INTERIM REMEDIAL INVESTIGATION & PROPOSED SITE CLOSURE

Acrowood Corp Site
4425 S 3rd Avenue
Everett, Washington 98203
Facility Site ID #22755667

Prepared For:

Acrowood Corporation

By:

PO Box 2546
Bellingham, WA 98227
(360) 714-9409

February 25, 2025

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STRATUM GROUP
PO Box 2546, Bellingham, WA 98227
Phone: (360) 714-9409

February 25, 2025

Jeffery Poertner
Acrowood Corporation
jpoertner@acrowood.com

Re: Report
Interim Remedial Investigation & Proposed Site Closure
Acrowood Corp Site
4425 S 3rd Avenue
Snohomish County Parcel 29053200200100
Everett, Washington 98203
Facility Site ID #22755667

Dear Acrowood Corporation:

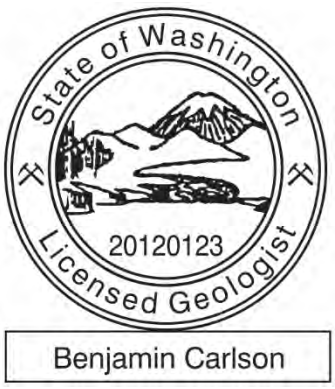
This document presents data gathered to complete characterization of contamination on the Acrowood Corp site and a proposed roadmap for site closure, including institutional controls to limit exposure pathways to contamination on the site associated with historical fueling and paint and solvent use.

We recommend that this document be submitted to the Washington State Department of Ecology's Voluntary Cleanup Program for review with a request for a 'No Further Action Likely' letter, based upon Model Toxics Control Act industrial cleanup standards for soil and unrestricted (Method A) standards for groundwater along with a planned restrictive covenant to maintain industrial use at the site.

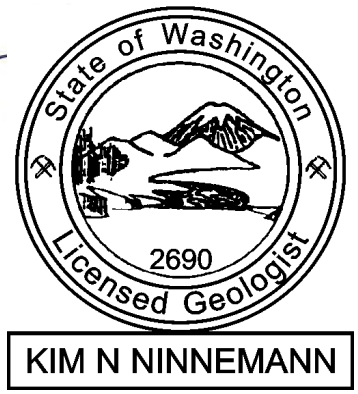
Should you have any questions concerning this work plan, please do not hesitate to contact us at (360) 714-9409.

Sincerely,
Stratum Group

Ben Carlson, M.Sc., L.G.
Licensed Geologist



Kim Ninnemann, B.S.
Licensed Geologist



1.0 INTRODUCTION

Stratum Group has prepared this interim remedial investigation report and proposed path to site closure for the Acrowood Corp site located at 4425 S 3rd Avenue in Everett, Washington. This document includes a summary of previous sampling and remedial action work, presents new data collected to fill data gaps and complete characterization of site contamination, and outlines the steps that we recommend to reduce potential exposure pathways such that the site can reach regulatory closure.

The Acrowood site is located on the west side of the Snohomish River just southwest of downtown Everett. The property is located in a historically industrial area. The property was initially developed by the early 1910s with a foundry that operated through the 1970s. The property has since operated as an industrial manufacturing and metal fabrication facility, including operation as Acrowood Corporation since 1984.

Environmental concerns on the site were identified beginning with a Phase I environmental site assessment completed in 1999, in association with petroleum storage, surface spills of paints and solvents, and dumping of metal debris and slag. Several environmental sampling investigations were completed by others between 1999 and 2019 to characterize contamination on the site. The areas of concern have since been described in three locations on the site:

- Area 1: small area of solvent (trichloroethylene) contamination in soil and groundwater near a former paint and solvent shed.
- Area 2: small area of petroleum contamination in soil near a former heating oil UST.
- Area 3: petroleum contaminated soil and groundwater associated with a suspected former fuel oil fueling area.

Contamination on the site was first reported to Ecology in January 2007, at which time the site became a listed contaminated site (Cleanup Site ID # 4703). No remediation actions, other than natural attenuation, are known to have taken place on the site. The property is actively enrolled in Ecology's Voluntary Cleanup Program.

Our initial review identified a few remaining data gaps that warranted additional investigation including evaluation of seasonal variation in groundwater quality and whether metals contamination was present in site groundwater. To evaluate the groundwater conditions, four quarters of groundwater monitoring was completed for the Area 3 well network in 2023 and 2024. These results confirmed that petroleum contamination remains present in Area 3 but is limited in extent and does not extend beyond the property boundaries. Carcinogenic PAH (cPAH) and arsenic contamination in site groundwater in Area 3 is similarly limited in extent and does not extend beyond the property boundaries.

Our review indicates that it is reasonable to apply Model Toxics Control Act (MTCA) industrial cleanup standards to soil and Method A cleanup standards to groundwater, which are

protective of drinking water, on the Acrowood site. Although residual contamination above these standards remains present in some locations on the site, all contamination above applicable unrestricted land use and groundwater cleanup standards has been fully characterized and is located within the property boundaries.

To remedy residual contamination on the site, we recommend construction of impermeable caps over Area 1, 2, and 3. Also, an environmental covenant that restricts property use to industrial purposes and limits subsurface disturbance and groundwater extraction without notification to Ecology should be implemented. It is our opinion that if these remedies are implemented, the Acrowood site meets the substantive requirements of Model Toxics Control Act (MTCA) for a No Further Action with an environmental covenant.

2.0 BACKGROUND

2.1 Property Location

The subject property is located within the city limits of Everett, Washington, approximately one mile southeast of the historical downtown core of Everett. The property is located southeast of the intersection of S 3rd Avenue and 41st Street, approximately 1,600 feet west of the Snohomish River. The property utilizes the street address 4425 S 3rd Avenue. The location of the subject property is presented in Figure 1 in Appendix I.

The Acrowood property is developed with a complex of industrial and warehouse buildings on an 8.93-acre parcel. The business manufactures large pieces of equipment used in the forestry industry.

Multiple sets of railroad tracks bound the subject property to the east. A mix of single-family residential, commercial, light industrial, and undeveloped properties surround the subject property. Acrowood owns four additional parcels to the south (Snohomish County parcels 29053200205900, 29053200200200, 29053200201400, and 29053200304200), which are not being addressed in this report.

The subject property is zoned as Light Industrial 1.

An annotated aerial photograph of the property and vicinity is provided in Figure 2 in Appendix I.

2.2 Development and Use History

A summary of the site's history, based upon the findings of a 1999 Phase I environmental site assessment by ADAPT Engineering Inc., is presented below.

The site was developed with an iron and metal foundry, operated as Sumner Iron Works, by at least 1913. Many of the existing site buildings, including the main industrial building and several

storage buildings, have existed on site since that time. Sumner operated the site as an iron casting and molding facility from 1913 until approximately the early 1970s. Additional outbuildings were constructed between the 1940s and 1970s. Black-Clawson-Sumner operated the site as a metal fabrication facility from the early 1970s through 1984, when the property was acquired by Acrowood Corporation. Acrowood has operated the site for metal fabrication of industrial forestry equipment since that time.

2.3 Geology and Soils

The following descriptions of the surficial deposits in the vicinity of the subject property were interpreted from the Washington Department of Natural Resources (DNR) Geologic Information Portal (geologyportal.dnr.wa.gov) 1:24,000 geologic mapping. The subject property is mapped as being underlain by surficial deposits of Pre-Fraser glaciation to Fraser glaciation transition beds (Qtb). This unit is described as stratified layers of clay, silt, and fine sand deposited in a generally low-energy river environment. The unit was subsequently overridden and compacted by glacial ice resulting in a generally very dense unit with variable permeability depending on the grain size composition of each layer.

Subsurface conditions encountered during previous investigations on the property have shown that the site is underlain by a mix of fill and sand to silty sand with gravel to at least 20 feet below the ground surface (bgs). Fill material is particularly prevalent around Area 3. Fill material, described as a mix of red-brown to black sand with metal slag and debris has been noted between 4 and 13 feet thick with an average thickness closer to 5 feet in borings completed around Area 3. These observed materials are consistent with a long historical accumulation of fill on top of the mapped transition bed deposits.

2.4 Hydrology

No surface water features are located on the subject property. The nearest surface water feature is the Snohomish River, located approximately 1,600 feet to the east-northeast of the subject property. The Snohomish River flows north in the immediate vicinity of the subject property.

Based upon site characterization activities completed on the site between 1999 and 2024 groundwater depth is generally between 10 and 13 feet bgs on the northern portion of the property west of the retaining wall, and between 2 and 5 feet bgs to the east and below the retaining wall. Groundwater flow on the site has been modeled to the southeast.

Based upon our review of Ecology's Well Construction & Licensing database, no drinking water wells are present on the subject property or in the immediate vicinity. Water is provided to the subject property and the surrounding area by the City of Everett.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

Previous environmental investigations on the site are documented in the following reports, which have been previously submitted to Ecology.

- *Closure Report* – LSI ADAPT, Inc., January 18, 2002
- *Supplemental Phase II ESA and Groundwater Monitoring* – ADAPT Engineering, Inc., February 6, 2009
- *Focused Subsurface Investigation* - EcoCon, Inc., September 30, 2011
- *Feasibility Study & Disproportionate Cost Analysis Report & Submittal* – EcoCon, Inc., February 28, 2012
- *Groundwater Monitoring Well Installation & Sampling Report* – ECI, December 12, 2019 (copy attached in Appendix II)

In summary, contamination on the site was first identified in 1999, after a Phase I ESA identified several recognized environmental conditions (RECs) on the site including:

1) A former heating oil UST located just south of the middle portion of the main building.
2) Fuel oil tanks that reportedly operated by the southeast corner of the main building. It is unknown whether they were above ground or underground.
3) Suspected surface spills of chlorinated solvents.
4) Metal debris and slag in shallow fill soils.
5) Potential contamination concentrated by a stormwater outfall along the east property edge.
6) Potential contamination associated with a pre-1970 septic system.

Several soil and groundwater sampling investigations were completed between 1999 and 2019 to investigate these REC areas, including installation and sampling of groundwater monitoring wells. Geophysical surveys of the site indicated that no underground storage tanks (USTs) remained in the areas where tanks were known or suspected to have been previously located. Contamination on the site was found to be limited to three areas: Area 1, 2, and 3.

The locations of Areas 1, 2, and 3 are presented in Figure 2. A summary of previous soil and groundwater samples in each area are presented in Figure 3 (soil) and Figure 4 (groundwater).

Area 1 – Paint Storage Building

Area 1 is located in the immediate vicinity of a former paint and solvent storage building by the southwest corner of the main building.

Trichloroetheylene (TCE) was found to be present in the soil by the paint storage building (sample location P7) at 8 feet bgs at a concentration of 0.055 mg/kg, above the Model Toxics Control Act

(MTCA) Method A cleanup level (CUL) of 0.03 mg/kg. However, this is well below the Method C industrial CUL of 2,900 mg/kg. Soil samples collected in several other locations, including beneath the building foundation, did not contain elevated TCE concentrations. Soil vapor samples collected from four locations around and beneath the building did not contain elevated TCE concentrations.

Groundwater in one location immediately south of the building (sample location P6) contained concentrations of TCE above the MTCA Method A CUL of 5 µg/L, with a detected concentration of 8.38 µg/L. Water samples collected approximately 50 feet to the west and south of P6 met Method A CULs for TCE.

Area 2 – Former Heating Oil UST

Area 2 is located in the vicinity of the former heating oil UST, located just east of the south-central portion of the main building.

Diesel- and oil-range petroleum were detected above industrial CULs in soil (2,000 mg/kg combined) through the former UST pit (sample location P8), with a combined concentration of 2,903 mg/kg. Field indicators estimated the vertical extent of contamination to be between 8 and 11 feet bgs. Several samples collected within approximately 10 feet of P8 to the northwest, southwest, and east were non-detect for petroleum, indicating the area of soil impact was very limited in lateral extent.

Two groundwater samples collected from the immediate vicinity of the former heating oil UST were non-detect for petroleum hydrocarbons. This data serves as empirical evidence that groundwater has not been impacted by the historical release observed in the overlying soils.

Area 3 – Former Fueling Area

Area 3 is located in the vicinity of the suspected former fuel oil tanks, by the southeast corner of the east wing of the main building. The 1999 Phase I report stated that fuel oil tanks were depicted in this location on a 1960 fire insurance map. However, conversations with Acrowood Corp personnel indicated no memory of tanks being present in this location over the last 40+ years.

Approximately 23 locations have been sampled in the vicinity of the former fueling area including off-property locations to the east of the retaining wall. Diesel- and oil-range petroleum hydrocarbons, naphthalene, and/or carcinogenic polycyclic aromatic hydrocarbons (cPAHs) have been detected at concentrations above MTCA Method A CULs directly beneath the suspected former fuel tanks, however, the naphthalene and cPAH concentrations were well below the Method C industrial CULs. The area of impact is located just west of an approximately 10-foot-high retaining wall. Sampling has shown soil contamination to be located at depths between 8 and 15 feet bgs and within approximately 15 feet of sampling location P1 (see Figure 3). No soil contamination above MTCA Method A CULs has been detected east of the retaining wall.

Groundwater within Area 3, in the immediate vicinity of the former fueling area, has been shown to be contaminated with diesel- and oil-range petroleum hydrocarbons, naphthalene, and/or cPAHs. However, the contaminant plume appears to be limited in lateral extent. Water collected from three locations just down gradient, east of the retaining wall, has been either non-detect for the contaminants of concern, or detections have been well below MTCA Method A CULs.

Carcinogenic PAHs (cPAHs) were detected in the groundwater at concentrations above MTCA Method A CULs in one well south of the fueling area (ECIMW-5) during one sampling event in 2019. The source of this elevated hit was not determined nor further investigated. cPAHs were again detected in water collected from ECIMW-5 in 2023 but at a concentration one order of magnitude below the MTCA Method A CUL of 0.1 µg/L.

Maps indicating the estimated extent of contamination above the proposed site CULs (Section 4.5) are provided in Figure 3 for soil and in Figure 4 for groundwater samples, in Appendix I.

3.1 Department of Ecology Opinions

The Department of Ecology has provided three opinion letters for the Acrowood site to date, including in April 2007, June 2010, and January 2012. In these opinion letters, Ecology made multiple requests for further investigation. Since the issuance of these letters, all of Ecology's requests were fulfilled, including:

- Installation and quarterly monitoring of wells around the paint shed area for one year **(completed in 2007-2008)**
- Groundwater characterization around the former heating oil UST **(completed in 2011)**
- Installation and quarterly monitoring of monitoring wells for long-term monitoring down gradient of the fueling area **(well network completed in 2019; sampling completed in 2024)**
- Completion of a Terrestrial Ecological Evaluation (TEE) for the site to help determine appropriate cleanup levels **(completed in 2012)**
- Preparation of a Feasibility Study (FS) and Disproportionate Cost Analysis (DCA) to support the preferred regulatory closure via a restrictive covenant **(completed in 2012)**

Additionally, in the June 2010 opinion letter, Ecology confirmed the successful characterization of some aspects of the site, including:

- Groundwater monitoring had sufficiently demonstrated no TCE impacts to groundwater around the paint shed [Area 1]
- Characterization of contamination around the former fueling area was complete [Area 3]

Following completion of the monitoring well installation and sampling in 2019, an additional opinion letter was requested from Ecology in 2020. Ecology's database indicates that a request was submitted and received by Ecology, but to the best of our knowledge no response from

Ecology was received.

3.2 Feasibility Study/Disproportionate Cost Analysis

ECI prepared a report dated February 28, 2012 that includes a TEE and an FS/DCA.

ECI reportedly contacted the City of Everett and learned that the area immediately east of the railroad tracks that bound the subject property to the east is slated for eventual redevelopment ("Lowell Riverfront") that will result in increased traffic and a loss of much of the nearby land that could be considered wildlife habitat. Based upon the planned removal of the east-adjacent wild space, ECI concluded that the site likely qualifies for at least two exclusions from the TEE process. First, the known soil contamination is located greater than 6 feet below the surface (Exclusion 1). Second, the cleanup method proposed involved capping the areas of residual contamination with asphalt to prevent direct contact and vertical movement of surface water (Exclusion 2). Therefore, ECI concluded that the TEE could be concluded.

Four potential alternatives for site actions were evaluated in the FS/DCA: (1) No action, (2) Monitored natural attenuation with institutional controls, (3) Partial removal and off-site disposal with institutional controls, and (4) Complete removal and off-site disposal. Based upon ECI's analysis, Alternative 2, which included on-going quarterly groundwater monitoring of the existing wells until four consecutive quarters of clean sampling were collected, was found to be nearly as effective across all evaluation criteria as Alternative 3 and 4. However, Alternatives 3 and 4 were estimated to cost approximately two to three times as much as Alternative 2, respectively. Therefore, ECI argued that monitored natural attenuation, construction of a physical cap over the area of residual contamination, and implementation of a restrictive covenant was the most appropriate cleanup solution for the site.

A copy of ECI's TEE and FS/DCA documents are attached in Appendix II.

After our review of site documentation and ECI's above analysis, Stratum Group concurs that Alternative 2 as presented by ECI is the most appropriate cleanup option for the Acrowood site.

4.0 IDENTIFIED DATA GAPS

Based upon our review of data collected on the Acrowood site prior to 2023, the following data gaps remained in the characterization of site contamination:

Area 1

- No data gaps were identified. Area 1 has been characterized and is wholly within the property boundaries. Ecology has previously agreed that characterization of groundwater impacts is complete.

Area 2

- No data gaps were identified. Area 2 has been characterized and is wholly within the property boundaries.

Area 3

- The temporal persistence and potential lateral extent of cPAH contamination in groundwater around ECIMW-5 was unknown.
- Year-round variation in groundwater quality was needed to verify that the groundwater contamination plume is contained within the monitoring well network.
- The presence of metals contamination in site groundwater, particularly around Area 3, had not been investigated.
- **These data gaps have since been addressed (see Section 5)**

5.0 INTERIM REMEDIAL INVESTIGATION – GROUNDWATER MONITORING

In an effort to address outstanding data gaps on the site, Stratum Group was engaged to conduct four rounds groundwater monitoring from the existing network of wells in Area 3 between October 2023 and October 2024. Samples were collected and analyzed to evaluate the current status of groundwater quality on the site. The locations of the active monitoring wells are shown in Figure 5 in Appendix I. Descriptions of the active monitoring wells are provided in Table 1, below.

Table 1. Acrowood Corp Site Monitoring Well Information

Monitoring Well	Well Casing Diameter (in)	Well Location	Well Position Relative to Release Area
ECIMW-9	1”	Through building floor NW of fueling area	Up gradient
MW-1	2”	W of fueling area	
ECIMW-5	1”	S of fueling area	Laterally gradient
ECIMW-8	1”	Middle of fueling area	Within
ECIMW-6	1”	NE of fueling area	Down gradient
ECIMW-7	1”	E of fueling area	
MW-4	2”	SE of fueling area	

Groundwater sampling work was conducted according to Stratum Group’s standard field procedures and methods for field testing and sample handling, presented in the Field Procedures document in Appendix IV.

5.1 Professional Monitoring Well Elevation Survey

Harmsen LLC of Everett, Washington completed a survey of the monitoring wells on the subject property on November 30, 2023. Harmsen established the horizontal position of the wells on the ground (UTM) using horizontal datum NAD 83/2011 and the elevation of both the top of the monument (ground surface) and the top of the PVC well casing inside the monument based on a vertical datum of NAVD88. Well elevations were used to calculate groundwater table elevations and model groundwater flow.

A copy of Harmsen's survey report is provided in Appendix II.

5.2 Groundwater Depth & Flow Direction

Stratum Group personnel conducted four rounds of groundwater monitoring on the Acrowood Corp site on October 25, 2023, February 22, 2024, May 30, 2024, and October 9, 2024. Prior to each round of groundwater sampling, field personnel opened the well casing cap and allowed the water level to equilibrate to atmospheric pressure for a minimum of 30 minutes. A depth to water measurement was collected from the north rim of the PVC well casing prior to well purging. Depth to water measurements were used to model groundwater flow on the site. Depth to water measurements and calculated groundwater elevations for each sampling period event are presented in Table 2.

Groundwater elevations across the site ranged between 43.27 feet and 48.77 feet above mean sea level (AMSL). Groundwater depths were generally shallowest in the peak of the wet season (February) and deeper during and at the end of the dry season. Interestingly, groundwater depths were found to be deepest during the October 9, 2024 sampling event. Although October would on average be representative of the early rainy season and thus groundwater elevations would be expected to be starting to rebound, a review of historical weather data for Everett, Washington indicates that rainfall during September 2024 was less than one fifth of the measured rainfall in September 2023 and well below average, which effectively made early October 2024 an unusual extension of the dry season. The October 2024 sampling interval can thus be inferred to represent some of the lowest groundwater elevations expected for this site.

Modeled groundwater flow directions during the last four quarters of groundwater monitoring indicated consistent flow to the east-southeast. Groundwater contour maps for each of the four quarterly sampling events are provided in Figures 5 through 8 in Appendix I.

Table 2. Groundwater Depths & Elevations

Monitoring Well	Top of PVC elevation (ft)	Measurement Date	Depth-to-Water (ft)	Calculated Elevation of Top of Groundwater (ft)
ECIMW-9	58.60	10/25/2023	10.71	47.89
		2/22/2024	9.83	48.77
		5/30/2024	10.70	47.90
		10/9/2024	10.98	47.62
MW-1	58.25	10/25/2023	12.48	45.77
		2/22/2024	10.90	45.35
		5/30/2024	11.24	47.01
		10/9/2024	12.72	45.53
ECIMW-5	57.86	10/25/2023	13.31	44.55
		2/22/2024	12.42	45.44
		5/30/2024	12.54	45.32
		10/9/2024	13.99	43.87
ECIMW-8	58.07	10/25/2023	12.79	45.28
		2/22/2024	12.10	45.97
		5/30/2024	12.12	45.95
		10/9/2024	13.56	44.51
ECIMW-6	48.82	10/25/2023	3.63	45.19
		2/22/2024	3.62	45.20
		5/30/2024	3.77	45.05
		10/9/2024	5.07	43.75
ECIMW-7	48.50	10/25/2023	3.58	44.92
		2/22/2024	3.82	44.68
		5/30/2024	3.72	44.78
		10/9/2024	5.18	43.32
MW-4	48.12	10/25/2023	3.51	44.61
		2/22/2024	3.54	44.58
		5/30/2024	3.48	44.64
		10/9/2024	4.85	43.27

5.3 Groundwater Sample Collection

Water samples were collected from all seven monitoring wells surrounding the former fueling area during each of the four monitoring periods. The water samples were collected into labeled laboratory supplied containers. Dedicated plastic tubing was utilized throughout each sampling period for each of the wells except ECIMW-8. New tubing was used each time when purging and collecting samples from ECIMW-8.

A minimum of three well volumes were purged from each of the wells prior to sampling. Recharge from all wells was sufficiently rapid and no wells ran dry during purging. No hydrocarbon odor or sheen was observed on purge water from any of the wells except ECIMW-8. A slight to moderate petroleum odor and sheen was observed in purge water from ECIMW-8 during each sampling period.

Samples were immediately placed into an ice-chilled cooler for storage and were shipped to Friedman & Bruya Laboratory in Seattle, Washington on the day of sample collection.

Friedman & Bruya Laboratory informed Stratum Group on October 26, 2023 that several of the bottles had broken in transit to the laboratory, resulting in insufficient water volume from MW-4, ECIMW-7, and ECIMW-8 to conduct the desired analyses. Due to how the samples were packaged, no concerns of cross-contamination due to the breakage were identified by the laboratory. Stratum Group returned to the Acrowood site on November 2, 2023 to collect additional samples from MW-4, ECIMW-7, and ECIMW-8 for analysis for the Q1 sampling period.

5.4 Groundwater Sample Results

The groundwater samples were analyzed for diesel- and oil-range petroleum using method NWTPH-DX, and for naphthalene and cPAHs via EPA Method 8270E. The samples collected during the October 2024 monitoring event were further analyzed for metals. These were the contaminants of concern identified from the previous sampling results in Area 3.

A summary of the groundwater sample results is presented in Tables 3 and 4, and on maps in Figures 9 and 10 in Appendix I. Table 3 includes the results of the four quarters of sampling performed as part of this interim action and the water quality results from November 2019, the most recent previous groundwater monitoring event, for comparison. The groundwater data is compared to the MTCA Method A cleanup standards for unrestricted land use to evaluate for compliance. Complete analytical laboratory reports and chain-of-custody forms are presented in Appendix III.

Table 3. Groundwater Sample Results – Petroleum & SVOCs (November 2019-October 2024)

Well ID	Well Position Relative to Release Area	Sample Date	Contaminant Concentrations (µg/L)										
			Diesel	**Oil**	**Naphthalene**	**Benzo (a) pyrene**	**Benzo (a) anthracene**	**Benzo (b) fluoranthene**	**Benzo (k) fluoranthene**	**Chrysene**	**Dibenz (ah) anthracene**	**Indeno (1,2,3-cd) pyrene**	**Total cPAHs [a]**
ECIMW-9	Up gradient	11/13/19	**200**	U<250	**0.37**	ND	ND	ND	ND	ND	ND	ND	ND
		10/25/23	U<50	U<250	U<0.4	U<0.04	U<0.04	U<0.04	U<0.04	U<0.04	U<0.04	U<0.04	--
		2/22/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		5/30/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
MW-1		11/13/19	**150**	U<250	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10/25/23	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		2/22/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	**0.025**	U<0.02	U<0.02	U<0.02	U<0.02	**0.0025**
		5/30/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
ECIMW-5	Laterally gradient	11/13/19	U<130	U<250	ND	**0.16**	**0.16**	**0.31**	**0.13**	**0.21**	**0.054**	**0.13**	**0.24**
		10/25/23	U<50	U<250	U<0.4	U<0.04	**0.048**	**0.054**	U<0.04	U<0.04	U<0.04	U<0.04	**0.010**
		2/22/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		5/30/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
ECIMW-8	Within	11/13/19	**16,000**	**4,000**	**174**	**0.079**	**0.22**	**0.068**	ND	**0.33**	ND	ND	**0.11**
		11/2/23	**1,500 x**	**610 x**	**0.41**	**0.088**	**0.14**	**0.063**	U<0.02	**0.17**	U<0.02	**0.028**	**0.11**
		2/22/2024	**1,400 x**	U<250	**2.7**	U<0.02	**0.021**	U<0.02	U<0.02	**0.024**	U<0.02	U<0.02	**0.0023**
		2/22/2024 (D)	**1,200 x**	U<250	**2.3**	U<0.02	**0.027**	U<0.02	U<0.02	**0.035**	U<0.02	U<0.02	**0.0030**
		5/30/2024	**1,100 x**	U<250	**2.3**	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		5/30/2024 (D)	**780 x**	U<250	**2.1**	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024	**790**	U<250	**2.4**	**0.061**	**0.07**	**0.041**	U<0.02	**0.16**	U<0.02	**0.026**	**0.076**
		10/9/2024 (D)	**1,000**	**370 x**	**2.3**	**0.02**	**0.031**	U<0.02	U<0.02	**0.055**	U<0.02	U<0.02	**0.024**
ECIMW-6	Down gradient	11/13/19	U<130	U<250	ND	ND	ND	ND	ND	ND	ND	ND	ND
		10/25/23	U<50	U<250	U<0.4	U<0.04	U<0.04	U<0.04	U<0.04	U<0.04	U<0.04	U<0.04	ND
		2/22/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		5/30/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
ECIMW-7		11/13/19	**320**	**400**	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11/2/23	**180 x**	**420 x**	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		2/22/2024	**470 x**	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		5/30/2024	**89 x**	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024	**590 x**	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024-SGC	U<50	U<250	--	--	--	--	--	--	--	--	--
MW-4		11/13/19	U<130	U<250	ND	ND	ND	ND	ND	ND	ND	ND	ND
		11/2/23	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		2/22/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		5/30/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
		10/9/2024	U<50	U<250	U<0.2	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	U<0.02	ND
Site Selected CULs			*500*		*160*	*0.1*	→	→	→	→	→	→	→	→	*0.1*

U= contaminant not detected above the reporting limit shown in the cell; ND = analyte not detected above reporting limit (for historical data where reporting limit is not provided); a = Total cPAHs are calculated in accordance with Ecology's Implementation Memo #10 (*Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs)*; x = laboratory qualifier indicating that the sample chromatographic pattern does not resemble the fuel standard used for quantitation; Sample dates ending in (D) indicate a field duplicate sample collected on the same date as the original; **BOLD and shaded** values indicate exceedances of CULs.

