oregon for chemical analysis. Laboratory reports with chain-of-custody documentation are included in Appendix A.

Soil samples were analyzed for:

- Total Petroleum Hydrocarbons (TPH) in the gasoline (GRPH) range by Northwest Method NWTPH-Gx;
- TPH in the diesel (DRPH) and motor oil (ORPH) ranges by Northwest Method NWTPH-Dx;
- Benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEX+N) by EPA Method 8260D; and
- Total lead by EPA Method 6020B.

Additionally, EXSW-E-9 was analyzed for:

- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270;
- Total arsenic, barium, cadmium, chromium, mercury, selenium, and silver by EPA Method 6020B; and
- Total cyanide by EPA Method 9013M/9012.

Due to an elevated lead concentration in UST-NE-11 (240 milligrams per kilogram [mg/kg]), the excavated PCS adjacent to the UST (212 tons) was profiled as D008-listed hazardous waste and disposed of at the Waste Management Hazardous Waste Facility in Arlington, Oregon. All sand from within the UST (estimated at 100 tons) was characterized and disposed of as non-hazardous PCS at Hillsboro Landfill. The UST was recycled at Rivergate Scrap Metals in Portland, Oregon. Copies of the disposal receipts (non-hazardous soils from the UST were stockpiled and bulked with similarly characterized PCS from elsewhere on the Site) are included as Appendix B. Photographic documentation of the UST decommissioning and remedial excavation are shown in Appendix C.

3.2 Analytical Results

Soil analytical results are summarized below and presented on Tables 1 and 2. Sample locations are shown on Figure 3.

GRPH concentrations of the soil samples collected below the UST were 41 mg/kg below the east end, and non-detect beneath the west end. GRPH in UST-NE-11 was 582 mg/kg. DRPH concentrations below the UST were 10,600 mg/kg below the east end (UST-E-13), and 63.6 mg/kg below the west end (UST-W-13). DRPH in UST-NE-11 was 4,220 mg/kg. Additionally, UST-NE-11 detected a lead concentration of 240 mg/kg. Contaminated soil represented by these samples was subsequently removed as part of the remedial excavation activities. Field screening by visual/olfactory observation as well as use of a photoionization detector (PID) and sheen testing was used to screen soil that was excavated. A release was reported to DEQ (LUST 26-21-0510). The 20-day DEQ reporting form is included in Appendix D.

An estimated 100 tons of sand removed from the UST and 652 tons of PCS were removed from the excavation. Upon completion of remedial excavation activities, confirmation soil samples were collected from the excavation sidewalls (EXSW-N-8, EXSW-S-8, EXSW-E-9, EXSW-W-10, and EXSW-NE-11) and floor (EXF-14.5). Additionally, soil within the excavation was field screened to confirm the absence of petroleum. Results are summarized in Table 1 and are described further in Section 5. Neither free product or groundwater were observed.

3.3 Site Restoration

After the confirmation samples were collected, the UST pit was backfilled with clean fill.

4.0 CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) is a site-specific evaluation of potential contaminant sources, exposure pathways, and receptors applicable to the site based on the distribution of constituents, and current and reasonably likely future land and water uses. Exposure pathways, based on DEQ's RBDM guidance document (DEQ, 2017), were assessed for the site utilizing soil and groundwater data, hydrogeologic data, and current and potential future land and water uses. A CSM is illustrated in Figure 4.

The Site is zoned General Industrial (IG2), which does not allow residential use. The Site is slated to continue to be used for industrial use as the future NW Natural Central Portland Service Center. Future development of the Site will include a connection to the municipal water supply, and no future groundwater uses are likely. Previous water well survey work as documented in the 2017 RI Report for the Site and the subsequent DEQ NFA for ECSI 1488, concluded that the ingestion or inhalation of groundwater/tapwater is an incomplete pathway.

It is likely that future redevelopment will require the installation of new utilities, or modification to existing utilities. These may include water, sanitary sewer, and storm sewer utilities, which can exceed depths of 10 feet below the surface (e.g., construction or trench worker exposure to deep soils is possible).

Analytical results were compared to following DEQ Risk-Based Concentrations (RBCs), which are based on exposure pathways that are potentially complete for occupational, construction, and/or excavation worker receptors.

Soil:

- *Soil Ingestion, Dermal Contact, and Inhalation (RBCss)*
- *Volatilization to Outdoor Air (RBCso)*
- *Vapor Intrusion into Buildings (RBCsi)*

The DEQ RBCs for the applicable exposure pathways are included in Tables 1 and 2. A CSM including potential exposure pathways is included as Figure 4.

5.0 RISK-BASED SCREENING

Detected concentrations were screened against DEQ-established generic RBCs for the exposure pathways identified. Results of the screening are described below and shown in Tables 1 and 2.

Gasoline-range organics (GRO), diesel-range organics (DRO), and lead exceeded one or more RBC in the initial samples that were collected prior to remedial excavation activities (UST-NE-11, UST-E-13, and UST-W-13). However, the soil represented by these samples was subsequently removed and is therefore not of concern.

In confirmation samples, DRO in one soil sample (EXSW-E-9; collected in an inaccessible pocket of stained soil beneath the sewer line) exceeded the RBC for leaching to groundwater. Additionally, lead in every confirmation sample exceeded the RBC for leaching to groundwater. Because groundwater in the vicinity is not used for drinking water purposes, and had been fully characterized for DRO and lead as part of the RI (including well MW-8-38 located west of the former UST), the leaching to groundwater pathway is not deemed to be of concern.

Arsenic in soil sample (EXSW-E-9 at 6.88 mg/kg) exceeded the RBC for direct contact by occupational workers. However, the detected concentration is below the 8.8 mg/kg concentration deemed typical of naturally-occurring background for the Portland Basin region and therefore is not of concern.

No other soil concentrations exceeded relevant RBCs, including PAHs in in-place sample EXSE-E-9 (Table 2).

6.0 SUMMARY AND CONCLUSIONS

On May 28, 2021, AEC and MEI Excavating removed a 32-foot long by 8-foot diameter UST from the NW Natural property located at 2600 SE 9th Avenue in Portland, Oregon. The tank had historically been emptied of all contents and decommissioned in place by filling with sand. The decommissioning work was done prior to the current DEQ decommissioning standards and some amount of soil contamination (petroleum and related constituents) remained near the tanks. After removal, Hydrocon sampled soil beneath both ends of the UST and based on field observations of petroleum staining and characterization results, approximately 212 tons PCS was removed and disposed of at the Chemical Waste Management Hazardous Waste Facility in Arlington, Oregon as D008 (lead). Sand that was previously used to fill the UST at the time that it was originally decommissioned, was removed from the UST and stockpiled with other similarly profiled PCS generated from site construction work. Based on the capacity of the UST (10,000 gallons), it is estimated that approximately 100 tons of non-hazardous PCS from within the UST were disposed as non-hazardous PCS at the Waste Management, Inc. Hillsboro Landfill. Disposal receipts (includes stockpiled PCS from other portions of the site) are included in Appendix D. Groundwater was not encountered during the excavating. Confirmation samples were subsequently collected to verify the PCS had been adequately removed. None of the post-removal confirmation samples contained petroleum concentrations above relevant RBCs and the excavation was backfilled.

A Conditional NFA determination has already been issued for the Site in 2018 (ECSI 1488). We request DEQ issue an NFA and close LUST file number of 26-21-0510 as related to the removal and cleanup associated with the UST described herein.

7.0 QUALIFICATIONS

HydroCon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period.

Findings and conclusions resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this monitoring. Subsurface conditions may vary from those encountered at specific sampling locations or during other surveys, tests, assessments, investigations, or exploratory services; the data, interpretations and findings are based solely upon data obtained at the time and within the scope of these services.

This report is intended for the sole use of **MEI Excavation, Inc.** This report may not be used or relied upon by any other party without the written consent of HydroCon. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

The conclusions presented in this report are, in part, based upon subsurface sampling performed at selected locations and depths. There may be conditions between borings or samples that differ significantly from those presented in this report and which cannot be predicted by this study.

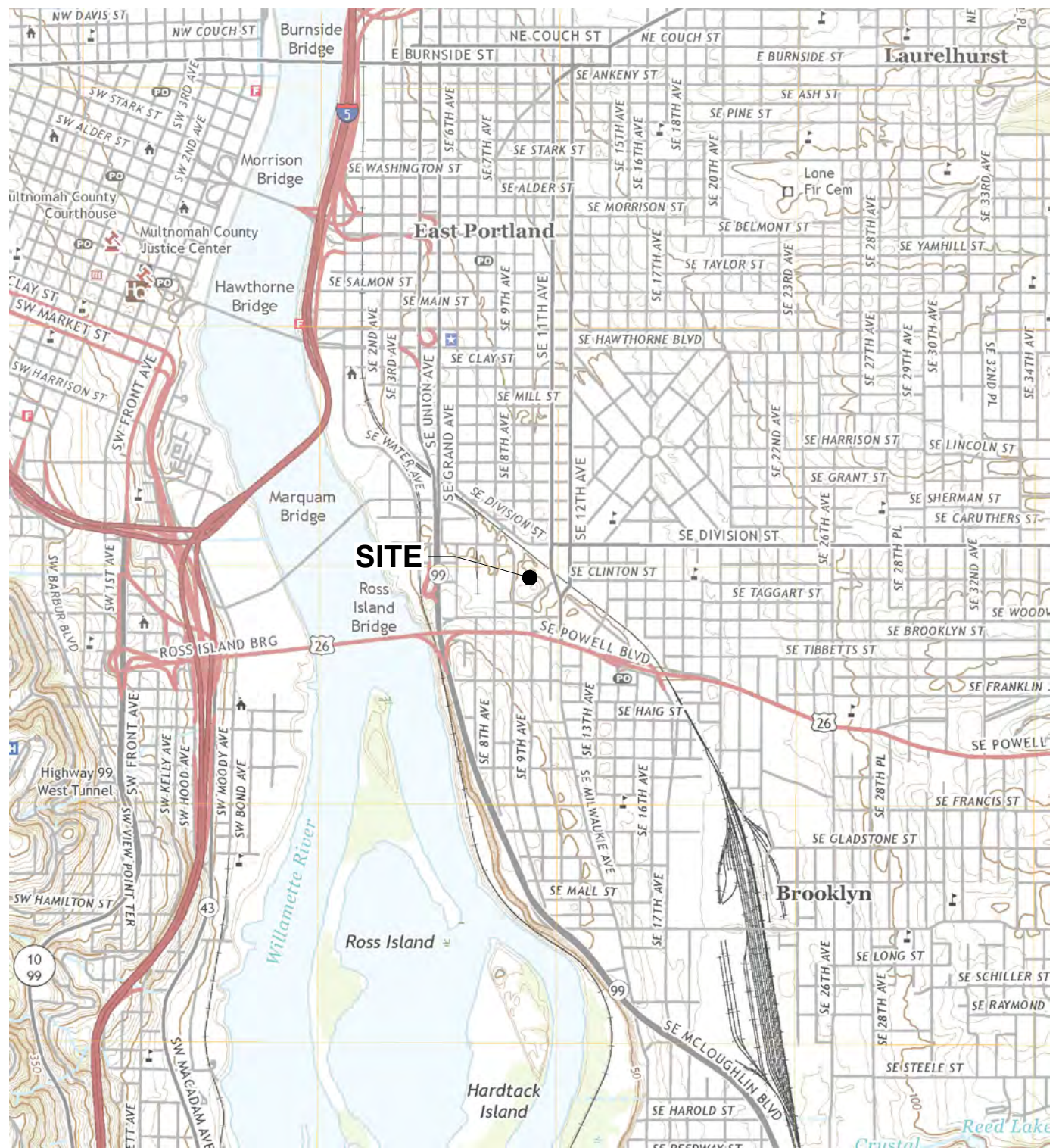
Signature:

Report Prepared By:

A handwritten signature in black ink, appearing to read "Chris Sheridan".

Christopher Sheridan, RG
Senior Geologist

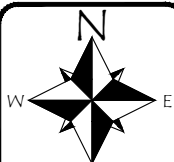




NOTE(S):
 USGS, LAKE OSWEGO AND PORTLAND QUADRANGLES
 OREGON-CLACKAMAS, MULTNOMAH, AND WASHINGTON COS.
 7.5 MINUTE SERIES (TOPOGRAPHIC)

0 2000 4000

SCALE IN FEET
 1" = 2000'



DATE: 6-14-21
 DWN: MW
 CHK: DB
 APPROVED: DB
 PRJ. MGR: DB
 PROJECT NO:
 2021-061

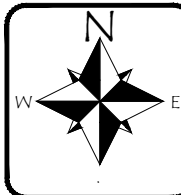
FIGURE 1
 SITE LOCATION MAP
 UST DECOMMISSIONING REPORT
 MEI - NW NATURAL
 2600 SE 9TH AVENUE
 PORTLAND, OREGON

S:\2021 Projects\2021-061 MEI NW Natural\Figures\CAD\2021-061_NW Natural UST_REV01.dwg



Legend

— — Subject Site Property Boundary (Approximate)



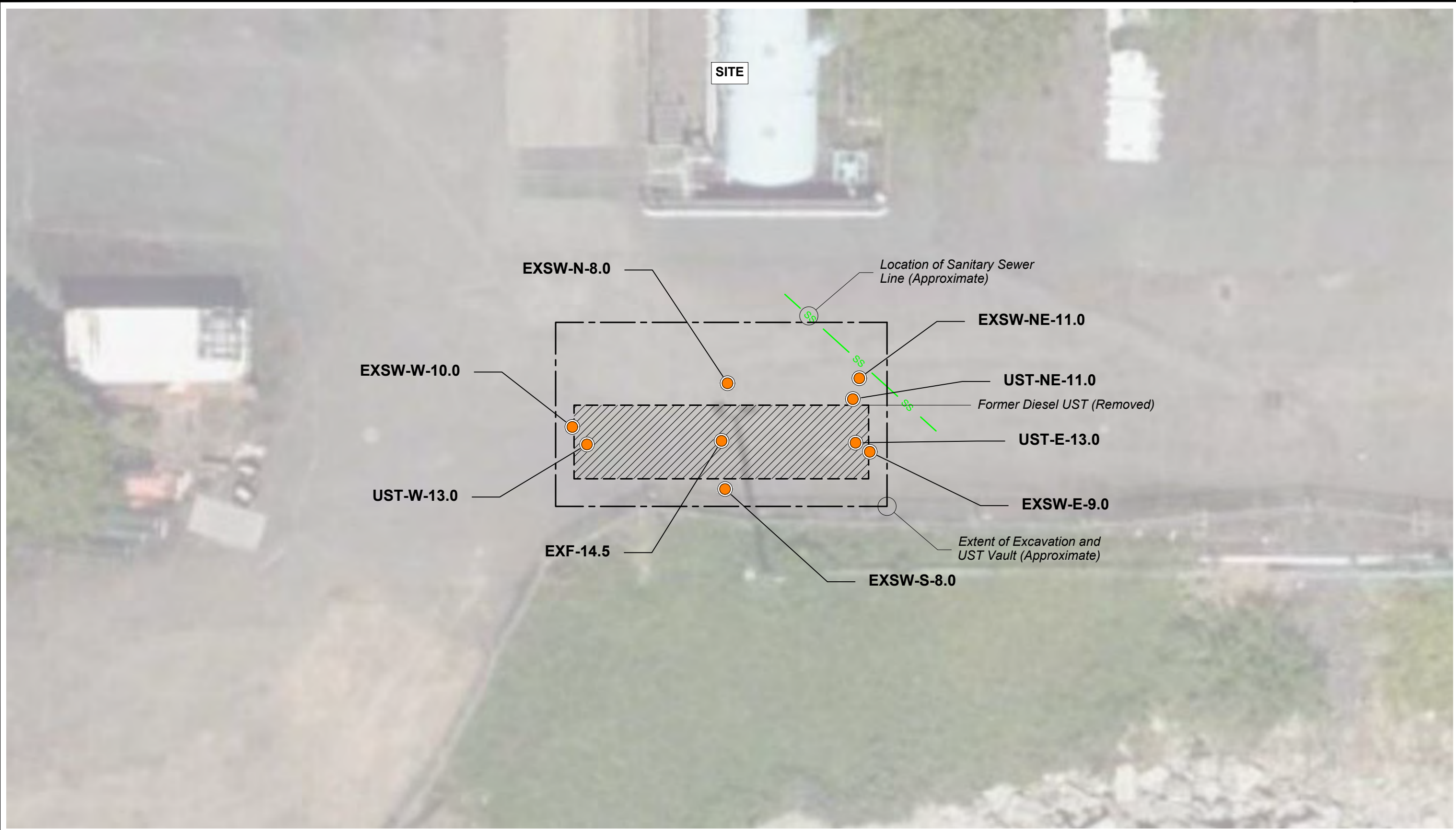
0 50 100
SCALE IN FEET
1" = 50'



DATE: 6-16-21
DWN: MW
CHK: DB
APPROVED: DB
PRJ. MGR: DB
PROJECT NO:
2021-061

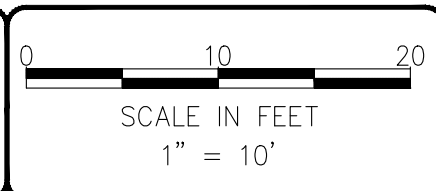
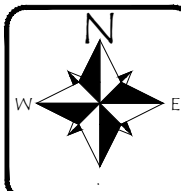
FIGURE 2
SITE VICINITY MAP
UST DECOMMISSIONING REPORT
MEI - NW NATURAL
2600 SE 9TH AVENUE
PORTLAND, OREGON

S:\2021 Projects\2021-061 MEI NW Natural\Figures\CAD\2021-061_NW Natural UST_REV01.dwg



Legend

UST-E-13.0  Soil Sample Location and Identificatoin



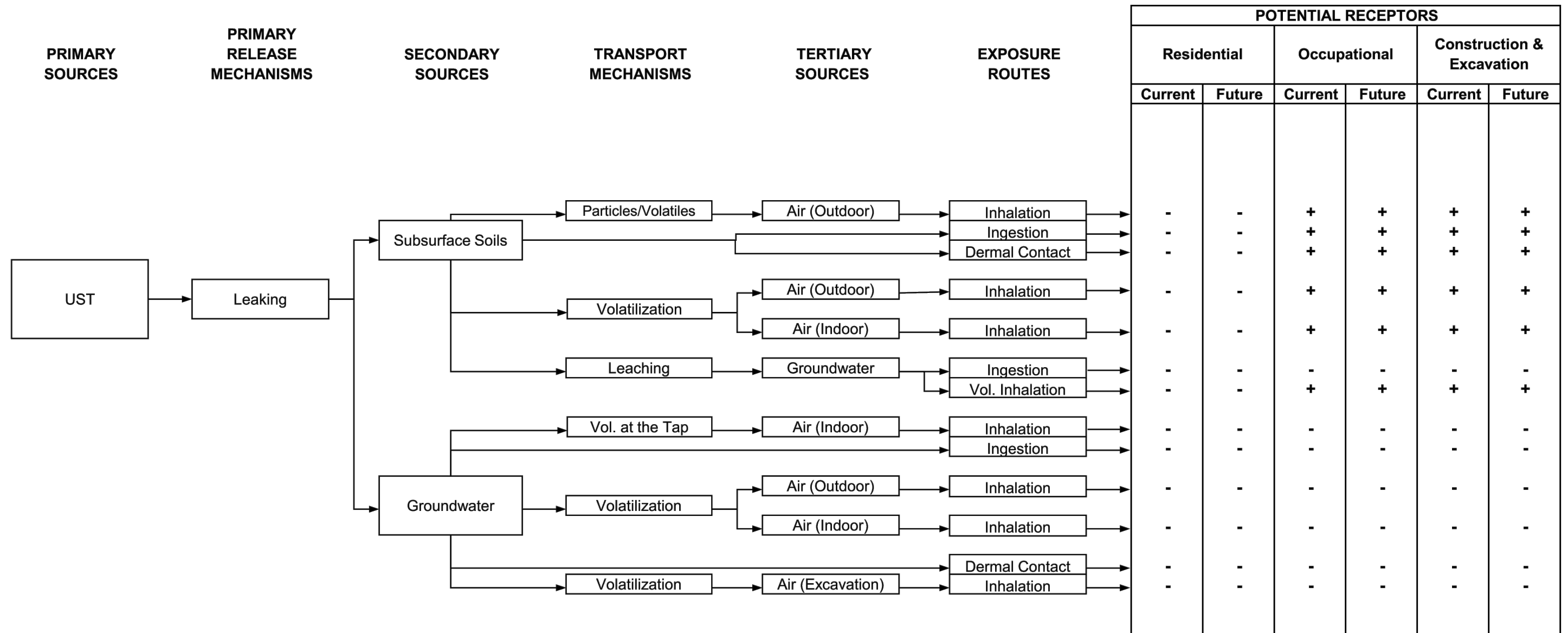
HydroCon

314 W 15th Street, Suite 300, Vancouver, Washington 98660
Phone 360.703.6079 Fax 360.703.6086

DATE: 6-16-21
DWN: MW
CHK: DB
APPROVED: DB
PRJ. MGR: DB
PROJECT NO:
2021-061

FIGURE 3
SITE FEATURES AND SAMPLE LOCATIONS
UST DECOMMISSIONING REPORT
MEI - NW NATURAL
2600 SE 9TH AVENUE
PORTLAND, OREGON

S:\2021 Projects\2021-061 MEI NW Natural\Figures\CAD\2021-061.dwg



- Notes:
- + This route is a primary source of exposure.
 - There is no exposure by this route.