Table 4. Groundwater Sample Results – Metals (October 9, 2024)

Well ID	Well Position Relative to Release Area	Contaminant Concentrations (µg/L)				
		Arsenic	**Cadmium**	**Chromium**	**Lead**	**Mercury**
ECIMW-9	Up gradient	U<1	U<1	**1.5**	U<1	U<1
MW-1		U<1	U<1	**1.3**	U<1	U<1
ECIMW-5	Laterally gradient	U<1	U<1	**3.1**	U<1	U<1
ECIMW-8	Within	**11**	U<1	**2.7**	**1.1**	U<1
		10 (D)	U<1 (D)	U<5 (D)	**1.2** (D)	U<1 (D)
ECIMW-6	Down gradient	U<1	U<1	**1.9**	U<1	U<1
ECIMW-7		U<1	U<1	**1.2**	U<1	U<1
MW-4		U<1	U<1	**1.1**	U<1	U<1
Screening Levels		*5*	*5*	*50*	*15*	*2*

U= contaminant not detected above the reporting limit shown in the cell; -- = analyte not tested; (D) = represents results from a field duplicate sample; **BOLD and shaded** values indicate exceedances of CULs.

Petroleum

Groundwater collected through the former fueling area (ECIMW-8) continues to exhibit elevated concentrations of diesel- and oil-range petroleum, with the combined concentration of diesel and oil exceeding the MTCA Method A CUL during each sampling period. However, petroleum concentrations have consistently decreased throughout the monitoring period, suggesting that petroleum contaminants are slowly naturally attenuating.

Water from all other wells met Method A CULs for diesel and oil throughout the monitoring period with one exception. Diesel- and/or oil-range petroleum were detected in MW-7, west southwest of ECIMW-8, at a combined 600 µg/L and 590 µg/L during the October 2023 and October 2024 sampling events, respectively. These detections are slightly above the Method A CUL of 500 µg/L (sum of diesel and oil detections in sample). To investigate this sporadic exceedance further, the sample collected during the October 2024 sampling event was reanalyzed for diesel and oil after undergoing the silica gel cleanup (SGC) protocol to remove non-petroleum organic material that could be biasing the results high. The October 2024 sample contained no detectable petroleum hydrocarbons after undergoing SGC. These results indicate that water from MW-7 does in fact meet the Method A CUL and that the initially recorded exceedance was simply the result of interference from non-petroleum organics in site groundwater.

Sample data collected demonstrates that petroleum contamination in site groundwater is confined to the immediate vicinity of the former fueling area (ECIMW-8) and does not extend beyond the property boundaries.

cPAHs & Naphthalene

cPAHs were not detected or were detected at concentrations well below the Method A CUL in each well throughout the monitoring period with one exception. cPAH concentrations in ECIMW-8, through the former fueling area, slightly exceeded the CUL of 0.1 µg/L (detection of 0.11 µg/L) during the October 2023 sampling interval. However, cPAH concentrations dropped well below the CUL for the remaining three sampling intervals.

This represents a change since 2019, when cPAHs were also detected above the Method A 0.1 µg/L CUL (0.24 µg/L) in ECIMW-5. In October 2023, cPAHs were still detected in ECIMW-5 but at an order of magnitude below the Method A CUL. Water from ECIMW-5 was non-detect for cPAHs for the subsequent three sampling intervals. cPAHs were also detected once in water from MW-1 during the February 2024 sampling interval, but at concentrations well below the Method A CUL.

These results suggest that the 2019 spike in cPAH concentrations outside the fueling area (ECIMW-8) was likely the result of field cross contamination, laboratory contamination, or potentially associated with turbidity in the sample that may have biased the result high. Sample data collected since 2023 demonstrate that cPAH contamination in site groundwater is confined to the immediate vicinity of the former fueling area within the property boundaries and even in this location, cPAH

concentrations have been below Method A CULs for the last three consecutive sampling intervals.

Naphthalenes were only detected in water from ECIMW-8 across the monitoring period. However, concentrations have been consistently well below the Method A CUL of 5 µg/L.

Metals

Arsenic, chromium, and lead were detected in one or more of the water samples collected in October 2024. However, only arsenic concentrations in ECIMW-8 exceeded the Method A CUL of 5 µg/L, with a detection of 11 µg/L (10 µg/L in the field duplicate). The sample was not field or laboratory filtered and field notes indicate that the sample from ECIMW-8 was slightly turbid at the time of sample collection, which could have biased the metals concentration high. Regardless, these results show that metals contamination in site groundwater is confined to the immediate vicinity of the former fueling area and does not extend beyond the property boundaries.

Cadmium and mercury were not detected in water from any of the site wells.

6.0 CONCEPTUAL SITE MODEL

Contamination on the Acrowood site can be divided into three areas of concern (Areas 1, 2, and 3), as described in Section 3.0. A narrative discussion of the potential contaminant sources, site-specific contaminants of concern and potential pathways for migration of the contamination is presented below. A schematic representation of the Acrowood conceptual site model is presented in Figure 11 in Appendix I.

6.1 Potential Contamination Sources

Area 1 – Contamination in the vicinity of the paint shed is suspected to be the result of poor handling practices that resulted in spills to the concrete floor of the shed and/or adjacent to the building exterior.

Area 2 – Contamination in the vicinity of the former heating oil UST is likely the result of leaks from the UST, leaks from underground piping, or overfills of the tank when it was operational. The tank was removed, but a small zone of diesel-range petroleum impacted soil remains.

Area 3 – Contamination in the vicinity of the former fueling area is likely the result of leaks from the former tanks and product piping, overfills, releases of fuel to the ground during transfers to equipment, and/or dumping. Additionally, fill material with metal slag has been observed in the vicinity of Area 3.

A Phase I ESA report from August 1999 identified other areas of potential contamination sources on the site including leaks from site equipment, disposal of waste foundry slag, concentration of

contaminants at a stormwater outfall location, and former operation of an on-site septic system. However, early site sampling work in 1999 and 2000 did not identify significant contamination issues in these locations.

All known contamination in both soil and groundwater that exceeds MTCA Method A CULs for unrestricted land use is present within the parcel boundaries of the site. Numerous environmental borings and monitoring wells have been completed off-site to the east of Area 3, but no soil or groundwater results have exceeded MTCA Method A CULs. The contamination around Areas 1 and 2 is very limited in lateral extent and is located far from the property boundaries.

No potential off-site sources of contamination have been previously identified as posing a significant environmental risk to the subject property.

6.2 Contaminants of Concern

Table 5 identifies the known and potential COCs at the site.

Table 5. Known and Potential Contaminants of Concern

Source	Contaminants of Concern	Media	Status	Characterized?
Area 1 – Paint Shed	Trichloroethylene (TCE)	Soil	Below MTCA Method C	Yes
		Groundwater	**Confirmed**	
		Soil Vapor	Below MTCA Method B	
Area 2 – Former Heating Oil UST	Oil/Diesel	Soil	**Confirmed**	Yes
		Groundwater	Below MTCA Method A	
		Soil Vapor	Not suspected	
Area 3 – Former Fueling Area	Oil/Diesel	Soil	**Confirmed**	Yes
		Groundwater	**Confirmed**	
		Soil Vapor	Not suspected	
	cPAHs	Soil	Below MTCA Method C	
		Groundwater	Below MTCA Method A	
	Metals	Soil	Below MTCA Method A	
		Groundwater	Below MTCA Method A except Arsenic	

Confirmed = contamination identified above MTCA Method A concentrations
Not suspected = Based on contaminant location and type of COC, vapor intrusion not suspected
Below MTCA = samples collected and contaminants not found exceeding MTCA Method A

6.3 Potential Exposure Pathways

Potential exposure and/or mobilization pathways for releases on the site include direct contact with contaminated soil and groundwater, soil to groundwater, soil and groundwater to surface water/sediment, and soil and groundwater to vapor. Although soil vapor and/or groundwater may be impacted by one or more COCs, it is our opinion that the groundwater ingestion and vapor intrusion pathways are not currently complete, as discussed below.

At present and for the foreseeable future, potential receptors to site contamination include commercial/industrial workers and construction workers, as long as the site remains in industrial use and zoning.

Direct Contact Pathway: Soil and Groundwater to Receptors

Direct contact with contaminated soil and/or groundwater is the most significant exposure pathway for the site. TCE-contaminated soil above MTCA Method A CULs but below Method C CULs is suspected to be present on the site in Area 1. Contaminated soil is only suspected to be located between approximately 6 and 10 feet bgs and occupy a lateral area of approximately 100 square feet or less.

Diesel- and oil-contaminated soil is suspected to be present on the site in Area 2. Contaminated soil is suspected to be between approximately 7 and 10 feet bgs and occupy a lateral area of approximately 100 square feet or less.

Soil contaminated with diesel, oil, naphthalene, and cPAHs is suspected to be present on the site in Area 3. Contaminated soil is suspected to be between approximately 10 and 17 feet bgs and cover a lateral area of approximately 200 square feet or less.

The direct contact pathway between contaminated soil and receptors is complete.

No drinking water wells are known to be present on the property and water is delivered to the property from the City of Everett. Therefore, the groundwater ingestion pathway is not complete at present.

Soil to Groundwater Pathway

Groundwater is present between approximately 10 and 13 feet bgs in the vicinity of the site buildings and approximately 3 to 4 feet bgs to the east of the site, below the retaining wall.

Impacts to groundwater have been identified in association with Area 1 and Area 3. Contaminated soil is present at depths in these areas to potentially interact with shallow groundwater and therefore this pathway is complete in Areas 1 and 3. The soil to groundwater pathway is complete in Areas 1 and 3.

Soil contamination remains present around Area 2 within the potential depths of groundwater contact, but sampling data has provided empirical evidence that residual soil contamination in Area 2 is not impacting groundwater quality. Therefore, the soil to groundwater pathway is not complete for Area 2.

Groundwater to Surface Water/Sediment Pathway

The areas of known contamination at the site are located approximately 1,600 feet west of the Snohomish River at its nearest point. Based upon the documented lateral extent of contaminant plumes on the site and the distance of those plumes from the Snohomish River, it is our opinion that the likelihood of the groundwater to surface water/sediment exposure pathway being complete is low.

Soil or Groundwater to Vapor Pathway

Each of the areas of known contamination are located in close proximity to buildings on the property.

Highly volatile substances (TCE) are present in Area 1 on the site. A soil vapor study conducted in Area 1 in March 2000 did not detect any VOCs in soil vapor beneath the paint shed structure or around the shed exterior. Based upon the lack of detections in the soil vapor study, the pathway for soil to vapor pathway in Area 1 is not complete.

Area 2 has been impacted by low volatility COCs including diesel- and oil-range petroleum. Area 2 only marginally exceeded its unrestricted CULs and based upon the concentration of residual diesel and oil in the soil, the soil to vapor pathway is incomplete in Area 2. Additionally, no groundwater contamination has been identified in Area 2, so the groundwater to vapor pathway is incomplete.

Area 3 has been impacted by low volatility COCs including diesel and oil-range petroleum, and cPAHs in the soil and groundwater. Samples of soil and groundwater from beneath the Area 3 building foundation (ECIMW-9) have been shown to meet unrestricted CULs. Additionally, groundwater in the vicinity of Area 3 has been shown to be flowing away from the building to the southeast, suggesting that any future migration of the contaminant plume is not likely to be toward or beneath the building. Finally, due to the heavy industrial use of the building, the concrete foundation underlying the Area 3 building is likely significantly thicker than a standard foundation, providing additional protection against potential vapor intrusion. It is our opinion that based on the relatively low volatility of these COCs, the nature of residual contamination, and the heavy industrial activities occurring inside the adjacent structures that likely utilize petroleum and solvent-based products, any contribution to indoor air quality made by subsurface contamination in Area 3 is negligible and this exposure pathway does not require further investigation.

6.4 Ecological Receptors

A terrestrial ecological evaluation (TEE) of the site was completed by ECI in February 2012. Their findings indicated that the site qualifies and/or will qualify for Primary Exclusion 1 and 2, therefore bypassing a need for any additional ecological evaluation. A site qualifies for Exclusion 1 if all of the contamination at the site is located deep in the soil and will not be accessible to ecological receptors. A site qualifies for Exclusion 2 if all of the contamination at the site is covered by physical barriers and a restrictive covenant is implemented to prevent direct contact with subsurface soil. ECI further argued that the site likely qualifies for Exclusion 3 as well, due to the planned development of the green space adjacent to the site to the west.

The site is zoned as light industrial and is currently in active industrial use for the manufacturing of timber industry equipment. It is our understanding that the site is planned for continued industrial use for the foreseeable future.
Based upon the site qualifying for primary exclusions from additional ecological evaluation, and planned ongoing industrial use of the site, final cleanup levels for the site do not have to take into account ecological receptors.

6.5 Proposed Cleanup Standards

The MTCA regulation requires that selected cleanup standards for a site are protective of human health and the environment. At present, the only documented or suspected exposure pathways are through direct contact with soil and the soil to groundwater pathways. The site COCs are TCE, diesel- and oil-range petroleum hydrocarbons, cPAHs, and arsenic.

Ecology offers three options for cleanup standards: Method A, Method B, and Method C.

Method A is used on sites where the cleanup action is limited, and common contaminants are present. Method A utilizes a common list of approximately 20 chemicals that have standardized cleanup levels for the protection of human health. A Terrestrial Ecological Evaluation must be conducted to make sure cleanup levels are protective of ecological health. When the standards are met, the site can be used with unrestricted land use.

Method B cleanup standards can be used at any site. The cleanup standards are developed using standard default assumptions in risk equations; however, the default assumptions can be modified, if appropriate. Cleanup levels for Method B are set at a risk level where the risk does not exceed 1 in 100,000. Cleanup levels must also be protective of terrestrial and aquatic ecological environments. Most sites that meet Method B cleanup standards can be used with unrestricted land use. Ecology has expanded its use of the Method B values to create Model Remedies for sites with only petroleum contamination; however, due to there being multiple types of contaminants on this site, model remedies are not appropriate for this site.

Method C cleanup standards are utilized on industrial sites and typically require an institutional control (e.g., restrictive covenant) to maintain protection for human and ecological health.

We recommend that the site use MTCA industrial CULs for soil and MTCA Method A (unrestricted) for groundwater. Where Method C CULs are available, it is our opinion that Method C is appropriate for soil given the current and future industrial use of the site and the proposed implementation of a restrictive covenant for the site. If a contaminant is present for which a Method C CUL is not available, then the site will use the Method A industrial CULs (e.g., petroleum).

The proposed site-specific cleanup levels are presented in Table 6, below. Cleanup levels for soil are presented in milligrams per kilogram (mg/kg) and cleanup levels for groundwater are presented in micrograms per liter (µg/L).

Table 6. Proposed Site-Specific CULs for Acrowood

Contaminants of Concern	Cleanup Standards	
	Soil (mg/kg)	**Groundwater (µg/L)**
TCE	2,900 (Method C)	5 (Method A)
Oil	2,000* (Method A industrial)	500* (Method A)
Diesel		
Naphthalene	7,000 (Method C)	160 (Method A)
cPAHs	130 (Method C)	0.1 (Method A)
Arsenic	--	5 (Method A)

*Cleanup standard is the combined concentration of oil- and diesel-range petroleum hydrocarbons.

The point of compliance for all contaminants of concern in soil and groundwater is throughout the site.

6.6 Current Known Extent of Site Contamination

A map indicating the extent of residual soil and groundwater contamination above unrestricted land use CULs is presented as Figure 12 in Appendix I.

Area 1 – Paint Storage Building

Existing data indicates that TCE is present in the soil by the paint storage building (sample location P7) at 8 feet bgs at a concentration of 0.055 mg/kg, above the Model Toxics Control Act (MTCA) Method A CUL of 0.03 mg/kg. The lateral extent of contamination above Method A CULs is limited to within ~10 feet of the P7 location and in a narrow depth range around 8 feet bgs. However, the maximum detected TCE concentrations in soil are still well below the Method C industrial CUL of 2,900 mg/kg. Therefore, soil meets the selected site CULs.

Existing data indicates that groundwater immediately south of the building (sample location P6) contains concentrations of TCE above the MTCA Method A CUL of 5 µg/L, with a detected

concentration of 8.38 µg/L. Water samples collected approximately 50 feet to the west and south of P6 met Method A CULs for TCE. Thus, residual contaminated groundwater is expected to occupy only a small area surrounding P6.

Soil vapor samples collected from four locations around and beneath the building contained no detectable concentrations of TCE. Therefore, soil vapor is not an impacted media in Area 1.

Area 2 – Former Heating Oil UST

Existing data indicates that diesel- and oil-range petroleum is present above soil CULs (2,000 mg/kg combined) through the former UST pit (sample location P8), with a combined concentration of 2,903 mg/kg. Field indicators estimated the vertical extent of contamination as between 8 and 11 feet bgs and additional samples demonstrated soil impacts extended less than 10 feet laterally.

Groundwater in Area 2 has not been impacted by the release from the former heating oil UST.

Area 3 – Former Fueling Area

Existing data indicates that diesel- and oil-range petroleum hydrocarbons, naphthalene, and/or cPAHs are present in soil at concentrations above unrestricted CULs directly beneath the suspected former fuel tanks, however, the naphthalene and cPAH concentrations are well below the site industrial CULs. The area of impact is located just west of an approximately 10-foot-high retaining wall. Sampling has shown soil contamination to be concentrated between 8 and 15 feet bgs and within approximately 15 feet of sampling location P1 (see Figure 3). No soil contamination above MTCA Method A CULs has been detected east of the retaining wall beyond the property boundary.

Groundwater in the immediate vicinity of the former fueling area (ECIMW-8), remains contaminated with diesel- and oil-range petroleum hydrocarbons above the groundwater CULs. Arsenic may also be present at concentrations above the Method A CUL in this location, but those results may have been biased high by field turbidity. Regardless, the contaminant plume is limited in lateral extent and does not extend beyond the property boundary. Four quarters of groundwater monitoring have demonstrated that the plume is stable and is not changing significantly through time or seasons. The petroleum plume on the site is located fully within the parcel boundaries.

7.0 PROPOSAL FOR SITE CLOSURE

The work described herein outlines a proposed pathway to site closure for the Acrowood site via a No Further Action determination with a restrictive covenant.

We propose that the work plan be implemented in two stages:

1. Environmental cap construction
2. Preparation of an environmental covenant

7.1 Environmental Cap Construction

We propose the construction of three impermeable caps over the areas of residual soil and groundwater contamination on the site. Caps should be constructed such that access to the existing network of groundwater monitoring wells on the site is maintained.

These caps, constructed of either impermeable asphalt or concrete, will be constructed by a professional and licensed contractor. The pavement cap will serve to prevent incidental contact with residual contaminated soil and limit infiltration of rainwater through the residual contaminated soil, reducing the potential for future contamination of groundwater.

Based upon existing knowledge of residual contamination on the site, we propose the caps be constructed as follows:

- Area 1 → ~50 feet E-W by ~25 feet N-S, extending from the east edge of the building and west of the paint shed building, to cover the residual TCE contamination by P-6.
- Area 2 → ~50 feet E-W by ~30 feet N-S, centered over P-8 and extending south from the north-adjacent building.
- Area 3 → ~40 feet E-W by ~40 feet N-S, centered over ECIMW-8 and extending up to the edge of the retaining well to the east.

A map showing the proposed environmental caps is provided as Figure 12 in Appendix I.

7.2 Environmental Covenant

A draft environmental covenant will be prepared for the Acrowood site, per Toxics Cleanup Program Procedure 440A. The covenant will be drafted restricting property use to industrial purposes and limiting subsurface disturbance and groundwater extraction without notification to Ecology. Upon approval from Ecology, the covenant will be recorded on the property deed through Snohomish County Auditor's office.

7.3 Reporting

Upon completion of the environmental caps, a brief report documenting the cap construction and a copy of the draft environmental covenant will be submitted to Ecology with a request for a No Further Action determination.

All supporting data not previously supplied to Ecology will be entered into Ecology's Environmental Information Management (EIM) system.

APPENDIX I

Figure 1 – Site Vicinity Map

Figure 2 – Annotated Aerial Photograph

Figure 3 – Map of Existing Subsurface Explorations (Soil & Soil Vapor)

Figure 4 – Map of Existing Subsurface Explorations (Groundwater)

Figure 5 – Q1 Groundwater Contour Map (October 2023)

Figure 6 – Q2 Groundwater Contour Map (February 2024)

Figure 7 – Q3 Groundwater Contour Map (May 2024)

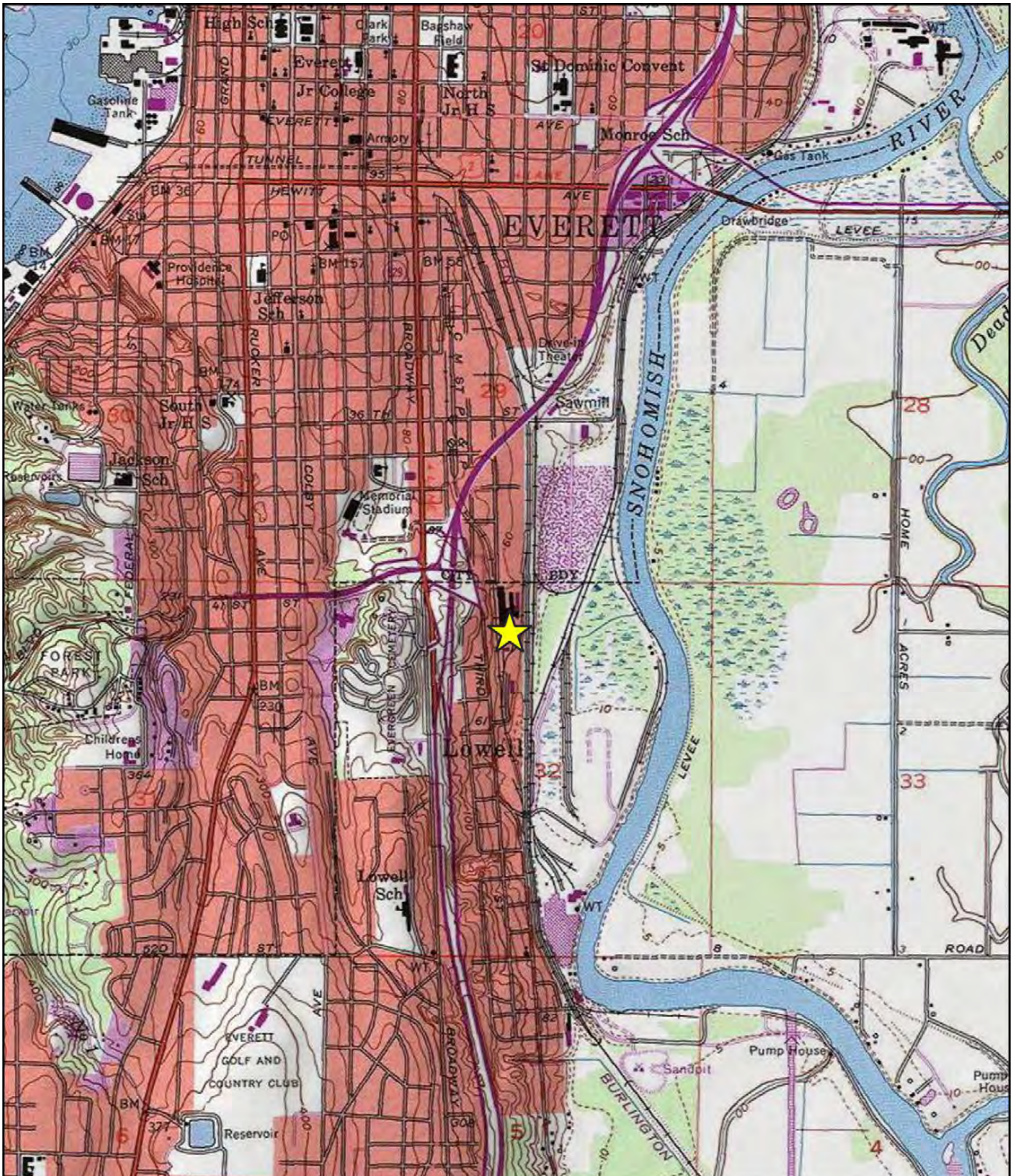
Figure 8 – Q4 Groundwater Contour Map (October 2024)

Figure 9 – Groundwater Sampling Results – Petroleum & cPAHs

Figure 10 – Groundwater Sampling Results – Metals

Figure 11 – Conceptual Site Model

Figure 12 – Environmental Cap Areas



★ Acrowood Site	Vicinity Map Acrowood Corp Site 4425 S 3rd Avenue Everett, Washington 98203	**Figure 1** 0 0.25 0.5 mi	N	STRATUM GROUP

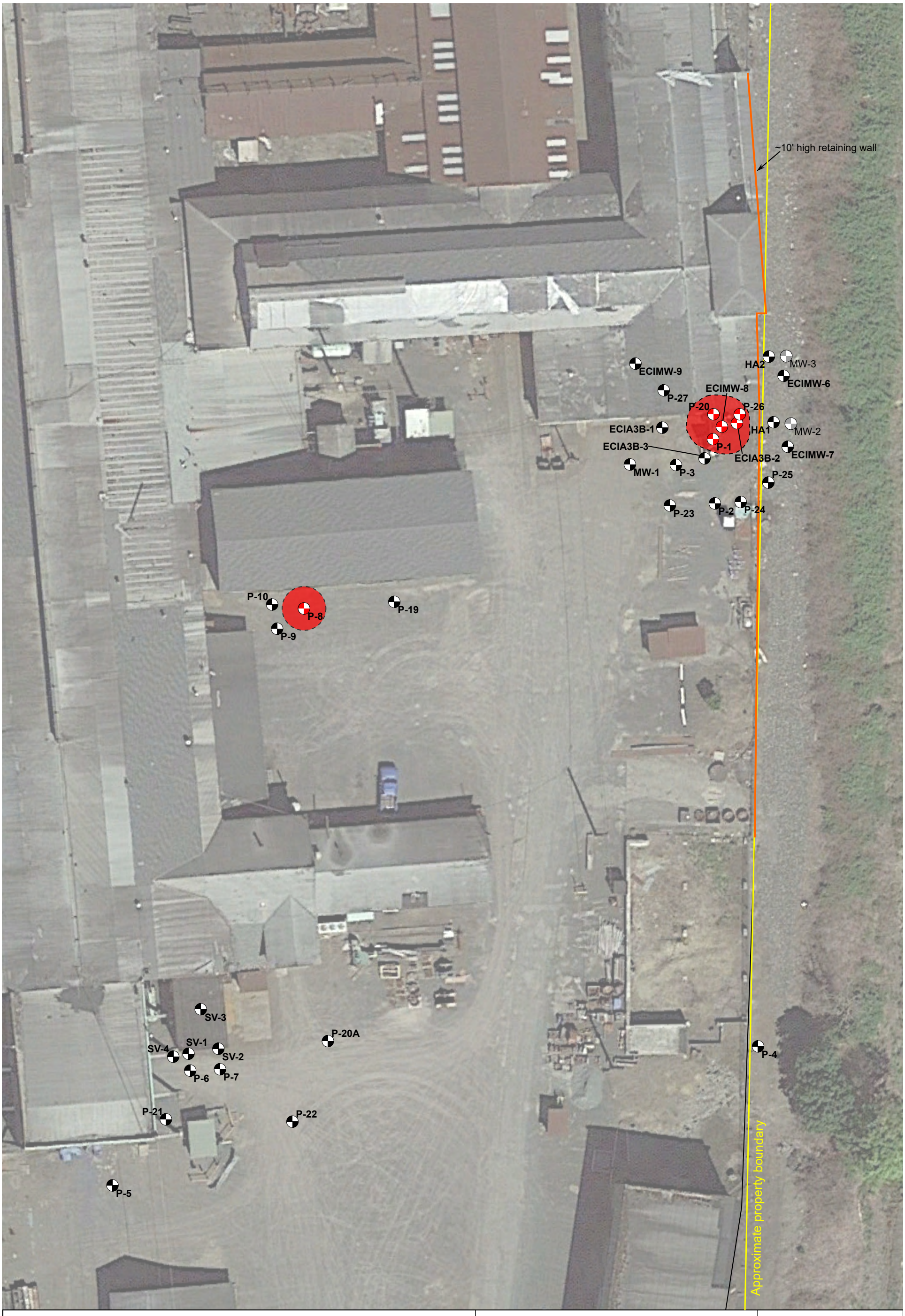
Annotated Aerial Photograph of the Site & Vicinity

Acrowood Corp Site
4425 3rd Avenue
Everett, Washington 98203

Figure 2

0 100 200 400 Feet

STRATUM GROUP



Key

- Sampling Location (below site CULs)
- Sampling Location (above site CULs)
- Abandoned monitoring well
- Estimated area of residual contamination

Map of Previous Subsurface Explorations:
Soil & Soil Vapor

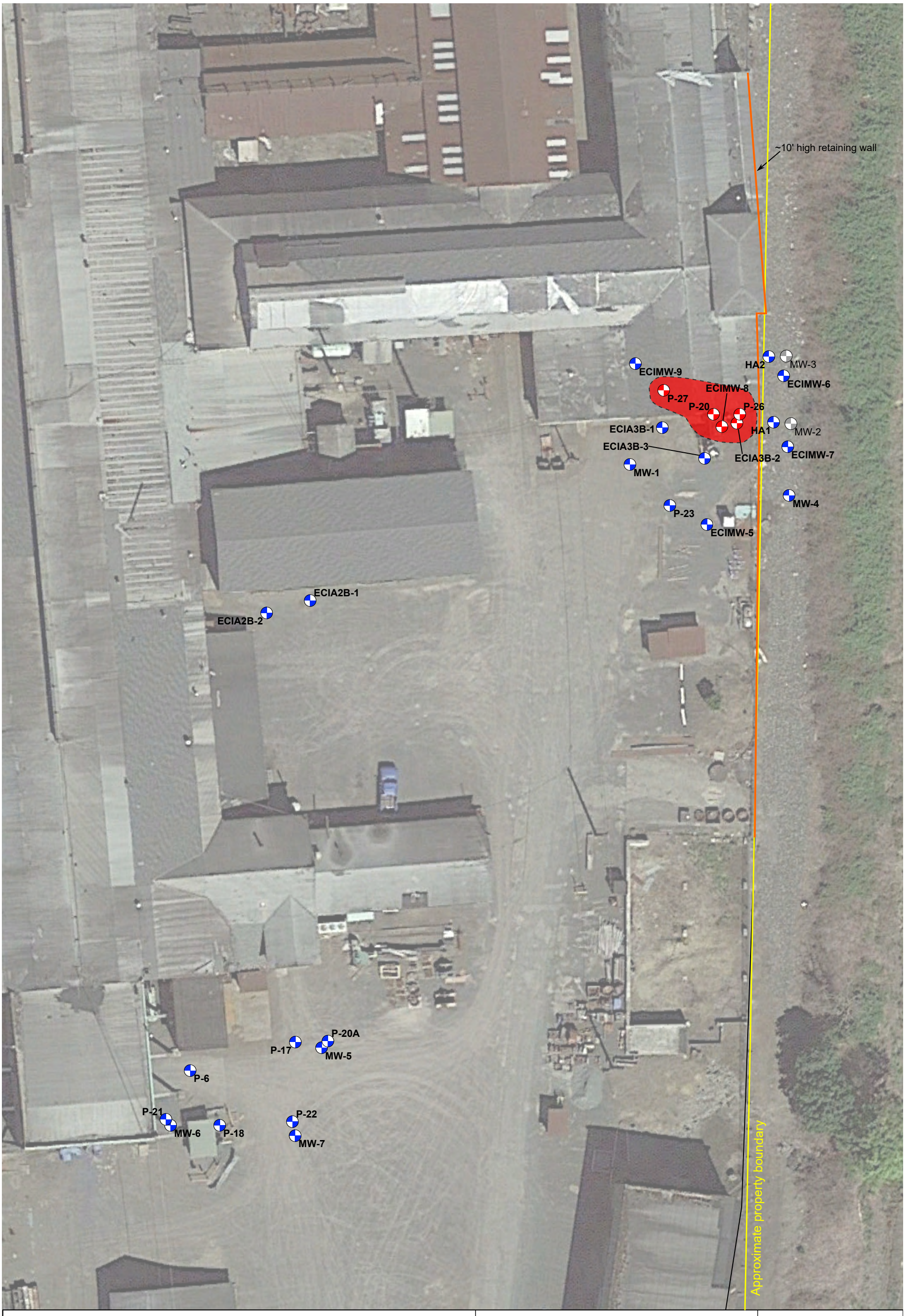
Figure 3

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

N

0 25 50 100 Feet

STRATUM GROUP



Key

- Sampling Location (below site CULs)
- Sampling Location (exceeds site CULs)
- Abandoned monitoring well
- Estimated area of residual contamination

Map of Previous Subsurface Explorations: Groundwater

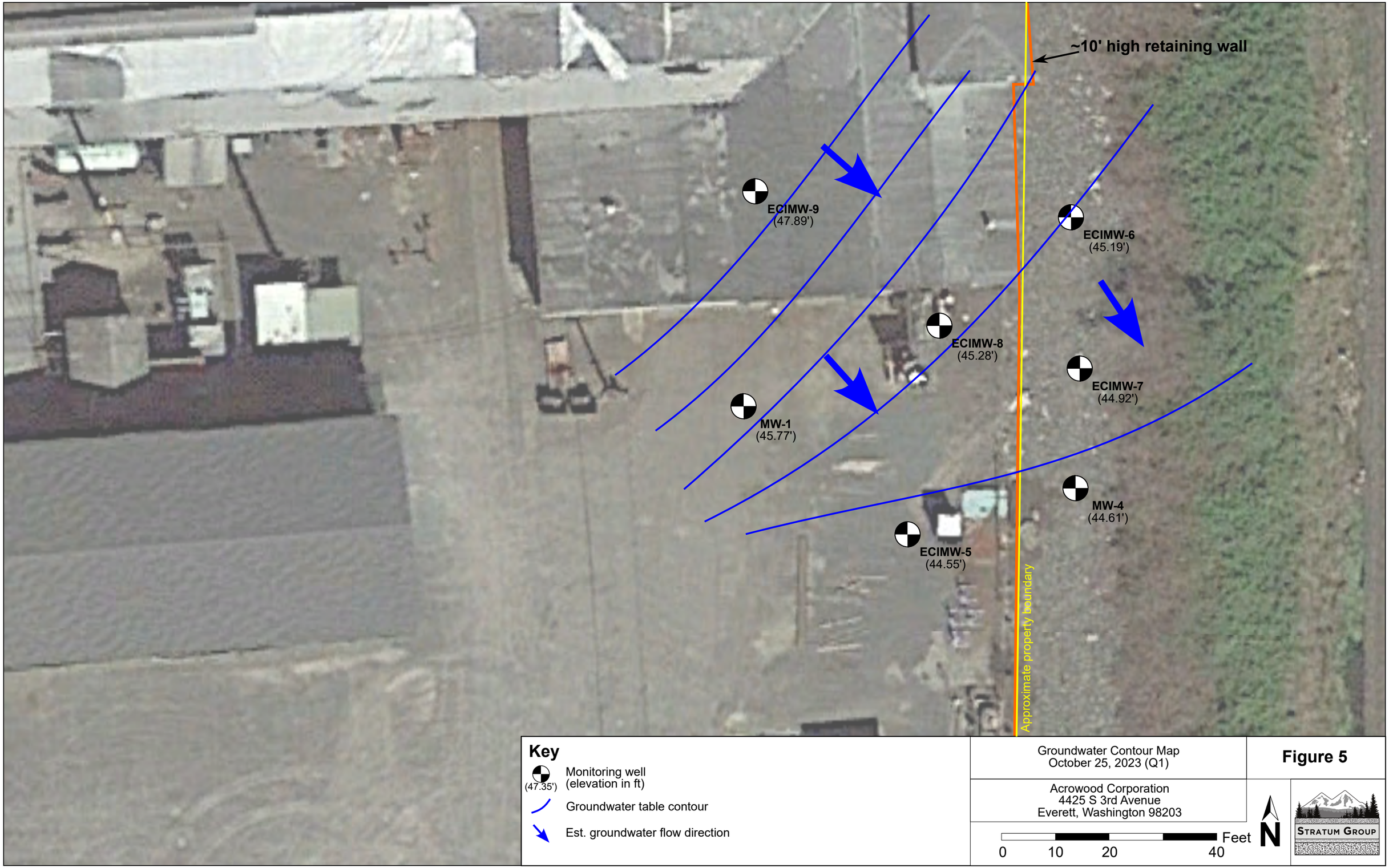
Figure 4

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

N

0 25 50 100 Feet

STRATUM GROUP



Key

(47.35') Monitoring well (elevation in ft)

Groundwater table contour

Est. groundwater flow direction

Groundwater Contour Map
October 25, 2023 (Q1)

Figure 5

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

0 10 20 40 Feet

N

Stratum Group

Key

(47.35') Monitoring well (elevation in ft)

Groundwater table contour

Est. groundwater flow direction

Groundwater Contour Map
February 22, 2024 (Q2)

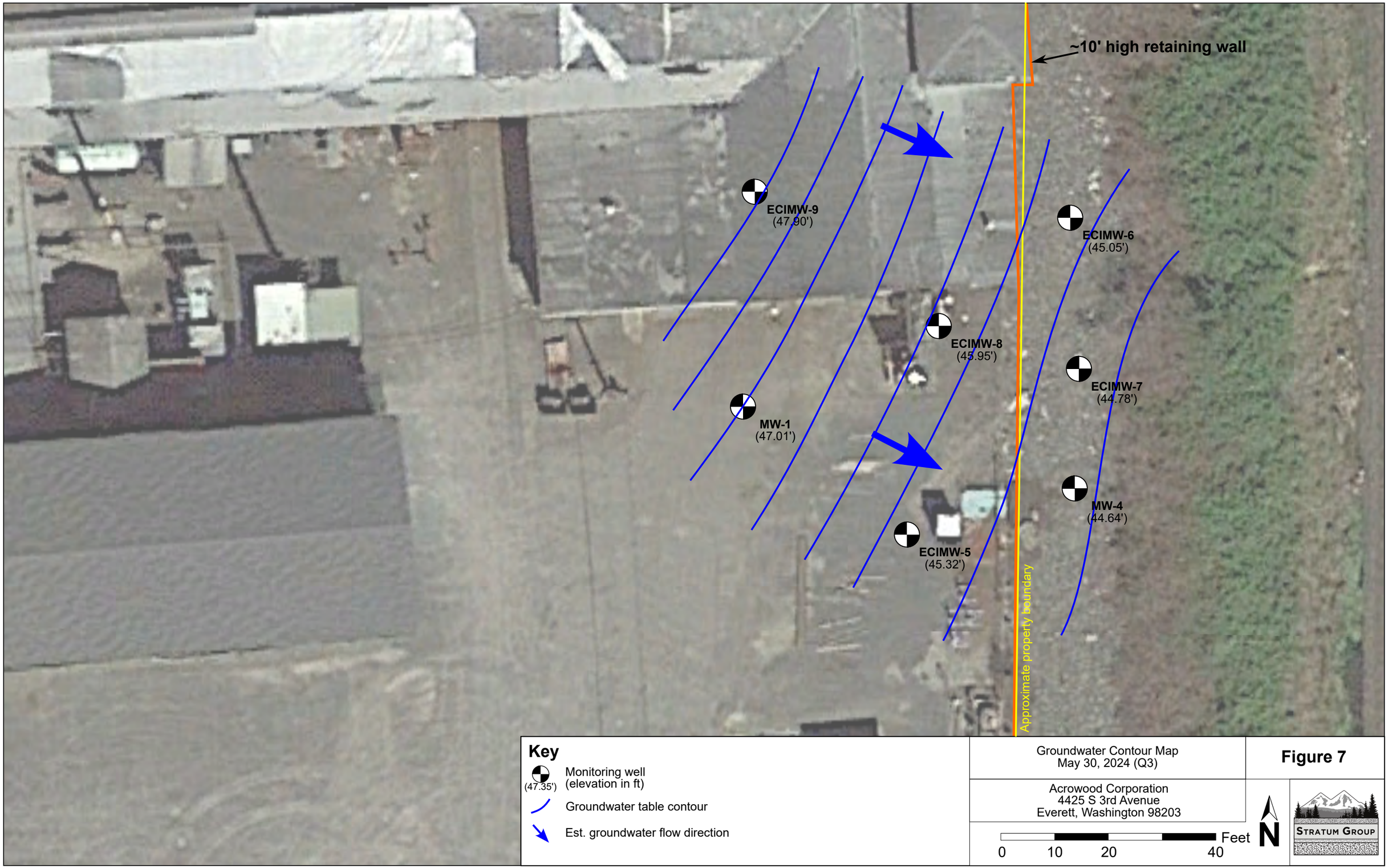
Figure 6

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

0 10 20 40 Feet

N

Stratum Group



Key

(47.35') Monitoring well (elevation in ft)

Groundwater table contour

Est. groundwater flow direction

Groundwater Contour Map
May 30, 2024 (Q3)

Figure 7

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

0 10 20 40 Feet

N

Stratum Group

Key

(47.35') Monitoring well (elevation in ft)

Groundwater table contour

Est. groundwater flow direction

Groundwater Contour Map
October 9, 2024 (Q4)

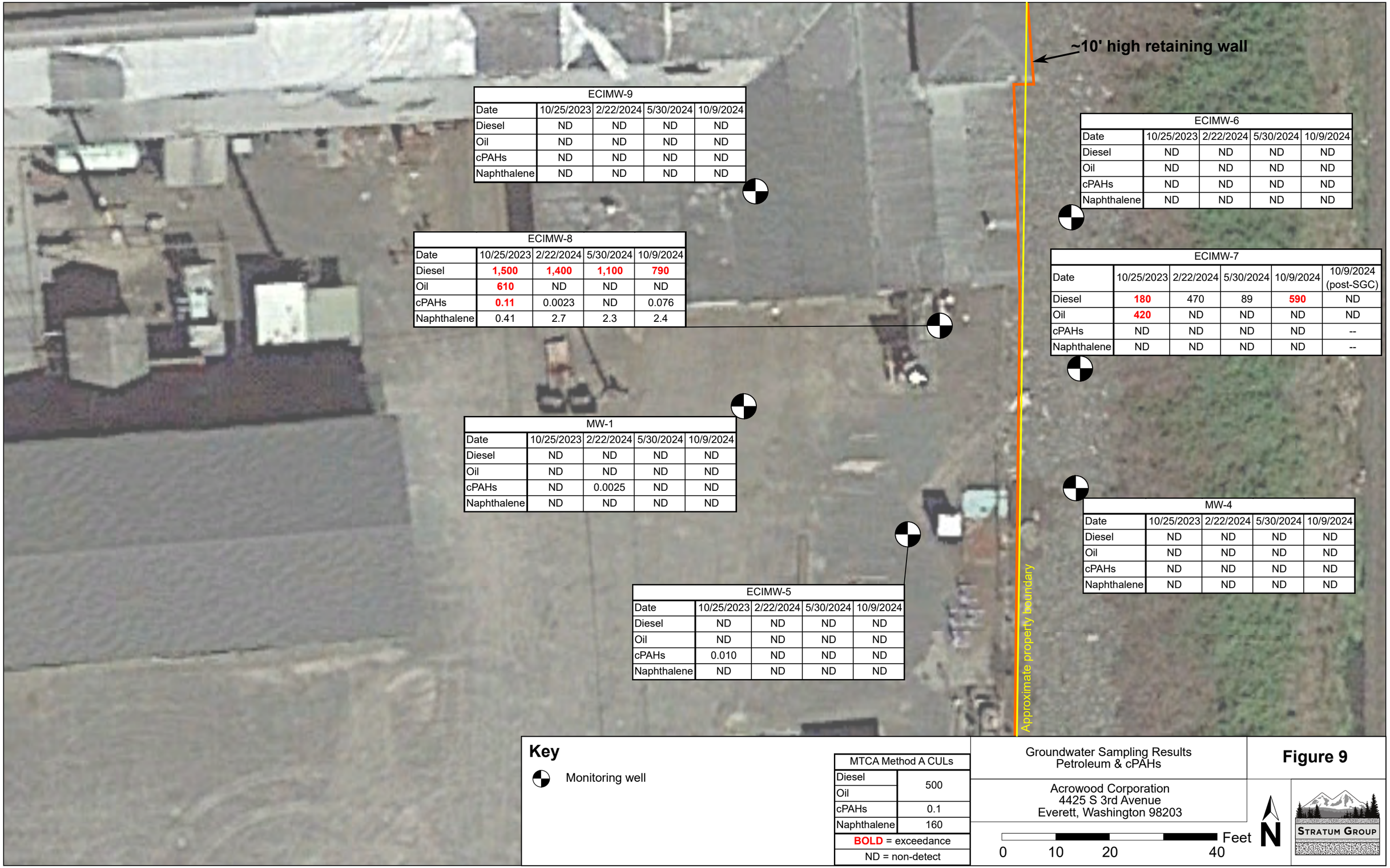
Figure 8

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

0 10 20 40 Feet

N

Stratum Group



ECIMW-9				
Date	10/25/2023	2/22/2024	5/30/2024	10/9/2024
Diesel	ND	ND	ND	ND
Oil	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND

ECIMW-8				
Date	10/25/2023	2/22/2024	5/30/2024	10/9/2024
Diesel	**1,500**	**1,400**	**1,100**	**790**
Oil	**610**	ND	ND	ND
cPAHs	**0.11**	0.0023	ND	0.076
Naphthalene	0.41	2.7	2.3	2.4

MW-1				
Date	10/25/2023	2/22/2024	5/30/2024	10/9/2024
Diesel	ND	ND	ND	ND
Oil	ND	ND	ND	ND
cPAHs	ND	0.0025	ND	ND
Naphthalene	ND	ND	ND	ND

ECIMW-5				
Date	10/25/2023	2/22/2024	5/30/2024	10/9/2024
Diesel	ND	ND	ND	ND
Oil	ND	ND	ND	ND
cPAHs	0.010	ND	ND	ND
Naphthalene	ND	ND	ND	ND

ECIMW-6				
Date	10/25/2023	2/22/2024	5/30/2024	10/9/2024
Diesel	ND	ND	ND	ND
Oil	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND

ECIMW-7					
Date	10/25/2023	2/22/2024	5/30/2024	10/9/2024	10/9/2024 (post-SGC)
Diesel	**180**	470	89	**590**	ND
Oil	**420**	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND	--
Naphthalene	ND	ND	ND	ND	--

MW-4				
Date	10/25/2023	2/22/2024	5/30/2024	10/9/2024
Diesel	ND	ND	ND	ND
Oil	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND

Key

Monitoring well

MTCA Method A CULs	
Diesel	500
Oil	
cPAHs	0.1
Naphthalene	160
BOLD = exceedance	
ND = non-detect	

Groundwater Sampling Results
Petroleum & cPAHs

Figure 9

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

0 10 20 40 Feet

N

STRATUM GROUP

ECIMW-9	
Arsenic	ND
Cadmium	ND
Chromium	1.5
Lead	ND
Mercury	ND

ECIMW-8	
Arsenic	**11**
Cadmium	ND
Chromium	2.7
Lead	1.1
Mercury	ND

ECIMW-6	
Arsenic	ND
Cadmium	ND
Chromium	1.9
Lead	ND
Mercury	ND

ECIMW-7	
Arsenic	ND
Cadmium	ND
Chromium	1.2
Lead	ND
Mercury	ND

MW-1	
Arsenic	ND
Cadmium	ND
Chromium	1.3
Lead	ND
Mercury	ND

MW-4	
Arsenic	ND
Cadmium	ND
Chromium	1.1
Lead	ND
Mercury	ND

ECIMW-5	
Arsenic	ND
Cadmium	ND
Chromium	3.1
Lead	ND
Mercury	ND

Key

Monitoring well

MTCA Method A CULs	
Arsenic	5
Cadmium	5
Chromium	50
Lead	15
Mercury	2

BOLD = exceedance

ND = non-detect

Groundwater Sampling Results
Metals

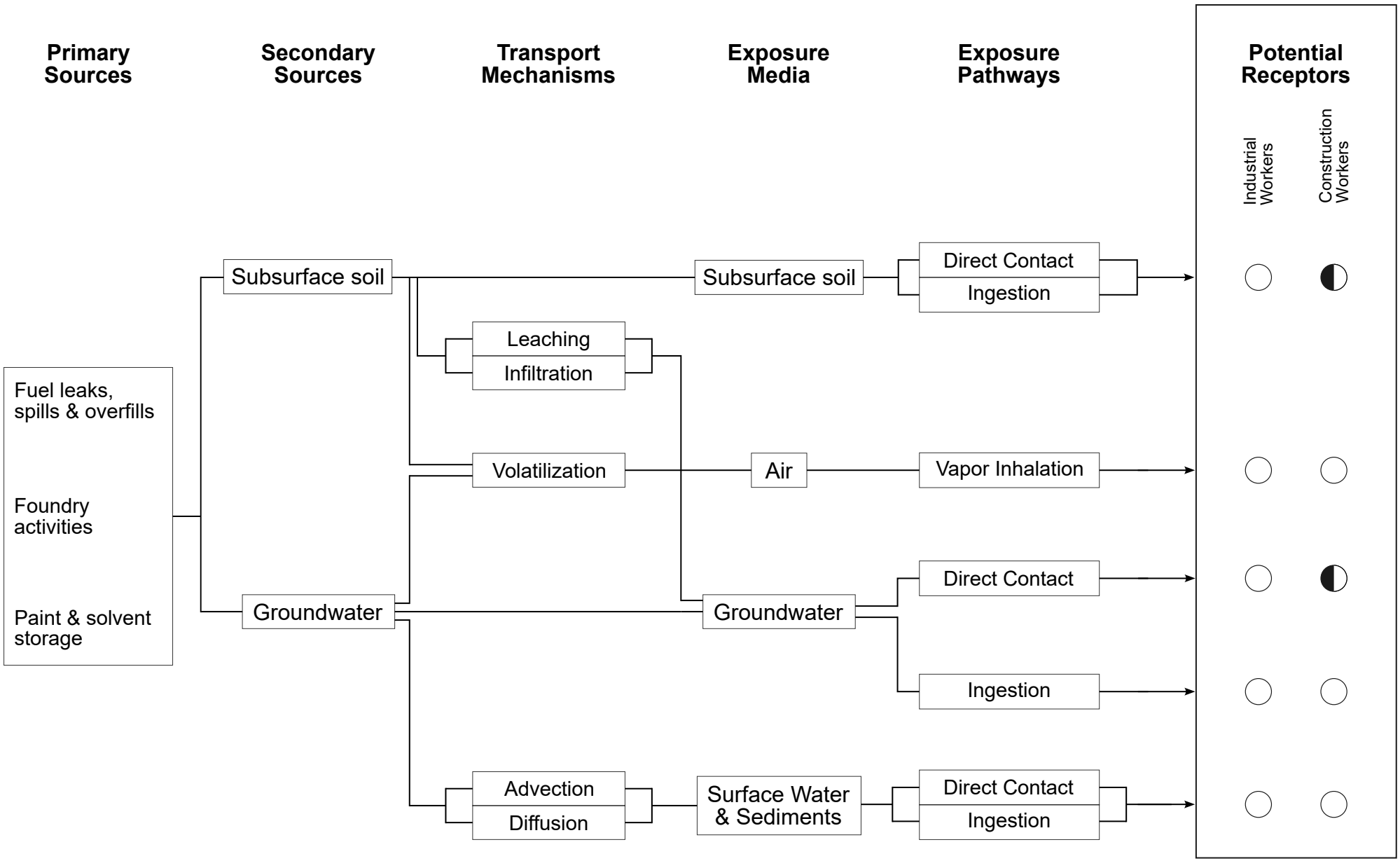
Figure 10

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

0 10 20 40 Feet

N

STRATUM GROUP



Key

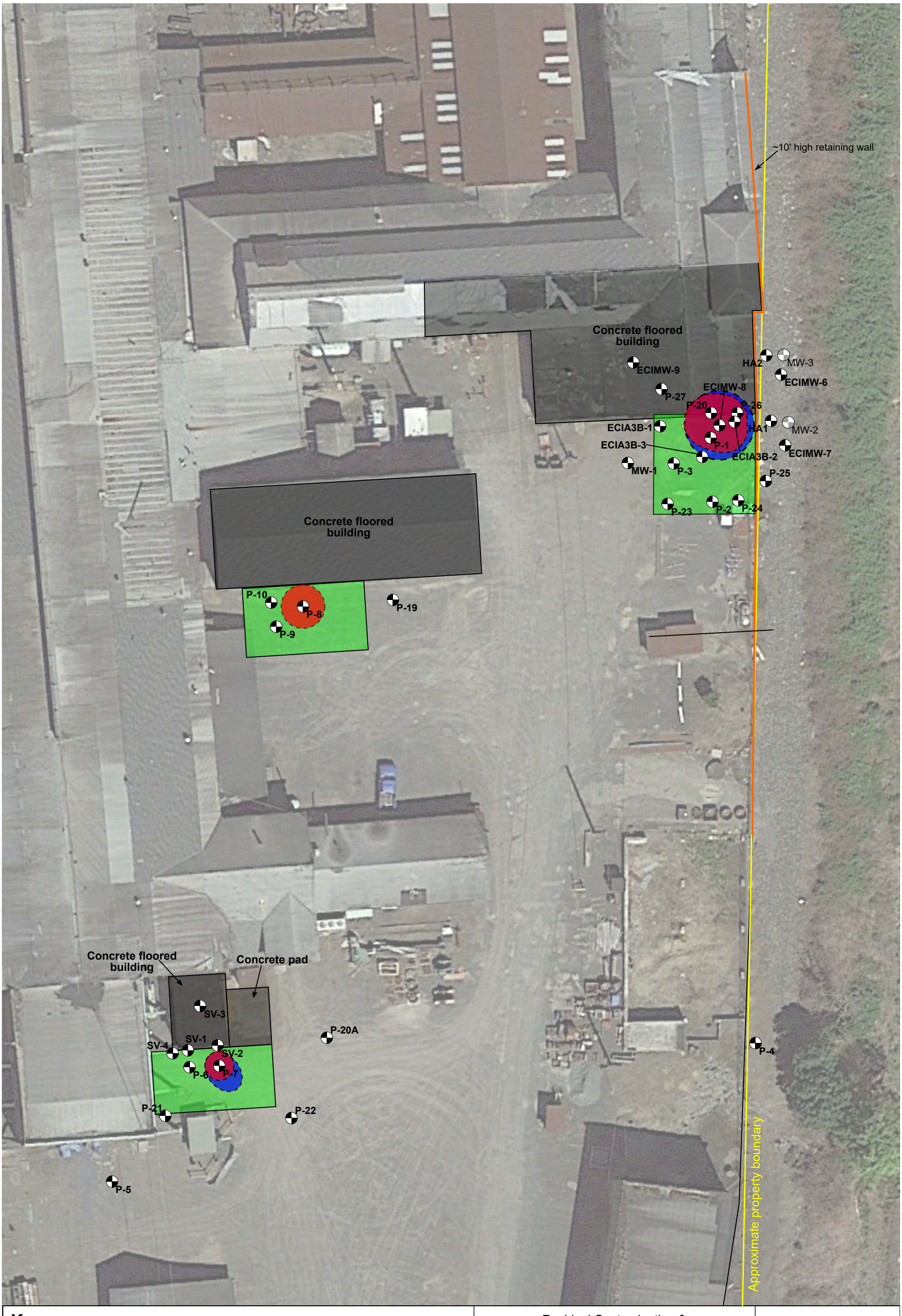
- ○ Exposure pathway incomplete
- ◐ Exposure pathway potentially complete
- ● Exposure pathway cinokete

Figure 3

Conceptual Site Model

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

STRATUM GROUP



Key

- Sampling Location
- Abandoned monitoring well
- Proposed Environmental Cap
- Estimated area of residual soil contamination (above unrestricted CULs)
- Estimated area of residual groundwater contamination (above unrestricted CULs)

Residual Contamination & Proposed Environmental Caps

Figure 12

Acrowood Corporation
4425 S 3rd Avenue
Everett, Washington 98203

N

0 25 50 100 Feet

STRATUM GROUP

APPENDIX II

Terrestrial Ecological Evaluation, Feasibility Study, and Disproportionate Cost Analysis (ECI, 2012)

Groundwater Monitoring Well Installation & Sampling Report (ECI, 2019)

Monitoring Well Survey Report (Harmsen, 2023)

ECI | environmental services
www.ecocononline.com

EMS Group Inc. is now EcoCon, Inc.

February 28, 2012

Washington State Department of Ecology
Northwest Regional Office: Toxics Cleanup Division
Attention: Dale Myers
3190 160th Avenue, SE
Bellevue, WA 98008

Delivery Method: USPS & Electronic Copy
Emailed: damy461@ecy.wa.gov

Re: Feasibility Study/Disproportionate Cost Analysis Report & Submittal
Acrowood Corporation
VCP No.: NW2151
4425 S. Third Avenue
Everett, WA 98203

Than Smith 253-365-7647

Mr. Myers:

EcoCon, Inc. (ECI), on half of The Acrowood Corporation (Acrowood) is pleased to present you with a Draft Feasibility Study (FS), Disproportionate Cost Analysis (DCA) and Terrestrial & Ecological Evaluation. These documents were competed as requested from the Washington State Department of Ecology (Ecology) in the Further Action Letter dated June 22, 2010.