314 W 15th Street, Suite 300, Vancouver, Washington 98660
Phone 360.703.6079 Fax 360.703.6086

DATE: 7-30-2021
DWN: LC
CHK: CS
APPROVED: CS
PRJ. MGR: CS
PROJECT NO: 2021-061

FIGURE 4
CONCEPTUAL SITE MODEL
UST DECOMMISSIONING REPORT
MEI - NW NATURAL
2600 SE 9TH AVENUE
PORTLAND, OREGON

Table 1
Summary of Soil Analytical Data - TPH, BTEX, Metals, and Cyanide
NW Natural Portland Resource Center
2600 SE 9th Avenue
Portland, Oregon

Sample ID	Sample Date	TPH			BTEX					Metals				Cyanide
		GRO	DRO	ORO	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Naphthalene	Lead	Arsenic	Barium	Chromium	Cyanide
Milligrams per kilogram (mg/kg)														
UST-NE-11	05/28/21	582	4,220	<524	<0.0591	<0.296	0.461	1.82	<0.961	240	--	--	--	--
UST-E-13	05/28/21	41	10,600	<962	<0.0145	<0.0725	<0.0363	<0.109	<0.163	6.12	--	--	--	--
UST-W-13	05/28/21	<7.91	63.6	<52.4	<0.0158	<0.0791	<0.0385	<0.119	<0.158	11.7	--	--	--	--
EXSW-N-8	05/28/21	<7.92	<26.6	<53.2	<0.0158	<0.0792	<0.0396	<0.119	<0.158	15.9	--	--	--	--
EXSW-S-8	05/28/21	<7.46	38.8	108	<0.0149	<0.0746	<0.0373	<0.112	<0.149	169	--	--	--	--
EXSW-E-9	05/28/21	50.1	2,110	<52.3	<0.0139	<0.0697	<0.0349	<0.105	<0.139	48.7	6.88	179	22.2	4.0
EXSW-W-10	05/28/21	<6.08	<25	<50	<0.122	<0.0608	<0.0304	<0.0912	<0.122	33.8	--	--	--	--
EXF-14.5	05/28/21	11.7	166	<50	<0.0119	<0.0597	<0.0298	<0.0895	<0.119	86.1	--	--	--	--
EXSW-NE-11	05/28/21	<7.10	<26.8	<53.6	<0.0142	<0.0710	<0.0355	<0.106	<0.142	16.2	--	--	--	--
Oregon DEQ Risk-Based Concentrations (RBCs)														
Occ. RBCss		20,000	14,000	14,000	37	88,000	150	25,000	16,000	800	1.9	220,000	>Max	700
Con. RBCss		9,700	4,600	11,000	380	28,000	1,700	20,000	580	800	15	69,000	53,000	210
Ex. RBCss		>Max	>Max	>Max	11,000	770,000	49,000	560,000	16,000	800	420	>Max	>Max	5,900
Occ. RBCso		69,000	>Max	>Max	50	>Csat	160	>Csat	83.0	NV	NV	NV	NV	NV
Occ. RBCsi		>Max	>Max	>Max	2.10	>Csat	17	>Csat	83.0	NV	NV	NV	NV	NV
Occ. RBCsw		450	430	430	2.10	6,300	6	830	0.7	15	0.31	33,00	250,000	98

Notes:

Bolded, red values indicate reported concentration exceeds corresponding DEQ RBC.

Yellow highlight indicates the sample was removed via excavation.

-- = not analyzed or not available.

mg/kg = milligrams per kilogram (parts per million).

NV=This chemical is considered "nonvolatile" for purposes of the exposure calculations.

>Max=The constituent RBC for this pathway is greater than 1,000,000 mg/kg.

Therefore, these substances are not expected to pose risks in the scenario shown.

GRO = Gasoline range organics.

DRO = Diesel range organics.

RBCss = Soil Ingestion, Dermal Contact, and Inhalation

RBCso = Volatilization to Outdoor Air

RBCsi = Vapor Intrusion in Buildings

RBCsw = Leaching To Groundwater.

Occ. = Occupational Receptor

Con & Ex = Construction and Excavation Worker

>Csat=This soil RBC exceeds the limit of three-phase partitioning.

Soil concentrations in excess of Csat indicate that free product might be present

Table 2
Summary of Soil Analytical Data - PAHs
NW Natural Portland Resource Center
2600 SE 9th Avenue
Portland, Oregon

Sample ID	Sample Date	PAHs															
		Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1,-Methylnaphtalene	2-Methylnaphtalene	Naphtalene	Phenanthrene	Pyrene	Dibenzofuran
Milligrams per kilogram (mg/kg)																	
EXSW-E-9	05/28/21	0.171	0.223	0.310	0.0743	0.342	0.296	0.0424	0.500	1.520	0.292	0.222	0.537	0.320	2.910	0.667	0.431
Oregon DEQ Risk-Based Concentrations (RBCs)																	
Occ. RBCss		21	2.1	21	210	--	2,100	2.1	30,000	47,000	21	--	--	23	--	23,000	--
Con. RBCss		170	17	170	1,700	--	17,000	17	10,000	14,000	170	--	--	580	--	7,500	--
Ex. RBCss		4,800	490	4,900	49,000	--	490,000	490	280,000	390,000	4,900	--	--	16,000	--	210,000	--
Occ. RBCso		>Csat	NV	NV	NV	--	NV	NV	NV	NV	NV	NV	NV	83	--	>Max	--
Occ. RBCsi		>Csat	NV	NV	NV	--	NV	NV	NV	NV	NV	NV	NV	83	--	>Max	--

Notes:

Bolded, red values indicate reported concentration exceeds corresponding DEQ RBC.

Yellow highlight indicates the sample was removed via excavation.

mg/kg = milligrams per kilogram (parts per million).

NV=This chemical is considered "nonvolatile" for purposes of the exposure calculations.

>Max=The constituent RBC for this pathway is greater than 1,000,000 mg/kg.

Therefore, these substances are not expected to pose risks in the scenario shown.

RBCss = Soil Ingestion, Dermal Contact, and Inhalation

RBCso = Volatilization to Outdoor Air

RBCsi = Vapor Intrusion in Buildings

Occ. = Occupational Receptor

Con & Ex = Construction and Excavation Worker

>Csat=This soil RBC exceeds the limit of three-phase partitioning. Soil concentrations in excess of Csat indicate that free product might be present

APPENDIX A

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Tuesday, July 6, 2021

Dave Borys
HydroCon LLC
314 W 15th Street Suite 300
Vancouver, WA 98660

RE: A1E1199 - NW Natural 2600 SE 9th Ave - 2021-

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A1E1199, which was received by the laboratory on 5/28/2021 at 12:50:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: KFriscia@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	0.5 degC
-----------	----------

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

Kevin Friscia, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300
Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
UST-NE-11.0	A1E1199-01	Soil	05/28/21 09:00	05/28/21 12:50
UST-E-13.0	A1E1199-02	Soil	05/28/21 09:15	05/28/21 12:50
UST-W-13.0	A1E1199-03	Soil	05/28/21 09:40	05/28/21 12:50
EXSW-N-8.0	A1E1199-04	Soil	05/28/21 10:15	05/28/21 12:50
EXSW-S-8.0	A1E1199-05	Soil	05/28/21 10:20	05/28/21 12:50
EXSW-E-9.0	A1E1199-06	Soil	05/28/21 10:30	05/28/21 12:50
EXSW-W-10.0	A1E1199-07	Soil	05/28/21 10:35	05/28/21 12:50
EXF-14.5	A1E1199-08	Soil	05/28/21 11:30	05/28/21 12:50
EXSW-NE-11.0	A1E1199-09	Soil	05/28/21 11:35	05/28/21 12:50

Apex Laboratories

Kevin Friscia, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1)				Matrix: Soil		Batch: 1051102		
Diesel	4220	---	262	mg/kg dry	10	06/01/21 08:13	NWTPH-Dx	
Oil	ND	---	524	mg/kg dry	10	06/01/21 08:13	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 92 %		Limits: 50-150 %	10	06/01/21 08:13	NWTPH-Dx	S-05
UST-E-13.0 (A1E1199-02RE1)				Matrix: Soil		Batch: 1051102		
Diesel	10600	---	481	mg/kg dry	20	06/01/21 08:54	NWTPH-Dx	
Oil	ND	---	962	mg/kg dry	20	06/01/21 08:54	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: %		Limits: 50-150 %	20	06/01/21 08:54	NWTPH-Dx	S-01
UST-W-13.0 (A1E1199-03)				Matrix: Soil		Batch: 1051102		
Diesel	63.6	---	26.2	mg/kg dry	1	05/29/21 00:19	NWTPH-Dx	F-11
Oil	ND	---	52.4	mg/kg dry	1	05/29/21 00:19	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 82 %		Limits: 50-150 %	1	05/29/21 00:19	NWTPH-Dx	
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil		Batch: 1051102		
Diesel	ND	---	26.6	mg/kg dry	1	05/29/21 00:40	NWTPH-Dx	
Oil	ND	---	53.2	mg/kg dry	1	05/29/21 00:40	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 85 %		Limits: 50-150 %	1	05/29/21 00:40	NWTPH-Dx	
EXSW-S-8.0 (A1E1199-05)				Matrix: Soil		Batch: 1051102		
Diesel	38.8	---	25.8	mg/kg dry	1	05/29/21 01:00	NWTPH-Dx	F-17
Oil	108	---	51.6	mg/kg dry	1	05/29/21 01:00	NWTPH-Dx	F-17
Surrogate: o-Terphenyl (Surr)		Recovery: 84 %		Limits: 50-150 %	1	05/29/21 01:00	NWTPH-Dx	
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1051102		
Diesel	2110	---	26.1	mg/kg dry	1	05/29/21 01:21	NWTPH-Dx	
Oil	ND	---	52.3	mg/kg dry	1	05/29/21 01:21	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 84 %		Limits: 50-150 %	1	05/29/21 01:21	NWTPH-Dx	
EXSW-W-10.0 (A1E1199-07)				Matrix: Soil		Batch: 1051102		
Diesel	ND	---	25.0	mg/kg dry	1	05/29/21 01:42	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg dry	1	05/29/21 01:42	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 82 %		Limits: 50-150 %	1	05/29/21 01:42	NWTPH-Dx	
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1051102		
Diesel	166	---	25.0	mg/kg dry	1	05/29/21 02:02	NWTPH-Dx	

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1051102		
Oil	ND	---	50.0	mg/kg dry	1	05/29/21 02:02	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 79 %		Limits: 50-150 %	1	05/29/21 02:02	NWTPH-Dx	
EXSW-NE-11.0 (A1E1199-09)				Matrix: Soil		Batch: 1051102		
Diesel	ND	---	26.8	mg/kg dry	1	05/28/21 22:17	NWTPH-Dx	
Oil	ND	---	53.6	mg/kg dry	1	05/28/21 22:17	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 85 %		Limits: 50-150 %	1	05/28/21 22:17	NWTPH-Dx	

Apex Laboratories

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503-718-2323

ORELAP ID: OR100062

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1)								
				Matrix: Soil	Batch: 1060017			
Gasoline Range Organics	582	---	29.6	mg/kg dry	200	06/01/21 18:46	NWTPH-Gx (MS)	F-09
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	116 %	Limits: 50-150 %	1	06/01/21 18:46	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			82 %	50-150 %	1	06/01/21 18:46	NWTPH-Gx (MS)	
UST-E-13.0 (A1E1199-02RE1)								
				Matrix: Soil	Batch: 1060017			
Gasoline Range Organics	40.8	---	7.25	mg/kg dry	50	06/01/21 18:19	NWTPH-Gx (MS)	F-09
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	100 %	Limits: 50-150 %	1	06/01/21 18:19	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			82 %	50-150 %	1	06/01/21 18:19	NWTPH-Gx (MS)	
UST-W-13.0 (A1E1199-03)								
				Matrix: Soil	Batch: 1060017			
Gasoline Range Organics	ND	---	7.91	mg/kg dry	50	06/01/21 12:00	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	95 %	Limits: 50-150 %	1	06/01/21 12:00	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			83 %	50-150 %	1	06/01/21 12:00	NWTPH-Gx (MS)	
EXSW-N-8.0 (A1E1199-04)								
				Matrix: Soil	Batch: 1060017			
Gasoline Range Organics	ND	---	7.92	mg/kg dry	50	06/01/21 12:27	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	93 %	Limits: 50-150 %	1	06/01/21 12:27	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			83 %	50-150 %	1	06/01/21 12:27	NWTPH-Gx (MS)	
EXSW-S-8.0 (A1E1199-05)								
				Matrix: Soil	Batch: 1060017			
Gasoline Range Organics	ND	---	7.46	mg/kg dry	50	06/01/21 12:54	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	93 %	Limits: 50-150 %	1	06/01/21 12:54	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			83 %	50-150 %	1	06/01/21 12:54	NWTPH-Gx (MS)	
EXSW-E-9.0 (A1E1199-06)								
				Matrix: Soil	Batch: 1060017			
Gasoline Range Organics	50.1	---	6.97	mg/kg dry	50	06/01/21 14:43	NWTPH-Gx (MS)	F-09
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	112 %	Limits: 50-150 %	1	06/01/21 14:43	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			91 %	50-150 %	1	06/01/21 14:43	NWTPH-Gx (MS)	
EXSW-W-10.0 (A1E1199-07)								
				Matrix: Soil	Batch: 1060018			
Gasoline Range Organics	ND	---	6.08	mg/kg dry	50	06/01/21 12:39	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	98 %	Limits: 50-150 %	1	06/01/21 12:39	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	1	06/01/21 12:39	NWTPH-Gx (MS)	
EXF-14.5 (A1E1199-08)								
				Matrix: Soil	Batch: 1060018			
Gasoline Range Organics	11.7	---	5.97	mg/kg dry	50	06/01/21 13:06	NWTPH-Gx (MS)	F-09

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503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1060018		
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery: 104 %	Limits: 50-150 %	1	06/01/21 13:06	NWTPH-Gx (MS)		
1,4-Difluorobenzene (Sur)		100 %	50-150 %	1	06/01/21 13:06	NWTPH-Gx (MS)		
EXSW-NE-11.0 (A1E1199-09)				Matrix: Soil		Batch: 1060018		
Gasoline Range Organics	ND	---	7.10	mg/kg dry	50	06/01/21 14:00	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery: 106 %	Limits: 50-150 %	1	06/01/21 14:00	NWTPH-Gx (MS)		
1,4-Difluorobenzene (Sur)		102 %	50-150 %	1	06/01/21 14:00	NWTPH-Gx (MS)		

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ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0591	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Toluene	ND	---	0.296	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Ethylbenzene	0.461	---	0.148	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Xylenes, total	1.82	---	0.443	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Naphthalene	ND	---	0.961	mg/kg dry	200	06/01/21 18:46	5035A/8260D	R-02
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	109 %	Limits: 80-120 %	1	06/01/21 18:46	5035A/8260D	
Toluene-d8 (Surr)			96 %	80-120 %	1	06/01/21 18:46	5035A/8260D	
4-Bromofluorobenzene (Surr)			104 %	79-120 %	1	06/01/21 18:46	5035A/8260D	
UST-E-13.0 (A1E1199-02RE1)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0145	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Toluene	ND	---	0.0725	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Ethylbenzene	ND	---	0.0363	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Xylenes, total	ND	---	0.109	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Naphthalene	ND	---	0.163	mg/kg dry	50	06/01/21 18:19	5035A/8260D	R-02
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	108 %	Limits: 80-120 %	1	06/01/21 18:19	5035A/8260D	
Toluene-d8 (Surr)			92 %	80-120 %	1	06/01/21 18:19	5035A/8260D	
4-Bromofluorobenzene (Surr)			107 %	79-120 %	1	06/01/21 18:19	5035A/8260D	
UST-W-13.0 (A1E1199-03)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0158	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Toluene	ND	---	0.0791	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Ethylbenzene	ND	---	0.0395	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Xylenes, total	ND	---	0.119	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Naphthalene	ND	---	0.158	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	108 %	Limits: 80-120 %	1	06/01/21 12:00	5035A/8260D	
Toluene-d8 (Surr)			91 %	80-120 %	1	06/01/21 12:00	5035A/8260D	
4-Bromofluorobenzene (Surr)			107 %	79-120 %	1	06/01/21 12:00	5035A/8260D	
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0158	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Toluene	ND	---	0.0792	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Ethylbenzene	ND	---	0.0396	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Xylenes, total	ND	---	0.119	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Naphthalene	ND	---	0.158	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	109 %	Limits: 80-120 %	1	06/01/21 12:27	5035A/8260D	
Toluene-d8 (Surr)			92 %	80-120 %	1	06/01/21 12:27	5035A/8260D	

Apex Laboratories

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil		Batch: 1060017		
<i>Surrogate: 4-Bromofluorobenzene (Surr)</i>		<i>Recovery: 108 %</i>	<i>Limits: 79-120 %</i>	<i>1</i>	<i>06/01/21 12:27</i>	<i>5035A/8260D</i>		
EXSW-S-8.0 (A1E1199-05)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0149	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Toluene	ND	---	0.0746	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Ethylbenzene	ND	---	0.0373	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Xylenes, total	ND	---	0.112	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Naphthalene	ND	---	0.149	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 111 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>06/01/21 12:54</i>	<i>5035A/8260D</i>		
<i>Toluene-d8 (Surr)</i>		<i>92 %</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:54</i>	<i>5035A/8260D</i>		
<i>4-Bromofluorobenzene (Surr)</i>		<i>106 %</i>	<i>79-120 %</i>	<i>1</i>	<i>06/01/21 12:54</i>	<i>5035A/8260D</i>		
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Toluene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Ethylbenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Xylenes, total	ND	---	0.105	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Naphthalene	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 107 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>06/01/21 14:43</i>	<i>5035A/8260D</i>		
<i>Toluene-d8 (Surr)</i>		<i>96 %</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 14:43</i>	<i>5035A/8260D</i>		
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>	<i>79-120 %</i>	<i>1</i>	<i>06/01/21 14:43</i>	<i>5035A/8260D</i>		
EXSW-W-10.0 (A1E1199-07)				Matrix: Soil		Batch: 1060018		
Benzene	ND	---	0.0122	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Toluene	ND	---	0.0608	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Ethylbenzene	ND	---	0.0304	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Xylenes, total	ND	---	0.0912	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Naphthalene	ND	---	0.122	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 107 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>06/01/21 12:39</i>	<i>5035A/8260D</i>		
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:39</i>	<i>5035A/8260D</i>		
<i>4-Bromofluorobenzene (Surr)</i>		<i>110 %</i>	<i>79-120 %</i>	<i>1</i>	<i>06/01/21 12:39</i>	<i>5035A/8260D</i>		
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1060018		
Benzene	ND	---	0.0119	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Toluene	ND	---	0.0597	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Ethylbenzene	ND	---	0.0298	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Xylenes, total	ND	---	0.0895	mg/kg dry	50	06/01/21 13:06	5035A/8260D	

Apex Laboratories

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503-718-2323
ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300
Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXF-14.5 (A1E1199-08)		Matrix: Soil			Batch: 1060018			
Naphthalene	ND	---	0.119	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	105 %	Limits:	80-120 %	1	06/01/21 13:06	5035A/8260D
Toluene-d8 (Surr)			97 %		80-120 %	1	06/01/21 13:06	5035A/8260D
4-Bromofluorobenzene (Surr)			103 %		79-120 %	1	06/01/21 13:06	5035A/8260D
EXSW-NE-11.0 (A1E1199-09)		Matrix: Soil			Batch: 1060018			
Benzene	ND	---	0.0142	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Toluene	ND	---	0.0710	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Ethylbenzene	ND	---	0.0355	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Xylenes, total	ND	---	0.106	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Naphthalene	ND	---	0.142	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	115 %	Limits:	80-120 %	1	06/01/21 14:00	5035A/8260D
Toluene-d8 (Surr)			97 %		80-120 %	1	06/01/21 14:00	5035A/8260D
4-Bromofluorobenzene (Surr)			104 %		79-120 %	1	06/01/21 14:00	5035A/8260D