Feasibility Study & Disproportionate Cost Analysis

ECI completed the FS and DCA with the assumption that a minimum of one groundwater monitoring well will be installed in the area of the previously decommissioned monitoring wells MW2 and MW3, located immediately northeast of the impacted area (Area 3) discussed in the FS/DCA. It is not clear why the original monitoring wells MW2 & MW3 were decommissioned, however, a replacement monitoring well in this area, positioned between former MW2 and MW3 will be necessary to adequately monitor groundwater down gradient of Area 3.

The results of the FS/DCA determined that the remedial selection of natural attenuation, institutional controls and compliance groundwater monitoring is compliant with MTCA's DCA process for cost/benefit analysis. As a part of the DCA and on-going FS, ECI recommends capping the general area with asphalt to prevent vertical movement of surface water, along with a compliance groundwater monitoring plan (including a minimum of quarterly monitoring for one year) and deed restriction.

Terrestrial Ecological Evaluation (TEE)

The TEE was completed as part of a process to evaluate how contaminates of concern may potentially impact surrounding properties' habitat or potential habitat. Following in-depth review of the general area, subject property, proposed remedial efforts (Capping & Natural Attenuation Monitoring), ECI determined the area to the east, Lowell Riverfront was the most susceptible area for "potential" impact. ECI understands through the City of Everett, the current and future development of the Lowell Riverfront area will include increased traffic, municipal infrastructure and private mixed use development to the east of the Site beyond the immediately adjacent BNSF railroad tracks.

This development greatly reduces any potential impact that may have been of concern. The combination of the depth of contamination (beyond 6-feet bgs – conditional point of compliance), asphalt capping, and limited adjacent/contiguous properties containing critical habitat, limits the TEE process Exclusion 2 - Incomplete Pathway. Refer to the attached TEE Process Evaluation Table – Primary Exclusions created by Ecology and completed by ECI. Ecology denotes that "If any of these exclusions apply to your site, you may end your ecological evaluation". Electronic copies of the Final Environmental Impact Statement (FEIS), Addendum No. 1 of the FEIS and Riverfront Development Public Amenities Master Plan are available from the City of Everett Riverfront Redevelopment web page and electronic document library at http://www.everettwa.org/default.aspx?ID=1614.

On behalf of Acrowood, ECI requests Ecology perform a review of Site data and information submitted from Acrowood, ECI and previous consultants with specific focus on the FS/DCA and TEE.

On behalf of Acrowood and ECI, we appreciate your time and efforts. Please let me know if you have any questions regarding the enclosed documents or project.

Respectfully,

No Longer @ ECI

Matthew P. Loxterman
Sr. Environmental Scientist

Direst: (360) 561-4656
mloxterman@ecocononline.com

Enc: Terrestrial Ecological Evaluation Process – Primary Exclusions (2 pages)

Washington State Department of Ecology
Toxics Cleanup Program

Terrestrial Ecological Evaluation Process - Primary Exclusions

Documentation Form

Exclusion #	Exclusion Detail	Yes or No?	Are Institutional Controls Required If The Exclusion Applies?
1	Will soil contamination be located at least 6 feet beneath the ground surface and less than 15 feet?	Yes / No	Yes
	Will soil contamination located at least 15 feet beneath the ground surface?	Yes / No	No
	Will soil contamination located below the conditional point of compliance?	Yes / No	Yes
2	Will soil contamination be covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed?	Yes / No	Yes
3	Is there less than 1.5 acres of contiguous undeveloped land on the site, or within 500 feet of any area of the site affected by hazardous substances **other than** those listed in the table of Hazardous Substances of Concern? And Is there less than 0.25 acres of contiguous undeveloped land on or within 500 feet of any area of the site affected by hazardous substances **listed in** the table of Hazardous Substances of Concern?	Yes / No Yes / No	Other factors determine
4	Are concentrations of hazardous substances in the soil less than or equal to natural background concentrations of those substances at the point of compliance	Yes / No	No

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]

Washington State Department of Ecology
Toxics Cleanup Program

Acrowood Corporation – 4425 S. 3rd Avenue, Everett, WA

Terrestrial Ecological Evaluation Process - Primary Exclusions

If any of these exclusions apply to your site, you may end your ecological evaluation.

Exclusion #	Exclusion Detail	Yes or No?	Are Institutional Controls Required If The Exclusion Applies?
1	Will soil contamination be located at least 6 feet beneath the ground surface and less than 15 feet?	**Yes**	**Yes**
	Will soil contamination located at least 15 feet beneath the ground surface?	**No**	**No**
	Will soil contamination located below the conditional point of compliance?	**Yes**	**Yes**
2	Will soil contamination be covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed?	**Yes**	**Yes**
3	Is there less than 1.5 acres of contiguous undeveloped land on the site, or within 500 feet of any area of the site affected by hazardous substances **other than** those listed in the table of Hazardous Substances of Concern? & Is there less than 0.25 acres of contiguous undeveloped land on or within 500 feet of any area of the site affected by hazardous substances **listed in** the table of Hazardous Substances of Concern?	**No** **No**	Other factors determine
4	Are concentrations of hazardous substances in the soil less than or equal to natural background concentrations of those substances at the point of compliance	**Yes**	No

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

NW 2151

DRAFT Feasibility Study / Disproportionate Cost Analysis

4425 South 3rd Street
Everett, Washington
Facility/Site ID#: 22755667
VCP #: NW2151

February 27, 2012

Prepared For:
Acrowood Corporation
4425 South 3rd Street
Everett, Washington

Matthew P. Loxterman, LG
Sr. Environmental Scientist

Stephen M. Spencer
Principal Environmental Scientist

Prepared By:
ECI | Environmental Consulting
PO Box 153
Fox Island, Washington 98333
(253) 238-9270

ECI Project No. 0377-03

ECI | environmental services
www.ecocononline.com

Table of Contents

List of Attachments

1.0 Introduction

The following report provides a site-specific Feasibility Study (FS) / Disproportionate Cost Analysis (DCA) for selection of potential remedial alternatives for addressing petroleum-impacted soil and groundwater at the Acrowood Corporation (Acrowood) Facility located at 4425 South 3rd Street, in Everett, Washington (Site/Facility). The Site is currently enrolled in Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP) and is moving forward with remedial action planning. This report, attachments and enclosures were prepared per to satisfy Ecology's "Further Action" letter dated June 22, 2010.

This FS/DCA report includes a summary and timeline of previous subsurface investigations completed by ECI and others at the Site and incorporates ECI's investigations detailed below and documented in the *Focused Subsurface Investigation/Remedial Investigation Report* dated September 30, 2011. As a part of this FS, three remedial alternatives were evaluated against Model Toxics Control Act (MTCA) requirements. Each alternative addresses contaminated media with a combination of remedial methodologies and/or controls appropriate for the chemicals of concern (COCs) and Site conditions. The three alternatives represent a reasonable number and range of potentially applicable cleanup components to provide a basis for evaluation as the DCA.

This FS/DCA has been completed with three main assumptions:

1. Additional soil and groundwater investigations will be completed to the east and northeast of the impacted area;
2. Soil and groundwater conditions are similar to previous investigations in this area, i.e., any impacted media is below current or Site specific cleanup levels, and
3. Current and proposed additional groundwater monitoring wells located in the impacted area will provide adequate groundwater monitoring requirements.

1.1 Site Location & Description

1.1.1 Topography

The United States Geological Survey (USGS), Everett, Washington 7.5-Minute Quadrangle topographic map 1991, was reviewed for this ESA. According to the contour lines on the topographic map, the Site is located approximately 45 feet above mean sea level (MSL). The contour lines in the area of the Site indicate the area is generally flat, confirmed by on-site reconnaissance.

1.1.2 Geology and Soils

The subject property and surrounding area are located within the Puget Sound Basin on glaciated outwash (toward the west of the Site), and nearly level alluvial plains closer to the Snohomish River. The

lands in the vicinity of the Site are underlain by inter-bedded gravelly sandy loam (coarse-grained soils) with silty sands.

The USDA Natural Resources Conservation Service, Washington Soil Survey Reports for Snohomish County, indicates the native soil at the Site and surrounding properties is the Everett Gravelly Sandy Loam. This soil is in the Class A Hydrologic Group, indicating high infiltration rates, through both drained sand and gravels. This soil is reported to have high conductivity and low water holding capacity.

1.1.3 Surface Water and Groundwater

No naturally occurring water bodies or wetlands were observed at or within the Site boundary during this investigation. The nearest mapped surface water body is the Snohomish River that lies just to the east of the subject Site. The Snohomish River flows northwesterly through Everett towards the Puget Sound.

The groundwater elevations in monitoring wells in Area 3 of the Site ranged from 85.07 to 87.93 feet on June 14, 2011. The hydraulic gradient was approximately 0.055 feet/foot (i.e., MW-1 to MW-4) and the inferred groundwater flow direction is generally southeast. However, variations in the site-specific geology can influence gradient direction, including perched conditions, confining soil conditions/characteristics, and a retaining wall along the eastern side of Area 3.

2.0 Background & Previous Environmental Investigations

The Site is currently utilized as a metal fabrication facility and is currently occupied by a company named Acrowood. The facility was reportedly constructed in 1913 and occupied by an iron and metal foundry until the early-1970s. Since then, the Site has reportedly been used for metal fabrication since the early-1970s; Acrowood being the owner / operator since 1984.

2.1 Adapt Engineering (1999-2008)

In 1999, Adapt Engineering (Adapt) conducted investigations identifying three areas as containing concentrations of trichloroethene (TCE), oil-range organics (ORO), diesel-range organics (DRO), and polycyclic aromatic hydrocarbons (PAHs) COCs in soil and/or groundwater at concentrations above Model Toxics Control Act (MTCA) Method A or B Cleanup Levels (CULs). Details of these investigations are provided in Adapt's *Supplemental Phase II Site Assessment Report* dated February 6, 2009.

The three areas are of concern are as follows:

1) Area 1: - Paint and solvent storage shed where TCE was encountered in soil and groundwater at concentrations exceeding applicable Method A Soil & Groundwater CULs. (Refer to Figure 3).

2) Area 2: - Former heating oil UST location where ORO were encountered in soil at concentrations below the Method A Soil CUL (Refer to Figure 4).

3) Area 3: - Former diesel fuel tank occurred and concentrations of DRO, ORO and PAHs in soil and groundwater exceeded Method A & B Soil & Groundwater CULs (Refer to Figures 5 & 6).

Subsequent investigations by Adapt between 1999 and 2002 involved the installation and monitoring of groundwater monitoring wells MW-1, MW-2 and MW-3 and additional soil and groundwater sampling to further evaluate the extent of impacts in these three areas. The Site was submitted into the VCP by Adapt in January 2007 and Adapt requested a No Further Action (NFA) determination. Ecology responded to this request in a Further Action Opinion Letter dated April 18, 2007 stating that it was necessary to determine the areal extent and depth of TCE groundwater contamination in Area 1 using groundwater monitoring wells. Ecology further indicated that was necessary to determine the areal extent and depth of COCs in Area 2 using existing and additional groundwater monitoring wells.

Based on Ecology's comments, Adapt conducted a Supplemental Phase II Environmental Site Assessment in 2007, which included the installation and quarterly sampling of groundwater monitoring wells MW-4 – MW-7. MW-4 was installed in Area 3, south of the former diesel tank at a lower elevation and MW-5 – MW-7 were installed within Area 1. Refer to attached Figures.

techniques in the locations depicted on Figures 4, 5 and 6. The maximum depth of exploration during the FSI was approximately 14 feet bgs in Area 2 and 20.5 feet bgs in Area 3.

The groundwater table was consistently encountered during soil logging between 8 and 10 feet bgs in Area 2 and between 12 and 14 feet bgs in Area 3. Groundwater samples were collected from all boring locations except ECIMW-5, which required development at a later date prior to sampling. Groundwater samples were collected through a temporary stainless steel well screen using a peristaltic pump and dedicated tubing.

Boring ECIMW-5 was completed as a monitoring well with a 1-inch diameter PVC casing and 0.010-inch factory slotted well screen. The well screen was placed from 5 feet bgs to 20 feet bgs which was sufficient to allow the well screen to intersect the saturated/unsaturated interface throughout normal seasonal changes in water levels. Saturated soil conditions were encountered at approximately 14 feet bgs during drilling. A sand filter-pack surrounds the PVC from 4 feet bgs to 20 feet bgs and a bentonite seal is present above that between 1.5 and 4 feet bgs. The well was completed with a surface seal consisting of a concrete and a flush-mounted well box.

A total of 11 soil samples and five groundwater samples were submitted to ESN Northwest Chemistry Laboratory in Olympia, Washington for analysis of DRO and ORO using Ecology Method NWTPH-Dx. One soil sample and one groundwater sample were selected for follow-up analysis with PAHs using EPA Method 8270 based on initial analytical results.

2.4 Groundwater Sampling

On August 25, 2011 ECI returned to the Site to develop, monitor and sample monitoring well ECIMW-5, monitor and sample MW-1 and MW-4 and sample and take inventory of the 9 unlabeled soil and water drums situated in Area 3 for disposal purposes.

ECI developed well ECIMW-5 by purging approximately 20-gallons of water from the well prior to sampling. Water was observed to be very clear upon completion of well development and no visual or olfactory evidence of impacts were observed. Prior to sampling or development of monitoring wells, the water level in each well was measured relative to the northernmost point on the well casing using an electronic probe. Groundwater samples were transferred directly into laboratory supplied sample containers using standard low-flow groundwater sampling techniques.

Groundwater samples obtained from MW-1, MW-4 and ECIMW-5 were submitted to ALS Environmental Laboratory (ALS) in Everett, WA for analysis of DRO and ORO using Ecology Method NWTHP-Dx and PAHs using EPA Method 8270SIM.

Surface and subsurface conditions at the Site generally consisted of asphalt, gravel or grass at the surface underlain by fill material and intermittent intervals of silt, sand and gravel mixtures that were observed to the maximum depth of exploration of approximately 20.5 feet bgs. Saturated conditions were consistently encountered between 8 and 10 feet bgs in Area 2 and between 12 and 14 feet bgs in Area 3.

2.5 ECI's Analytical Results & cPAH Soil and Groundwater Cleanup Levels

Carcinogenic PAHs (cPAHs) were analyzed in soil and groundwater during the FSI and include benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and ideno(1,2,3-cd)pyrene. When establishing compliance with cleanup levels under MTCA, the mixture of these compounds is considered a single hazardous substance. The toxicity equivalency factor (TEF) methodology was developed by the US Environmental Protection Agency (EPA) to evaluate the toxicity and assess the risks of a mixture of structurally related chemicals with a common mechanism of action. A TEF is an estimate of the relative toxicity of a chemical compared to a reference chemical. For mixtures of cPAHs, the reference chemical is benzo(a)pyrene. Therefore, for compliance purposes, the calculated total cPAHs (TEF modified) is compared to the MTCA Method A Soil or Groundwater Cleanup Level for benzo(a)pyrene of 0.1 micrograms/liter (ug/L) for groundwater and 0.1 milligrams/kilogram (mg/kg) for soil.

Soil - Eleven soil samples were collected in Area 3 and submitted to ESN for analysis of DRO and ORO using Ecology Method NWTPH-Dx. Soil sample ECIA3B-2:12 was selected for follow-up analysis with PAHs using EPA Method 8270 based on the results of initial analytical results and field screening. Soil sample analytical results are provided in ECI's FSI Report.

Soil sample location ECIA3B-2:12 was the only location where soil concentrations exceeded MTCA Method A Soil Cleanup Levels. DRO, ORO, total naphthalenes and total cPAHs (TEF modified) were detected in soil at concentrations of 31,000 mg/kg, 2,600 mg/kg, 168 mg/kg and 0.13 mg/kg, respectively. The MTCA Method A Soil Cleanup Level is 2,000 mg/kg for DRO and ORO, 5 mg/kg for total naphthalenes and 0.1 mg/kg for total cPAHs (TEF modified).

Soil samples were collected from below the groundwater table in boring locations ECIA3B-2 and ECIA3B-3 to verify if soil containing concentrations of target analytes exceeding MTCA Method A Soil Cleanup Levels was present below the groundwater table as previously reported. In all of the soil sample locations collected below the observed ground water level, target analytes were either not detected above the laboratory detection limit or detected at a concentration below the applicable MTCA Method A Soil Cleanup Level. No target analytes were detected above laboratory detection limits in any of the remaining soil sample locations.

Groundwater - As previously mentioned, a total of eight groundwater samples were collected during the FSI (i.e., Two from probe locations in Area 2, three from probe locations in Area 3 and three from groundwater monitoring wells). Groundwater samples collected during the first phase of the FSI were submitted to ESN for analysis of DRO and ORO using Ecology Method NWTPH-Dx. Groundwater sample ECIA3B-2GW was selected for follow-up analysis with PAHs using EPA Method 8270 based on initial analytical results. All groundwater monitoring well samples were submitted to ALS for analysis of DRO and ORO using Ecology Method NWTPH-Dx and PAHs using EPA Method 8270 SIM which has a lower laboratory detection limit of 0.02 ug/L. Groundwater analytical results obtained during the FSI are presented in ECI's FSI Report.

During the first phase of the FSI, DRO was detected in sample location ECIA3B-2GW at a concentration of 920 ug/L, which exceeds the MTCA Method A Groundwater Cleanup Level for DRO of 500 ug/L. Naphthalenes and cPAHs were also detected in this location, but at concentrations below applicable MTCA Method A Groundwater Cleanup Levels. It should be noted that the laboratory detection limit for cPAHs was 0.1 ug/L and it is possible for concentrations of cPAHs below 0.1 ug/L to result in a total cPAH (TEF modified) concentration that exceeds the MTCA Method A Groundwater Cleanup Level of 0.1 ug/L. During the second phase of the FSI, monitoring wells MW-1, MW-4 and ECIMW-5 were sampled and none of the monitoring wells contained dissolved-phase concentrations of target analytes that exceeded MTCA Method A Groundwater Cleanup Levels. Dissolved-phase concentrations of cPAHs were detected in ECIMW-5, but at concentrations below the MTCA Method A Groundwater Cleanup Level. No target analytes were detected above laboratory detection limits in the remaining two groundwater monitoring well sample locations.

2.6 Chemicals of Concern (COCs) & Media of Concern

Cleanup Level (CUL)	Remedial Action Objective
GROUNDWATER 500 µg/L – Diesel Range Organics 500 µg/L – Oil Range Organics	Reduce concentrations of COCs in groundwater to achieve the respective MTCA Method A cleanup levels.
SOIL 2,000 mg/kg - Diesel Range Organics 2,000 mg/kg - Oil Range Organics	Reduce concentrations of COCs in soil to achieve the respective MTCA Method A cleanup levels.

2.7 Extent of Impacts

2.7.1 Soil

Soil analytical data obtained from previous investigation activities combined with FSI data demonstrate that soil impacts are no longer a concern in Areas 1 and 2 and these areas require no further action.

The estimated lateral extent of soil impacts in Area 3 is depicted on Figure 5. Soil data obtained during the FSI indicates that all soil containing concentrations of target analytes exceeding MTCA Method A Soil Cleanup Levels is situated above the ground water table. Therefore, the estimated vertical extent of the area where soil exceeds MTCA Cleanup Levels is between 9 and 13 feet bgs. This is a conservative estimate based on the fact that current FSI data was incorporated with previous investigation data, some of which is over 10 years old, to generate the estimated area of impacts. It is possible that soil concentrations in the previous sample locations have decreased due natural attenuation and this was not taken into consideration when estimating the area of soil impacts.

There is an estimated 60 cubic-yards of impacted soil present in this area and soil impacts do not appear to extend off-Site. However, soil impacts likely extend beneath the eastern portion of the shop structure. This would appear to make it cost prohibitive to excavate these soils due to the fact that extensive costs would be associated with supporting the building and retaining wall during excavation. When compared to the benefit of removing such a such a small volume of soil, the costs are disproportionate.

2.7.2 Groundwater

Groundwater analytical data obtained from previous investigation activities demonstrate that groundwater impacts are no longer a concern in Area 1. Therefore, no further action is necessary in Area 1.

During the FSI, ECI complied with Ecology's request to sample groundwater in the area of the former heating oil tank (Area 2) by collecting groundwater sample ECIA2B-1 in the location where a previous soil sample (i.e., P-8) contained an ORO soil concentration of 1,920 mg/kg. In addition, ground water was collected at ECIA2B-2 situated west of ECIA2B-1, also in the location of the former heating oil tank. Neither of the groundwater samples contained concentrations of target analytes above the laboratory detection limits. Therefore, no further action is necessary in Area 2.

The estimated extent of groundwater impacts in Area 3 is depicted on Figure 6. FSI data combined with previous groundwater data indicate that an approximate 500 square-foot area is impacted with concentrations of one or more target analytes exceeding MTCA Method A Groundwater Cleanup Levels. It does not appear that impacted ground water extends off-site and the estimated area of groundwater impacts is a conservative estimate based on the fact that current FSI data was incorporated with

previous investigation data, some of which is over 10 years old, to generate the estimated area of impacts and potential natural attenuation of impacts was not taken into consideration.

During ECI's FSI, sample ECIA3B-2 was collected approximately 2 feet southwest of boring P-26, which was sampled in July of 2007. The dissolved-phase concentration of DRO detected at that time was 7,800 ug/L and the detected DRO concentration in ECIA3B-2 during the FSI in July of 2011 was 920 ug/L. This decrease in concentration over a 4 year period appears to indicate that natural attenuation may be effective at remediating groundwater impacts at the Site and the estimated area of groundwater impacts depicted on Figure 6 of ECI's FSI Report.

2.8 Exposure Pathways

This section presents the evaluation, findings and conclusions pertaining to the exposure pathways at the Site. The goal of this subsection is to identify potential exposure scenarios that will assist in the evaluation of potential feasible cleanup alternatives that are protective of human health.

2.8.1 Direct-Contact Pathway

Direct contact with soil and groundwater exhibiting concentrations of petroleum hydrocarbons in excess of the cleanup levels is limited to human receptors that come into close contact with the media via direct exposure, including dermal contact or ingestion of excavated soil or groundwater. The standard point of compliance for soil contamination beneath a site is approximately 15 feet bgs, which represents a reasonable estimate of the depth that could be accessed during normal site redevelopment activities (WAC 173-340-740[6][d]). Although PCS is present within 15 feet of the ground surface, due to the existing pavement, contaminated soil beneath the Site is not easily accessible, thereby minimizing the direct-contact pathway. However, until such point as the contaminated soil and groundwater are removed from the Site or an institutional control limiting direct contact is implemented, the direct-contact pathway is complete.

2.8.2 Soil to Groundwater Pathway

Results from the FSI and previous investigations conducted by others suggest that soil contamination exists locally in the subsurface at depths greater than the seasonally high groundwater level (FSI – ECI 2012). The petroleum contaminated soil can therefore potentially act as an ongoing source to groundwater contamination as the hydrocarbons desorb from the soil particles into water.

Under MTCA, monitored natural attenuation can be considered an active remedial measure if site conditions conform to the expectations listed in WAC 173-340-370(7), as follows:

- Source control (including removal and/or treatment of hazardous substances) has been conducted to the maximum extent practicable.
- Leaving contaminants on-site during the restoration time frame does not pose an unacceptable threat to human health or the environment.

- There is evidence that natural biodegradation or chemical degradation is occurring and will continue to occur at a reasonable rate at the site.
- Appropriate monitoring requirements are conducted to ensure that the monitored natural attenuation process

2.8.3 Vapor Intrusion Pathway

Using the guidance provided in Ecology 2009 draft guidance document *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (Ecology 2009), the potential risks to human health and the environmental from the vapor intrusion pathway at the Site are not significant and do not warrant additional investigation. The observations that form the basis for this conclusion are the following:

- The risk of vapor intrusion into overlying building is mitigated by the absence of volatile organic compounds in soil and groundwater, as stated in Section 1.4.1 of the Ecology draft guidance document.

2.8.4 Surface Water

Migration of contaminants via surface water infiltration and leaching to the subsurface is partially mitigated by the asphalt and concrete covering certain areas of the Site. Additional institutional controls may be necessary to manage future surface water infiltration.

3.0 Remedial Alternatives Review

The purpose of this feasibility study (FS) is to develop and evaluate cleanup action alternatives to facilitate selection of a final cleanup action at the Site in accordance with WAC 173-340-350(8). An FS typically includes an extensive development, screening, and evaluation process for numerous remedial alternatives. However, because property-specific conditions preclude many remedial components from application at the Site, the evaluation focused on a limited number of likely feasible components and alternatives that are both implementable and capable of achieving the remediation objectives.

In addition, the FS process screens cleanup alternatives to eliminate those that are not technically possible, those with costs that are disproportionate under WAC 173-340-360(3)(e), or those that will substantially affect the future planned business operations at the Site. Based on the screening, the FS presented below evaluates the most advantageous remedial components to recommend a final cleanup action for the Site in conformance with WAC 173-340-360 through WAC 173-340-390. Selection of the final cleanup action and details of its implementation will be documented in the Cleanup Action Plan (CAP), which will be prepared by Ecology in accordance with WAC 173-340-380.

3.1 Cleanup Standards

The selected cleanup alternative must comply with MTCA cleanup regulations specified in WAC 173-340 and with applicable state and federal laws. The cleanup standards selected for the Site are discussed in detail below.

3.1.1 Applicable or Relevant and Appropriate Requirements

Under WAC 173-340-350 and 173-340-710, applicable requirements include regulatory cleanup standards, standards of control, and other environmental requirements, criteria, or limitations established under state or federal law that specifically address a contaminant, remedial action, location, or other circumstances at a site.

MTCA (WAC 173-340-710[3]) defines relevant and appropriate requirements as:

> *Those cleanup action standards, standards of control, and other environmental requirements, criteria or limitations established under state and federal law that, while not legally applicable to the hazardous substance, cleanup action, location, or other circumstances at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site.*

The criteria used to make this determination are presented in WAC 173-340-710(4)(a)-(i).

Remedial actions conducted under MTCA must comply with the substantive requirements of the applicable or relevant and appropriate requirements (ARARs) but are exempt from their procedural

requirements (WAC 173-340-710[9]). Specifically, this exemption applies to state and local permitting requirements under the Washington State Water Pollution Control Act, Solid Waste Management Act, Hazardous Waste Management Act, Clean Air Act, State Fisheries Code, and Shoreline Management Act.

3.1.2 Development of Cleanup Standards

MTCA Method A cleanup levels for soil and groundwater have been established as the cleanup level for groundwater at the Site. The table below provides the MTCA Method A cleanup level for soil and groundwater for each COC that has historically been detected at a concentration exceeding its respective cleanup level, as well as the Site-specific benzene concentration in soil that would be protective of occupational vapor intrusion scenarios.

3.1.3 Remedial Action Objectives

RAOs are general administrative goals for a cleanup action that address the overall MTCA cleanup process. The purpose of establishing RAOs for a site is to provide remedial alternatives that protect human health and the environment (WAC 173-340-350). In addition, RAOs are designated in order to:

- Implement administrative principles for cleanup (WAC 173-340-130).
- Meet the requirements, procedures, and expectations for conducting an FS and developing cleanup action alternatives as discussed in WAC 173-340-350 through 173-340-370.
- Develop cleanup levels (WAC 173-340-700 through 173-340-760) and remedial alternatives that are protective of human health and the environment.

In particular, RAOs must include the following threshold requirements from WAC 173-340:

- Protect human health and the environment.
- Comply with cleanup levels.
- Comply with applicable state and federal laws.
- Provide for compliance monitoring.

The remedial action objectives for the Site are to mitigate risks to human health and the environment and to obtain regulatory closure from Ecology.

3.2 Evaluation of Alternatives

The evaluation of remedial alternatives was based on Model Toxics Control Act's (MTCA) disproportionate cost analysis (DCA) that identifies which of the alternatives met MTCA threshold requirements and Remedial Action Objectives. This analysis compares the relative benefits and costs of cleanup alternatives in selecting the alternative whose incremental cost is not disproportionate to the incremental benefits. The seven criteria used in the DCA, as specified in WAC 173-340-360(2) and (3), are:

Table 1: Remediation Alternative Comparison

MTCA threshold requirements and Remedial Action Objectives	Remedial Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Protectiveness	1	2	2	3
Permanence	1	2	2	3
Long-term Effectiveness	1	2	2	3
Management of Short-term Risks	1	3	3	3
Technical & Administrative Implementability	3	3	3	1
Consideration of Public Concerns	1	2	3	3
Totals:	8	14	15	16

4.2 Base Alternative

Alternative 2, Capping and Institutional Controls, is considered to be the *base alternative* because it represents a viable remedy with the lowest cost disregarding Alternative 1: No Action. The benefits and costs of all other alternatives are compared to the base alternative to determine if their higher costs are in proportion to their expected increased benefit. This procedure is termed the "disproportionate cost analysis" and is one of the evaluation steps referenced under MTCA.

For the DCA, *benefit* is defined in terms of the evaluation criteria and each of the seven criteria is on an equal scale. Each alternative receives a score from 1 to 3 under each criterion. A score of 1 indicates the alternative satisfies the MTCA criterion the least, while a score of 3 indicates the best performance. A minimum score of 7 and a total maximum score of 21 is possible. The basis for scoring under each criterion is described below. Alternatives are evaluated and scored in Table 2: Evaluation and Scoring of Remedial Action Alternatives, attached.

4.2.1 Base Alternative Detail

The Base Alternative includes the preparation of a Cleanup Action Plan (CAP), implementation / installation of a containment cap (asphalt and / or concrete) over the affected exterior areas of the Site and implementation of an institutional control such as a management plan or contaminant contingency plan to limit access and/or administer proper protocol for dealing with soil beneath portions of the property. This cleanup alternative would also include monitoring of groundwater to demonstrate that the natural attenuation process is taking place at a reasonable rate.

DRO and ORO (COCs) concentrations in soil beneath the Site are expected to attenuate slowly by virtue of their physical and chemical properties that preclude volatilization as a significant removal mechanism for these compounds. To account for the slower attenuation rate of the COC compounds, the expected duration to achieve soil cleanup levels for all COCs ranges from 7 to 13 years with an average of 10 years.

Quarterly groundwater monitoring would be conducted until a minimum of four consecutive quarters of groundwater samples indicate concentrations of COCs that are compliant with their respective MTCA Method A cleanup levels.

4.3 Basis for *Benefit* Scoring

This section indicates the specific factors for each of the MTCA criteria used to assign a score between 1 and 3 to for the remedial alternatives.

4.3.1 Overall Protection of Human Health and the Environment

1. Protection of human health and the environment is uncertain.
2. Achieves remedial objectives for preventing exposure to indicator hazardous substances. Provides limited control of future releases to groundwater and surface water. Cleanup standards achieved over a long period of time.
3. Prevents exposure to indicator hazardous substances. Eliminates future releases to groundwater and surface water. Cleanup standards are achieved relatively quickly.

4.3.2 MTCA Compliance – Point of Compliance

1. Attaining the Point of Compliance is uncertain. Approvals may be difficult to obtain or require a lengthy process.
2. Meets Point of Compliance. Approvals from agencies and affected parties are likely to be obtainable.
3. Meets Point of Compliance. Cleanup standards are readily achievable. Approvals from agencies and affected parties are likely to be readily obtainable.

4.3.3 Short-term Effectiveness

1. Protection of human health and the environment is uncertain. May not reduce risks prior to attainment of cleanup standards.
2. Protects human health and the environment. Moderately reduces risks prior to attainment of cleanup standards.
3. Protects human health and the environment. Greatly reduces risks prior to attainment of cleanup standards.

4.3.4 Long-term Effectiveness

1. Cleanup success and long-term reliability are uncertain. Management of treatment wastes and untreated indicator hazardous substances is uncertain.
2. Moderate probability of cleanup success and long-term reliability. Management approaches for indicator hazardous substances are moderately certain to succeed.
3. High probability of cleanup success and long-term reliability. Management approaches for indicator hazardous substances are highly likely to succeed.

4.3.5 Reduction of Toxicity/Mobility/Volume through Treatment

1. Other than existing source controls indicator hazardous substances are not permanently reduced in toxicity, mobility, or volume, nor are they irreversibly immobilized or destroyed.
2. Some indicator hazardous substances would likely be permanently reduced in toxicity, mobility, or volume.
3. Most indicator hazardous substances would be permanently reduced in toxicity.

4.3.6 Implementability

1. Technology has technical or administrative constraints.
2. Technology that may have some technical or administrative constraints.
3. Conventional and readily available technology with no expected technical or administrative constraints.

4.3.7 Degree to which Community Concerns Are Addressed

Community concerns are not known at this time. However, the remedial efforts are within the confines of a large industrial facility, which is less than 5% of the area of the Property and facility.

1. Does not address community concerns.
2. Partially addresses community concerns, such as reducing long-term releases to groundwater and surface water.
3. Addresses community.

4.4 Cost Basis

Proposed costs for each alternative are presented below:

Alternative 1: NA

Alternative 2: $100,000 to $125,000

Alternative 3: $200,000 to $250,000

Alternative 4: $275,000 to $350,000

5.0 Summary

As an aid to selecting a preferred remedial alternative, costs versus benefits were assessed for each alternative, as shown in Table 2. The key result of the cost versus benefit evaluation is the cost/benefit ratio, shown in the far right column. This ratio indicates how the cost and benefit of each alternative varies relative to the base alternatives.

Alternative 2 (Capping and Institutional Controls) was used as the base cost alternative because it is a viable alternative and predicted to have the lowest cost, other than No Action. Benefit ratios were determined relative to the base case of Alternative 4 because it has the highest benefit score.

A cost-benefit ratio of 1 indicates that an alternative's benefits are in proportion to its cost. If the ratio is greater than 1, it indicates that the cost is disproportionate to the benefit. As shown in Table 4 Remedial Action Cost Comparison, Alternative 4 were judged to have costs that are disproportionate to benefits.

Alternative 3 has a cost-benefit ratio of 1.1, indicating that its cost only slightly exceeds its benefit. All of the other alternatives (other than No Action) have much higher cost-benefit ratios than Alternative 2, indicating their costs exceed their benefits to a much greater degree than for Alternative 2.

Attachment A

Project Figures

Figure 1 - General Vicinity map

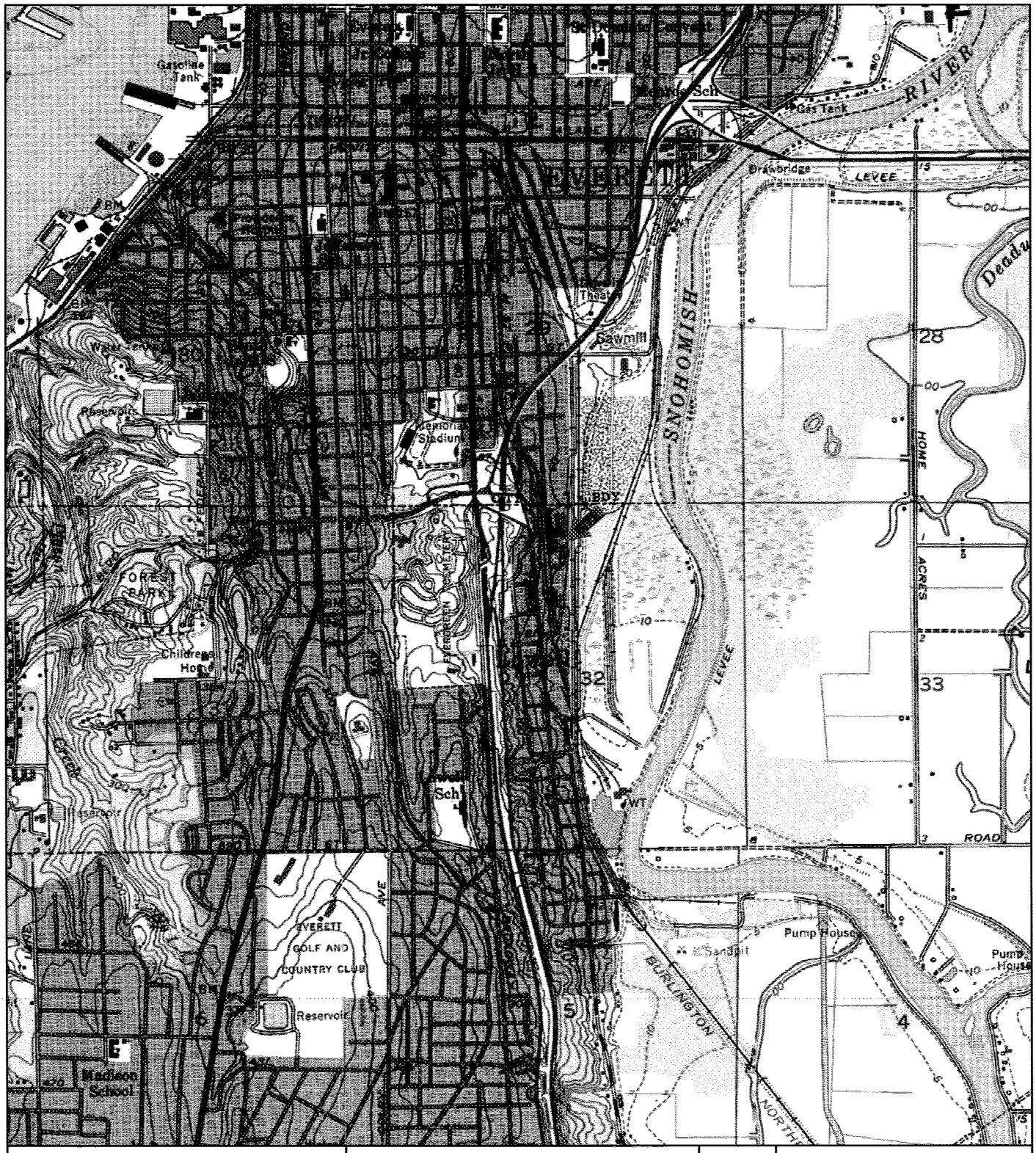
Figure 2 - Site Representation Map

Figure 3 - Area 1 Paint/Solvent Storage Area

Figure 4 - Area 2 Former Heating Oil UST & ECI Investigation Area

Figure 5 - Area 3 Former Location of Fuel Tank & Estimated Extent of Soil Impacts

Figure 6 - Area 3 Former Location of Fuel Tank & Estimated Extent of Groundwater Impacts



KEY:

SOURCE: USGS 7.5 MINUTE QUADRANGLES (TOPOGRAPHIC)

EVERETT, WASHINGTON
NW 1/4 OF EVERETT 15' QUADRANGLE
1953 (PHOTOREVISED 1968 & 1973)

SCALE = 1:24,000

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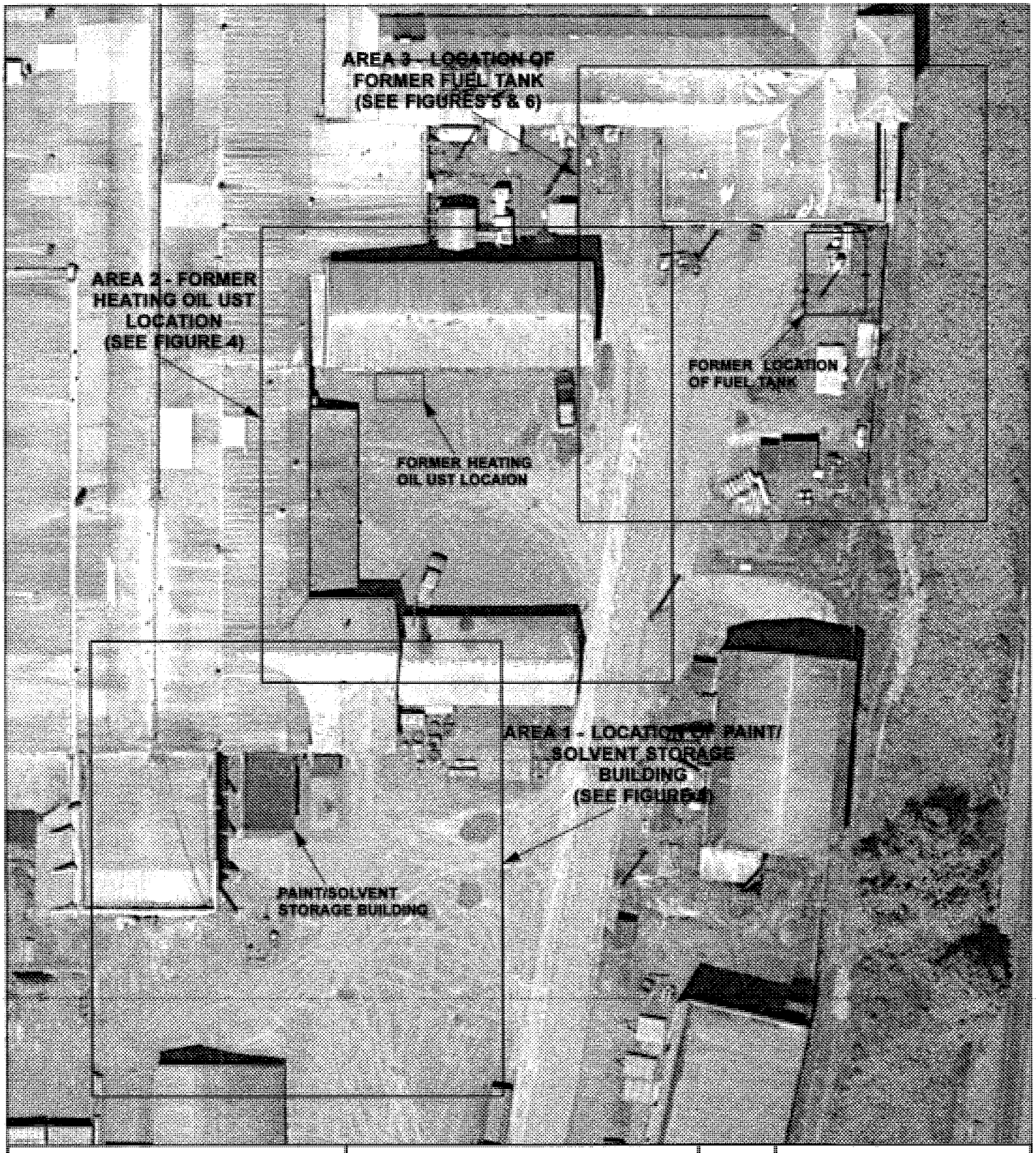
FIGURE 1

GENERAL VICINITY MAP

PROJECT	ACROWOOD CORP		
PREPARED FOR	ACROWOOD CORPORATION		
LOCATION	4425 SOUTH THIRD AVENUE EVERETT, WASHINGTON		
SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	JS	SS	9/30/11



APPROXIMATE SCALE: 1" = 80'

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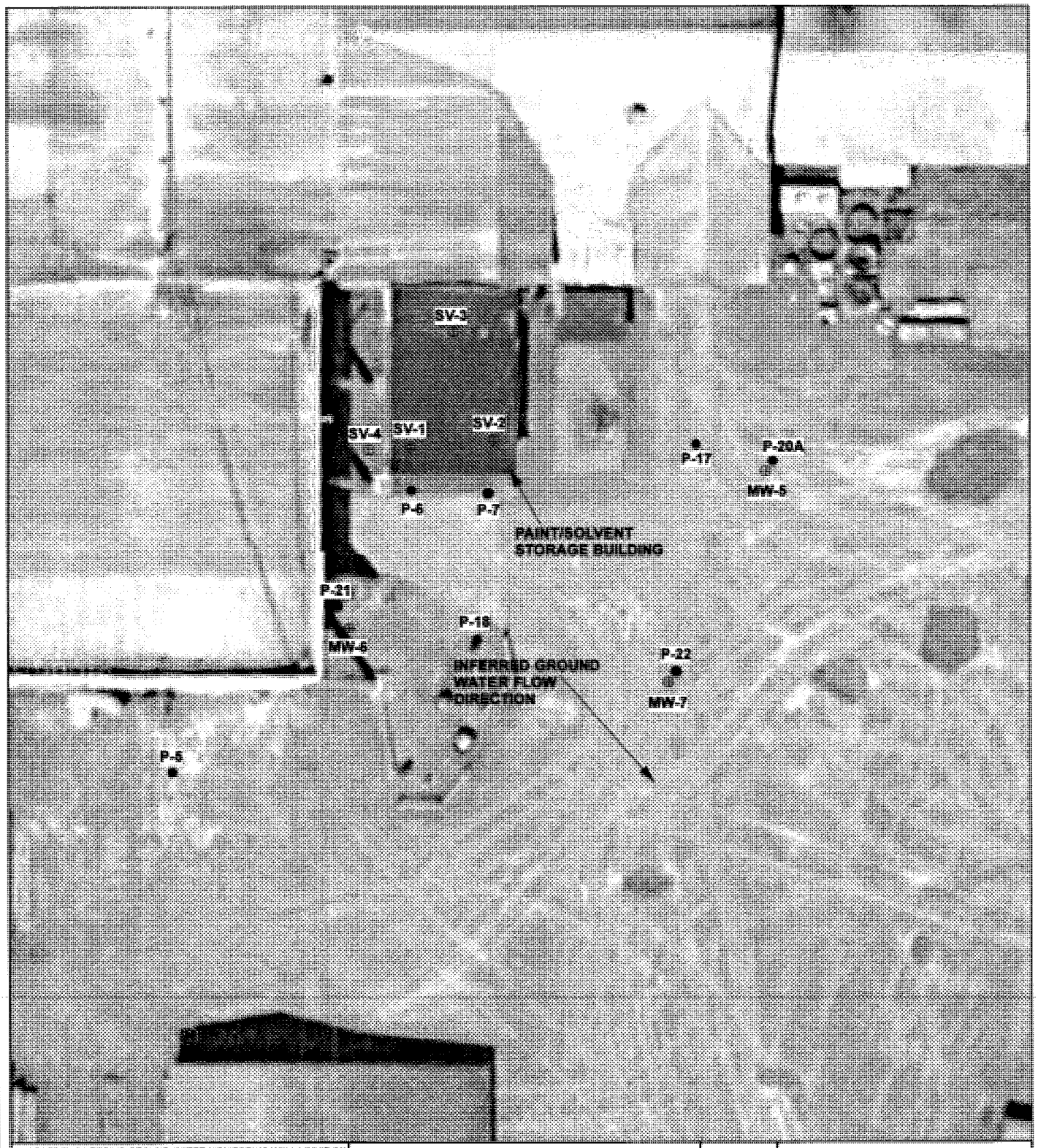
FIGURE 2

SITE REPRESENTATION

PROJECT	ACROWOOD CORP
PREPARED FOR	ACROWOOD CORPORATION
LOCATION	4425 SOUTH THIRD AVENUE EVERETT, WASHINGTON

SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	JS	SS	9/30/11



ADAPT ENGINEERING GROUND WATER MONITORING WELL LOCATION

ADAPT ENGINEERING SOIL VAPOR HOLE LOCATION

ADAPT ENGINEERING GEOPROBE LOCATION

INFERRED GROUND WATER FLOW DIRECTION BASED ON GROUND WATER ELEVATION DATA OBTAINED FROM PREVIOUS INVESTIGATIONS

0 10 20

APPROXIMATE SCALE: 1" = 20'

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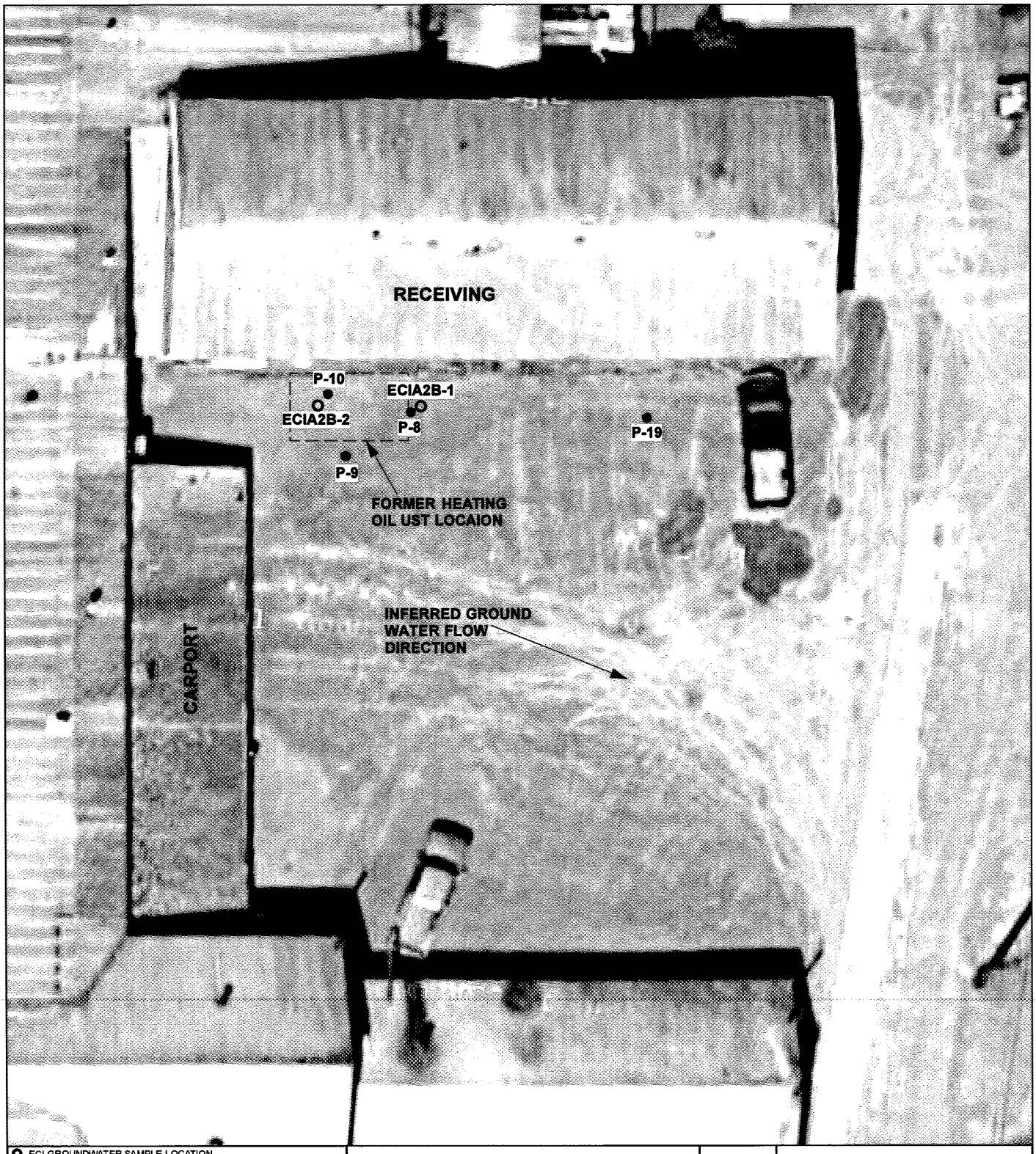
FIGURE 3

AREA 1
PAINT/SOLVENT STORAGE AREA

PROJECT	ACROWOOD CORP
PREPARED FOR	ACROWOOD CORPORATION
LOCATION	4425 SOUTH THIRD STREET EVERETT, WASHINGTON

SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	JS	SS	9/30/11



O ECI GROUNDWATER SAMPLE LOCATION

● ADAPT ENGINEERING GEOPROBE LOCATION

INFERRED GROUND WATER FLOW DIRECTION BASED ON GROUND WATER ELEVATION DATA OBTAINED FROM PREVIOUS INVESTIGATIONS

HEATING OIL UST LOCATION BASED ON ADAPT ENGINEERING SITE PLAN WHICH WAS NOT TO SCALE

0 10 20

APPROXIMATE SCALE: 1" = 20'

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FIGURE 4

AREA 2
FORMER HEATING OIL UST LOCATION &
ECI INVESTIGATION AREA

PROJECT	ACROWOOD CORP		
PREPARED FOR	ACROWOOD CORPORATION		
LOCATION	4425 SOUTH THIRD AVENUE EVERETT, WASHINGTON		
SHEET	***DRAWN BY***	***REVIEWED BY***	***DATE***
1 of 1	*JS*	*SS*	*9/30/11*

- ECI GROUNDWATER MONITORING WELL LOCATION
- ECI SOIL AND/OR GROUNDWATER SAMPLE LOCATION
- ADAPT ENGINEERING GROUND WATER MONITORING WELL LOCATION
- ADAPT ENGINEERING GEOPROBE LOCATION
- ADAPT ENGINEERING HAND AUGER LOCATION

INFERRED GROUND WATER FLOW DIRECTION BASED ON GROUND WATER ELEVATION DATA OBTAINED FROM PREVIOUS INVESTIGATIONS

0 10 20

APPROXIMATE SCALE: 1" = 20'

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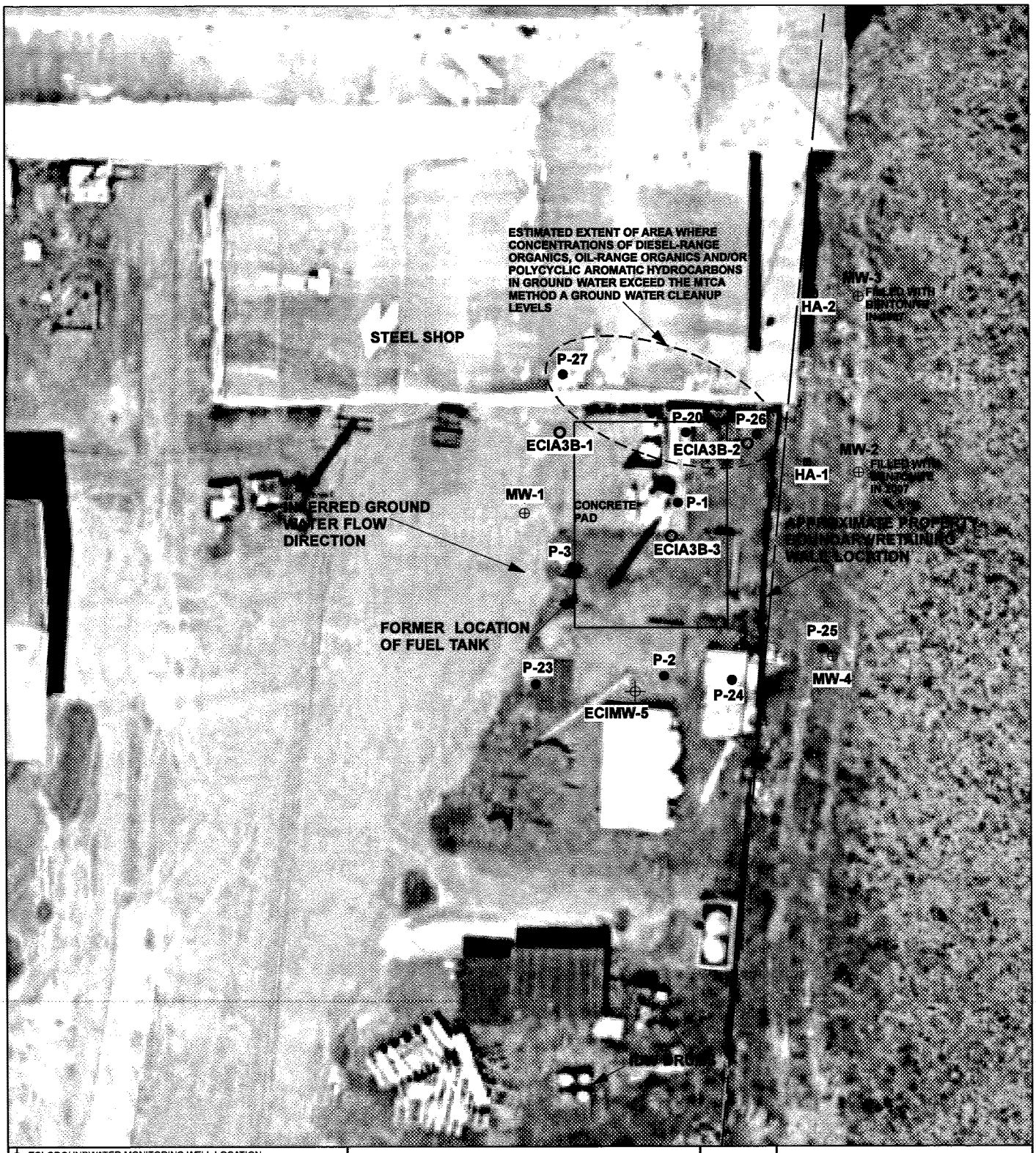
FIGURE 5

AREA 3
FORMER LOCATION OF FUEL TANK &
ESTIMATED EXTENT OF SOIL IMPACTS

PROJECT	ACROWOOD CORP		
PREPARED FOR	ACROWOOD CORPORATION		
LOCATION	4425 SOUTH THIRD AVENUE EVERETT, WASHINGTON		
SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	JS	SS	9/30/11



- ECI GROUNDWATER MONITORING WELL LOCATION
- ECI SOIL AND/OR GROUNDWATER SAMPLE LOCATION
- ADAPT ENGINEERING GROUND WATER MONITORING WELL LOCATION
- ADAPT ENGINEERING GEOPROBE LOCATION
- ADAPT ENGINEERING HAND AUGER LOCATION