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Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1060017		
Acetone	ND	---	1.39	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Acrylonitrile	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Benzene	ND	---	0.0139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Bromobenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Bromochloromethane	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Bromodichloromethane	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Bromoform	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Bromomethane	ND	---	0.697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	Q-30
2-Butanone (MEK)	ND	---	0.697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
n-Butylbenzene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
sec-Butylbenzene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
tert-Butylbenzene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Carbon disulfide	ND	---	0.697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Carbon tetrachloride	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Chlorobenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Chloroethane	ND	---	0.697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	Q-30
Chloroform	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Chloromethane	ND	---	0.349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
2-Chlorotoluene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
4-Chlorotoluene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Dibromochloromethane	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2-Dibromo-3-chloropropane	ND	---	0.349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Dibromomethane	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2-Dichlorobenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,3-Dichlorobenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,4-Dichlorobenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Dichlorodifluoromethane	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,1-Dichloroethane	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,1-Dichloroethene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
cis-1,2-Dichloroethene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
trans-1,2-Dichloroethene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2-Dichloropropane	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,3-Dichloropropane	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
2,2-Dichloropropane	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,1-Dichloropropene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
cis-1,3-Dichloropropene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
trans-1,3-Dichloropropene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil	Batch: 1060017			
Ethylbenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Hexachlorobutadiene	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
2-Hexanone	ND	---	0.697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Isopropylbenzene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
4-Isopropyltoluene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Methylene chloride	ND	---	0.697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
4-Methyl-2-pentanone (MiBK)	ND	---	0.697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Naphthalene	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
n-Propylbenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Styrene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Toluene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2,3-Trichlorobenzene	ND	---	0.349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2,4-Trichlorobenzene	ND	---	0.349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,1,1-Trichloroethane	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,1,2-Trichloroethane	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Trichloroethene (TCE)	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Trichlorofluoromethane	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	Q-30
1,2,3-Trichloropropane	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Vinyl chloride	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
m,p-Xylene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
o-Xylene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	107 %	Limits:	80-120 %	1	06/01/21 14:43	5035A/8260D
Toluene-d8 (Surr)			96 %		80-120 %	1	06/01/21 14:43	5035A/8260D
4-Bromofluorobenzene (Surr)			105 %		79-120 %	1	06/01/21 14:43	5035A/8260D

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503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: NW Natural 2600 SE 9th Ave

Project Number: 2021-

Project Manager: Dave Borys

Report ID:

A1E1199 - 07 06 21 0951

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1060397		
Acenaphthene	ND	---	0.502	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	R-02
Acenaphthylene	ND	---	0.160	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	R-02
Anthracene	ND	---	0.120	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	R-02
Benz(a)anthracene	0.171	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Benzo(a)pyrene	0.223	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Benzo(b)fluoranthene	0.310	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Benzo(k)fluoranthene	0.0743	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	M-05
Benzo(g,h,i)perylene	0.342	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Chrysene	0.296	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Dibenz(a,h)anthracene	0.0424	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Fluoranthene	0.500	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Fluorene	1.52	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	0.292	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
1-Methylnaphthalene	0.222	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	Q-42
2-Methylnaphthalene	0.537	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	Q-42
Naphthalene	0.320	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Phenanthrene	2.91	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Pyrene	0.667	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Dibenzofuran	0.431	---	0.0132	mg/kg dry	1	06/09/21 11:47	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 93 %		Limits: 44-120 %	1	06/09/21 11:47	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		78 %		54-127 %	1	06/09/21 11:47	EPA 8270E SIM	

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503-718-2323

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HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1) Matrix: Soil								
Batch: 1051101								
Lead	240	---	0.268	mg/kg dry	10	06/02/21 01:17	EPA 6020B	
UST-E-13.0 (A1E1199-02RE1) Matrix: Soil								
Batch: 1051101								
Lead	6.12	---	0.252	mg/kg dry	10	06/02/21 01:22	EPA 6020B	
UST-W-13.0 (A1E1199-03RE1) Matrix: Soil								
Batch: 1051101								
Lead	11.7	---	0.261	mg/kg dry	10	06/02/21 01:36	EPA 6020B	
EXSW-N-8.0 (A1E1199-04RE1) Matrix: Soil								
Batch: 1051101								
Lead	15.9	---	0.272	mg/kg dry	10	06/02/21 01:41	EPA 6020B	
EXSW-S-8.0 (A1E1199-05RE1) Matrix: Soil								
Batch: 1051101								
Lead	169	---	0.273	mg/kg dry	10	06/02/21 01:46	EPA 6020B	
EXSW-E-9.0 (A1E1199-06) Matrix: Soil								
Batch: 1051101								
Arsenic	6.88	---	1.29	mg/kg dry	10	05/29/21 02:11	EPA 6020B	
Barium	179	---	1.29	mg/kg dry	10	05/29/21 02:11	EPA 6020B	
Cadmium	ND	---	0.258	mg/kg dry	10	05/29/21 02:11	EPA 6020B	
Chromium	22.2	---	1.29	mg/kg dry	10	05/29/21 02:11	EPA 6020B	
Mercury	ND	---	0.103	mg/kg dry	10	05/29/21 02:11	EPA 6020B	
Selenium	ND	---	1.29	mg/kg dry	10	05/29/21 02:11	EPA 6020B	
Silver	ND	---	0.258	mg/kg dry	10	05/29/21 02:11	EPA 6020B	
EXSW-E-9.0 (A1E1199-06RE1) Matrix: Soil								
Batch: 1051101								
Lead	48.7	---	0.258	mg/kg dry	10	06/02/21 01:51	EPA 6020B	
EXSW-W-10.0 (A1E1199-07RE1) Matrix: Soil								
Batch: 1051101								
Lead	33.8	---	0.250	mg/kg dry	10	06/02/21 01:56	EPA 6020B	

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ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXF-14.5 (A1E1199-08RE1)				Matrix: Soil				
Batch: 1051101								
Lead	86.1	---	0.219	mg/kg dry	10	06/02/21 02:00	EPA 6020B	
EXSW-NE-11.0 (A1E1199-09RE1)				Matrix: Soil				
Batch: 1051101								
Lead	16.2	---	0.268	mg/kg dry	10	06/02/21 02:05	EPA 6020B	

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ANALYTICAL SAMPLE RESULTS

Soluble Cyanide by Flow Analysis (Non-Aqueous/Water Leach)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1060415		
Total Cyanide	4.00	---	0.133	mg/kg dry	1	06/09/21 16:57	EPA 9013M/9012	B-02

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6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062**HydroCon LLC**314 W 15th Street Suite 300
Vancouver, WA 98660Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01)				Matrix: Soil		Batch: 1051069		
% Solids	74.6	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
UST-E-13.0 (A1E1199-02)				Matrix: Soil		Batch: 1051069		
% Solids	79.2	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
UST-W-13.0 (A1E1199-03)				Matrix: Soil		Batch: 1051069		
% Solids	73.8	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil		Batch: 1051069		
% Solids	73.9	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-S-8.0 (A1E1199-05)				Matrix: Soil		Batch: 1051069		
% Solids	76.4	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1051069		
% Solids	74.8	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-W-10.0 (A1E1199-07)				Matrix: Soil		Batch: 1051069		
% Solids	80.8	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1051069		
% Solids	88.2	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-NE-11.0 (A1E1199-09)				Matrix: Soil		Batch: 1051069		
% Solids	72.9	---	1.00	%	1	06/01/21 08:26	EPA 8000D	

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Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1051102 - EPA 3546 (Fuels)						Soil						
Blank (1051102-BLK1)		Prepared: 05/28/21 14:57 Analyzed: 05/28/21 22:13										
NWTPH-Dx												
Diesel	ND	---	18.2	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	---	36.4	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 89 %		Limits: 50-150 %		Dilution: 1x						
LCS (1051102-BS1)		Prepared: 05/28/21 14:57 Analyzed: 05/28/21 22:34										
NWTPH-Dx												
Diesel	97.9	---	20.0	mg/kg wet	1	125	---	78	73 - 115%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 92 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (1051102-DUP3)		Prepared: 05/28/21 14:57 Analyzed: 06/01/21 08:34										
QC Source Sample: UST-NE-11.0 (A1E1199-01RE1)												
NWTPH-Dx												
Diesel	5660	---	258	mg/kg dry	10	---	4220	---	---	29	30%	
Oil	ND	---	516	mg/kg dry	10	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		Recovery: 86 %		Limits: 50-150 %		Dilution: 10x					S-05	

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Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
Blank (1060017-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:33										
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 89 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		83 %		50-150 %		"						
LCS (1060017-BS2)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:06										
NWTPH-Gx (MS)												
Gasoline Range Organics	22.2	---	5.00	mg/kg wet	50	25.0	---	89	80 - 120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 91 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		84 %		50-150 %		"						

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QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060018 - EPA 5035A						Soil						
Blank (1060018-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 12:12										
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 95 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		100 %		50-150 %		"						
LCS (1060018-BS2)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:45										
NWTPH-Gx (MS)												
Gasoline Range Organics	24.3	---	5.00	mg/kg wet	50	25.0	---	97	80 - 120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 98 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		98 %		50-150 %		"						

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
Blank (1060017-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:33										
5035A/8260D												
Benzene	ND	---	0.00667	mg/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Xylenes, total	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 109 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		96 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		106 %		79-120 %		"						
LCS (1060017-BS1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 10:40										
5035A/8260D												
Benzene	1.01	---	0.0100	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
Toluene	0.894	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
Ethylbenzene	0.893	---	0.0250	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
Xylenes, total	2.65	---	0.0750	mg/kg wet	50	3.00	---	88	80 - 120%	---	---	
Naphthalene	0.897	---	0.100	mg/kg wet	50	1.00	---	90	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 108 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		97 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		103 %		79-120 %		"						

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060018 - EPA 5035A						Soil						
Blank (1060018-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 12:12										
5035A/8260D												
Benzene	ND	---	0.00667	mg/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Xylenes, total	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery:		110 %	Limits: 80-120 %		Dilution: 1x					
Toluene-d8 (Surr)				99 %	80-120 %		"					
4-Bromofluorobenzene (Surr)				105 %	79-120 %		"					
LCS (1060018-BS1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:18										
5035A/8260D												
Benzene	1.17	---	0.0100	mg/kg wet	50	1.00	---	117	80 - 120%	---	---	
Toluene	0.990	---	0.0500	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Ethylbenzene	1.06	---	0.0250	mg/kg wet	50	1.00	---	106	80 - 120%	---	---	
Xylenes, total	3.01	---	0.0750	mg/kg wet	50	3.00	---	100	80 - 120%	---	---	
Naphthalene	0.994	---	0.100	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery:		111 %	Limits: 80-120 %		Dilution: 1x					
Toluene-d8 (Surr)				98 %	80-120 %		"					
4-Bromofluorobenzene (Surr)				100 %	79-120 %		"					

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Kevin Friscia, Project Manager

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
Blank (1060017-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:33										
5035A/8260D												
Acetone	ND	---	0.667	mg/kg wet	50	---	---	---	---	---	---	
Acrylonitrile	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
Benzene	ND	---	0.00667	mg/kg wet	50	---	---	---	---	---	---	
Bromobenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Bromochloromethane	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Bromodichloromethane	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Bromoform	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
Bromomethane	ND	---	0.333	mg/kg wet	50	---	---	---	---	---	---	Q-30
2-Butanone (MEK)	ND	---	0.333	mg/kg wet	50	---	---	---	---	---	---	
n-Butylbenzene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Carbon disulfide	ND	---	0.333	mg/kg wet	50	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Chloroethane	ND	---	0.333	mg/kg wet	50	---	---	---	---	---	---	Q-30
Chloroform	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Chloromethane	ND	---	0.167	mg/kg wet	50	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Dibromochloromethane	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	0.167	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Dibromomethane	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
Blank (1060017-BLK1)		Prepared: 06/01/21 09:00		Analyzed: 06/01/21 11:33								
1,2-Dichloropropane	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
2-Hexanone	ND	---	0.333	mg/kg wet	50	---	---	---	---	---	---	
Isopropylbenzene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Methylene chloride	ND	---	0.333	mg/kg wet	50	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	0.333	mg/kg wet	50	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Styrene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	0.167	mg/kg wet	50	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	0.167	mg/kg wet	50	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	Q-30
1,2,3-Trichloropropane	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
m,p-Xylene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
o-Xylene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 109 %		Limits: 80-120 %		Dilution: 1x						

Surr: 1,4-Difluorobenzene (Surr)

Recovery: 109 %

Limits: 80-120 %

Dilution: 1x

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
Blank (1060017-BLK1)		Prepared: 06/01/21 09:00		Analyzed: 06/01/21 11:33								
Surr: Toluene-d8 (Surr)		Recovery: 96 %		Limits: 80-120 %		Dilution: 1x						
4-Bromofluorobenzene (Surr)		106 %		79-120 %		"						
LCS (1060017-BS1)		Prepared: 06/01/21 09:00		Analyzed: 06/01/21 10:40								
5035A/8260D												
Acetone	1.71	---	1.00	mg/kg wet	50	2.00	---	85	80 - 120%	---	---	
Acrylonitrile	1.04	---	0.100	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
Benzene	1.01	---	0.0100	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
Bromobenzene	1.01	---	0.0250	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
Bromochloromethane	0.987	---	0.0500	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Bromodichloromethane	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
Bromoform	1.47	---	0.100	mg/kg wet	50	1.00	---	147	80 - 120%	---	---	Q-56
Bromomethane	0.648	---	0.500	mg/kg wet	50	1.00	---	65	80 - 120%	---	---	Q-30
2-Butanone (MEK)	1.85	---	0.500	mg/kg wet	50	2.00	---	92	80 - 120%	---	---	
n-Butylbenzene	0.813	---	0.0500	mg/kg wet	50	1.00	---	81	80 - 120%	---	---	
sec-Butylbenzene	0.870	---	0.0500	mg/kg wet	50	1.00	---	87	80 - 120%	---	---	
tert-Butylbenzene	0.788	---	0.0500	mg/kg wet	50	1.00	---	79	80 - 120%	---	---	Q-55
Carbon disulfide	0.864	---	0.500	mg/kg wet	50	1.00	---	86	80 - 120%	---	---	
Carbon tetrachloride	1.45	---	0.0500	mg/kg wet	50	1.00	---	145	80 - 120%	---	---	Q-56
Chlorobenzene	0.972	---	0.0250	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
Chloroethane	0.604	---	0.500	mg/kg wet	50	1.00	---	60	80 - 120%	---	---	Q-30
Chloroform	0.983	---	0.0500	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
Chloromethane	1.04	---	0.250	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
2-Chlorotoluene	1.00	---	0.0500	mg/kg wet	50	1.00	---	100	80 - 120%	---	---	
4-Chlorotoluene	0.892	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
Dibromochloromethane	1.21	---	0.100	mg/kg wet	50	1.00	---	121	80 - 120%	---	---	Q-56
1,2-Dibromo-3-chloropropane	1.01	---	0.250	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
1,2-Dibromoethane (EDB)	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
Dibromomethane	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
1,2-Dichlorobenzene	0.995	---	0.0250	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
1,3-Dichlorobenzene	1.01	---	0.0250	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
1,4-Dichlorobenzene	0.917	---	0.0250	mg/kg wet	50	1.00	---	92	80 - 120%	---	---	
Dichlorodifluoromethane	1.04	---	0.100	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
1,1-Dichloroethane	1.01	---	0.0250	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	

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Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
LCS (1060017-BS1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 10:40										
1,2-Dichloroethane (EDC)	0.919	---	0.0250	mg/kg wet	50	1.00	---	92	80 - 120%	---	---	
1,1-Dichloroethene	0.920	---	0.0250	mg/kg wet	50	1.00	---	92	80 - 120%	---	---	
cis-1,2-Dichloroethene	0.969	---	0.0250	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
trans-1,2-Dichloroethene	0.965	---	0.0250	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
1,2-Dichloropropane	1.03	---	0.0250	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
1,3-Dichloropropane	0.965	---	0.0500	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
2,2-Dichloropropane	1.22	---	0.0500	mg/kg wet	50	1.00	---	122	80 - 120%	---	---	Q-56
1,1-Dichloropropene	0.949	---	0.0500	mg/kg wet	50	1.00	---	95	80 - 120%	---	---	
cis-1,3-Dichloropropene	0.963	---	0.0500	mg/kg wet	50	1.00	---	96	80 - 120%	---	---	
trans-1,3-Dichloropropene	0.939	---	0.0500	mg/kg wet	50	1.00	---	94	80 - 120%	---	---	
Ethylbenzene	0.893	---	0.0250	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
Hexachlorobutadiene	0.981	---	0.100	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
2-Hexanone	1.59	---	0.500	mg/kg wet	50	2.00	---	79	80 - 120%	---	---	Q-55
Isopropylbenzene	0.889	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
4-Isopropyltoluene	0.878	---	0.0500	mg/kg wet	50	1.00	---	88	80 - 120%	---	---	
Methylene chloride	1.04	---	0.500	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
4-Methyl-2-pentanone (MiBK)	1.61	---	0.500	mg/kg wet	50	2.00	---	80	80 - 120%	---	---	
Methyl tert-butyl ether (MTBE)	1.09	---	0.0500	mg/kg wet	50	1.00	---	109	80 - 120%	---	---	
Naphthalene	0.897	---	0.100	mg/kg wet	50	1.00	---	90	80 - 120%	---	---	
n-Propylbenzene	0.883	---	0.0250	mg/kg wet	50	1.00	---	88	80 - 120%	---	---	
Styrene	0.913	---	0.0500	mg/kg wet	50	1.00	---	91	80 - 120%	---	---	
1,1,1,2-Tetrachloroethane	1.37	---	0.0250	mg/kg wet	50	1.00	---	137	80 - 120%	---	---	Q-56
1,1,2,2-Tetrachloroethane	0.976	---	0.0500	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
Tetrachloroethene (PCE)	1.00	---	0.0250	mg/kg wet	50	1.00	---	100	80 - 120%	---	---	
Toluene	0.894	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
1,2,3-Trichlorobenzene	1.02	---	0.250	mg/kg wet	50	1.00	---	102	80 - 120%	---	---	
1,2,4-Trichlorobenzene	0.953	---	0.250	mg/kg wet	50	1.00	---	95	80 - 120%	---	---	
1,1,1-Trichloroethane	1.05	---	0.0250	mg/kg wet	50	1.00	---	105	80 - 120%	---	---	
1,1,2-Trichloroethane	1.00	---	0.0250	mg/kg wet	50	1.00	---	100	80 - 120%	---	---	
Trichloroethene (TCE)	1.10	---	0.0250	mg/kg wet	50	1.00	---	110	80 - 120%	---	---	
Trichlorofluoromethane	0.636	---	0.100	mg/kg wet	50	1.00	---	64	80 - 120%	---	---	Q-30
1,2,3-Trichloropropane	0.977	---	0.0500	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
1,2,4-Trimethylbenzene	0.924	---	0.0500	mg/kg wet	50	1.00	---	92	80 - 120%	---	---	
1,3,5-Trimethylbenzene	0.925	---	0.0500	mg/kg wet	50	1.00	---	93	80 - 120%	---	---	

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A							Soil					
LCS (1060017-BS1)		Prepared: 06/01/21 09:00		Analyzed: 06/01/21 10:40								
Vinyl chloride	0.851	---	0.0250	mg/kg wet	50	1.00	---	85	80 - 120%	---	---	
m,p-Xylene	1.76	---	0.0500	mg/kg wet	50	2.00	---	88	80 - 120%	---	---	
o-Xylene	0.889	---	0.0250	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 108 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		97 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		103 %		79-120 %		"						

Apex Laboratories

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Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060397 - EPA 3546						Soil						
Blank (1060397-BLK1)		Prepared: 06/09/21 07:27 Analyzed: 06/09/21 10:57										
EPA 8270E SIM												
Acenaphthene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Anthracene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Chrysene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Fluoranthene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Fluorene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Naphthalene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Phenanthrene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Pyrene	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Dibenzofuran	ND	---	0.00909	mg/kg wet	1	---	---	---	---	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 104 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		86 %		54-127 %		"						

LCS (1060397-BS1)

Prepared: 06/09/21 07:27 Analyzed: 06/09/21 11:22

EPA 8270E SIM

Acenaphthene	0.755	---	0.0100	mg/kg wet	1	0.800	---	94	40 - 123%	---	---
Acenaphthylene	0.792	---	0.0100	mg/kg wet	1	0.800	---	99	32 - 132%	---	---
Anthracene	0.724	---	0.0100	mg/kg wet	1	0.800	---	91	47 - 123%	---	---
Benz(a)anthracene	0.727	---	0.0100	mg/kg wet	1	0.800	---	91	49 - 126%	---	---
Benzo(a)pyrene	0.724	---	0.0100	mg/kg wet	1	0.800	---	91	45 - 129%	---	---
Benzo(b)fluoranthene	0.633	---	0.0100	mg/kg wet	1	0.800	---	79	45 - 132%	---	---
Benzo(k)fluoranthene	0.659	---	0.0100	mg/kg wet	1	0.800	---	82	47 - 132%	---	---
Benzo(g,h,i)perylene	0.661	---	0.0100	mg/kg wet	1	0.800	---	83	43 - 134%	---	---
Chrysene	0.755	---	0.0100	mg/kg wet	1	0.800	---	94	50 - 124%	---	---

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060397 - EPA 3546						Soil						
LCS (1060397-BS1)						Prepared: 06/09/21 07:27 Analyzed: 06/09/21 11:22						
Dibenz(a,h)anthracene	0.784	---	0.0100	mg/kg wet	1	0.800	---	98	45 - 134%	---	---	
Fluoranthene	0.632	---	0.0100	mg/kg wet	1	0.800	---	79	50 - 127%	---	---	
Fluorene	0.685	---	0.0100	mg/kg wet	1	0.800	---	86	43 - 125%	---	---	
Indeno(1,2,3-cd)pyrene	0.693	---	0.0100	mg/kg wet	1	0.800	---	87	45 - 133%	---	---	
1-Methylnaphthalene	0.702	---	0.0100	mg/kg wet	1	0.800	---	88	40 - 120%	---	---	
2-Methylnaphthalene	0.707	---	0.0100	mg/kg wet	1	0.800	---	88	38 - 122%	---	---	
Naphthalene	0.701	---	0.0100	mg/kg wet	1	0.800	---	88	35 - 123%	---	---	
Phenanthrene	0.717	---	0.0100	mg/kg wet	1	0.800	---	90	50 - 121%	---	---	
Pyrene	0.639	---	0.0100	mg/kg wet	1	0.800	---	80	47 - 127%	---	---	
Dibenzofuran	0.715	---	0.0100	mg/kg wet	1	0.800	---	89	44 - 120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)												
			Recovery: 102 %	Limits: 44-120 %	Dilution: 1x							
p-Terphenyl-d14 (Surr)			77 %	54-127 %	"							

Duplicate (1060397-DUP1)

Prepared: 06/09/21 07:27 Analyzed: 06/09/21 12:12

QC Source Sample: EXSW-E-9.0 (A1E1199-06)**EPA 8270E SIM**

Acenaphthene	ND	---	0.504	mg/kg dry	1	---	ND	---	---	---	30%	R-02
Acenaphthylene	ND	---	0.191	mg/kg dry	1	---	ND	---	---	---	30%	R-02
Anthracene	ND	---	0.121	mg/kg dry	1	---	ND	---	---	---	30%	R-02
Benz(a)anthracene	0.136	---	0.0133	mg/kg dry	1	---	0.171	---	---	22	30%	
Benzo(a)pyrene	0.192	---	0.0133	mg/kg dry	1	---	0.223	---	---	15	30%	
Benzo(b)fluoranthene	0.236	---	0.0133	mg/kg dry	1	---	0.310	---	---	27	30%	
Benzo(k)fluoranthene	0.0704	---	0.0133	mg/kg dry	1	---	0.0743	---	---	5	30%	M-05
Benzo(g,h,i)perylene	0.275	---	0.0133	mg/kg dry	1	---	0.342	---	---	22	30%	
Chrysene	0.223	---	0.0133	mg/kg dry	1	---	0.296	---	---	28	30%	
Dibenz(a,h)anthracene	0.0304	---	0.0133	mg/kg dry	1	---	0.0424	---	---	33	30%	Q-05
Fluoranthene	0.401	---	0.0133	mg/kg dry	1	---	0.500	---	---	22	30%	
Fluorene	1.29	---	0.0133	mg/kg dry	1	---	1.52	---	---	16	30%	
Indeno(1,2,3-cd)pyrene	0.233	---	0.0133	mg/kg dry	1	---	0.292	---	---	22	30%	
1-Methylnaphthalene	0.149	---	0.0133	mg/kg dry	1	---	0.222	---	---	39	30%	Q-17
2-Methylnaphthalene	0.327	---	0.0133	mg/kg dry	1	---	0.537	---	---	49	30%	Q-17
Naphthalene	0.366	---	0.0133	mg/kg dry	1	---	0.320	---	---	13	30%	
Phenanthrene	2.28	---	0.0133	mg/kg dry	1	---	2.91	---	---	24	30%	
Pyrene	0.542	---	0.0133	mg/kg dry	1	---	0.667	---	---	21	30%	

Apex Laboratories

Kevin Friscia, Project Manager

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060397 - EPA 3546						Soil						
Duplicate (1060397-DUP1)		Prepared: 06/09/21 07:27 Analyzed: 06/09/21 12:12										
QC Source Sample: EXSW-E-9.0 (A1E1199-06)												
Dibenzofuran	0.354	---	0.0133	mg/kg dry	1	---	0.431	---	---	20	30%	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 97 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		78 %		54-127 %		"						
Matrix Spike (1060397-MS1)		Prepared: 06/09/21 07:27 Analyzed: 06/09/21 12:38										
QC Source Sample: EXSW-E-9.0 (A1E1199-06)												
EPA 8270E SIM												
Acenaphthene	1.37	---	0.0133	mg/kg dry	1	1.06	ND	82	40 - 123%	---	---	
Acenaphthylene	1.09	---	0.0133	mg/kg dry	1	1.06	ND	89	32 - 132%	---	---	
Anthracene	0.986	---	0.0133	mg/kg dry	1	1.06	ND	82	47 - 123%	---	---	
Benz(a)anthracene	1.00	---	0.0133	mg/kg dry	1	1.06	0.171	78	49 - 126%	---	---	
Benzo(a)pyrene	1.04	---	0.0133	mg/kg dry	1	1.06	0.223	77	45 - 129%	---	---	
Benzo(b)fluoranthene	0.983	---	0.0133	mg/kg dry	1	1.06	0.310	64	45 - 132%	---	---	
Benzo(k)fluoranthene	0.839	---	0.0133	mg/kg dry	1	1.06	0.0743	72	47 - 132%	---	---	
Benzo(g,h,i)perylene	1.04	---	0.0133	mg/kg dry	1	1.06	0.342	65	43 - 134%	---	---	
Chrysene	1.05	---	0.0133	mg/kg dry	1	1.06	0.296	71	50 - 124%	---	---	
Dibenz(a,h)anthracene	0.900	---	0.0133	mg/kg dry	1	1.06	0.0424	81	45 - 134%	---	---	
Fluoranthene	1.30	---	0.0133	mg/kg dry	1	1.06	0.500	75	50 - 127%	---	---	
Fluorene	2.17	---	0.0133	mg/kg dry	1	1.06	1.52	62	43 - 125%	---	---	
Indeno(1,2,3-cd)pyrene	1.02	---	0.0133	mg/kg dry	1	1.06	0.292	68	45 - 133%	---	---	
1-Methylnaphthalene	0.966	---	0.0133	mg/kg dry	1	1.06	0.222	70	40 - 120%	---	---	
2-Methylnaphthalene	1.15	---	0.0133	mg/kg dry	1	1.06	0.537	58	38 - 122%	---	---	
Naphthalene	1.23	---	0.0133	mg/kg dry	1	1.06	0.320	86	35 - 123%	---	---	
Phenanthrene	3.16	---	0.0133	mg/kg dry	1	1.06	2.91	24	50 - 121%	---	---	Q-03
Pyrene	1.45	---	0.0133	mg/kg dry	1	1.06	0.667	74	47 - 127%	---	---	
Dibenzofuran	1.18	---	0.0133	mg/kg dry	1	1.06	0.431	71	44 - 120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 92 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		73 %		54-127 %		"						

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503-718-2323

ORELAP ID: OR100062

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314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1051101 - EPA 3051A						Soil						
Blank (1051101-BLK1)		Prepared: 05/28/21 14:38 Analyzed: 05/29/21 00:15										
EPA 6020B												
Arsenic	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	---	0.192	mg/kg wet	10	---	---	---	---	---	---	
Chromium	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Mercury	ND	---	0.0769	mg/kg wet	10	---	---	---	---	---	---	
Selenium	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Silver	ND	---	0.192	mg/kg wet	10	---	---	---	---	---	---	
Blank (1051101-BLK2)		Prepared: 05/28/21 14:38 Analyzed: 06/01/21 23:54										
EPA 6020B												
Lead	ND	---	0.192	mg/kg wet	10	---	---	---	---	---	---	Q-16
LCS (1051101-BS1)		Prepared: 05/28/21 14:38 Analyzed: 05/29/21 00:19										
EPA 6020B												
Arsenic	49.5	---	1.00	mg/kg wet	10	50.0	---	99	80 - 120%	---	---	
Barium	49.0	---	1.00	mg/kg wet	10	50.0	---	98	80 - 120%	---	---	
Cadmium	49.7	---	0.200	mg/kg wet	10	50.0	---	99	80 - 120%	---	---	
Chromium	49.7	---	1.00	mg/kg wet	10	50.0	---	99	80 - 120%	---	---	
Mercury	1.10	---	0.0800	mg/kg wet	10	1.00	---	110	80 - 120%	---	---	
Selenium	24.4	---	1.00	mg/kg wet	10	25.0	---	98	80 - 120%	---	---	
Silver	25.2	---	0.200	mg/kg wet	10	25.0	---	101	80 - 120%	---	---	
LCS (1051101-BS2)		Prepared: 05/28/21 14:38 Analyzed: 06/01/21 23:59										
EPA 6020B												
Lead	50.0	---	0.200	mg/kg wet	10	50.0	---	100	80 - 120%	---	---	Q-16

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951**

QUALITY CONTROL (QC) SAMPLE RESULTS

Soluble Cyanide by Flow Analysis (Non-Aqueous/Water Leach)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060415 - DI Leach						Soil						
Blank (1060415-BLK1)		Prepared: 06/09/21 09:14 Analyzed: 06/09/21 16:53										
EPA 9013M/9012												
Total Cyanide	ND	---	0.100	mg/kg wet	1	---	---	---	---	---	---	B-02
LCS (1060415-BS1)		Prepared: 06/09/21 09:14 Analyzed: 06/09/21 16:55										
EPA 9013M/9012												
Total Cyanide	4.11	---	0.100	mg/kg wet	1	4.00	---	103	76 - 120%	---	---	B-02
Duplicate (1060415-DUP1)		Prepared: 06/09/21 09:14 Analyzed: 06/09/21 16:59										
QC Source Sample: EXSW-E-9.0 (A1E1199-06)												
EPA 9013M/9012												
Total Cyanide	3.94	---	0.133	mg/kg dry	1	---	4.00	---	---	2	20%	B-02
Matrix Spike (1060415-MS1)		Prepared: 06/09/21 09:14 Analyzed: 06/09/21 17:01										
QC Source Sample: EXSW-E-9.0 (A1E1199-06)												
EPA 9013M/9012												
Total Cyanide	9.51	---	0.131	mg/kg dry	1	5.24	4.00	105	76 - 120%	---	---	B-02

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HydroCon LLC

314 W 15th Street Suite 300
Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1051069 - Total Solids (Dry Weight)							Soil					
Duplicate (1051069-DUP5)		Prepared: 05/28/21 19:41 Analyzed: 06/01/21 08:26										
QC Source Sample: EXSW-N-8.0 (A1E1199-04)												
EPA 8000D												
% Solids	73.6	---	1.00	%	1	---	73.9	---	---	0.4	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Kevin Friscia, Project Manager

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**ANALYTICAL REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951****SAMPLE PREPARATION INFORMATION****Diesel and/or Oil Hydrocarbons by NWTPH-Dx****Prep: EPA 3546 (Fuels)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1051102							
A1E1199-01RE1	Soil	NWTPH-Dx	05/28/21 09:00	05/28/21 14:57	10.23g/5mL	10g/5mL	0.98
A1E1199-02RE1	Soil	NWTPH-Dx	05/28/21 09:15	05/28/21 14:57	10.5g/5mL	10g/5mL	0.95
A1E1199-03	Soil	NWTPH-Dx	05/28/21 09:40	05/28/21 14:57	10.33g/5mL	10g/5mL	0.97
A1E1199-04	Soil	NWTPH-Dx	05/28/21 10:15	05/28/21 14:57	10.17g/5mL	10g/5mL	0.98
A1E1199-05	Soil	NWTPH-Dx	05/28/21 10:20	05/28/21 14:57	10.15g/5mL	10g/5mL	0.99
A1E1199-06	Soil	NWTPH-Dx	05/28/21 10:30	05/28/21 14:57	10.23g/5mL	10g/5mL	0.98
A1E1199-07	Soil	NWTPH-Dx	05/28/21 10:35	05/28/21 14:57	10.5g/5mL	10g/5mL	0.95
A1E1199-08	Soil	NWTPH-Dx	05/28/21 11:30	05/28/21 14:57	10.34g/5mL	10g/5mL	0.97
A1E1199-09	Soil	NWTPH-Dx	05/28/21 11:35	05/28/21 14:57	10.24g/5mL	10g/5mL	0.98

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx**Prep: EPA 5035A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1060017							
A1E1199-01RE1	Soil	NWTPH-Gx (MS)	05/28/21 09:00	05/28/21 09:00	5.89g/5mL	5g/5mL	0.85
A1E1199-02RE1	Soil	NWTPH-Gx (MS)	05/28/21 09:15	05/28/21 09:15	5.31g/5mL	5g/5mL	0.94
A1E1199-03	Soil	NWTPH-Gx (MS)	05/28/21 09:40	05/28/21 09:40	5.52g/5mL	5g/5mL	0.91
A1E1199-04	Soil	NWTPH-Gx (MS)	05/28/21 10:15	05/28/21 10:15	5.49g/5mL	5g/5mL	0.91
A1E1199-05	Soil	NWTPH-Gx (MS)	05/28/21 10:20	05/28/21 10:20	5.54g/5mL	5g/5mL	0.90
A1E1199-06	Soil	NWTPH-Gx (MS)	05/28/21 10:30	05/28/21 10:30	6.33g/5mL	5g/5mL	0.79
Batch: 1060018							
A1E1199-07	Soil	NWTPH-Gx (MS)	05/28/21 10:35	05/28/21 10:35	6.33g/5mL	5g/5mL	0.79
A1E1199-08	Soil	NWTPH-Gx (MS)	05/28/21 11:30	05/28/21 11:30	5.35g/5mL	5g/5mL	0.94
A1E1199-09	Soil	NWTPH-Gx (MS)	05/28/21 11:35	05/28/21 11:35	6.54g/5mL	5g/5mL	0.77

BTEX+N Compounds by EPA 8260D**Prep: EPA 5035A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1060017							
A1E1199-01RE1	Soil	5035A/8260D	05/28/21 09:00	05/28/21 09:00	5.89g/5mL	5g/5mL	0.85
A1E1199-02RE1	Soil	5035A/8260D	05/28/21 09:15	05/28/21 09:15	5.31g/5mL	5g/5mL	0.94
A1E1199-03	Soil	5035A/8260D	05/28/21 09:40	05/28/21 09:40	5.52g/5mL	5g/5mL	0.91
A1E1199-04	Soil	5035A/8260D	05/28/21 10:15	05/28/21 10:15	5.49g/5mL	5g/5mL	0.91
A1E1199-05	Soil	5035A/8260D	05/28/21 10:20	05/28/21 10:20	5.54g/5mL	5g/5mL	0.90

Apex Laboratories

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Kevin Friscia, Project Manager

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**HydroCon LLC**314 W 15th Street Suite 300
Vancouver, WA 98660Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951****SAMPLE PREPARATION INFORMATION****BTEX+N Compounds by EPA 8260D****Prep: EPA 5035A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A1E1199-06	Soil	5035A/8260D	05/28/21 10:30	05/28/21 10:30	6.33g/5mL	5g/5mL	0.79
Batch: 1060018							
A1E1199-07	Soil	5035A/8260D	05/28/21 10:35	05/28/21 10:35	6.33g/5mL	5g/5mL	0.79
A1E1199-08	Soil	5035A/8260D	05/28/21 11:30	05/28/21 11:30	5.35g/5mL	5g/5mL	0.94
A1E1199-09	Soil	5035A/8260D	05/28/21 11:35	05/28/21 11:35	6.54g/5mL	5g/5mL	0.77

Volatile Organic Compounds by EPA 8260D**Prep: EPA 5035A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A1E1199-06	Soil	5035A/8260D	05/28/21 10:30	05/28/21 10:30	6.33g/5mL	5g/5mL	0.79
Batch: 1060017							

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM**Prep: EPA 3546**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A1E1199-06	Soil	EPA 8270E SIM	05/28/21 10:30	06/09/21 07:27	10.12g/5mL	10g/5mL	0.99
Batch: 1060397							

Total Metals by EPA 6020B (ICPMS)**Prep: EPA 3051A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1051101							
A1E1199-01RE1	Soil	EPA 6020B	05/28/21 09:00	05/28/21 14:38	0.5g/50mL	0.5g/50mL	1.00
A1E1199-02RE1	Soil	EPA 6020B	05/28/21 09:15	05/28/21 14:38	0.501g/50mL	0.5g/50mL	1.00
A1E1199-03RE1	Soil	EPA 6020B	05/28/21 09:40	05/28/21 14:38	0.518g/50mL	0.5g/50mL	0.97
A1E1199-04RE1	Soil	EPA 6020B	05/28/21 10:15	05/28/21 14:38	0.497g/50mL	0.5g/50mL	1.01
A1E1199-05RE1	Soil	EPA 6020B	05/28/21 10:20	05/28/21 14:38	0.48g/50mL	0.5g/50mL	1.04
A1E1199-06	Soil	EPA 6020B	05/28/21 10:30	05/28/21 14:38	0.519g/50mL	0.5g/50mL	0.96
A1E1199-06RE1	Soil	EPA 6020B	05/28/21 10:30	05/28/21 14:38	0.519g/50mL	0.5g/50mL	0.96
A1E1199-07RE1	Soil	EPA 6020B	05/28/21 10:35	05/28/21 14:38	0.495g/50mL	0.5g/50mL	1.01
A1E1199-08RE1	Soil	EPA 6020B	05/28/21 11:30	05/28/21 14:38	0.518g/50mL	0.5g/50mL	0.97
A1E1199-09RE1	Soil	EPA 6020B	05/28/21 11:35	05/28/21 14:38	0.512g/50mL	0.5g/50mL	0.98

Apex Laboratories

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6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 07 06 21 0951****SAMPLE PREPARATION INFORMATION****Soluble Cyanide by Flow Analysis (Non-Aqueous/Water Leach)****Prep: DI Leach**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1060415							
A1E1199-06	Soil	EPA 9013M/9012	05/28/21 10:30	06/09/21 09:14	2.5169g/50mL	2.5g/50mL	0.99

Percent Dry Weight**Prep: Total Solids (Dry Weight)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1051069							
A1E1199-01	Soil	EPA 8000D	05/28/21 09:00	05/28/21 19:41			NA
A1E1199-02	Soil	EPA 8000D	05/28/21 09:15	05/28/21 19:41			NA
A1E1199-03	Soil	EPA 8000D	05/28/21 09:40	05/28/21 19:41			NA
A1E1199-04	Soil	EPA 8000D	05/28/21 10:15	05/28/21 19:41			NA
A1E1199-05	Soil	EPA 8000D	05/28/21 10:20	05/28/21 19:41			NA
A1E1199-06	Soil	EPA 8000D	05/28/21 10:30	05/28/21 19:41			NA
A1E1199-07	Soil	EPA 8000D	05/28/21 10:35	05/28/21 19:41			NA
A1E1199-08	Soil	EPA 8000D	05/28/21 11:30	05/28/21 19:41			NA
A1E1199-09	Soil	EPA 8000D	05/28/21 11:35	05/28/21 19:41			NA

Apex Laboratories

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- B-02** Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- F-09** Results in the Gasoline Range are impacted by the overlap of a heavier fuel hydrocarbon product.
- F-11** The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- F-17** No fuel pattern detected. The Diesel result represents carbon range C12 to C24, and the Oil result represents >C24 to C40.
- M-05** Estimated results. Peak separation for structural isomers is insufficient for accurate quantification.
- Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-05** Analyses are not controlled on RPD values from sample and duplicate concentrations that are below 5 times the reporting level.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-17** RPD between original and duplicate sample is outside of established control limits.
- Q-30** Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
- Q-42** Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- Q-55** Daily CCV/LCS recovery for this analyte was below the +/-20% criteria listed in EPA 8260, however there is adequate sensitivity to ensure detection at the reporting level.
- Q-56** Daily CCV/LCS recovery for this analyte was above the +/-20% criteria listed in EPA 8260
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- S-01** Surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interference.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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Project Number: **2021-**

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Report ID:

A1E1199 - 07 06 21 0951

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported.
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).