INFERRED GROUND WATER FLOW DIRECTION BASED ON GROUND WATER ELEVATION DATA OBTAINED FROM PREVIOUS INVESTIGATIONS

0 10 20

APPROXIMATE SCALE: 1" = 20'

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FIGURE 6

AREA 3
FORMER LOCATION OF FUEL TANK &
ESTIMATED EXTENT OF GROUND WATER IMPACTS

PROJECT	ACROWOOD CORP		
PREPARED FOR	ACROWOOD CORPORATION		
LOCATION	4425 SOUTH THIRD AVENUE EVERETT, WASHINGTON		
SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	JS	SS	9/30/11

Attachment B

Feasibility Level Cost Estimate Tables

Alternative 1 - Monitored Natural Attenuation with Institutional Controls

Alternative 2 - Partial Removal & Off Site Disposal & Institutional Controls

Alternative 3 - Complete Removal & Offsite Disposal

Attachment B
Feasibility Level Cost Estimate Tables

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Feasibility Level Cost Estimate
Alternative 1 - Monitored Natural Attenuation with Institutional Controls
Acrowood Facility
4425 South 3rd Street
Everett, Washington
Facility/Site ID#: 22755667 | VCP #: NW2151

Cost Description		Qty	Unit	Unit Cost	Total Cost
Institutional Controls					
	Negotiate with Ecology and implement institutional control	1	$ 15,000.00	$ 15,000.00	
Site Work					
	Installation of an asphalt/concrete cap	1	$ 15,000.00	$ 15,000.00	
Contingency					
	Percentage of total scope of work	1		$ 6,000.00	
Professional Services					
	Project management & administration (15% of total)			$ 5,400.00	
			Total Project Costs:		**$ 41,400.00**

Operations & Maintenance Items		**Annual Cost**		**Extended Costs**
Quarterly Groundwater Monitoring and Reporting (1 year)	$	15,000.00	$	15,000.00
Annual Maintenance and Monitoring (10 years)	$	500.00	$	5,000.00
Annual MNA Sampling (10 years)	$	5,000.00	$	50,000.00
Confirmation Sampling, Analysis, Well Closure and Reporting (Year 10)			$	15,000.00
Total O&M Project Costs:				**$ 85,000.00**

Total Project Estiamted Cost:	**$ 126,400.00**

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Feasibility Level Cost Estimate
Alternative 2 - Partial Removal & Off-Site Disposal & Institutional Controls
Acrowood Facility
4425 South 3rd Street
Everett, Washington
Facility/Site ID#: 22755667 | VCP #: NW2151

Cost Description	Qty	Unit	Unit Cost	Total Cost
Permitting				
Grading Permit Fees	1	ls	$ 3,500.00	$ 3,500.00
Shoring Permit Fees	1	ls	$ 3,500.00	$ 3,500.00
Geotechnical Engineering Support Services				
Preliminary geotechnical engineering report	1		$ 7,500.00	$ 7,500.00
Structural Engineering Support Services				
Shoring Design	1		$ 3,000.00	$ 3,000.00
Geotechnical Engineering Services				
Field oversight - shoring installation	3	day	$ 1,200.00	$ 3,600.00
Field oversight - excavation and backfill	10	day	$ 1,200.00	$ 12,000.00
Shoring Contractor				
Install H-pile & lagging shoring	250	face foot	$ 55.00	$ 13,750.00
Install pin pile shoring around building perimeter	20	ea	$ 750.00	$ 15,000.00
Well abandonment within proposed excavation				
Survey - baseline, weekly, conclusion of field work	1	ls	$ 10,000.00	$ 10,000.00
Excavation Contractor				
Mob/demob, erosion control, temporary site controls	1		$ 7,500.00	$ 7,500.00
Asphalt demolition and removal	1	ls	$ 2,000.00	$ 2,000.00
Asphalt and concrete disposal	1	ls	$ 1,000.00	$ 1,000.00
Excavate and stockpile overburden	250	tn	$ 5.00	$ 1,250.00
Excavate, haul and dispose PCS at Subtitle D landfill	250	tn	$ 55.00	$ 13,750.00
Place and compact overburden	250	tn	$ 20.00	$ 5,000.00
Import, place and compact structural backfill	250	tn	$ 25.00	$ 6,250.00
Confirmation analytical - Mobile Laboratory	3	ea	$ 1,750.00	$ 5,250.00
Well replacement	2	ea	$ 2,000.00	$ 4,000.00
Site restoration (gravel only)	1	ls	$ 3,000.00	$ 3,000.00
Institutional Controls				
Negotiate with Ecology and implement institutional control				$ 15,000.00
Contingency: Percentage of total scope of work	20	%		$ 27,170.00
		Construction Subtotal:		**$ 163,020.00**
Mobilization, Contingencies & Demobilization				
Mobilization (0.5% of construction subtotal)				$ 815.10
Bid (1.5% of construction subtotal)				$ 2,445.30
Scope (10% of construction subtotal)				$ 16,302.00
Engineering / Environmental Consulting Services (15% of construction total)				$ 24,453.00
		Construction Total:		**$ 207,035.40**

Operations & Maintenance Items	Annual Cost	Extended Costs
Quarterly Groundwater Monitoring and Reporting (1 year)	$ 15,000.00	$ 15,000.00
Annual Maintenance and Monitoring (10 years)	$ 500.00	$ 5,000.00
Annual MNA Sampling (10 years)	$ 5,000.00	$ 50,000.00
Confirmation Sampling, Analysis, Well Closure and Reporting (Year 10)		$ 15,000.00
Total O&M Project Costs:		**$ 85,000.00**
	Total Project Estimated Cost:	**$ 292,035.40**

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Feasibility Level Cost Estimate
Alternative 3 - Complete Removal & Off-Site Disposal
Acrowood Facility
4425 South 3rd Street
Everett, Washington
Facility/Site ID#: 22755667 | VCP #: NW2151

Cost Description	Qty	Unit	Unit Cost	Total Cost
Permitting				
Grading Permit Fees	1	ls	$ 3,500.00	$ 3,500.00
Shoring Permit Fees	1	ls	$ 3,500.00	$ 3,500.00
Geotechnical Engineering Support Services				
Preliminary geotechnical engineering report	1	ls	$ 7,500.00	$ 7,500.00
Structural Engineering Support Services				
Shoring Design (Building & Retaining Wall)	1	ls	$ 7,500.00	$ 7,500.00
Geotechnical Engineering Services				
Field oversight - shoring installation	5	day	$ 1,200.00	$ 6,000.00
Field oversight - excavation and backfill	15	day	$ 1,200.00	$ 18,000.00
Shoring Contractor				
Install H-pile & lagging shoring	500	face foot	$ 55.00	$ 27,500.00
Install pin pile shoring	40	ea	$ 750.00	$ 30,000.00
Well abandonment within proposed excavation				
Survey - baseline, weekly, conclusion of field work	1	ls	$ 15,000.00	$ 15,000.00
Excavation Contractor				
Mob/demob, erosion control, temporary site controls	1		$ 7,500.00	$ 7,500.00
Asphalt demolition and removal	1	ls	$ 2,000.00	$ 2,000.00
Asphalt and concrete disposal	1	ls	$ 1,000.00	$ 1,000.00
Excavate and stockpile overburden	250	tn	$ 5.00	$ 1,250.00
Excavate, haul and dispose PCS at Subtitle D landfill (exterior)	250	tn	$ 55.00	$ 13,750.00
Excavate, haul and dispose PCS at Subtitle D landfill (exterior)	400	tn	$ 75.00	$ 30,000.00
Place and compact overburden (exterior)	250	tn	$ 20.00	$ 5,000.00
Import, place and compact structural backfill	250	tn	$ 25.00	$ 6,250.00
Import, place and compact structural backfill	400	tn	$ 25.00	$ 10,000.00
Confirmation analytical - Mobile Laboratory	3	ea	$ 1,750.00	$ 5,250.00
Well replacement	2	ea	$ 2,000.00	$ 4,000.00
Site restoration (exterior gravel only)	1	ls	$ 3,000.00	$ 3,000.00
Site restoration (Interior Floor)	1	ls	$ 16,000.00	$ 16,000.00
Institutional Controls				
Negotiate with Ecology and implement institutional control	1	ls		$ 15,000.00
Contingency: Percentage of total scope of work	20	%		$ 47,700.00
			Construction Subtotal:	**$ 286,200.00**
Mobilization, Contingencies & Demobilization				
Mobilization (0.5% of construction subtotal)				$ 1,431.00
Bid (1.5% of construction subtotal)				$ 4,293.00
Scope (10% of construction subtotal)				$ 28,620.00
Engineering / Environmental Consulting Services (15% of construction total)				$ 42,930.00
			Construction Total:	**$ 363,474.00**

Operations & Maintenance Items	Annual Cost	Extended Costs
Quarterly Groundwater Monitoring and Reporting (1 year)	$ 15,000.00	$ 15,000.00
Well Decommissining		$ 5,000.00
Total O&M Project Costs:		**$ 20,000.00**
	Total Project Estimated Cost:	**$ 383,474.00**

Attachment C

Project Analytical Tables

Table 1- Summary of Area 1 Soil Analytical Results

Table 2 - Summary of Area 2 Soil Analytical Results

Table 3 - Summary of Area 3 Soil Analytical Results

Table 4 - Summary of Area 1 Groundwater Analytical Results

Table 5 - Summary of Areas 2 & 3 Groundwater Analytical Results

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Table 1
Summary of Area 1 Analytical Results
VOCs in Soil (milligrams/kilogram)
Acrowood Corporation
4425 South Third Avenue, Everett, WA
September 09, 2011

Sample ID	Date Collected	Sample depth (bg)	Benzene	Toluene	Ethylbenzene	Total Xylenes	cis-1,2-Dichloroethylene	Trichloroethylene	Tetrachloroethylene	Acetone	1,1-Dichloroethylene
P5S2	11/3/1999	8	ND	ND	ND	ND	ND	ND	ND	ND	ND
P6S2	11/3/1999	8	ND	ND	ND	ND	ND	ND	ND	ND	ND
P7S2	11/3/1999	8	ND	ND	ND	ND	ND	**0.055**	ND	ND	ND
SV-1-4	3/27/2000	2.5-4	ND	ND	ND	ND	ND	ND	ND	ND	ND
SV-2-3.5	3/27/2000	2.5-3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
SV-3-3.5	3/27/2000	2.5-3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
SV-4-3.5	3/27/2000	2.5-3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
P20A	7/24/2007	10-12	<0.03	<0.05	<0.06	<0.1	<0.05	<0.03	<0.026	<0.5	<0.05
P-21	7/24/2007	8-10	<0.03	<0.05	<0.06	<0.1	<0.05	<0.03	<0.026	<0.5	<0.05
P-22	7/24/2007	8-10	<0.03	<0.05	<0.06	<0.1	<0.05	<0.03	<0.026	<0.5	<0.05
MTCA Method A Soil Cleanup Level For Unrestricted Land Uses			**0.03**	**7**	**6**	**9**	NA	**0.03**	**0.05**	NA	NA

Bolded and shaded concentration - indicates that the concentration exceeded the MTCA Method A Soil Cleanup Level

Volatile organic compounds analyzed using EPA Method 8260

All data obtained from previous consultants

ND - indicates analyte was not detected at a concentration above the laboratory detection limit

NA - indicates that data was not available

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Table 2
Summary of Area 2 Analytical Results
DRO & ORO in Soil (milligrams/kilogram)
Acrowood Corporation
4425 South Third Avenue, Everett, WA

September 9, 2011

Sample ID	Date Collected	Sample depth (bg)	HCID-Gasoline Range Organics	HCID-Diesel Range Organics	HCID-Oil Range Organics	Diesel Range Organics	Oil Range Organics
P8S3	11/3/1999	8.5	<20	**>50**	**>100**	**983**	**1,920**
P9S3	11/3/1999	12	<20	<50	<100	-	-
P10S3	11/3/1999	12	<20	<50	<100	-	-
P19-9	4/17/2000	6-9	-	-	-	<30	<60
MTCA Method A Soil Cleanup Level For Unrestricted Land Uses			NA	NA	NA	**2,000**	**2,000**

Bolded concentration - Indicates that the detected concentration was above the compound-specific laboratory detection limit

HCID - Hydrocarbon Identification analyzed using Ecology Method NWTPH-HCID

Diesel and oil range organics anayzed using Ecology Method NWTPH-Dx

All data obtained from previous consultants

NA - indicates that data was not available

"-" Indicates sample was not analyzed for the inicated analysis

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Table 3
Summary of Area 3 Analytical Results
DRO, ORO and PAHs in Soil (milligrams/kilogram)
Acrowood Corporation
4425 South Third Avenue, Everett, WA

September 9, 2011

Sample ID	Date Collected	Sample depth (bg)	Diesel-Range Organics(e)	Oil-Range Organics(e)	1-Methylnaphthalene(b)	2-Methylnaphthalene(b)	Naphthalene(b)	Total Naphthalenes(b,c)	Acenaphthene(b)	Acenaphthylene(b)	Anthracene(b)	Benzo(g,h,i)perylene(b)	Fluorene(b)	Fluoranthene(b)	Phenanthrene(b)	Pyrene(b)	Benzo(a)anthracene(d)	Benzo(a)pyrene(d)	Benzo(b)fluoranthene(d)	Benzo(k)fluoranthene(d)	Chrysene(d)	Dibenzo(a,h)anthracene(d)	Ideno(1,2,3-cd)pyrene(d)	Total cPAHs
Adapt Engineering Investigation Data																								
P1S4	11/3/1999	16	10,000	4,010	-	-	-	11.8	6.27	1.21	6.94	0.745	7.86	2.86	28.2	11.3	4.62	1.53	0.705	ND	7.01	ND	ND	2.133
P1S6	11/3/1999	22	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P2S3	11/3/1999	12	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P3S3	11/3/1999	12	134	210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P20-12	4/17/2000	9-12	-	-	-	-	-	16	7.9	ND	7.1	<2	12	2.1	33	11	5.1	1.4	<2	<2	8	ND	ND	1.99
P20-16	4/17/2000	12-16	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
HA1-4	4/17/2000	3-4	75	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
HA2-5	4/17/2000	4-5	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P-23	7/23/2007	12-14	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P-24	7/23/2007	12-14	<50	<100	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	NA
P-25	7/24/2007	4-6	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P-26	7/24/2007	12-14	440	580	-	-	-	1.9	1.9	<0.5	1.6	6.2	2	1.7	5.8	4.3	3.1	6.1	7	2.9	5	1.9	5.2	6.16
P-27	7/24/2007	12-14	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
EcoCon, Inc Investigation Data																								
ECIA3B-1:4	7/21/2011	4	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
ECIA3B-1:12	7/21/2011	12	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
ECIA3B-2:8	7/21/2011	8	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
ECIA3B-2:12	7/21/2011	12	31,000	2,600	58	96	14	168	11	1.5	7.3	0.61	2.4	ND	29	ND	0.3	ND	ND	0.91	0.61	ND	ND	0.13
ECIA3B-2:16	7/21/2011	16	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
ECIA3B-2:17	7/21/2011	17	250	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA

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Table 3
Summary of Area 3 Analytical Results
DRO, ORO and PAHs in Soil (milligrams/kilogram)
Acrowood Corporation
4425 South Third Avenue, Everett, WA

September 9, 2011

Sample ID	Date Collected	Sample depth (bg)	Diesel-Range Organics(a)	Oil-Range Organics(a)	1-Methylnaphthalene(b)	2-Methylnaphthalene(b)	Naphthalene(b)	Total Naphthalenes(b,c)	Acenaphthene(b)	Acenaphthylene(b)	Anthracene(b)	Benzo(g,h,i)perylene(b)	Fluorene(b)	Fluoranthene(b)	Phenanthrene(b)	Pyrene(b)	Benzo(a)anthracene(d)	Benzo(a)pyrene(d)	Benzo(b)fluoranthene(d)	Benzo(k)fluoranthene(d)	Chrysene(d)	Dibenzo(a,h)anthracene(d)	Ideno(1,2,3-cd)pyrene(d)	Total cPAHs
ECIA3B-2:20	7/21/2011	20	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
ECIA3B-3:12	7/21/2011	12	<50	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
ECIA3B-3:16	7/21/2011	16	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
Toxicity Equivalency Factors (TEF)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.1**	**1**	**0.1**	**0.1**	**0.01**	**0.1**	**0.1**	NA
MTCA Method A Soil Cleanup Level For Unrestricted Land Uses			**2,000**	**2,000**	NA	NA	**5**	**5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.1**	NA	NA	NA	NA	NA	**0.1**

Bolded and shaded concentration - indicates that the concentration exceeded the MTCA Method A Soil Cleanup Level

Bolded concentration - Indicates that the detected concentration was above the compound-specific laboratory detection limit, but did not exceed a cleanup level

(a) Diesel and oil-range orgainics analyzed using Ecology Method NWTPH-Dx with silica gel cleanup

(b) Polycyclic aromatic hydrocarbons (PAHs) analyzed using EPA Method 8270

(c) Total naphthalenes is the sum of the naphthalene, 1-Methylnaphthalene and 2-Methylnaphthalene concentrations

(d) Carcinogenic PAHs analyzed using EPA Method 8270

(e) Total carcenogenic polycyclic aromatic hydrobarbons is the sum of each individual cPAH concentration multiplied by the corresponding toxicity equivalency factors. The total represents the total toxicity equivalent concentration for the mixture and is compared to the MTCA Method A Cleanup Level for benzo(a)pyrene for compliance purposes

EcoCon, Inc. investigation soil sample analysis performed by Environmental Services Network

"-" Indicates sample was not analyzed for the inicated compound

NA - indicates that data was not available or applicable

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Table 4
Summary of Area 1 Analytical Results
VOCs in Groundwater (micrograms/liter)
Acrowood Corporation
4425 South Third Avenue, Everett, WA

September 9, 2011

Sample ID	Date Collected	Benzene	Toluene	Ethylbenzene	Total Xylenes	cis-1,2-Dichloroethylene	Trichloroethylene	Tetrachloroethylene	Acetone	1,1-Dichloroethylene
P6W1	11/3/1999	ND	ND	ND	ND	ND	**8.38**	ND	ND	ND
P-17W	11/3/1999	ND	ND	ND	ND	ND	**4.9**	ND	ND	ND
P-18W	11/3/1999	ND	ND	ND	ND	ND	**0.27**	ND	ND	ND
MW-5	8/20/2007	<1	<1	<1	<2	<1	**1.6**	<1	<10	<1
	1/17/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
	3/21/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
	8/7/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
MW-6	8/20/2007	<1	<1	<1	<2	<1	<1	<1	<10	<1
	1/17/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
	3/21/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
	8/7/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
MW-7	8/20/2007	<1	<1	<1	<2	<1	<1	<1	<10	<1
	1/17/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
	3/21/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
	8/7/2008	<1	<1	<1	<2	<1	<1	<1	<10	<1
P20A	7/24/2007	<1	<1	<1	<2	<1	<1	<1	<10	<1
P-21	7/24/2007	<1	<1	<1	<2	<1	<1	<1	<10	<1
P-22	7/24/2007	<1	<1	<1	<2	<1	<1	<1	<10	<1
MTCA Method A Groundwater Cleanup Level For Unrestricted Land Uses		**5**	**1,000**	**700**	**1,000**	NA	**5**	**5**	NA	NA

ates that the concentration exceeded the MTCA Method A Ground Water Cleanup Leve
:ted concentration was above the laboratory detection limit, but did not exceed a cleanup le
rganic compounds analyzed using EPA Method 826
All data obtained from previous consultants
as not detected at a concentration above the laboratory detection lin
NA - indicates that data was not available

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Table 5
Summary of Areas 2 & 3 Analytical Results
DRO, ORO and PAHs in Ground Water (micrograms/liter)
Acrowood Corporation
4425 South Third Avenue, Everett, WA

September 09, 2011

Sample ID	Date Collected	Diesel-Range Organics(a)	Oil-Range Organics(a)	1-Methylnaphthalene(b)	2-Methylnaphthalene(b)	Naphthalene(b)	Total Naphthalenes(b,c)	Acenaphthene(b)	Acenaphthylene(b)	Anthracene(b)	Benzo(g,h,i)perylene(b)	Fluorene(b)	Fluoranthene(b)	Phenanthrene(b)	Pyrene(b)	Benzo(a)anthracene(d)	Benzo(a)pyrene(d)	Benzo(b)fluoranthene(d)	Benzo(k)fluoranthene(d)	Chrysene(d)	Dibenzo(a,h)anthracene(d)	Ideno(1,2,3-cd)pyrene(d)	Total cPAHs(e)
Adapt Engineering Area 3 Investigation Data																							
P-20	4/17/2000	-	-	-	-	-	60	16	2.1	8.7	0.94	17	2.7	36	12	5.6	1.6	0.77	<0.5	8.8	<0.5	<0.5	2.33
HA1-W	4/17/2000	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
HA2-W	4/17/2000	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P23-GW	7/23/2007	52	<250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
P26-GW	7/24/2007	7,800	3,100	-	-	-	58	17	<1	11	4.4	16	4.9	43	18	7.4	6.2	5.4	2.3	13	1.1	3.4	8.29
P27-GW	7/24/2007	160	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
MW-1	8/10/2000	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	11/15/2000	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	2/23/2001	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	6/5/2001	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	NA
	6/20/2007	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
	1/17/2008	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
	3/21/2008	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
	8/7/2008	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA
MW-2	8/10/2000	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	11/15/2000	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	2/23/2001	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	6/5/2001	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
MW-3	8/10/2000	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	11/15/2000	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	2/23/2001	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	6/5/2001	<250	<500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA

GROUNDWATER MONITORING WELL INSTALLATION AND SAMPLING REPORT

Fourth Quarter 2019

Acrowood Corp
Site Address: 4425 S 3rd Avenue
Everett, Washington 98203
Facility/Site No.: 22755667
VCP Project No.: NW2151
Cleanup Site ID No.: 4703

December 12, 2019

Prepared for:

Acrowood Corp
4425 S 3rd Avenue
Everett, Washington 98203

Stephanie Holt
Staff Geologist

David R. Polivka L.G. / L.Hg.
Senior Hydrogeologist

State of Washington Hydrogeologist 203 Licensed Geologist
DAVID R. POLIVKA

Prepared by:

ECI | Environmental Services
PO Box 153
Fox Island, Washington 98333
Office: (253) 238-9270

ECI Project No.: 0377-08

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List of Appendices

1.0 INTRODUCTION

EcoCon, Inc. (ECI) has prepared this Groundwater Monitoring Well Installation and Sampling Report to document the installation of four additional groundwater monitoring wells and groundwater-sampling conducted at 4425 South 3rd Avenue, Everett, Washington (Site/Subject Site/Property/Subject Property) (Figure 1, Appendix A). This report details field activities and observations, sampling activities, chemical analysis, and provides conclusions and recommendations.

As established in WAC 173-340-200, the "Site" is defined as:

> *"...any area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed or otherwise come to be located..."*

For this report, the "Site" is defined by the full lateral and vertical extent of contamination that has resulted from a former diesel underground storage tank (UST) that was located on the Property. Based on the findings of the previous environmental investigations, the Site has been defined as the nature and extent of the following contaminants in the soil and groundwater:

- Diesel-range Organics (DRO), and
- Oil-range Organics (ORO),
- Naphthalene, and
- Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs).

1.1 Property Description/Location

According to the Snohomish County Assessor, the Property (Snohomish County Tax Parcel numbers 29053200200100, 29053200200200, 29053200201400, 29053200205900, and 29053200304200) consists of a single industrial lot, approximately 21.07 acres in total. The Site is contained within the northernmost parcel, 29053200200100. This parcel is approximately 6.87 acres in size, and currently improved with two structures. The first structure was constructed in 1913 totally 120,284 square feet, and the second structure was constructed in 1948 totaling 324 square feet. Other buildings are present on the Property but are not listed on the Snohomish County Assessor's website. According to information obtained at the Snohomish County Assessor's office, the site is zoned "M-1" for general manufacturing/industrial uses.

ECI's historical research on the Property indicates that former land use activities included metal fabrication and iron foundry facilities dating as far back as the 1890s. The Property is currently used as a metal fabrication facility specializing in machinery for the pulp and paper industry. According to the Snohomish County Assessor, the Property is currently owned by Acrowood Corp.

1.2 Physical Setting

1.2.1 Geology and Hydrogeology

Geological and hydrogeological conditions can often affect, to some extent, the environmental integrity of property. Underlying soil and bedrock formations may facilitate or impede the migration of chemical contaminants in groundwater and may even be the source of contaminants such as radon and metals. This section of the report summarizes geologic factors that may affect the Subject Property in regard to environmental concerns.

The Site is located in the Puget Lowland geologic region. The Puget Sound Lowland is an elongated topographic and structural depression filled with complex sequences of glacial and non-glacial sediments that overlie bedrock. Continental ice sheets up to 3,000 feet thick covered portions of the Puget Lowland several times during the Quaternary period. Retreating ice carved new landscapes, rechanneled rivers, drained or formed lakes, and deposited glacial drift including till and outwash sands and gravels (WA DNR, 2002).

The primary aquifers in the Puget Sound region are typically in glacial sands and gravels overlain by relatively impermeable glacial till deposits, that are present at or near the ground surface. Within these till deposits are localized areas or lenses of water-bearing sands and gravels that may result in a shallow, localized, perched water table. Lateral and vertical migration of shallow groundwater may be impeded by the relatively impermeable nature of the till and by the sometimes-discontinuous nature of the perched water-bearing sands and gravel.

Perched and discontinuous zones of shallow groundwater may be seasonally or perennially present, depending on site-specific conditions. Shallow groundwater flow directions fluctuate and tend to follow topographic gradient but are also affected by seasonal high-water tables and variable soil characteristics. Groundwater migration pathways may also follow underground conduits.

1.2.2 Site Geology

According to the Washington State Geologic Portal, the area near the Property is characterized by Pleistocene Fraser-age to pre-Fraser transitional beds. These deposits consist of clay, silt, and very fine to fine sand; some layers of peaty sand and gravel are in the lower part of compact deposits but may be unstable because of high moisture content, plasticity, and local vertical jointing. The sediments were mostly deposited in still to slowly moving water, except for the coarse stream deposits in the lower part of the unit In the urban and more highly developed areas these materials can include modified land and artificial fill.

Soils observed during this and previous Site investigations on the Subject Property include red to medium brown silts and sands overlain by dark brown to black topsoil typically containing organic matter.

1.2.3 Site Hydrogeology

Based on previous environmental investigations at the Site, the depth to groundwater is between 2 and 9 feet below ground surface (bgs). Shallow groundwater beneath the Subject Property is anticipated to follow

the general topography near the Property and flow to the east towards wetlands and the Snohomish River approximately 1000 feet to the east (Figure 2, Appendix A). Land development and glacial till may also cause contaminants to migrate in different directions through utility corridors or other paths of least resistance.

2.0 PREVIOUS INVESTIGATIONS / INTERIM ACTIONS

According to documents reviewed by ECI, several previous investigations have been performed at the Site by Adapt Engineering, Inc (Adapt) beginning in 1999. During the course of investigations, three areas were identified as containing concentrations of target analytes in soil and/or groundwater at concentrations above the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A or B Cleanup Levels (Figure 3, Appendix A). These areas are described as:

- Area 1 - A paint and solvent storage shed where trichloroethene (TCE) was encountered in soil and groundwater at concentrations exceeded applicable MTCA Method A Soil and Groundwater Cleanup Levels.
- Area 2 - A former heating oil UST location where oil-range organics (ORO) were encountered in soil at concentrations below the MTCA Method A Soil Cleanup Level. This area is referred to as Area 2.
- Area 3 - An area where a release from a former fuel tank occurred and concentrations of DRO, ORO and polycyclic aromatic hydrocarbons (PAHs) in soil and groundwater exceeded MTCA Method A Soil and Groundwater Cleanup Levels.

An "*Opinion Letter*" dated June 22, 2010 issued through the Ecology Voluntary Cleanup Program (VCP) indicated that:

> *"Ecology does agree that groundwater monitoring in the area of the former paint and solvent storage shed [Area 1] indicates that there is no longer a TCE impact."*

This opinion letter also indicated that:

> *"Groundwater characterization has not been completed for the area around the former heating oil UST [Area 2] located by the shipping and receiving dock."*

Groundwater characterization in Area 2 was later completed in 2011 by ECI.

Because of the opinions given by Ecology in their 2010 "*Opinion Letter*", and the completion of the groundwater characterization in 2011 by ECI, Area 1 and Area 2 were not investigated during this groundwater monitoring event. The history presented in this section therefore omits information regarding Area 1 and Area 2 and focuses on presenting historical environmental investigations pertaining to Area 3.