If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

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Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

Kevin Friscia, Project Manager

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300
Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 07 06 21 0951

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation)

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
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All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Project: NW Natural 2600 SE 9th Ave

Project Number: 2021-

Project Manager: Dave Borys

Report ID:

A1E1199 - 07 06 21 0951

APEX LABS		CHAIN OF CUSTODY		Lab # A1E1199		COC 1 of 1																		
Company: HYDROCON		Project Mgr: DAVE BORYS		Project Name: NW NATURAL 2600 SE 9TH AVE		Project #: 2021-																		
Address: 314 W 15TH ST STE 300 VANCOUVER, WA		Phone:		Email: MICHAEL@HYDROCON.NET		PO #																		
Sampled by: MICHAEL WHITSON		Site Location:		ANALYSIS REQUEST																				
SAMPLE ID		LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-DX	NWTPH-GX	8260 BTEX + N	8260 RBDN VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pest	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Bi, Cd, Ca, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Se, Ag, Na, Ti, V, Zn	(TOTAL) DISS. TCLP	TCLP Metals (8)	Archive	
UST-NE-11.0			05/28/21	0900	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
UST-E-18.0			05/28/21	0915	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
UST-W-18.0			05/28/21	0940	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXSN-N-8.0			1015	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXSN-S-8.0			1020	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXSN-E-9.0			1030	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXSN-W-10.0			1035	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXF-14.5			1130	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXSN-NE-11.0			1135	S	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Normal Turn Around Time (TAT) - 10 Business Days

TAT Requested (circle) 1 Day 2 Day 3 Day 4 Day 5 Day Other: _____

SPECIAL INSTRUCTIONS: RUSH TAT REQUESTED

RELINQUISHED BY:		RECEIVED BY:	
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>
Date: 05/28/21	Date: 05/28/21	Date: 05/28/21	Date: 05/28/21
Printed Name: MICHAEL WHITSON	Printed Name: <i>[Name]</i>	Printed Name: <i>[Name]</i>	Printed Name: <i>[Name]</i>
Company: HCE	Company: <i>[Company]</i>	Company: <i>[Company]</i>	Company: <i>[Company]</i>

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: NW Natural 2600 SE 9th Ave

Project Number: 2021-

Project Manager: Dave Borys

Report ID:

A1E1199 - 07 06 21 0951

APEX LABS COOLER RECEIPT FORM

Client: Hydrocon Element WO#: A1 E1199Project/Project #: NW Natural 2600 SE 9th Ave / 2021-

Delivery Info:

Date/time received: 5/28/21 @ 1250 By: 80Delivered by: Apex ☐ Client ☒ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐Cooler Inspection Date/time inspected: 5/28/21 @ 1250 By: (80)Chain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>0.5</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>NY (80) 5/28/21</u>						
Ice type: (Gel/Real/Other)	<u>real</u>						
Condition:	<u>good</u>						

Cooler out of temp? (Y/N) (N) Possible reason why: _____Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐Sample Inspection: Date/time inspected: 5/28/21 @ 1339 By: (80)All samples intact? Yes ☒ No ☐ Comments: _____Bottle labels/COCs agree? Yes ☒ No ☐ Comments: _____COC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments: _____Do VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments: _____

Water samples: pH checked: Yes ☐ No ☐ NA ☒ pH appropriate? Yes ☐ No ☐ NA ☒

Comments: _____

Additional information: _____

Labeled by: (80) Witness: (signature) Cooler Inspected by: (80)

Apex Laboratories

Kevin Friscia, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

APPENDIX B
DISPOSAL RECIEPTS

 ket Date	Ticket ID	MAS Unique ID	Customer	Generator	Profile	Truck	Material Description	Origin	Rate	Rate Unit	Tons
6/17/2021	1607508	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	03-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	25.26
6/17/2021	1607509	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	003-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	29.14
6/17/2021	1607515	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	17-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	28.1
6/17/2021	1607566	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	003-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	30.19
6/17/2021	1607570	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	517-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	27.32
6/17/2021	1607572	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	07-16-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	27.7
6/17/2021	1607574	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	03-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	26.04
6/17/2021	1607584	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	17-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	26.5
6/17/2021	1607598	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	003-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	26.9
6/17/2021	1607601	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	07-16-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	26.18
6/17/2021	1607605	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	03-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	25.58
6/17/2021	1607606	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	517-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	25.74
6/17/2021	1607611	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	17-SIDESPILL	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	25.97
6/28/2021	1608743	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	405-PUP	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	30.32
6/28/2021	1608747	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	724-PUP	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	29.74
6/28/2021	1608748	240318503001	MOORE EXCAVATION INC	168-NW NATURAL PORTLAND	134178OR	252-PUP	Cont. Soil - Petroleum, PMT is RGC	MULT-IN	\$35.39	TON	29

439.68



Chemical Waste Management Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA ID # ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND

T/D: 11:08:35 2021-06-28
ID: R87 TRK ID: 482388
99080 lb G

OUTBOUND

T/D: 12:04:20 2021-06-28
ID: R87 TRK ID: 482388
99080 lb G
39420 lb PT
59660 lb N

NET 29.83 TONS

GENERATOR _____



Chemical Waste Management Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA ID # ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND

T/D: 11:25:16 2021-06-28
ID: R82 TRK ID: 482389
104200 lb G

OUTBOUND

T/D: 12:05:55 2021-06-28
ID: R82 TRK ID: 482389
104200 lb G
42460 lb PT
61740 lb N

NET 30.87 TONS

GENERATOR _____



Chemical Waste Management Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D # ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND

T/D: 11:29:01 2021-06-28
ID: R86 TRK ID: 482391
98360 lb G

OUTBOUND

T/D: 12:07:25 2021-06-28
ID: R86 TRK ID: 482391
98360 lb G
39560 lb PT
58800 lb N

NET 29.40 TONS

GENERATOR _____



**Chemical Waste Management
Of The Northwest**

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643

EPA I.D.# ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND

T/D: 10:07:35 2021-07-06

ID: R83 TRK ID: 48249801

103440 lb G

OUTBOUND

T/D: 10:47:45 2021-07-06

ID: R83 TRK ID: 48249801

103440 lb G

41340 lb PT

62100 lb N

NET 31.05 TONS

GENERATOR _____

903-ARLINGTON, OR



**Chemical Waste Management
Of The Northwest**

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND

T/D: 10:10:13 2021-07-06
ID: R88 TRK ID: 482499
99120 lb G

OUTBOUND

T/D: 11:02:09 2021-07-06
ID: R88 TRK ID: 482499
99120 lb G
39420 lb PT
59700 lb N

NET 29.85 TONS

GENERATOR _____

803-ARLINGTON, OR



**Chemical Waste Management
Of The Northwest**

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND
T/D: 10:14:12 2021-07-06
ID: R87 TRK ID: 482500
99560 lb G

OUTBOUND
T/D: 11:01:36 2021-07-06
ID: R87 TRK ID: 482500
99560 lb G
39380 lb PT
60180 lb N

NET 30.09 TONS

GENERATOR _____

903-ARLINGTON_OR



Chemical Waste Management Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA ID.# ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND

T/D: 13:34:28 2021-07-06
ID: R85 TRK ID: 482504
101120 lb G

OUTBOUND

T/D: 14:09:28 2021-07-06
ID: R85 TRK ID: 482504
101120 lb G
39420 lb PT
61700 lb N

NET 30.85 TONS

GENERATOR _____

7 METAL RECYCLING, INC.
: RIVERGATE SCRAP METALS

N COLUMBIA BLVD
T LAND, OR 97203

83-3324

WEIGHT TICKET

Recv Date: 06/08/2021

Receiver #: 1311030

Control #: 1311030

Contract:

nt: MEI GROUP
5501 NE 223 RD AVE

FAIRVIEW

OR 97024

modity	Description	Gross	Tare	Deduct	Net
	SHEARABLE UNPREPARED	49,360	37,940	0	11,420
nt: MEI 517/NW NATURAL		IN: 06/08/2021 8:58:44 AM	OUT: 06/08/2021 9:51:27 AM		
				Totals	11,420

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION



Photo #1 The former UST removed and opened.



Photo #2 Stained soil in tank pit.



Photo #3 Exposed sewer line in east end of pit.



Photo #4 Stained soil and sewer line. Removing visually impacted soil.



Photo #5 View of pit facing west while removing impacted soil



Photo #6 Post soil removal. Small residual soil contamination beneath active sewer line.

APPENDIX A
DEQ FORMS



OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
UNDERGROUND STORAGE TANK PROGRAM

Initial (Twenty Day) Report Form for UST Cleanup Projects

This report is due twenty (20) days from the date of the release.

DEQ USTC File No. 26-21-0510
DEQ Facility ID No. _____
Site Name: NW Natural
Site Address: 2600 SE 9th Ave, Portland, OR 97202

INITIAL CLEANUP INFORMATION

(1) Type of contamination (check ☒ all that apply):

☒ Gasoline ☒ Diesel ☐ Waste Oil ☐ Heating Oil
☒ Other (specify) Lead

(2) Estimate quantity of release (based on information known to date – • select only one):

☒ <100 gal. ☐ 100-499 gal. ☐ 500-999 gal. ☐ 1,000-5,000 gal. ☐ >5,000 gal.

SITE INFORMATION (check ☒ yes or ☐ no)

(3) ☐ Y ☒ N Did any water enter the excavation? If yes, please describe and identify the depth to groundwater in feet below ground surface: _____

(4) ☐ Y ☐ N Was a sheen or odor observed on any water in the excavation?

Note: If groundwater is encountered, soil samples from the soil/water interface must be collected and analyzed for BTEX and by the appropriate TPH method.

At sites where diesel or other non-gasoline products have been released, the water may also have to be screened or tested for polynuclear aromatic hydrocarbons (PAHs). *Please refer to OAR 340-122-0218.*

(5) ☐ Y ☐ N Was water pumped from the excavation?

☐ Y ☐ N If yes, did groundwater recharge within 24 hours after pumping?

Please describe the pumping procedure and disposal option selected for the purged excavation water:

(6) ☐ Y ☐ N Were any water samples collected from the excavation? If yes, please describe: _____

(7) ☒ Y ☐ N Have any soil and/or water sample results been received at this time?
If so, please attach any lab reports.

IF GROUNDWATER HAS BEEN ENCOUNTERED, PLEASE ANSWER QUESTIONS #8-13, BELOW.

IF NO WATER HAS BEEN ENCOUNTERED, PLEASE SKIP TO QUESTION #14

(8) What are the known uses of groundwater within a 500-foot radius of the release site (check ☒ all that apply)?

☒ non-use ☐ industrial ☐ agricultural ☐ drinking supply

(9) If groundwater in this area is being used as a drinking water supply, please check ☒ the type and size of population served by the supply:

☐ Community (community well used for drinking water year round – • select only one)

size: ☐ <1,000 people ☐ 1,000 - 5,000 people ☐ >5,000 people

☐ Intermittent use (public water used for drinking water only on a part-time basis – • select only one)

size: ☐ <50 people ☐ 50 - 300 people ☐ > 300 people

☐ Private wells (individual private well or wells used for drinking water – • select only one)

size: ☐ <10 people ☐ 10 - 25 people ☐ >25 people

(10) ☐ Y ☒ N Is there any evidence this water supply has been or is likely to be impacted from the petroleum product release? If yes, estimate how difficult it would be to replace the existing supply:

☐ bottled water is the only alternative

☐ on-site water treatment; bulk water delivery; new wells are available

☐ able to connect to existing water supply

☐ do not know what alternatives would be available

(11) ☐ Y ☒ N Are/were vapors present in on-site or nearby buildings? If yes:

A. Are you monitoring and/or mitigating any potential fire and safety hazards posed by vapors and free product? Explain: _____

B. Estimate the number of people potentially affected by vapors – • select only one:

☐ 1-2 people ☐ 3-10 people ☐ >10 people

(12) ☐ Y ☒ N Are vapors or is petroleum contamination present in the utility corridors?

If yes, please explain: _____

(13) ☐ Y ☒ N Are natural areas located within 1/4 mile of the site? If so, please describe types (parks, rivers, wetlands, sensitive habitats, etc.) and proximity: _____

(14) ☐ Y ☒ N If groundwater was not encountered in the excavation, do you believe that this cleanup project can be conducted under the requirements for an UST Cleanup Matrix site? If yes, then refer to OAR 340-122-0305 through 0360.

AREA/SITE CONDITIONS:

- (15) Mean annual rainfall: ☐ <20 inches ☒ 20-45 inches ☐ >45 inches
- (16) Soil type(s) of the naturally occurring soils, not the backfill around the tank – • select only one:
- ☐ clays, compact tills, shales, and unfractured metamorphic and igneous rocks
- ☒ sandy loams, loamy sands, silty clays, clay loams, moderately permeable limestone, dolomite, sandstones, moderately fractured igneous and metamorphic rock
- ☐ fine and silty sands, sands and gravels, highly fractured igneous and metamorphic rock, permeable basalts and lavas, karst limestones and dolomites

SOIL MANAGEMENT

- (17) If soil sample results have been received:
☒ Y ☐ N Will the level of contamination detected require removal of contaminated soil for treatment or disposal?
- (18) All contaminated soil temporarily stockpiled on-site prior to treatment or disposal must be contained within a bermed area, kept covered, and the entire area secured to prevent unauthorized access by the public. If you haven't done this, please explain why:

All contaminated soil has been bermed and stockpile on and covered with visqueen.

Note: It is a violation to stockpile petroleum contaminated soil (PCS) on-site for greater than 30 days without a DEQ Solid Waste Letter Authorization (SWLA) Permit.

- (19) If contaminated soil is currently stockpiled on-site, please indicate when disposal will occur or when treatment will begin: Disposal will be in June 2021

- (20) Estimated volume of contaminated soil (specify tons or cubic yards): 100 tons

- (21) Intended disposition of soils (please • select only one):

- ☐ On-site/off-site treatment, Solid Waste Letter Authorization Permit Application attached.
- ☐ Thermal treatment off-site at an authorized facility.
 Facility name: _____
- ☒ Landfill disposal.
 Name of Landfill: Hillsboro Landfill and Chem Waste.

Note: Please attach additional information as necessary to explain any unusual circumstances associated with this project.

This initial report is intended to provide the Department with the basic initial information about activities associated with the release. Future reports should provide a more detailed and complete picture of the cleanup project.

Please be aware that a DEQ permit/authorization is required for the following activities:

- 1) Soil aeration, bioremediation (on-site or off-site), or on-site thermal treatment.
- 2) Water discharges to a stream/storm drain from the excavation or treatment tank.

If these activities will be included in your cleanup project, contact the regional DEQ office for the appropriate application forms, information on permit fees and guidance documents.

THIS REPORT WAS PREPARED BY:

Individual:	David Borys	Date:	6/15/21
Company:	HydroCon Environmental	Phone:	360-719-0682
Address:	314 W 15th St, Suite 300		
City:	Vancouver	State:	WA Zip 98682

**1. Please return this form to the regional office in which the site is located.
If you have questions, call the contact person in your regional office.**

2. For all tanks, except heating oil tanks, you must submit an *UST Decommissioning Checklist and Site Assessment Report* to the appropriate regional office within 30 days of the UST decommissioning.

Failure to do so can result in delays to your project and may result in continued billing for the annual tank permit fees.

**3. Addresses and phone numbers for the regional offices can be found in the *UST Cleanup Manual* or viewed and downloaded from this DEQ Webpage:
<http://www.deq.state.or.us/about/locations.htm>**

**4. Copies of the *UST Cleanup Manual* and other UST program forms and checklists can be viewed and downloaded from DEQ's Website:
<http://www.deq.state.or.us/lq/tanks/ust/index.htm>**

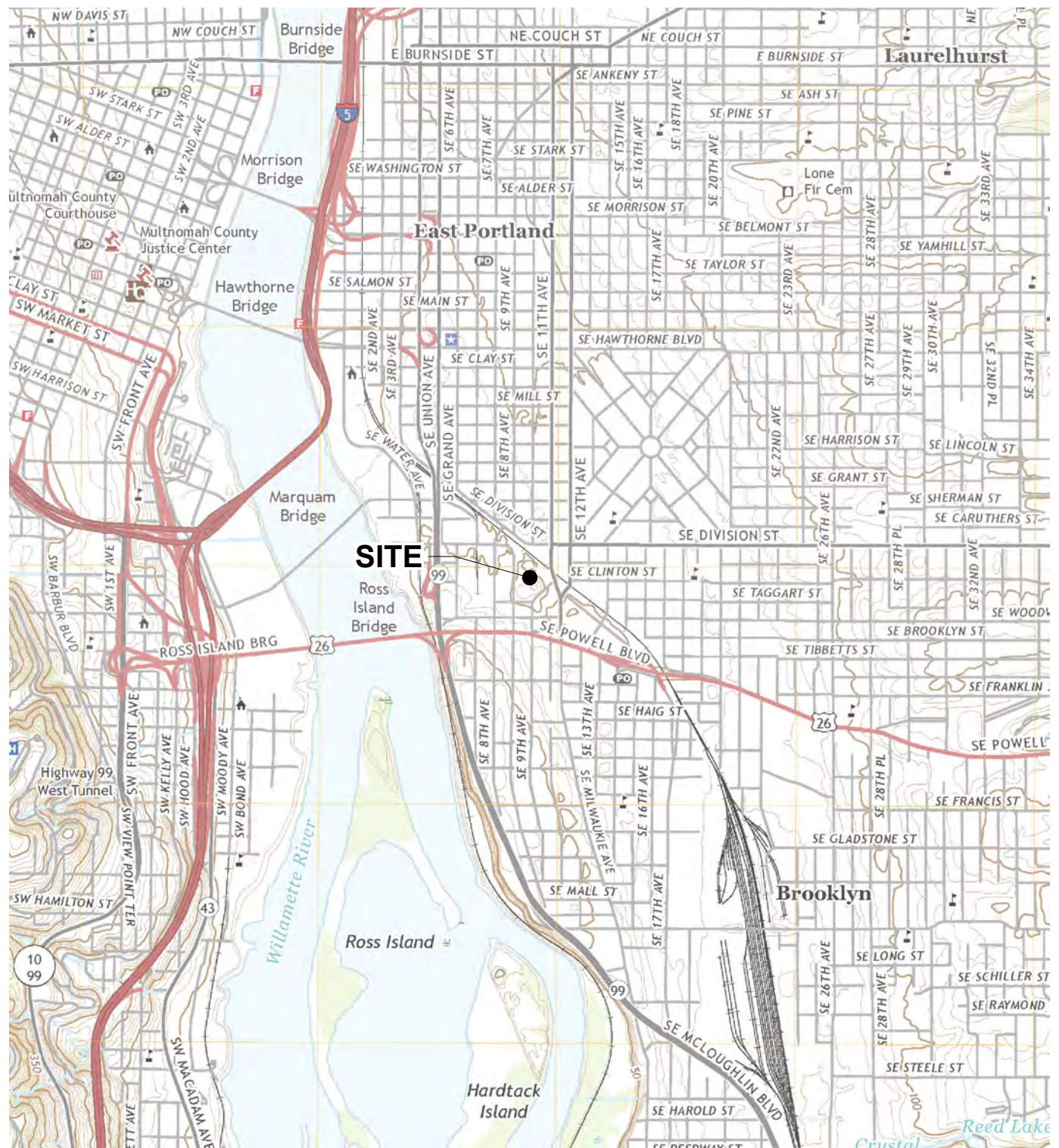
or in the Portland area by calling Steve Paiko at 503-229-6652

or outside the Portland area leaving a message on the UST Help Line (toll-free in Oregon) at 1-800-742-7878