2.1 Adapt Engineering, Inc, November 1999, Preliminary Phase II Environmental Site Assessment

In 1999, ADAPT conducted a Preliminary Phase II Environmental Site Assessment (ESA) to evaluate possible impacts from recognized environmental conditions identified in a Phase I ESA dated August 20, 1999. The Phase I ESA had identified five potential recognized environmental conditions that included:

- A former (heating oil) underground storage tank (Area 2),
- An area where a former fuel oil tank was located (Area 3),

- A paint storage building (Area 1),
- Iron and foundry waste fill area, and
- A storm water discharge pipe.

The Preliminary Phase II assessed the soil, and groundwater, conditions beneath the Site to provide data for evaluation of possible contaminants associated with the identified recognized environmental conditions.

The Preliminary Phase II ESA consisted of advancing 16 Geoprobe® borings to depths of between 8 and 22 feet within the areas of concern and the collection of soil and groundwater samples. Three of the boring were advanced in Area 3, the subject area of this report. The field and analytical data collected suggested that there was petroleum hydrocarbon impact in soil and groundwater above MTCA Method A Cleanup Levels (Figure 5, Appendix A; Table 5, Appendix B).

Adapt detailed the history and investigation of Area 3 in their Preliminary Phase II ESA report,

> *"The 1960 Sanborn Map, reviewed by ADAPT, depicts suspect fuel oil tanks located adjacent to the steel shop on the east edge of the site. According to Acrowood personnel, the tanks were removed prior to the 1970s when Acrowood purchased the site. Additional information was not available regarding the nature of these suspected tanks. Based on the location and current limited access to the area, it is likely that the fuel oil tanks were above ground tanks.*
>
> *Analytical results from borings placed in and around the suspected fuel oil tanks area indicated that there had been a release of petroleum hydrocarbons. One boring (P1) placed within the estimated footprint of the fuel tanks, exhibited heavy staining and residual free product adhering to the soil particles from approximately 5 to 15 feet below ground surface. Analytical results from a soil sample at 16 feet below ground surface exhibited concentrations of diesel and heavy oil at 10,000 and 4,010 ppm, respectively.*
>
> *Two additional borings (P3 and P2) were placed approximately 12 and 20 feet radial from P1, respectively, to the west and south, to delineate the lateral migration of the petroleum hydrocarbon. Diesel and heavy oil hydrocarbons were exhibited in P3, at 134 ppm for diesel and 210 for heavy oil, but not in P2. Analytical results appeared to limit the lateral extent of the release to an area within approximately 10 to 12 feet of P1. Vertical soil sampling results appeared to delineate the vertical extent to between approximately 4.5 feet and 20 feet below ground surface."*

2.2 Adapt Engineering, Inc, May 2000 - Supplemental Phase II Environmental Site Assessment

Based on the results of the Preliminary Phase II ESA, a Supplemental Phase II was performed by Adapt to further delineate the extent of soil and groundwater impacts in Areas 1, 2, and 3 .

Adapt states that four additional borings (P2, P3, HA1 and HA2) were placed south, west, east and northeast of boring P1 in Area 3 at a radial distance of approximately 20, 12, 10 and 15 feet from P1, respectively. However, results reported by Adapt in the Supplemental Phase I ESA indicated that samples from boring

locations P20, HA1, and HA2 were collected in April 2000 and that samples from locations P2 and P3 were collected in November 1999. The analytical results of samples from the borings revealed concentrations of ORO and DRO below the MTCA Method A Cleanup level of 2,000mg/kg for soils.

Adapt concluded that analytical results from soil and groundwater samples appeared to indicate that the area of petroleum hydrocarbon impact was localized to an area approximately 10 to 15 feet radial from P1 and P20 to the east, west and south. Adapt noted that the vertical extent of the release appears to be located from approximately 8 to 15 feet bgs. Due to the presence of the steel shop building, the northern lateral extent was not delineated. Adapt also noted that it was possible there may be residual localized petroleum hydrocarbons beneath the steel shop structure (Figure 5 & Figure 6, Appendix A; Tables 4 & 5, Appendix B).

2.3 Adapt Engineering, Inc, August 2000 through August 2001 - Groundwater Monitoring Well Installation and Groundwater Quality Monitoring Reports

In August 2000, Adapt oversaw the installation of three groundwater-monitoring wells in the former fuel tank area (Area 3) adjacent to the south wall of the fabrication shop. A *"Groundwater Monitoring Well Installation Report"* dated August 29, 2000 was prepared detailing the installation of the three monitoring wells and the results of the first quarterly groundwater quality sampling.

At the time of well installation, groundwater was estimated to be flowing to the east towards the Snohomish River. An upgradient well was placed approximately 30 feet west of the Geoprobe® borings that were located in the former fuel tank area during the Phase II ESAs and two downgradient wells were placed approximately ten feet east of a retaining wall on the fire lane easement.

The three groundwater-monitoring wells were sampled using low-flow purge and sample methods to minimize interferences caused by particulate material. Based on results from the initial (1st Quarter) sampling event, groundwater was observed to be flowing east-southeast. Analytical results indicated that ORO observed in the Geoprobe® and hand auger borings were not detected above the standard laboratory detection limits in the groundwater of the three wells.

Adapt conducted three additional quarterly sampling events in the groundwater-monitoring wells installed in the vicinity of the former fuel tanks. Based on the results of the additional quarterly sampling, DRO, ORO, and PAHs, were not detected above the standard laboratory detection limits in the upgradient or downgradient wells (Figure 6, Appendix A; Table 6, Appendix B).

2.4 Adapt Engineering, Inc, January 2002 – Acrowood Closure Report

In January 2002, Adapt prepared a closure report for Acrowood which detailed the previous environmental activities on the Property and recommended that the report be submitted to Ecology to obtain a "No Further Action" (NFA) determination. Based on the information summarized below, ADAPT believed the Subject Property qualified for an NFA. Adapt also noted that restrictive covenants as dictated by Ecology may be an appropriate condition for the NFA. Adapt made the following arguments for closure in Area 3:

- *According to empirical data collected from four quarterly sampling events, in the area of the former fuel oil tanks, the groundwater migrating off-site meets MTCA Method A Cleanup Levels for TPH* [total petroleum hydrocarbons] *and PAHs. Based on these results, it appears site groundwater conditions meet requirements for site closure.*

- *Using the Johnson and Ettinger vapor intrusion model it appears that residual PAHs concentrations in on-site soil and groundwater do not pose an unacceptable risk to workers in the existing or proposed future site structures.*

- *Using Ecology's Worksheet for Calculating Soil Cleanup Levels for Unrestricted & Industrial Land Use for individual chemicals the current observed concentration of… TPH in soil meets current MTCA Method B cleanup levels and is protective of groundwater.*

- *Based on a review of records at the Washington Department of Ecology, it appears the closest possible sensitive receptor is the Snohomish River, located approximately 1/2 mile to the east of the site. Based on the attenuation observed on site, the likelihood that this receptor could be affected by the subject property appears to be low. No wetlands or drinking water wells were reported within approximately one mile of the subject property. The City of Everett provides water to the subject property and surrounding area. The water is obtained from surface sources collected approximately 10 to 20 miles east. It is unlikely the shallow aquifer below the site would be developed for beneficial uses.*

- *The site as well as adjacent and downgradient properties are currently used and zoned for industrial purposes. It is unlikely the site or downgradient properties would be used for residential purposes in the foreseeable future, further mitigating concern about residual TPH and PAHs.*

- *Proposed restrictive covenants would likely include requirement to excavate any heavy oil impacted soil during future redevelopment of the site, restriction on use of groundwater from the site, and deed restrictions.*

2.5 Adapt Engineering, Inc., February 2009 – Supplemental Phase II Environmental Site Assessment

In 2009, a Phase II Environmental Site Assessment (Phase II ESA) was conducted by Adapt Engineering, Inc. (Adapt). The purpose of this Phase II ESA was to comply with additional sampling requirements requested by Ecology an April 18, 2007 "*Opinion Letter*". In June 2007, a total of eight direct push borings were advanced on site (three borings within Area 3) as well as four hollow-stem auger borings which were completed as 2-inch diameter monitoring wells (one of which was installed in Area 3). Groundwater samples were collected from the wells at the Site on August 20, 2007 and January 17, 2008.

Soil samples from borings advanced in Area 3 (P-23 through P-27) did not contain detectible concentrations of DRO, ORO, naphthalene, or PAHs except for soil sample P-26:12-14. While this sample contained DRO, ORO, and naphthalene below the MTCA Method A Cleanup Level, it contained a concentration of benzo(a)pyrene (BaP) at 6.1 ug/L with a total carcinogenic PAH (cPAH) toxic equivalent concentration (TEQ) as BaP of 8.2 ug/L, both well above the MTCA Method A Cleanup Level.

Groundwater samples collected from Area 3 revealed ORO above the MTCA Method A Cleanup in borings P-26 and P-27. DRO and cPAHs above the MTCA Method A Cleanup Level were also reported in P-26 (Figure 5 & Figure 6, Appendix A; Table 4 & Table 5, Appendix B).

Adapt concluded the following regarding Area 3:

- That further groundwater monitoring would not be necessary in Area 3 based on four consecutive quarters of groundwater monitoring in MW4 which did not indicate that groundwater contamination was migrating.
- Adapt argued that excavation of the residual contamination in Area 3 would likely affect the structural integrity of the building due to the sandy nature of soil observed on site. Adapt went on to say that the contamination is not anticipated to be migrating and that the retaining wall adjacent to the contaminated area may be acting as a barrier to contamination migration.

2.6 EcoCon Inc., September 2011 – Focused Subsurface Investigation

On July 21, 2011 ECI advanced a total of six borings (three within Area 3) as part of a Focused Subsurface investigation (FSI) on the Subject Property. The purpose of the FSI was to comply with a request from Ecology in their 2010 "*Further Action Letter*" stating that a single downgradient well in Area 3 is insufficient to demonstrate groundwater is meeting cleanup standards. The maximum depth of exploration during the FSI was approximately 20.5 feet bgs. Groundwater samples were collected from each of the boring locations except ECIMW-5,which was completed as a monitoring well with a 1-inch diameter PVC casing and 0.010-inch factory slotted well screen.

A total of 9 soil samples and 3 groundwater samples were collected in Area 3 and submitted to ESN Northwest Chemistry Laboratory in Olympia, Washington for analysis of DRO and ORO using Ecology Method NWTPH-Dx. One soil sample and one groundwater sample were selected for additional analysis of PAHs using EPA Method 8270 based on initial analytical results.

On August 25, 2011, ECI returned to the Site to develop, monitor, and sample the monitoring wells in Area 3. Groundwater samples obtained from MW1, MW4, and ECIMW-5 (Referred to as MW5 in this report) were submitted to ALS Environmental Laboratory (ALS) in Everett, Washington for analysis of DRO and ORO using Ecology Method NWTHP-Dx and PAHs using EPA Method 8270SIM.

Of the soil samples submitted to the laboratory, only soil sample ECIA3B-2:12 was above the MTCA Method A Cleanup Level for the contaminants analyzed, containing concentrations of DRO, ORO, total naphthalenes, and cPAHs above the MTCA Method A Cleanup Level.

Of the groundwater samples collected, one sample (ECIA3B-1GW) was above the MTCA Method A Cleanup Level for DRO, but below the MTCA Method A Cleanup Level for total naphthalene and cPAHs. However, ECI noted that the laboratory reporting limit for cPAHs for this sample was 0.1 ug/L, which makes it possible for the TEQ to be greater than 0.1 ug/L, and thus above the MTCA Method A Cleanup Level. Additionally, the analytical results of the groundwater sample (ECIMW5-5) collected from the newly installed MW5

revealed that cPAHs were present below the MTCA method A Cleanup Level with a total toxic equivalent concentration (TEQ) of 0.046 ug/L (Figure 5 & Figure 6, Appendix A; Tables 4 & 5, Appendix B).

The following conclusions were reported by ECI regarding Area 3:

- FSI soil and groundwater data combined with previous investigation data were sufficient to characterize the extent of soil and groundwater impacts at the Site.
- Soil in Area 3 was impacted with DRO, ORO, cPAHs, and naphthalenes at concentrations exceeding applicable MTCA Method A Soil Cleanup Levels. Soil impacts in Area 3 are confined to a relatively small area and do not appear to extend off-Property. It was estimated that approximately 60 yards of impacted soil remain in place in this location and that some of this soil is likely situated beneath the building. Soil impacts did not appear to be present below the groundwater table as previously reported.
- It would not be cost effective to excavate the small amount of impacted soil in Area 3 due to excessive costs associated with supporting the building and retaining wall during excavation activities.
- Groundwater in Area 3 is impacted with DRO, ORO, and cPAHs at concentrations exceeding MTCA Method A Groundwater Cleanup Levels. Groundwater impacts in Area 3 are confined to a relatively small area and do not appear to extend off-Property.
- The observed decreases in dissolved-phase concentrations of DRO, ORO, and cPAHs from July 2007 to July 2011 in the location of borings ECIA3B-2 and P-26 indicated that natural attenuation may be effective at remediating the observed groundwater impacts at the Site.
- The installation of groundwater monitoring well ECIMW-5 (MW5) has satisfied Ecology's requirement to install a monitoring well downgradient and south of the former excavation area in Area 3.

Based on the findings of this FSI, ECI recommended the following:

- ECI recommended leaving the estimated 60 yards of impacted soil in place and allowing groundwater impacts to naturally attenuate. This would involve requesting a "*No Further Action*" (NFA) determination from Ecology with an Environmental Covenant. ECI noted that Ecology would likely require the installation of additional groundwater monitoring wells in the impacted area and upgradient along with continued groundwater monitoring to achieve this goal.
- Ecology had indicated in previous opinion letters that a Feasibility Study (FS), including a disproportionate cost analysis (DCA) would be needed to support the selected cleanup action of leaving contaminated soil in place and implementing institutional controls. Ecology had also indicated that a Terrestrial Ecological Evaluation (TEE) needed to be completed for the Site.
- ECI also recommended scheduling a meeting with the Project Manager once he had had the opportunity to review the FSI report. The intent of the meeting would be to determine that the next actions taken at the Site were appropriate and cost effective.

3.0 GROUNDWATER MONITORING PROGRAM

The groundwater monitoring program discussed in this report was initiated at the Site beginning the fourth quarter of 2019 and includes:

- Installation of four additional groundwater-monitoring wells;
- Sampling the wells on a quarterly basis for four consecutive quarters; and
- Describes contaminants of concern along with their respective MTCA Method A Clean Up Levels (CULs).

3.1 Regulatory Compliance

Regulatory compliance for this project is based on the Washington Administrative Code (WAC) 173-340 – Model Toxic Control Act (MTCA) - RCW Chapter 70.105D, implemented by the Washington State Department of Ecology (Ecology). Pursuant to Chapter 70.105D RCW, Ecology has established procedures for developing cleanup levels and requirements for cleanup actions. The rules establishing these levels and requirements were developed by Ecology in consultation with a Science Advisory Board (established under the Act) and with representatives from local government, citizen, environmental, and business groups. The rules were first published in February 1991, with amendments in January 1996, February 2001, and October 2007.

3.2 Contaminants of Concern (COCs) and Cleanup Levels

Based upon the results of previous investigations, the COCs and respective MTCA Method A Cleanup Levels for the Site are presented below:

Table 1: Contaminants of Concern

Contaminant	Analytical Method	Soil MTCA Method A CULs (mg/kg)	Groundwater MTCA Method A CULs (µg/L)
Primary Contaminants of Concern - Petroleum Hydrocarbons			
Diesel-range Organics (DRO)	NWTPH-Dx	2000	500
Oil-range Organics (ORO)	NWTPH-Dx	2000	500
Secondary Contaminants of Concern - Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)			
Benzo (a) anthracene	EPA 8270	--	--
Chrysene	EPA 8270	--	--
Benzo (b) fluoranthene	EPA 8270	--	--
Benzo (k) fluoranthene	EPA 8270	--	--
Benzo (a) pyrene*	EPA 8270	0.1	0.1
dibenzo(a,h)anthracene	EPA 8270	--	--
Indeno (1,2,3-cd) pyrene	EPA 8270	--	--

MTCA = Model Toxics Control Act
*The MTCA Method A Cleanup Level for cPAHs is based on a total toxic equivalent concentration (TEQ) calculation which compares the toxicity of individual cPAH compounds and presents them as a number equivalent to benzo(a)pyrene.

3.2.1 cPAH Soil and Groundwater Cleanup Levels

Carcinogenic PAHs (cPAHs) analyzed in soil and groundwater during the well installation and groundwater sampling included benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and ideno(1,2,3-cd)pyrene. When establishing compliance with cleanup levels under MTCA, the mixture of these compounds is considered a single hazardous substance. The toxicity equivalency factor (TEF) methodology was developed by the U.S. Environmental Protection Agency (EPA) to evaluate the toxicity and assess the risks of a mixture of structurally related chemicals with a common mechanism of action. To evaluate the human health toxicity of a cPAH mixture, the chemical concentrations of the cPAHs in the mixture are converted to an equivalent concentration of benzo(a)pyrene. This calculation is expressed mathematically, below. For notation purposes, the result is referred here as the "total toxic equivalent concentration" or "cPAH TEQ."

$$\text{Total TEQ} = \sum(Cn * TEFn)$$

Where:
Total TEQ = Total Toxic Equivalent Concentration of a cPAH mixture
Cn = Concentration of the individual cPAH in the mixture
TEFn = Toxicity equivalency factor for the individual cPAH in the mixture

3.3 Monitoring Well Installation

On March 7, 2019 ECI oversaw the installation of three groundwater monitoring wells on the Subject Property (Figure 4, Appendix A). A fourth monitoring well was installed on April 4, 2019. The wells were drilled using a push-probe operated by a Washington State licensed driller. The borings for the wells were drilled until groundwater was encountered and then a minimum of five feet past the soil-water interface. The wells were constructed pursuant to the Washington State Resource Protection Well Regulations (Chapter 173-160 WAC) with ten feet of 1-inch diameter slotted PVC well screen starting at the base of the boring. The boring logs and well construction details are presented in Appendix B.

After installation, to assure that representative samples of the groundwater could be obtained, each well was developed to remove the effects that drilling may have had on the soils adjacent to the boing and to clean the sand-pack of silt that may have been introduced during well construction. This was accomplished by surging the well and pumping the water from the well until the water was clear or as clear as reasonably possible.

The following wells were installed on the Subject Property:

- **MW6** was installed northeast of the known impacted area in the anticipated cross and downgradient direction.
- **MW7** was installed southeast of the known impacted area in the anticipated downgradient direction.

- **MW8** was installed directly through the known impacted soil area. This well was the most likely to have groundwater impacted by the COCs.
- **MW9** was installed inside of the building adjacent to the known impacted area in the anticipated upgradient position.

3.3.1 Soil Sampling

During drilling of the borings for the monitoring wells, undisturbed soil samples were collected directly from the Macro-core® liner of the drilling rod. The samples collected at the capillary fringe in each boring were submitted to the laboratory for analysis.

The analytical results of the samples collected are detailed in Table 2 below:

Table 2: Well Installation Soil Sample Results

Sample ID	Sample Depth (ft)	Date Sampled	Total Petroleum Hydrocarbons (mg/kg)		Polycyclic Aromatic Hydrocarbons (PAHs) (EPA 8270 SIM) (mg/kg)			
			Diesel (mg/kg)[2]	Heavy Oil (mg/kg)[2]	Naphthalene	2-Methyl Naphthalene	1-Methyl Naphthalene	cPAHs TEQ[1] as Benzo (a) Pyrene
MW6-6	6	11/12/2019	<25	<50	<0.02	<0.02	<0.02	<0.02
MW7-5	5	11/12/2019	**80**	**210**	<0.02	<0.02	<0.02	**0.06149**
MW8-5	5	11/12/2019	**27**	**120**	--	--	--	--
MW8-15	15	11/12/2019	**11,000**	**5,700**	**18**	**130**	**90**	**4.396**
MW8-19	19	11/12/2019	<25	<50	--	--	--	--
MW9-11	11	11/12/2019	<25	<50	<0.02	<0.02	<0.02	**0.06463**
Laboratory Reporting Limit			25	50	0.020	0.020	0.020	--
Ecology MTCA Method A Cleanup Levels			2,000	2,000	5	5	5	0.1

Notes:
[1]TEQ refers to total toxic equivalent concentration (TEQ) of cPAHs as benzo(a)pyrene. Full PAH results for soil are displayed in Table 4, Appendix B.
MTCA = Model Toxics Control Act
Mg/kg = milligram per kilogram
< indicated that the result is below the laboratory PQL
-- indicates that sample was not analyzed for this constituent
Bold indicates a detected concentration that is below Ecology MTCA Method A Cleanup Levels
Bold and Shaded indicates the detected concentration exceeds Ecology MTCA Method A or B Cleanup Levels

The analytical results revealed that monitoring well MW8 had been placed within the impacted area as intended. Analytical results of sample MW8-15 revealed DRO, ORO, Naphthalene, and the TEQ for cPAHs as benzo(a)pyrene were each above their respective MTCA Method A Cleanup Levels in soil. Two additional soil samples were collected and analyzed for DRO and ORO from boring MW8 in order to delineate the vertical extent of contamination. The results of the analysis of samples MW8-5 and MW8-19 indicated that DRO and ORO impact to soils is limited to between 5 and 19 feet bgs in the vicinity of MW8.

The analytical results for the soil sample collected from monitoring well MW6 were below laboratory reporting limits for each of the COCs analyzed, which are below their respective MTCA Method A Cleanup Levels.

Analytical results of the soil samples collected from monitoring wells MW7 and MW9 reported cPAHs above the reporting limit, with a calculated cPAH TEQ below the MTCA Method A Cleanup Level. Analytical results of soil from monitoring well MW7 revealed DRO, ORO above the reporting limit, but below the MTCA Method A Cleanup Level for DRO and ORO. For detailed analytical results including individual cPAH values, refer to Table 4, Appendix B.

Additional DRO and ORO analysis was requested for samples collected from MW8 at 5 feet and 19 feet bgs to further delineate the vertical extent of petroleum impact to soil. Analytical results revealed DRO and ORO present below the MTCA Method A Cleanup Level in sample MW8-5, and below the laboratory reporting limit for DRO and ORO in sample MW8-19. Detailed soil analytical results are presented in Table 4, Appendix B.

3.4 Groundwater Sampling Activities

Groundwater samples were collected from each of the seven monitoring wells (MW1, and MW4 through MW9) on November 13 and November 14, 2019 in accordance with American Society of Testing and Materials (*ASTM) Guideline* D6771-02 "*Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations*". Monitoring wells MW2 and MW3 had previously been destroyed and decommissioned in 2007.

ECI field staff followed the procedures described below when collecting groundwater samples:

- The cap from each monitoring well at the Site was removed and the groundwater level was allowed to equilibrate to atmospheric pressure for a minimum of 20 minutes.
- The depth to groundwater in each monitoring well at the Site was measured relative to the top of the well casing using an electronic water-level meter.
- Each monitoring well that was sampled was then purged at a low-flow rate (100 to 300 milliliters per minute) using a peristaltic pump and dedicated polyethylene tubing. Temperature, pH, dissolved oxygen (DO), oxygen reduction potential (ORP) and specific conductivity were monitored during purging using a water quality meter and a flow-through cell to determine when these parameters stabilized.

Samples were collected in new laboratory-provided analyte-specific sample containers and assigned a unique sample ID. The samples were placed in a climate-controlled container and maintained at or below 4° Celsius until they were delivered to the laboratory ALS Environmental under industry standard chain of custody protocol.

3.5 Groundwater Monitoring Results

3.5.1 Analytical Results

Seven groundwater samples were submitted to ALS Environmental, of Everett, Washington and analyzed for site-specific COCs. Analytical methods were consistent with those presented in Section 3.2.

The analytical results for groundwater samples collected from MW4 and MW6 were below their respective laboratory reporting limits, which are below their respective MTCA Method A Cleanup Levels for the identified COCs. Analytical results for groundwater samples in MW1, MW7, and MW9 were above their respective laboratory reporting limits for DRO, ORO, and total naphthalene, but below the MTCA Method A Cleanup Level.

Analytical results for groundwater samples collected from MW5 and MW8 indicated that groundwater was impacted above the MTCA Method A Cleanup Level for the cPAH TEQ in each of these areas. Analytical results for DRO and ORO were above the MTCA Method A Cleanup Level in the groundwater sample collected from monitoring well MW8. A summary of the laboratory analytical results is provided in Table 3 below. The laboratory data sheets are presented in Appendix C.

Table 3: Groundwater Sample Analytical Results

Sample Number	Date Sampled	Depth to Water	Total Petroleum Hydrocarbons (NWTPH-Dx) (µg/l)		Polycyclic Aromatic Hydrocarbons (EPA 8270 SIM) (µg/l)	
			Diesel (DRO)	Heavy Oil (ORO)	Total Naphthalene	cPAHs TEQ[1] as Benzo (a) Pyrene
MW1	11/13/19	12.76	**150**	<250	<0.040	<0.040
MW4	11/13/19	4.70	<130	<250	<0.040	<0.040
MW5	11/13/19	13.41	<130	<250	<0.040	**0.2405**
MW6	11/13/19	4.21	<130	<250	<0.040	<0.040
MW7	11/13/19	4.58	**320**	**400**	<0.040	<0.040
MW8	11/14/19	13.39	**16000**	**4000**	**174**	**0.1111**
MW9	11/13/19	11.18	**200**	<250	**0.37**	<0.040
Laboratory Reporting Limit			130	250	0.040	0.04
Ecology MTCA Method A Cleanup Levels			500	500	160	0.1

Notes:
[1]TEQ refers to total toxic equivalent concentration of cPAHs as benzo(a)pyrene. Full individual PAH results for groundwater are displayed in Table 6, Appendix B.
MTCA = Model Toxics Control Act
µg/l = milligram per kilogram
< indicated that the result is below the laboratory PQL
Bold indicates a detected concentration that is below Ecology MTCA Method A Cleanup Levels
Bold and Shaded indicates the detected concentration exceeds Ecology MTCA Method A or B Cleanup Levels

3.5.2 Site Groundwater Characteristics

The groundwater observed within the monitoring wells did not exhibit any strange odors or colors, however the water from monitoring well MW8 did exhibit some sheen on the surface of the purge water and sample. Monitoring wells MW4, MW6, and MW7 each exhibited either high pH values or malfunction of the pH probe (which is assumed to be the result of high pH). Each of these wells are located on the downgradient side of a partially buried concrete retaining wall within the fire lane. This concrete retaining wall may be the source of at least part of the elevated pH levels.

According to previous reports, the groundwater flow direction is to the east-southeast. Groundwater was encountered between 11.18 and 13.41 feet bgs in wells located on the level ground outside of the steel shop, and between 4.21 and 4.7 feet bgs in wells located in the fire lane beyond the retaining wall along the east of the steel shop. The elevation difference between the fire lane and the front of the steel shop is approximately 10 feet.

Groundwater levels for monitoring wells MW1 through MW9 were measured during the sampling of each well. A survey of the recently installed monitoring wells has not been conducted as of the date of this report. However, groundwater flow direction is expected to follow the general topography of the site to the east and southeast toward the Snohomish River as reported in previous groundwater monitoring reports. Detailed groundwater monitoring well results are presented in Table 6, Appendix B.

4.0 CONCLUSION & RECOMMENDATIONS

4.1 Conclusions

On November 12, 2019, ECI oversaw the installation of four additional groundwater monitoring wells on the Subject Property (MW6 through MW9). These wells were installed with the intent of monitoring the groundwater over four consecutive quarters before petitioning the Department of Ecology for a "*No Further Action*" determination with an Environmental Covenant to be prepared for the Subject Property.

Analytical results of soil samples collected during the well installation indicated DRO, ORO, and cPAH concentrations below the MTCA Method A Cleanup Levels in monitoring well MW7 and cPAH concentrations below the MTCA Method A Cleanup Level in monitoring well MW9. Analytical results of the soil sample MW8-15 indicated DRO, ORO, naphthalene, and cPAH concentrations above the MTCA Method A Cleanup Level in monitoring well MW8 at a depth of 15 feet bgs. Additional analysis of samples MW8-5 and MW8-19 indicated that the vertical extent of DRO and ORO contamination above the MTCA Method A Cleanup Level in the vicinity of MW8 is between 5 and 19 feet bgs.

On November 13 and November 14, 2019, groundwater samples were collected from the seven groundwater monitoring wells installed the Site. The samples were collected to evaluate groundwater quality and potential mobility of contaminants in Area 3.