KEEP A COPY OF THIS REPORT FOR YOUR FACILITY RECORDS

Clears All Entries

Print Form



NOTE(S):
 USGS, LAKE OSWEGO AND PORTLAND QUADRANGLES
 OREGON-CLACKAMAS, MULTNOMAH, AND WASHINGTON COS.
 7.5 MINUTE SERIES (TOPOGRAPHIC)

0 2000 4000

SCALE IN FEET
 1" = 2000'



314 W 15th Street, Suite 300, Vancouver, Washington 98660
 Phone 360.703.6079 Fax 360.703.6086

DATE: 6-14-21
 DWN: MW
 CHK: DB
 APPROVED: DB
 PRJ. MGR: DB
 PROJECT NO:
 2021-061

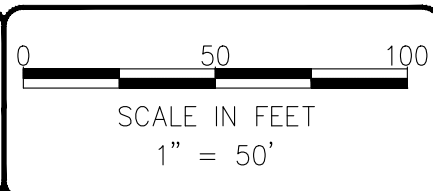
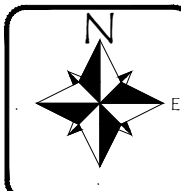
FIGURE 1
 SITE LOCATION MAP
 UST DECOMMISSIONING REPORT
 MEI - NW NATURAL
 2600 SE 9TH AVENUE
 PORTLAND, OREGON

S:\2021 Projects\2021-061 MEI NW Natural\Figures\CAD\2021-061_NW Natural UST.dwg



Legend

— — Subject Site Property Boundary (Approximate)



DATE: 6-14-21
DWN: MW
CHK: DB
APPROVED: DB
PRJ. MGR: DB
PROJECT NO:
2021-061

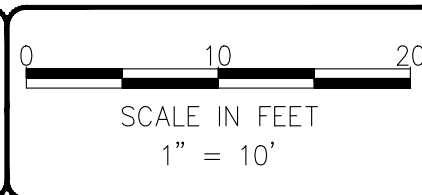
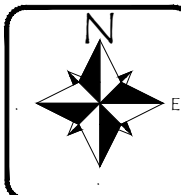
FIGURE 2
SITE VICINITY MAP
UST DECOMMISSIONING REPORT
MEI - NW NATURAL
2600 SE 9TH AVENUE
PORTLAND, OREGON

S:\2021 Projects\2021-061 MEI NW Natural\Figures\CAD\2021-061_NW Natural UST.dwg



Legend

- UST-E-13.0  Soil Sample Location and Identificatoin
- — Subject Site Property Boundary (Approximate)



DATE: 6-14-21
DWN: MW
CHK: DB
APPROVED: DB
PRJ. MGR: DB
PROJECT NO:
2021-061

FIGURE 3

SITE FEATURES AND SAMPLE LOCATIONS

UST DECOMMISSIONING REPORT

MEI - NW NATURAL

2600 SE 9TH AVENUE

PORTLAND, OREGON



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Wednesday, June 2, 2021

Dave Borys
HydroCon LLC
314 W 15th Street Suite 300
Vancouver, WA 98660

RE: A1E1199 - NW Natural 2600 SE 9th Ave - 2021-

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A1E1199, which was received by the laboratory on 5/28/2021 at 12:50:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: KFriscia@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1

0.5 degC



DRAFT REPORT

The results provided in this report are PRELIMINARY and are subject to change based on subsequent analysis, QC validation or final data review. Please use these results with the understanding that they may have not been finalized by the laboratory.

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**HydroCon LLC**314 W 15th Street Suite 300
Vancouver, WA 98660Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533****ANALYTICAL REPORT FOR SAMPLES****SAMPLE INFORMATION**

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
UST-NE-11.0	A1E1199-01	Soil	05/28/21 09:00	05/28/21 12:50
UST-E-13.0	A1E1199-02	Soil	05/28/21 09:15	05/28/21 12:50
UST-W-13.0	A1E1199-03	Soil	05/28/21 09:40	05/28/21 12:50
EXSW-N-8.0	A1E1199-04	Soil	05/28/21 10:15	05/28/21 12:50
EXSW-S-8.0	A1E1199-05	Soil	05/28/21 10:20	05/28/21 12:50
EXSW-E-9.0	A1E1199-06	Soil	05/28/21 10:30	05/28/21 12:50
EXSW-W-10.0	A1E1199-07	Soil	05/28/21 10:35	05/28/21 12:50
EXF-14.5	A1E1199-08	Soil	05/28/21 11:30	05/28/21 12:50
EXSW-NE-11.0	A1E1199-09	Soil	05/28/21 11:35	05/28/21 12:50

DRAFT REPORT

The results provided in this report are PRELIMINARY and are subject to change based on subsequent analysis, QC validation or final data review. Please use these results with the understanding that they may have not been finalized by the laboratory.



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**HydroCon LLC**314 W 15th Street Suite 300
Vancouver, WA 98660Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1)				Matrix: Soil	Batch: 1051102			
Diesel	4220	---	262	mg/kg dry	10	06/01/21 08:13	NWTPH-Dx	
Oil	ND	---	524	mg/kg dry	10	06/01/21 08:13	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 92 %		Limits: 50-150 %	10	06/01/21 08:13	NWTPH-Dx	S-05
UST-E-13.0 (A1E1199-02RE1)				Matrix: Soil	Batch: 1051102			
Diesel	10600	---	481	mg/kg dry	20	06/01/21 08:54	NWTPH-Dx	
Oil	ND	---	962	mg/kg dry	20	06/01/21 08:54	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: %		Limits: 50-150 %	20	06/01/21 08:54	NWTPH-Dx	S-01
UST-W-13.0 (A1E1199-03)				Matrix: Soil	Batch: 1051102			
Diesel	63.6	---	26.2	mg/kg dry	1	05/29/21 00:19	NWTPH-Dx	F-11
Oil	ND	---	52.4	mg/kg dry	1	05/29/21 00:19	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 82 %		Limits: 50-150 %	1	05/29/21 00:19	NWTPH-Dx	
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil	Batch: 1051102			
Diesel	ND	---	26.6	mg/kg dry	1	05/29/21 00:40	NWTPH-Dx	
Oil	ND	---	53.2	mg/kg dry	1	05/29/21 00:40	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 85 %		Limits: 50-150 %	1	05/29/21 00:40	NWTPH-Dx	
EXSW-S-8.0 (A1E1199-05)				Matrix: Soil	Batch: 1051102			
Diesel	38.8	---	25.8	mg/kg dry	1	05/29/21 01:00	NWTPH-Dx	F-17
Oil	108	---	51.6	mg/kg dry	1	05/29/21 01:00	NWTPH-Dx	F-17
Surrogate: o-Terphenyl (Surr)		Recovery: 84 %		Limits: 50-150 %	1	05/29/21 01:00	NWTPH-Dx	
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil	Batch: 1051102			
Diesel	2110	---	26.1	mg/kg dry	1	05/29/21 01:21	NWTPH-Dx	
Oil	ND	---	52.3	mg/kg dry	1	05/29/21 01:21	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 84 %		Limits: 50-150 %	1	05/29/21 01:21	NWTPH-Dx	
EXSW-W-10.0 (A1E1199-07)				Matrix: Soil	Batch: 1051102			
Diesel	ND	---	25.0	mg/kg dry	1	05/29/21 01:42	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg dry	1	05/29/21 01:42	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 82 %		Limits: 50-150 %	1	05/29/21 01:42	NWTPH-Dx	
EXF-14.5 (A1E1199-08)				Matrix: Soil	Batch: 1051102			
Diesel	166	---	25.0	mg/kg dry	1	05/29/21 02:02	NWTPH-Dx	

DRAFT REPORT

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1051102		
Oil	ND	---	50.0	mg/kg dry	1	05/29/21 02:02	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 79 %		Limits: 50-150 %	1	05/29/21 02:02	NWTPH-Dx	
EXSW-NE-11.0 (A1E1199-09)				Matrix: Soil		Batch: 1051102		
Diesel	ND	---	26.8	mg/kg dry	1	05/28/21 22:17	NWTPH-Dx	
Oil	ND	---	53.6	mg/kg dry	1	05/28/21 22:17	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 85 %		Limits: 50-150 %	1	05/28/21 22:17	NWTPH-Dx	

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DRAFT REPORT, DATA SUBJECT TO CHANGE



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Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1)		Matrix: Soil		Batch: 1060017				
Gasoline Range Organics	582	---	29.6	mg/kg dry	200	06/01/21 18:46	NWTPH-Gx (MS)	F-09
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	116 %	Limits: 50-150 %	1	06/01/21 18:46	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			82 %	50-150 %	1	06/01/21 18:46	NWTPH-Gx (MS)	
UST-E-13.0 (A1E1199-02RE1)		Matrix: Soil		Batch: 1060017				
Gasoline Range Organics	40.8	---	7.25	mg/kg dry	50	06/01/21 18:19	NWTPH-Gx (MS)	F-09
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	100 %	Limits: 50-150 %	1	06/01/21 18:19	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			82 %	50-150 %	1	06/01/21 18:19	NWTPH-Gx (MS)	
UST-W-13.0 (A1E1199-03)		Matrix: Soil		Batch: 1060017				
Gasoline Range Organics	ND	---	7.91	mg/kg dry	50	06/01/21 12:00	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	95 %	Limits: 50-150 %	1	06/01/21 12:00	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			83 %	50-150 %	1	06/01/21 12:00	NWTPH-Gx (MS)	
EXSW-N-8.0 (A1E1199-04)		Matrix: Soil		Batch: 1060017				
Gasoline Range Organics	ND	---	7.92	mg/kg dry	50	06/01/21 12:27	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	93 %	Limits: 50-150 %	1	06/01/21 12:27	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			83 %	50-150 %	1	06/01/21 12:27	NWTPH-Gx (MS)	
EXSW-S-8.0 (A1E1199-05)		Matrix: Soil		Batch: 1060017				
Gasoline Range Organics	ND	---	7.46	mg/kg dry	50	06/01/21 12:54	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	93 %	Limits: 50-150 %	1	06/01/21 12:54	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			83 %	50-150 %	1	06/01/21 12:54	NWTPH-Gx (MS)	
EXSW-E-9.0 (A1E1199-06)		Matrix: Soil		Batch: 1060017				
Gasoline Range Organics	50.1	---	6.97	mg/kg dry	50	06/01/21 14:43	NWTPH-Gx (MS)	F-09
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	112 %	Limits: 50-150 %	1	06/01/21 14:43	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			91 %	50-150 %	1	06/01/21 14:43	NWTPH-Gx (MS)	
EXSW-W-10.0 (A1E1199-07)		Matrix: Soil		Batch: 1060018				
Gasoline Range Organics	ND	---	6.08	mg/kg dry	50	06/01/21 12:39	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery:	98 %	Limits: 50-150 %	1	06/01/21 12:39	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	1	06/01/21 12:39	NWTPH-Gx (MS)	
EXF-14.5 (A1E1199-08)		Matrix: Soil		Batch: 1060018				
Gasoline Range Organics	11.7	---	5.97	mg/kg dry	50	06/01/21 13:06	NWTPH-Gx (MS)	F-09

DRAFT REPORT

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ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062**HydroCon LLC**314 W 15th Street Suite 300
Vancouver, WA 98660Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1060018		
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery: 104 %	Limits: 50-150 %	1	06/01/21 13:06	NWTPH-Gx (MS)		
1,4-Difluorobenzene (Sur)		100 %	50-150 %	1	06/01/21 13:06	NWTPH-Gx (MS)		
EXSW-NE-11.0 (A1E1199-09)				Matrix: Soil		Batch: 1060018		
Gasoline Range Organics	ND	---	7.10	mg/kg dry	50	06/01/21 14:00	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery: 106 %	Limits: 50-150 %	1	06/01/21 14:00	NWTPH-Gx (MS)		
1,4-Difluorobenzene (Sur)		102 %	50-150 %	1	06/01/21 14:00	NWTPH-Gx (MS)		

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ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0591	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Toluene	ND	---	0.296	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Ethylbenzene	0.461	---	0.148	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Xylenes, total	1.82	---	0.443	mg/kg dry	200	06/01/21 18:46	5035A/8260D	
Naphthalene	ND	---	0.961	mg/kg dry	200	06/01/21 18:46	5035A/8260D	R-02
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>109 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 18:46</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>96 %</i>		<i>80-120 %</i>	<i>1</i>	<i>06/01/21 18:46</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>104 %</i>		<i>79-120 %</i>	<i>1</i>	<i>06/01/21 18:46</i>	<i>5035A/8260D</i>
UST-E-13.0 (A1E1199-02RE1)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0145	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Toluene	ND	---	0.0725	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Ethylbenzene	ND	---	0.0363	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Xylenes, total	ND	---	0.109	mg/kg dry	50	06/01/21 18:19	5035A/8260D	
Naphthalene	ND	---	0.163	mg/kg dry	50	06/01/21 18:19	5035A/8260D	R-02
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>108 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 18:19</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>92 %</i>		<i>80-120 %</i>	<i>1</i>	<i>06/01/21 18:19</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>107 %</i>		<i>79-120 %</i>	<i>1</i>	<i>06/01/21 18:19</i>	<i>5035A/8260D</i>
UST-W-13.0 (A1E1199-03)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0158	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Toluene	ND	---	0.0791	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Ethylbenzene	ND	---	0.0395	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Xylenes, total	ND	---	0.119	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
Naphthalene	ND	---	0.158	mg/kg dry	50	06/01/21 12:00	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>108 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:00</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>91 %</i>		<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:00</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>107 %</i>		<i>79-120 %</i>	<i>1</i>	<i>06/01/21 12:00</i>	<i>5035A/8260D</i>
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0158	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Toluene	ND	---	0.0792	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Ethylbenzene	ND	---	0.0396	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Xylenes, total	ND	---	0.119	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
Naphthalene	ND	---	0.158	mg/kg dry	50	06/01/21 12:27	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>109 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:27</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>92 %</i>		<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:27</i>	<i>5035A/8260D</i>

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ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil		Batch: 1060017		
<i>Surrogate: 4-Bromofluorobenzene (Surr)</i>		<i>Recovery: 108 %</i>	<i>Limits: 79-120 %</i>	<i>1</i>	<i>06/01/21 12:27</i>	<i>5035A/8260D</i>		
EXSW-S-8.0 (A1E1199-05)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0149	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Toluene	ND	---	0.0746	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Ethylbenzene	ND	---	0.0373	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Xylenes, total	ND	---	0.112	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
Naphthalene	ND	---	0.149	mg/kg dry	50	06/01/21 12:54	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 111 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>06/01/21 12:54</i>	<i>5035A/8260D</i>		
<i>Toluene-d8 (Surr)</i>		<i>92 %</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:54</i>	<i>5035A/8260D</i>		
<i>4-Bromofluorobenzene (Surr)</i>		<i>106 %</i>	<i>79-120 %</i>	<i>1</i>	<i>06/01/21 12:54</i>	<i>5035A/8260D</i>		
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1060017		
Benzene	ND	---	0.0139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Toluene	ND	---	0.0697	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Ethylbenzene	ND	---	0.0349	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Xylenes, total	ND	---	0.105	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
Naphthalene	ND	---	0.139	mg/kg dry	50	06/01/21 14:43	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 107 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>06/01/21 14:43</i>	<i>5035A/8260D</i>		
<i>Toluene-d8 (Surr)</i>		<i>96 %</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 14:43</i>	<i>5035A/8260D</i>		
<i>4-Bromofluorobenzene (Surr)</i>		<i>105 %</i>	<i>79-120 %</i>	<i>1</i>	<i>06/01/21 14:43</i>	<i>5035A/8260D</i>		
EXSW-W-10.0 (A1E1199-07)				Matrix: Soil		Batch: 1060018		
Benzene	ND	---	0.0122	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Toluene	ND	---	0.0608	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Ethylbenzene	ND	---	0.0304	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Xylenes, total	ND	---	0.0912	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
Naphthalene	ND	---	0.122	mg/kg dry	50	06/01/21 12:39	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery: 107 %</i>	<i>Limits: 80-120 %</i>	<i>1</i>	<i>06/01/21 12:39</i>	<i>5035A/8260D</i>		
<i>Toluene-d8 (Surr)</i>		<i>98 %</i>	<i>80-120 %</i>	<i>1</i>	<i>06/01/21 12:39</i>	<i>5035A/8260D</i>		
<i>4-Bromofluorobenzene (Surr)</i>		<i>110 %</i>	<i>79-120 %</i>	<i>1</i>	<i>06/01/21 12:39</i>	<i>5035A/8260D</i>		
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1060018		
Benzene	ND	---	0.0119	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Toluene	ND	---	0.0597	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Ethylbenzene	ND	---	0.0298	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Xylenes, total	ND	---	0.0895	mg/kg dry	50	06/01/21 13:06	5035A/8260D	

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

ANALYTICAL SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
EXF-14.5 (A1E1199-08)		Matrix: Soil			Batch: 1060018			
Naphthalene	ND	---	0.119	mg/kg dry	50	06/01/21 13:06	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	105 %	Limits:	80-120 %	1	06/01/21 13:06	5035A/8260D
Toluene-d8 (Surr)			97 %		80-120 %	1	06/01/21 13:06	5035A/8260D
4-Bromofluorobenzene (Surr)			103 %		79-120 %	1	06/01/21 13:06	5035A/8260D
EXSW-NE-11.0 (A1E1199-09)		Matrix: Soil			Batch: 1060018			
Benzene	ND	---	0.0142	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Toluene	ND	---	0.0710	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Ethylbenzene	ND	---	0.0355	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Xylenes, total	ND	---	0.106	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Naphthalene	ND	---	0.142	mg/kg dry	50	06/01/21 14:00	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	115 %	Limits:	80-120 %	1	06/01/21 14:00	5035A/8260D
Toluene-d8 (Surr)			97 %		80-120 %	1	06/01/21 14:00	5035A/8260D
4-Bromofluorobenzene (Surr)			104 %		79-120 %	1	06/01/21 14:00	5035A/8260D

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ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01RE1)				Matrix: Soil				
Batch: 1051101								
Lead	240	---	0.268	mg/kg dry	10	06/02/21 01:17	EPA 6020B	
UST-E-13.0 (A1E1199-02RE1)				Matrix: Soil				
Batch: 1051101								
Lead	6.12	---	0.252	mg/kg dry	10	06/02/21 01:22	EPA 6020B	
UST-W-13.0 (A1E1199-03RE1)				Matrix: Soil				
Batch: 1051101								
Lead	11.7	---	0.261	mg/kg dry	10	06/02/21 01:36	EPA 6020B	
EXSW-N-8.0 (A1E1199-04RE1)				Matrix: Soil				
Batch: 1051101								
Lead	15.9	---	0.272	mg/kg dry	10	06/02/21 01:41	EPA 6020B	
EXSW-S-8.0 (A1E1199-05RE1)				Matrix: Soil				
Batch: 1051101								
Lead	169	---	0.273	mg/kg dry	10	06/02/21 01:46	EPA 6020B	
EXSW-E-9.0 (A1E1199-06RE1)				Matrix: Soil				
Batch: 1051101								
Lead	48.7	---	0.258	mg/kg dry	10	06/02/21 01:51	EPA 6020B	
EXSW-W-10.0 (A1E1199-07RE1)				Matrix: Soil				
Batch: 1051101								
Lead	33.8	---	0.250	mg/kg dry	10	06/02/21 01:56	EPA 6020B	
EXF-14.5 (A1E1199-08RE1)				Matrix: Soil				
Batch: 1051101								
Lead	86.1	---	0.219	mg/kg dry	10	06/02/21 02:00	EPA 6020B	
EXSW-NE-11.0 (A1E1199-09RE1)				Matrix: Soil				
Batch: 1051101								
Lead	16.2	---	0.268	mg/kg dry	10	06/02/21 02:05	EPA 6020B	

DRAFT REPORT

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
UST-NE-11.0 (A1E1199-01)				Matrix: Soil		Batch: 1051069		
% Solids	74.6	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
UST-E-13.0 (A1E1199-02)				Matrix: Soil		Batch: 1051069		
% Solids	79.2	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
UST-W-13.0 (A1E1199-03)				Matrix: Soil		Batch: 1051069		
% Solids	73.8	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-N-8.0 (A1E1199-04)				Matrix: Soil		Batch: 1051069		
% Solids	73.9	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-S-8.0 (A1E1199-05)				Matrix: Soil		Batch: 1051069		
% Solids	76.4	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-E-9.0 (A1E1199-06)				Matrix: Soil		Batch: 1051069		
% Solids	74.8	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-W-10.0 (A1E1199-07)				Matrix: Soil		Batch: 1051069		
% Solids	80.8	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXF-14.5 (A1E1199-08)				Matrix: Soil		Batch: 1051069		
% Solids	88.2	---	1.00	%	1	06/01/21 08:26	EPA 8000D	
EXSW-NE-11.0 (A1E1199-09)				Matrix: Soil		Batch: 1051069		
% Solids	72.9	---	1.00	%	1	06/01/21 08:26	EPA 8000D	

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1051102 - EPA 3546 (Fuels)						Soil						
Blank (1051102-BLK1)		Prepared: 05/28/21 14:57 Analyzed: 05/28/21 22:13										
NWTPH-Dx												
Diesel	ND	---	18.2	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	---	36.4	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 89 %		Limits: 50-150 %		Dilution: 1x						
LCS (1051102-BS1)		Prepared: 05/28/21 14:57 Analyzed: 05/28/21 22:34										
NWTPH-Dx												
Diesel	97.9	---	20.0	mg/kg wet	1	125	---	78	73 - 115%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 92 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (1051102-DUP3)		Prepared: 05/28/21 14:57 Analyzed: 06/01/21 08:34										
QC Source Sample: UST-NE-11.0 (A1E1199-01RE1)												
NWTPH-Dx												
Diesel	5660	---	258	mg/kg dry	10	---	4220	---	---	29	30%	
Oil	ND	---	516	mg/kg dry	10	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		Recovery: 86 %		Limits: 50-150 %		Dilution: 10x					S-05	

DRAFT REPORT

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
Blank (1060017-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:33										
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 89 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		83 %		50-150 %		"						
LCS (1060017-BS2)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:06										
NWTPH-Gx (MS)												
Gasoline Range Organics	22.2	---	5.00	mg/kg wet	50	25.0	---	89	80 - 120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 91 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		84 %		50-150 %		"						

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QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060018 - EPA 5035A						Soil						
Blank (1060018-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 12:12										
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 95 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		100 %		50-150 %		"						
LCS (1060018-BS2)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:45										
NWTPH-Gx (MS)												
Gasoline Range Organics	24.3	---	5.00	mg/kg wet	50	25.0	---	97	80 - 120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		Recovery: 98 %		Limits: 50-150 %		Dilution: 1x						
1,4-Difluorobenzene (Sur)		98 %		50-150 %		"						

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Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060017 - EPA 5035A						Soil						
Blank (1060017-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:33										
5035A/8260D												
Benzene	ND	---	0.00667	mg/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Xylenes, total	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 109 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		96 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		106 %		79-120 %		"						
LCS (1060017-BS1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 10:40										
5035A/8260D												
Benzene	1.01	---	0.0100	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
Toluene	0.894	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
Ethylbenzene	0.893	---	0.0250	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
Xylenes, total	2.65	---	0.0750	mg/kg wet	50	3.00	---	88	80 - 120%	---	---	
Naphthalene	0.897	---	0.100	mg/kg wet	50	1.00	---	90	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 108 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		97 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		103 %		79-120 %		"						

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HydroCon LLC

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX+N Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1060018 - EPA 5035A						Soil						
Blank (1060018-BLK1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 12:12										
5035A/8260D												
Benzene	ND	---	0.00667	mg/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	0.0333	mg/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.0167	mg/kg wet	50	---	---	---	---	---	---	
Xylenes, total	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	0.0667	mg/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 110 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		99 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		105 %		79-120 %		"						
LCS (1060018-BS1)		Prepared: 06/01/21 09:00 Analyzed: 06/01/21 11:18										
5035A/8260D												
Benzene	1.17	---	0.0100	mg/kg wet	50	1.00	---	117	80 - 120%	---	---	
Toluene	0.990	---	0.0500	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Ethylbenzene	1.06	---	0.0250	mg/kg wet	50	1.00	---	106	80 - 120%	---	---	
Xylenes, total	3.01	---	0.0750	mg/kg wet	50	3.00	---	100	80 - 120%	---	---	
Naphthalene	0.994	---	0.100	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 111 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		98 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		100 %		79-120 %		"						

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1051101 - EPA 3051A							Soil					
Blank (1051101-BLK2)		Prepared: 05/28/21 14:38 Analyzed: 06/01/21 23:54										
EPA 6020B												
Lead	ND	---	0.192	mg/kg wet	10	---	---	---	---	---	---	Q-16
LCS (1051101-BS2)		Prepared: 05/28/21 14:38 Analyzed: 06/01/21 23:59										
EPA 6020B												
Lead	50.0	---	0.200	mg/kg wet	10	50.0	---	100	80 - 120%	---	---	Q-16

DRAFT REPORT

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**ANALYTICAL REPORT****Apex Laboratories, LLC**

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ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533****QUALITY CONTROL (QC) SAMPLE RESULTS****Percent Dry Weight**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1051069 - Total Solids (Dry Weight)							Soil					
Duplicate (1051069-DUP5)		Prepared: 05/28/21 19:41 Analyzed: 06/01/21 08:26										
QC Source Sample: EXSW-N-8.0 (A1E1199-04)												
EPA 8000D												
% Solids	73.6	---	1.00	%	1	---	73.9	---	---	0.4	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

DRAFT REPORT

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**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**HydroCon LLC**314 W 15th Street Suite 300
Vancouver, WA 98660Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533****SAMPLE PREPARATION INFORMATION****Diesel and/or Oil Hydrocarbons by NWTPH-Dx****Prep: EPA 3546 (Fuels)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1051102							
A1E1199-01RE1	Soil	NWTPH-Dx	05/28/21 09:00	05/28/21 14:57	10.23g/5mL	10g/5mL	0.98
A1E1199-02RE1	Soil	NWTPH-Dx	05/28/21 09:15	05/28/21 14:57	10.5g/5mL	10g/5mL	0.95
A1E1199-03	Soil	NWTPH-Dx	05/28/21 09:40	05/28/21 14:57	10.33g/5mL	10g/5mL	0.97
A1E1199-04	Soil	NWTPH-Dx	05/28/21 10:15	05/28/21 14:57	10.17g/5mL	10g/5mL	0.98
A1E1199-05	Soil	NWTPH-Dx	05/28/21 10:20	05/28/21 14:57	10.15g/5mL	10g/5mL	0.99
A1E1199-06	Soil	NWTPH-Dx	05/28/21 10:30	05/28/21 14:57	10.23g/5mL	10g/5mL	0.98
A1E1199-07	Soil	NWTPH-Dx	05/28/21 10:35	05/28/21 14:57	10.5g/5mL	10g/5mL	0.95
A1E1199-08	Soil	NWTPH-Dx	05/28/21 11:30	05/28/21 14:57	10.34g/5mL	10g/5mL	0.97
A1E1199-09	Soil	NWTPH-Dx	05/28/21 11:35	05/28/21 14:57	10.24g/5mL	10g/5mL	0.98

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx**Prep: EPA 5035A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1060017							
A1E1199-01RE1	Soil	NWTPH-Gx (MS)	05/28/21 09:00	05/28/21 09:00	5.89g/5mL	5g/5mL	0.85
A1E1199-02RE1	Soil	NWTPH-Gx (MS)	05/28/21 09:15	05/28/21 09:15	5.31g/5mL	5g/5mL	0.94
A1E1199-03	Soil	NWTPH-Gx (MS)	05/28/21 09:40	05/28/21 09:40	5.52g/5mL	5g/5mL	0.91
A1E1199-04	Soil	NWTPH-Gx (MS)	05/28/21 10:15	05/28/21 10:15	5.49g/5mL	5g/5mL	0.91
A1E1199-05	Soil	NWTPH-Gx (MS)	05/28/21 10:20	05/28/21 10:20	5.54g/5mL	5g/5mL	0.90
A1E1199-06	Soil	NWTPH-Gx (MS)	05/28/21 10:30	05/28/21 10:30	6.33g/5mL	5g/5mL	0.79
Batch: 1060018							
A1E1199-07	Soil	NWTPH-Gx (MS)	05/28/21 10:35	05/28/21 10:35	6.33g/5mL	5g/5mL	0.79
A1E1199-08	Soil	NWTPH-Gx (MS)	05/28/21 11:30	05/28/21 11:30	5.35g/5mL	5g/5mL	0.94
A1E1199-09	Soil	NWTPH-Gx (MS)	05/28/21 11:35	05/28/21 11:35	6.54g/5mL	5g/5mL	0.77

BTEX+N Compounds by EPA 8260D**Prep: EPA 5035A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1060017							
A1E1199-01RE1	Soil	5035A/8260D	05/28/21 09:00	05/28/21 09:00	5.89g/5mL	5g/5mL	0.85
A1E1199-02RE1	Soil	5035A/8260D	05/28/21 09:15	05/28/21 09:15	5.31g/5mL	5g/5mL	0.94
A1E1199-03	Soil	5035A/8260D	05/28/21 09:40	05/28/21 09:40	5.52g/5mL	5g/5mL	0.91
A1E1199-04	Soil	5035A/8260D	05/28/21 10:15	05/28/21 10:15	5.49g/5mL	5g/5mL	0.91
A1E1199-05	Soil	5035A/8260D	05/28/21 10:20	05/28/21 10:20	5.54g/5mL	5g/5mL	0.90

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Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533****SAMPLE PREPARATION INFORMATION****BTEX+N Compounds by EPA 8260D****Prep: EPA 5035A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A1E1199-06	Soil	5035A/8260D	05/28/21 10:30	05/28/21 10:30	6.33g/5mL	5g/5mL	0.79
Batch: 1060018							
A1E1199-07	Soil	5035A/8260D	05/28/21 10:35	05/28/21 10:35	6.33g/5mL	5g/5mL	0.79
A1E1199-08	Soil	5035A/8260D	05/28/21 11:30	05/28/21 11:30	5.35g/5mL	5g/5mL	0.94
A1E1199-09	Soil	5035A/8260D	05/28/21 11:35	05/28/21 11:35	6.54g/5mL	5g/5mL	0.77

Total Metals by EPA 6020B (ICPMS)**Prep: EPA 3051A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1051101							
A1E1199-01RE1	Soil	EPA 6020B	05/28/21 09:00	05/28/21 14:38	0.5g/50mL	0.5g/50mL	1.00
A1E1199-02RE1	Soil	EPA 6020B	05/28/21 09:15	05/28/21 14:38	0.501g/50mL	0.5g/50mL	1.00
A1E1199-03RE1	Soil	EPA 6020B	05/28/21 09:40	05/28/21 14:38	0.518g/50mL	0.5g/50mL	0.97
A1E1199-04RE1	Soil	EPA 6020B	05/28/21 10:15	05/28/21 14:38	0.497g/50mL	0.5g/50mL	1.01
A1E1199-05RE1	Soil	EPA 6020B	05/28/21 10:20	05/28/21 14:38	0.48g/50mL	0.5g/50mL	1.04
A1E1199-06RE1	Soil	EPA 6020B	05/28/21 10:30	05/28/21 14:38	0.519g/50mL	0.5g/50mL	0.96
A1E1199-07RE1	Soil	EPA 6020B	05/28/21 10:35	05/28/21 14:38	0.495g/50mL	0.5g/50mL	1.01
A1E1199-08RE1	Soil	EPA 6020B	05/28/21 11:30	05/28/21 14:38	0.518g/50mL	0.5g/50mL	0.97
A1E1199-09RE1	Soil	EPA 6020B	05/28/21 11:35	05/28/21 14:38	0.512g/50mL	0.5g/50mL	0.98

Percent Dry Weight**Prep: Total Solids (Dry Weight)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1051069							
A1E1199-01	Soil	EPA 8000D	05/28/21 09:00	05/28/21 19:41			NA
A1E1199-02	Soil	EPA 8000D	05/28/21 09:15	05/28/21 19:41			NA
A1E1199-03	Soil	EPA 8000D	05/28/21 09:40	05/28/21 19:41			NA
A1E1199-04	Soil	EPA 8000D	05/28/21 10:15	05/28/21 19:41			NA
A1E1199-05	Soil	EPA 8000D	05/28/21 10:20	05/28/21 19:41			NA
A1E1199-06	Soil	EPA 8000D	05/28/21 10:30	05/28/21 19:41			NA
A1E1199-07	Soil	EPA 8000D	05/28/21 10:35	05/28/21 19:41			NA
A1E1199-08	Soil	EPA 8000D	05/28/21 11:30	05/28/21 19:41			NA
A1E1199-09	Soil	EPA 8000D	05/28/21 11:35	05/28/21 19:41			NA

DRAFT REPORT

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300
Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**

Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 06 02 21 1533

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- F-09** Results in the Gasoline Range are impacted by the overlap of a heavier fuel hydrocarbon product.
- F-11** The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- F-17** No fuel pattern detected. The Diesel result represents carbon range C12 to C24, and the Oil result represents >C24 to C40.
- Q-16** Reanalysis of an original Batch QC sample.
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- S-01** Surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interference.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported.
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

DRAFT REPORT

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Project Number: **2021-**

Project Manager: **Dave Borys**

Report ID:

A1E1199 - 06 02 21 1533

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

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Project: NW Natural 2600 SE 9th Ave

Project Number: 2021-

Project Manager: Dave Borys

Report ID:

A1E1199 - 06 02 21 1533

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation)

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
--------	----------	--------	---------	--------	---------------

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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ORELAP ID: OR100062

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Vancouver, WA 98660

Project: NW Natural 2600 SE 9th Ave

Project Number: 2021-

Project Manager: Dave Borys

Report ID:

A1E1199 - 06 02 21 1533

APEX LABS 6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323		CHAIN OF CUSTODY		Lab # <u>A1E1199</u> COC <u>1</u> of <u>1</u>	
Company: HYDROCON		Project Mgr: DAVE BORYS		Project Name: NW NATURAL 2600 SE 9TH AVE	
Address: 314 W 15TH ST STE 300 VANCOUVER, WA		Phone:		Project #: 2021-	
Sampled by: MICHAEL WHITSON		Email: MICHAELW@HYDROCONLLC.NET		PO #	
Site Location: (OR) WA CA AK ID		ANALYSIS REQUEST			
SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS
U5T-NE-11.0		05/28/09	0900	S	3
U5T-E-18.0		0915	0915	S	3
U5T-W-18.0		0940	0940	S	3
EX5N-N-8.0		1015	1015	S	3
EX5W-S-8.0		1020	1020	S	3
EX5W-E-9.0		1030	1030	S	3
EX5W-W-10.0		1035	1035	S	3
EXF-14.5		1130	1130	S	3
EX5W-NE-11.0		1135	1135	S	3
SPECIAL INSTRUCTIONS: RUSH TAT REQUESTED					
Normal Turn Around Time (TAT) - 10 Business Days					
TAT Requested (circle) 1 Day 2 Day 3 Day 4 DAY 5 DAY Other:					
SAMPLES ARE HELD FOR 30 DAYS					
RELINQUISHED BY: Signature: <u>[Signature]</u> Printed Name: MICHAEL WHITSON Company: HCE		RECEIVED BY: Signature: <u>[Signature]</u> Printed Name: <u>SWANBURG</u> Company: <u>SWANBURG</u>		RECEIVED BY: Signature: _____ Printed Name: _____ Company: _____	
Date: 05/28/21		Date: 05/28/21		Date: _____	
Time: 1250		Time: 1250		Time: _____	

DRAFT REPORT

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DRAFT REPORT, DATA SUBJECT TO CHANGE

**ANALYTICAL REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street

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503-718-2323

ORELAP ID: OR100062

HydroCon LLC

314 W 15th Street Suite 300

Vancouver, WA 98660

Project: **NW Natural 2600 SE 9th Ave**Project Number: **2021-**Project Manager: **Dave Borys****Report ID:****A1E1199 - 06 02 21 1533****APEX LABS COOLER RECEIPT FORM**Client: Hydrocon Element WO#: A1 E1199Project/Project #: NW Natural 2600 SE 9th Ave / 2021-**Delivery Info:**Date/time received: 5/28/21 @ 1250 By: 80Delivered by: Apex ☐ Client ☒ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐**Cooler Inspection** Date/time inspected: 5/28/21 @ 1250 By: (80)Chain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>0.5</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>NY (80) 5/28/21</u>						
Ice type: (Gel/Real/Other)	<u>real</u>						
Condition:	<u>good</u>						

Cooler out of temp? (Y/N) (N) Possible reason why: _____Green dots applied to out of temperature samples? Yes (N)Out of temperature samples form initiated? Yes (N)**Sample Inspection:** Date/time inspected: 5/28/21 @ 1339 By: (80)All samples intact? Yes ☒ No ☐ Comments: _____Bottle labels/COCs agree? Yes ☒ No ☐ Comments: _____COC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments: _____Do VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments: _____

Water samples: pH checked: Yes ☐ No ☐ NA ☒ pH appropriate? Yes ☐ No ☐ NA ☒

Comments: _____

Additional information: _____Labeled by: (80) Witness: (signature) Cooler Inspected by: (80)

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APPENDIX A
NEARBY WELL LOGS

2778

APR 24 1967

$$1/1 - 11E$$

The original and first copy
of this report are to be
filed with the

STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date _____
of well completion.

STATE OF OREGON
(Please type or print)

State Well No.

State Permit No. _____

(USE ADDITIONAL SHEETS IF NECESSARY)

STATE ENGINEER
Salem, Oregon

MULT

Well Record

STATE WELL NO. 1/1-11 D
COUNTY MULTNOMAH
APPLICATION NO. GR-1853

OWNER: Dairy Cooperative Association

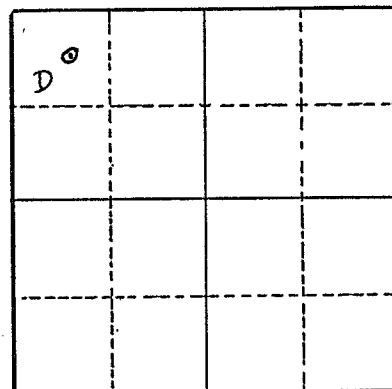
MAILING ADDRESS: 1313 E 12th Ave

LOCATION OF WELL: Owner's No.

CITY AND STATE: Portland, Oregon

NW 1/4 NW 1/4 Sec. 11 T. 1 S., R. 1 E., W.M.

Bearing and distance from section or subdivision corner



Altitude at well

TYPE OF WELL: Drilled Date Constructed 1946

Depth drilled 490' Depth cased 450'

Section 11

CASING RECORD:

16-inch

FINISH:

Casing perforated

AQUIFERS:

WATER LEVEL:

PUMPING EQUIPMENT: Type Pomona Turbin H.P. 60
Capacity 750 G.P.M.

WELL TESTS:

Drawdown ft. after hours 750 G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Manufacturing Temp. °F., 19

SOURCE OF INFORMATION GR-3986

DRILLER or DIGGER

ADDITIONAL DATA:

Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

STATE ENGINEER
Salem, Oregon

State Well No. 1/1-11 D
County Multnomah
Application No. GR-1853

Well Log

Owner: Dairy Cooperative Association Owner's No. _____

Driller: _____ Date Drilled 1946

CHARACTER OF MATERIAL	(Feet below land surface)		Thickness (feet)
	From	To	
Surface	0	12	12
Loose Dry gravel	12	27	15
Gravel and boulders	27	42	15
Cemented gravel	42	118	76
Fine sand and water	118	121	3
Cemented gravel	121	193	72
Sand with water	193	217	24
Loose gravel	217	219	2
Cemented gravel	219	257	38
Clay and fine sand	257	262	5
Blue Clay	262	312	50
Brown clay	312	315	3
Sand	315	323	8
Green soap stone	323	330	7
Dry sand	330	333	3
Blue clay	333	335	2
Brown clay	335	339	4
Sand	339	378	39
Brown clay	378	390	12
Brown clay and gravel	390	395	5
Sandy clay	395	409	14
Grey sand	409	414	5
Gravel - sand and water	414	422	8
Shale	422	489	67

STATE ENGINEER
Salem, Oregon

County _____

Well Log

Driller: _____ Date Drilled: _____

[illegible]

- Removed Pump Column;
- Pulled 4" Liner filled with Cement Grout (0-153 ft)
- Perforated 6" Casing (3 - 116 ft) backfilled with cement grout.
- Restore surface
- Construction Log (Amendment): Mult 2778

WATER SUPPLY WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

MULT 131946

7/1/2019

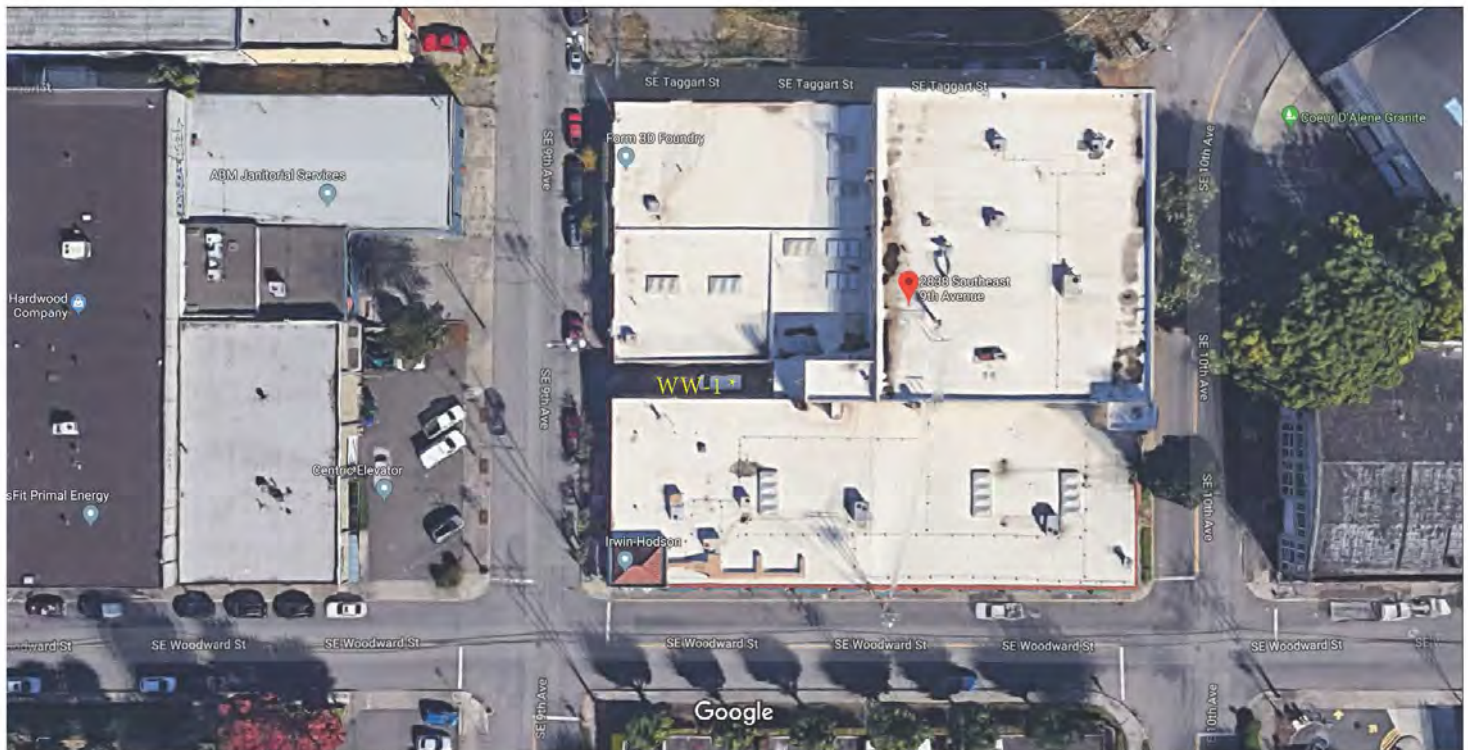
Map of Hole

7/1/2019

2838 SE 9th Ave - Google Maps

Google Maps

2838 SE 9th Ave
PORTLAND, OR 97202



N
W + E
S

110-19-1062

APPENDIX B

Structural Fill Material Specifications – Former Lower Elevation Area Infill (2021-2022)



**SUBMITTAL PACKAGE
FOR APPROVAL**
Bremik Construction Inc.
20010- - NW Natural Pit - Phase 1A

Page 1
DATE: 8/27/2020
PACKAGE NUM: 1
PACKAGE REV: 0
SPEC #: 312000

To: Skye Woodhouse
LRS Architects, Inc.
720 NW Davis, Suite 300
Portland, OR 97209

From: Maggie Settle
Bremik Construction Inc.
1026 SE Stark St.
Portland, OR 97214

We are transmitting the following Submittal Package Number: " 1", Revision: "0"
Description: "Earth Moving - Product Data - Structural Infill Material" for your review, intended to be compliant with contract Specification Number: "312000".

Please review and respond to: Maggie Settle, by: 9/08/2020 in accordance with the contract documents.

Additional Notes:

Submittal Item	Revision	Description	Status	Notes
312000 - 01	0	Earth Moving - Product Data	Submitted for Approval	

Sincerely,

Maggie Settle

Digitally signed by Maggie Settle
DN: C=US, E=msettle@bremik.com,
O="Bremik Construction ",
CN=Maggie Settle
Date: 2020.08.27 08:18:15-07'00'

Bremik Construction, Inc.

Date: 8/27/20 **By:** MFS

- ☒ **Reviewed**
☐ **Reviewed as noted**
☐ **Revise & resubmit**

Review of these documents does not relieve subcontractors of their responsibility in reference to: field verifications of all dimensions; jobsite conditions and requirements; coordination with all trades; full compliance with all contract requirements; compliance with all state and city ordinance requirements

Bremik comments noted in:    



**Humber
Design
Group, Inc.**

- ☐ Approved ☐ Rejected
☒ Furnish as Corrected ☐ Revise and Submit

This review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with the requirements of the plans and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. Contractor is responsible for: dimensions to be confirmed and correlated at the job-site; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work of all trades; and for performing all work in a safe and satisfactory manner.

Job #: LRS023
Date: 09/08/2020
By: paige.miller

Per Geotechnical Recommendation:

This material is suitable during the dry season and outside the influence zone of the stormwater facility and the upper aggregate surfacing. During the wet season, general structural fill should have less than 5 percent passing the US No. 200 sieve.

-Paige Miller 2020-09-08

MEI Group

A Moore Excavation Company

P.O. Box 789 - Fairview, OR 97024
5501 NE 223rd Ave - Fairview, OR 97024
Tel: (503) 674-0900 | Fax: (503) 674-0909
OR CCB#28397 | WA# MOORE166BR



SUBMITTAL TRANSMITTAL

Submittal Transmittal/Revision No. **001.1**

Project: NW Natural Portland Central - Phase 1A/1B

Date: 8/25/2020

General Description: Previous submittal missing page 1 of 2 of the statistical analysis for:
Imported Structural Fill

Pages 4

Spec Ref

Dwg Ref Permit Set sheet C302 dated 6/28/2019

Supplier Knife River

Product Reject from Angell Quarry

Project Application(s): This material will be used as the structural fill as shown on detail 1 of sheet C302 dated 6/28/2019

Response Status

- ☐ No Exceptions Taken
☐ Make Corrections Noted; Do Not Resubmit
☐ Amend; Resubmit
☐ Rejected; Resubmit

Response Date:

Reviewer:

Comments

Detailed Contents List (if applicable)

No.	Item	Specification / Drawing Reference
1	Angell Reject Product Description	C302 dated 6/28/2019
2	Statistical Analysis 3/4"- Reject	C302 dated 6/28/2019

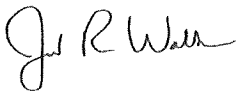
Metro Operations
12222 NW Marina Way
Portland, OR 97231
Ph: (503) 944-3500

Angell Reject Product Description

- Name:* Knife River's product labeled "2459001" is the product code for reject.
- Size:* The majority of reject/screenings at Angell quarry is 1" and smaller, and is occasionally mixed with larger rock.
- Source:* This product is produced at Knife River's Angell Quarry 14545 NW St. Helens Rd, Portland, OR 97231
- Fracture:* This product is 100% fractured quarry rock.
- Misc:* This product is not part of normal process control testing. Due to the higher p200 content, this material is weather sensitive and is best used during summer months.

If any addition information or samples are needed, please feel free to call or email anytime.

Thank you,



Jarred Walker
Knife River Metro Sales
Cell (503) 260-7802
Fax (503) 944-3599
jarred.walker@kniferiver.com



Statistical Analysis 04/05/2019 - 05/12/2020 Production
Knife River Corporation 242010-Angell Agg 10034000C-3/4"-0 Reject

Sample Id	Date	1" (%)	3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#16 (%)	#30 (%)	#50 (%)	#100 (%)	#200 (%)
57343981	04/05/2019 10:18	100	97	77	64	46	37	19	17	11	6	4	2	1.4
53846791	03/04/2020 08:15	100	99	82	67	50	43	31	31	26	22	19	15	10.2
64643325	04/01/2020 08:45	100	99	87	76	58	48	33	31	26	22	18	13	9.3
68261963	04/07/2020 09:10	100	99	93	85	72	64	48	44	35	27	21	14	8.8
56671331	05/05/2020 09:00	100	94	64	50	36	31	25	24	21	18	16	13	9.5
66578570	05/12/2020 09:15	100	97	81	69	56	49	40	39	34	30	25	20	14.4
		1" (%)	3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#16 (%)	#30 (%)	#50 (%)	#100 (%)	#200 (%)
	Count	6	6	6	6	6	6	6	6	6	6	6	6	6
	Mean	100	98	81	69	53	45	33	31	26	21	17	13	8.9
	St Dev	0.0	2.0	9.9	11.8	12.2	11.4	10.4	9.8	8.9	8.4	7.1	5.9	4.21
	Pay Factor													

Statistical Analysis 04/05/2019 - 05/12/2020 Production
Knife River Corporation 242010-Angell Agg 10034000C-3/4"-0 Reject

Sample Id	Date	PAN (%)	SE (%)	Absorption (%)	Total Moisture (%)	SPGR (Dry,Gsb)	SPGR (SSD)	SPGR (Apparent, Gsa)
57343981	04/05/2019 10:18	0.0						
53846791	03/04/2020 08:15	0.0	18	5.45	10.50	2.442	2.575	2.817
64643325	04/01/2020 08:45	0.0	24	8.38	21.07	2.227	2.414	2.738
68261963	04/07/2020 09:10	0.0	22	8.93	20.99	2.164	2.357	2.682
56671331	05/05/2020 09:00	0.0	20	4.68	5.17	2.492	2.608	2.820
66578570	05/12/2020 09:15	0.0	19	5.12	15.18	2.432	2.556	2.777
		PAN (%)	SE (%)	Absorption (%)	Total Moisture (%)	SPGR (Dry,Gsb)	SPGR (SSD)	SPGR (Apparent, Gsa)
Count		6	5	5	5	5	5	5
Mean		0.0	21	6.51	14.58	2.351	2.502	2.767
St Dev		0.00	2.4	1.985	6.870	0.1458	0.1098	0.0580

Pay Factor

Query
 Query Selections
 Date Created 06/03/2020
 Date Range 06/03/2018 - 06/03/2020
 Plant 242010-Angell Agg
 Product 10034000C-3/4"-0 Reject
 Limit Auto-Compute
 Production
 Number Of Tests 30

 Passing: 6
 Failures: 0
 Conformance: 100.0 %
 Non-Conformance: 0.0 %



**SUBMITTAL PACKAGE
FOR APPROVAL**
Bremik Construction Inc.
20010- - NW Natural Pit - Phase 1A

Page 1
DATE: 7/20/2021
PACKAGE NUM: 64
PACKAGE REV: 0
SPEC #: 312000

To: Skye Woodhouse
LRS Architects, Inc.
720 NW Davis, Suite 300
Portland, OR 97209

From: Zach Beaton
Bremik Construction Inc.
1026 SE Stark St.
Portland, OR 97214

We are transmitting the following Submittal Package Number: " 64", Revision: "0"
Description: "Coffee Lake Reject Product" for your review, intended to be compliant with
contract Specification Number: "312000".

Please review and respond to: Zach Beaton, by: 7/27/2021 in accordance with the contract documents.

Additional Notes:

Submittal Item	Revision	Description	Status	Notes
312000-36		Coffee Lake Reject Product - Product Data	Submitted for Approval	

Sincerely,

Bremik Construction, Inc.

Date: 2021 07 20 By: Zach Beaton

- ☒ **Reviewed**
☐ **Reviewed as noted**
☐ **Revise & resubmit**

Review of these documents does not relieve subcontractors of their responsibility in reference to: field verifications of all dimensions; jobsite conditions and requirements; coordination with all trades; full compliance with all contract requirements; compliance with all state and city ordinance requirements.

Bremik comments noted in: ■ ■ ■ ■

Submittal Review

Review is only for general conformance with the specified elements of the contract documents and does not relieve the Contractor of its responsibility for performance of work in conformance with the contract documents. GeoEngineers is not responsible for the specific means, methods, techniques, sequences or procedures selected by the Contractor or others.

- ☒ **No exceptions taken**
☐ **Make corrections noted, resubmittal not required**
☐ **Amend and resubmit**
☐ **Rejected – see remarks**

GEOENGINEERS  By Greg Landau at 10:59 am, Aug 10, 2021

MEI Group

A Moore Excavation Company

P.O. Box 789 - Fairview, OR 97024

5501 NE 223rd Ave - Fairview, OR 97024

Tel: (503) 674-0900 | Fax: (503) 674-0909

OR CCB#28397 | WA# MOOREI166BR



SUBMITTAL TRANSMITTAL

Submittal Transmittal/Revision No. **22**

Project: NW Natural Portland Central - Pit fill

Date: 7/20/2021

General Description: Submittal 022 - Pit Fill - KR Coffee Lake 1 inch - 0 reject, KR Coffee Lake 34-0 reject washed

Pages 5

Spec Ref

Dwg Ref

Supplier Knife River

Product 3/4"-0" reject washed and 1"-0" reject

Project Application(s): This material will be used as pit fill material

Response Status

- ☐ No Exceptions Taken
- ☐ Make Corrections Noted; Do Not Resubmit
- ☐ Amend; Resubmit
- ☐ Rejected; Resubmit

Response Date:

Reviewer:

Comments

Detailed Contents List (if applicable)

No.	Item	Specification / Drawing Reference



Western Oregon Division
www.kniferiver.com

Metro Operations
12222 NW Marina Way
Portland, OR 97231
Ph: (503) 944-3500

Coffee Lake Reject Product Description

Name: Knife River's product labeled "2459001" is the product code for reject.

Size: The majority of reject/screenings at Coffee Lake quarry is 1" and smaller, and is occasionally mixed with larger rock.

Source: This product is produced at Knife River's Coffee Lake Quarry 11911 SW Waldo Way, Sherwood OR 97140

Fracture: This product is 100% fractured quarry rock.

Misc: This product is not part of normal process control testing. Due to the higher p200 content, this material is weather sensitive and is best used during summer months.

If any addition information or samples are needed, please feel free to call or email anytime.

Thank you,

Jarred Walker
Knife River Metro Sales
Cell (503) 260-7802
Fax (503) 944-3599
jarred.walker@kniferiver.com

Statistical Analysis 06/03/2021 - 06/03/2021 Production
Knife River Corporation 241410-Coffee Lake Agg 10034000C W-3/4"-0 Reject (WashGrad)

Sample Id	Date	3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#5 (%)	#6 (%)	#8 (%)	#10 (%)	#16 (%)	#30 (%)	#40 (%)	#50 (%)
56969279/21B-702	06/03/2021 13:40	100	99	96	83	72	66	61	50	46	36	28	25	22
		3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#5 (%)	#6 (%)	#8 (%)	#10 (%)	#16 (%)	#30 (%)	#40 (%)	#50 (%)
	Count	1	1	1	1	1	1	1	1	1	1	1	1	1
	Mean	100	99	96	83	72	66	61	50	46	36	28	25	22
	St Dev													
	Pay Factor													

Statistical Analysis 06/03/2021 - 06/03/2021 Production
Knife River Corporation 241410-Coffee Lake Agg 10034000C W-3/4"-0 Reject (WashGrad)

Sample Id	Date	#100 (%)	#200 (%)	PAN (%)
56969279/21B-702	06/03/2021 13:40	19	14.9	0.0
#100 (%) #200 (%) PAN (%)				
Count				
		1	1	1
		Mean	19	14.9
		St Dev		0.0
		Pay Factor		
Query	Query Selections Date Created 06/07/2021 Date Range 05/21/2021 - 06/07/2021 Plant 241410-Coffee Lake Agg Product 10034000C W-3/4"-0 Reject (WashGrad) Specification Auto-Default Limit Auto-Compute Production Number Of Tests 30 Passing: 1 Failures: 0 Conformance: 100.0 % Non-Conformance: 0.0 %			

APPENDIX C

HAI Standard Operating Procedure (SOP) No. 260: Excavation Sampling

EXCAVATION SAMPLING

HAI Standard Operating Procedure No. 260

Revision No. 1.0, July 31, 2003

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1.0 OBJECTIVE/BACKGROUND

This Standard Operating Procedure (SOP) details the sampling methodology for the sampling of soil and pit water from an excavation.

Excavation sampling is generally performed to characterize contamination observed within the excavation or to confirm the absence of contamination following removal activities.

2.0 EQUIPMENT REQUIRED

Soil Sampling (one or more of these may be required as specified by project manager):

- 1) Stainless steel trowel(s)
- 2) Stainless steel hand auger
- 3) Brass tube(s), plastic end caps, teflon tape, aluminum foil

Pit Water Sampling:

- 1) Peristaltic Pump, polyethylene tubing, 3/8" OD, 1/4" ID, flexible peristaltic tubing
- 2) Disposable polyvinyl chloride bailer(s), bailer string

3.0 FORMS REQUIRED

Field forms to be used during excavation sampling include:

- 1) Project Field Notes Form
- 2) Chain of Custody

4.0 PROCEDURE

4.1 Soil Sample Collection by Excavator/Backhoe Bucket

- 1) Direct equipment operator to collect soil from excavation at specified location and depth. Operator may need to first remove slough from area to be sampled to ensure collection of representative soil sample.
 - a) The excavator bucket should be relatively clean and free from contamination.
 - b) Excavator bucket containing soil sample should be brought to the surface immediately and the soil sample collected directly from the excavator bucket after scraping away at least 3 inches of soil. Ensure the soil sample is not directly in contact with the bucket to avoid cross-contamination.
 - c) Clear soil from bucket prior to next sampling location
- 2) Soil sample can be collected from the bucket by a gloved hand (disposable nitrile glove), with a decontaminated stainless steel trowel, or with a brass tube driven into the soil (see Section 4.2). Immediately place soil sample in sample jar(s) and fill completely in order to minimize volatilization.

4.2 Soil Sample Collection by Brass Tube Sampler

- 1) Prior to sampling, ensure that brass tubes provided by the laboratory have been adequately decontaminated (decontamination is to be accomplished by the laboratory). If further decontamination is necessary, then proceed as per Section 4.6 of this SOP.
- 2) Identify sampling location and depth of sample. Sample can be collected directly from the pit or from the excavator bucket
 - a) Using a mallet or slide-hammer, drive the brass tube into soils until the tube has been entirely advanced.
 - b) With the slide hammer or a gloved hand, back the tube out from the soil with a slow rocking motion.

- c) Immediately place teflon tape and new plastic caps on both ends of the brass tube, and seal the end caps with non-VOC tape. Affix sample label to tube. Wrap brass tube in aluminum foil and place in cooler.

4.3 Grab Sample Collection Directly From Pit

- 1) This task is only applicable for relatively shallow excavations (less than 4 feet). If sampling area is identified as a confined space or a pit greater than 4 feet deep, the sampler cannot enter the area and an alternate collection method shall be used.
- 2) For pits that cannot be entered, a hand auger may be used to reach sample locations. However, do not advance hand auger from the lip of vertical excavation walls or unsafe areas.
- 3) Collect soil sample from chosen sample location with a gloved hand, decontaminated stainless steel trowel, or brass tube.

4.4 Field Screening

Field screening should be conducted in accordance with HAI SOP 130. Soil samples for headspace vapor screening should be collected immediately in order to minimize vaporization.

4.5 Collection of Pit Water Sample

This procedure is used to collect samples of water from an excavation pit. Either a peristaltic pump or disposable bailer may be used to collect the water samples. For VOC samples, a bailer should be used.

- 1) If necessary, direct excavator operator to dig a sump in the base of the excavation to collect an adequate volume or water column of pit water for collection.
- 2) Collect a sample of the pit water by slowly lowering a new disposable bailer or disposable tubing into the sump for collecting the pit water sample. Care should be taken to avoid disturbing the water column in order to minimize sample turbidity.

4.6 Decontamination of Field Equipment

Decontaminate all reusable equipment between sampling locations as per HAI SOP 150. Full decontamination of the excavator bucket is not necessary (unless visible contamination is present on the bucket), as long as the soil sample can be collected from an area that has never been in direct contact with the bucket.

5.0 SPECIAL CONSIDERATIONS

If sampling area is identified as a confined space or a pit greater than 4 feet deep, the sampler cannot enter the area and an alternate collection method shall be used.