The analytical results revealed concentrations of DRO, ORO, naphthalene, and cPAHs above their respective MTCA Method A Cleanup Levels in the groundwater sample collected from MW8, and cPAHs above the MTCA Method A Cleanup Levels for benzo(a)pyrene and total TEQ for cPAHs in the groundwater sample collected from MW5 (Table 6, Appendix B).

4.2 Recommendations

ECI recommends that the groundwater impact of cPAHs in the vicinity of MW5 be fully delineated. Following delineation, the source of the soil and groundwater contamination in Area 3 will need to be remediated, or show that the contamination is not migrating, and four consecutive quarters of groundwater monitoring completed before Ecology can be petitioned for a "*No Further Action*" determination.

5.0 REPORT LIMITATIONS AND GUIDELINES FOR USE

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology, and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. EcoCon Inc. includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with EcoCon if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or Site.

5.1 Use of this Report by Others

Our report was prepared for the exclusive use of Acrowood Corporation (Client) and / or their designated parties. This report may be provided to regulatory agencies for review if requested or required. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted environmental practices in this area at the time this report was prepared.

This report has been prepared for subsurface investigation activities at the Subject Property. ECI considered a number of unique, project-specific factors when establishing the scope of services for this project and report. No one except our Client should rely on this environmental report without first conferring with ECI. This report should not be applied for any purpose or project except the one originally contemplated.

Unless ECI specifically indicates otherwise, do not rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important site changes were made.

If important changes are made after the date of this report, ECI should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

5.2 Uncertainty May Remain after Completion of Site Investigation and Remedial Activities

The investigation and remediation activities completed in a portion of a site cannot wholly eliminate uncertainty regarding the potential for contamination in connection with the entire property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from the locations sampled. It is always possible that contamination exists in areas that were not explored, sampled, or analyzed.

5.3 Subsurface Conditions Can Change

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the Site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact EcoCon before applying this report to determine if it is still applicable.

5.4 Soil and Groundwater End Use

The cleanup levels referenced in this report are Site- and situation-specific and could change with time due to regulatory or Site changes. The cleanup levels may not be applicable for other sites or for other on-site uses of the affected media (soil and/or groundwater).

Note that hazardous substances may be present in some of the Site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup levels. Because these cleanup levels can change, ECI should be contacted to evaluate the potential for associated environmental liabilities prior to the export of soil or groundwater from the Subject Site or reuse of the affected media on the Site. We cannot be responsible for potential environmental liability arising out of the transfer of soil and/or groundwater from the Subject Site to another location or its reuse on the Site in instances that we were not aware of or could not control.

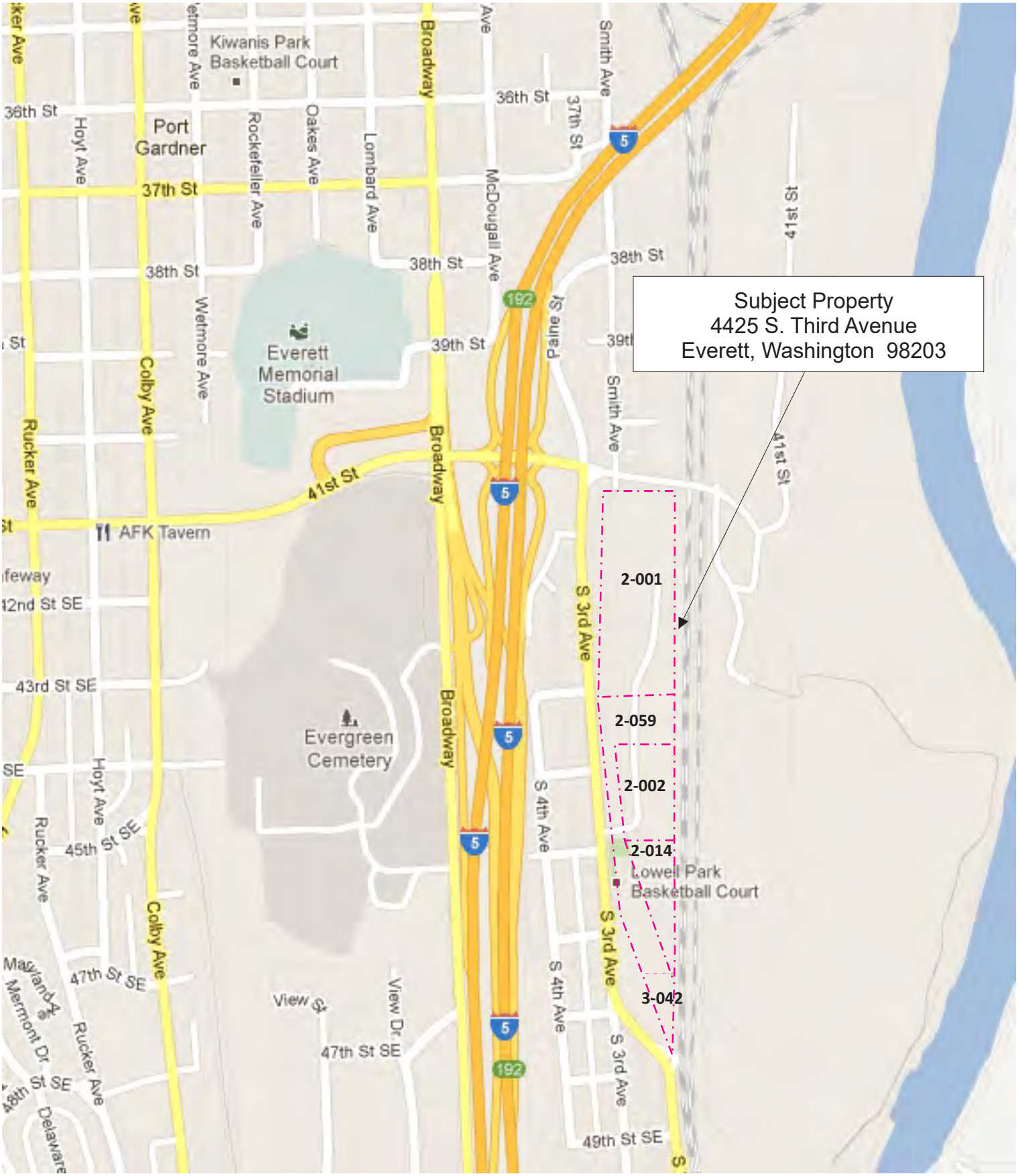
5.5 Most Environmental Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from the locations sampled at the Site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. EcoCon Inc. reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the Site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

List of Appendices

List of Appendices

Appendix A - Project Figures



N
Not To Scale

Site Location Map
Groundwater Monitoring Well Installation & Sampling Report
4425 S 3rd Ave
Everett, Washington 98203

Date:	December 3, 2019
Completed By:	C. Long
Reviewed By.:	S. Spencer
Version:	ECI-001
Project No.:	0377-08

Figure No.: 01
Sheet 01 of 07

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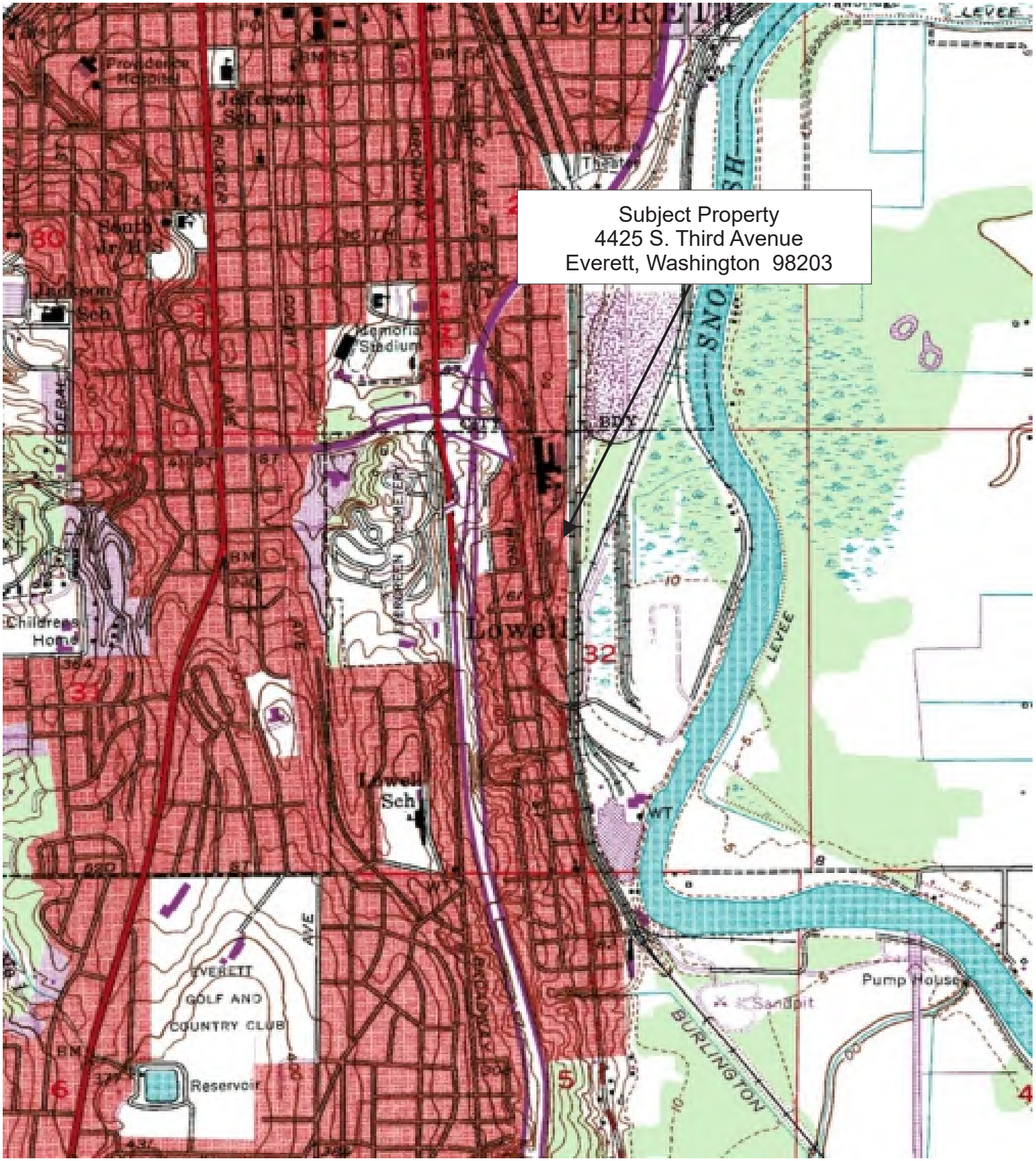

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Site Topographic Map
Groundwater Monitoring Well Installation & Sampling Report
4425 S 3rd Ave
Everett, Washington 98203

Date:	December 3, 2019
Completed By:	C. Long
Reviewed By.:	S. Spencer
Version:	ECI-001
Project No.:	0377-08

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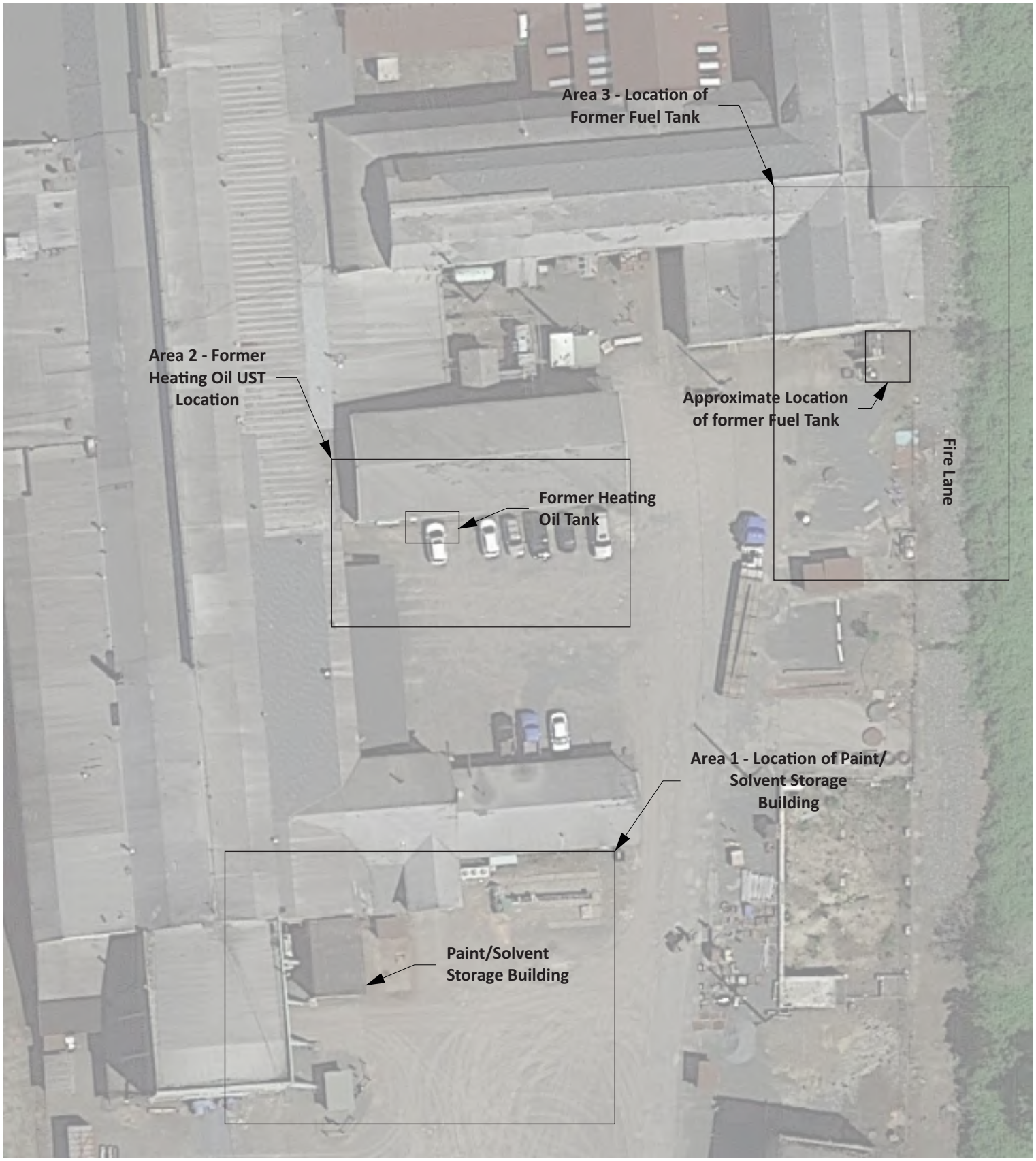

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Not To Scale

Site Overview

Groundwater Monitoring Well Installation & Sampling Report
4425 S 3rd Ave
Everett, Washington 98203

Date:	December 12, 2019
Completed By:	K. Spencer
Reviewed By.:	S. Spencer
Version:	ECI-001
Project No.:	0377-08

Figure No.: 03

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Steel Shop

MW9-W (ug/L)
DRO:200, ORO:<250
Tnap:0.37, cPAHs TEQ:<0.040
MW9-11 (mg/Kg)
DRO:<25, ORO:<50
Tnap:<0.020, **cPAHs TEQ: 0.06463**

MW-9

MW6-W (ug/L)
DRO:<130, ORO:<250,
Tnap:<0.040, cPAHs TEQ:<0.040
MW6-6 (mg/Kg)
DRO:<25, ORO:<50,
Tnap:<0.020, cPAHs TEQ:<0.020

MW-6

MW8-W (ug/L)
DRO:16000, ORO:4000
Tnap:174, cPAHs TEQ: 0.1111
MW8-15(mg/Kg)
DRO:11000, ORO:5700
Tnap:18, cPAHs TEQ: 4.396

MW-8

Approximate Location of Former Fuel Tank

MW1-W (ug/L)
DRO:150, ORO:<250
Tnap:<0.040, cPAHs TEQ: <0.040

MW-1

MW7-W (ug/L)
DRO:320, ORO:400
Tnap:<0.040, cPAHs TEQ:<0.040
MW-5 (mg/Kg)
DRO:80, ORO:210,
Tnap: <0.020, cPAHs TEQ: 0.06149

10' Retaining Wall

Fire Lane

MW4-W (ug/L)
DRO:<130, ORO:<250
Tnap: <0.040, cPAHs TEQ: <0.040

MW5-W (ug/L)
DRO:<130, ORO:<250
Tnap:<0.040, **cPAHs TEQ: 0.2405**

N

0 3.75 7.5 15

Approximate Scale

Legend

Samples < MTCA

Samples >MTCA

DRO: Diesel Range Organics

ORO: Oil Range Organics

Tnap: Total Naphtalene

cPAHs TEQ: Carcinogenic Polycyclic Aromatic Hydrocarbon Toxic Equivalent Quantity

Area 3 Well Location Map
Groundwater Monitoring Well Installation & Sampling Report
4425 S 3rd Ave
Everett, Washington 98203

Date:	December 3, 2019
Completed By:	C. Long
Reviewed By.:	S. Spencer
Version:	ECI-001
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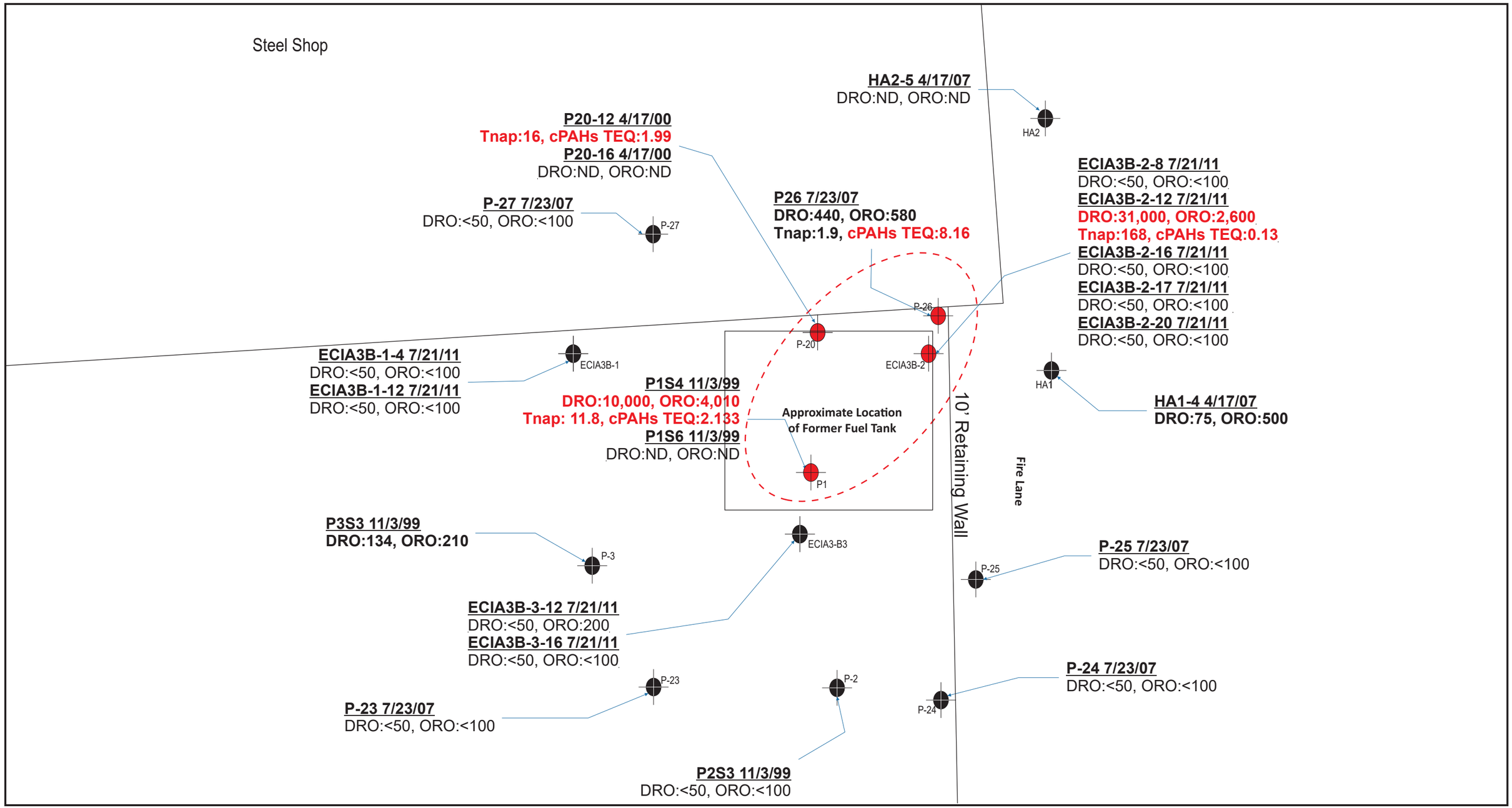

Legend

- Soil Samples < MTCA
- Soil Samples >MTCA
- Estimated Area of Impact

DRO: Diesel Range Organics

ORO: Oil Range Organics

Tnap: Total Naphtalene

cPAHs TEQ: Carcinogenic Polycyclic Aromatic Hydrocarbon Toxic Equivalent Quantity

N

0 7.5 15 30

Approximate Scale

Area 3 Historical Soil Sample Map
Groundwater Monitoring Well Installation & Sampling Report
4425 S 3rd Ave
Everett, Washington 98203

Date:	December 3, 2019
Completed By:	C. Long
Reviewed By.:	S. Spencer
Version:	ECI-001
Project No.:	0377-08

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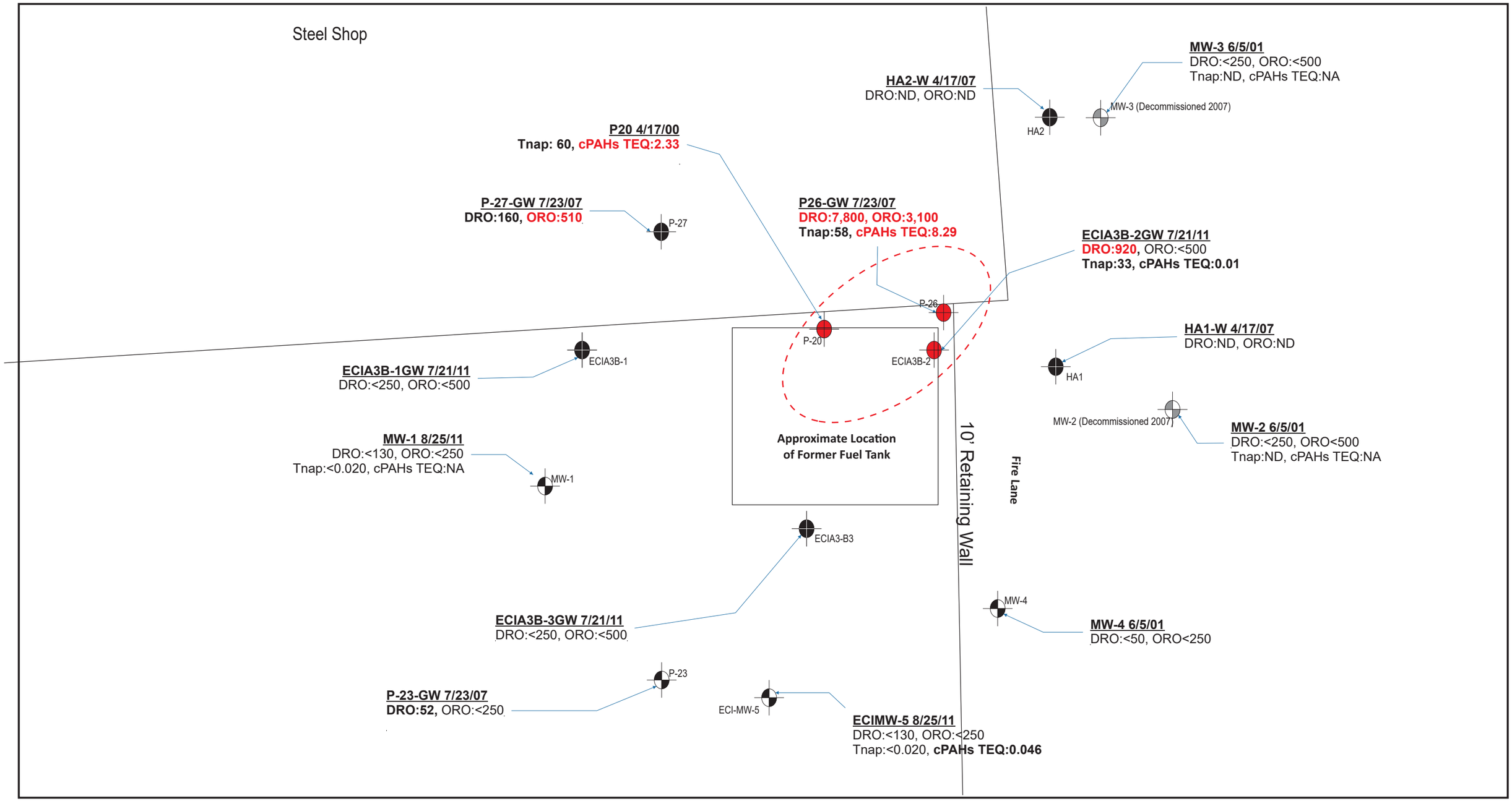

Legend

- Boring Groundwater Samples < MTCA
- Monitoring Well Groundwater Samples < MTCA
- Groundwater Samples > MTCA
- Estimated Area of Impact

DRO: Diesel Range Organics

ORO: Oil Range Organics

Tnap: Total Naphthalenes

cPAHs TEQ: Carcinogenic Polycyclic Aromatic Hydrocarbon Toxic Equivalent Quantity

N

0 7.5 15 30

Approximate Scale

Area 3 Historical Groundwater Sample Map
Groundwater Monitoring Well Installation & Sampling Report
4425 S 3rd Ave
Everett, Washington 98203

Date:	December 3, 2019
Completed By:	C. Long
Reviewed By.:	S. Spencer
Version:	ECI-001
Project No.:	0377-08

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Photograph One: Advancing Boring MW6

Photograph Two: MW7 Soil Core

Photograph Three: Preparing to Develop MW7

Photograph Four: Drilling sample with sheen from MW8

Photograph Five: Finished MW8

Photograph Six: Drilling of MW9

N

Not To Scale

Project Photographs

Groundwater Monitoring Well Installation & Sampling Report

4425 S 3rd Ave

Everett, Washington 98203

Date:	December 3, 2019
Completed By:	C. Long
Reviewed By.:	S.Spencer
Version:	ECI-001
Project No.:	0377-08

Figure No.: 07

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Appendix B – Project Tables

Table 4: Summary of Area 3 Soil Analytical Results

Table 5: Summary of Area 3 Groundwater Analytical Results

Table 6: Summary of Area 3 Monitoring Well Analytical Results

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Table 4: Summary of Area 3 Soil Analytical Results
Acrowood - Groundwater Monitoring Well Installation & Sampling
4425 S 3rd Avenue, Everett, Washington

Sample ID	Sample Depth (ft)	Date Sampled	Total Petroleum Hydrocarbons (NWTPH-DX) (mg/kg)		Semivolatile Organic Compounds (EPA 8270 SIM) (mg/kg)																		
			Diesel (DRO)	Heavy Oil (ORO)	Naphthalene	2-Methyl naphthlene	1-Methyl naphthlene	Total Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h) anthracene	Benzo (g,h,i) perylene	cPAHs TEQ as Benzo (a) Pyrene
Adapt Engineering Historical Soil Results																							
P1S4	16	11/3/1999	**10,000**	**4,010**	-	-	-	**11.8**	**1.21**	**6.27**	**7.86**	**28.2**	**6.94**	**2.86**	**11.3**	**4.62**	**7.01**	**0.705**	<ND	**1.53**	<ND	<ND	**0.745**	**2.133**
P1S6	22	11/3/1999	<ND	<ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
P2S3	12	11/3/1999	<ND	<ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
P3S3	12	11/3/1999	**134**	**210**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
P20-12	9-12	4/17/2000	-	-	-	-	-	**16**	**ND**	**7.9**	**12**	**33**	**7.1**	**2.1**	**11**	**5.1**	**8**	<2	<2	**1.4**	<ND	<ND	<2	**1.99**
P20-16	12-16	4/17/2000	<ND	<ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
HA1-4	3-4	4/17/2000	**75**	**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
HA2-5	4-5	4/17/2000	<ND	<ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
P-23	12-14	7/23/2007	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
P-24	12-14	7/23/2007	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
P-25	4-6	7/24/2007	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
P-26	12-14	7/24/2007	**440**	**580**	-	-	-	**1.9**	<0.5	**1.9**	**2**	**5.8**	**1.6**	**1.7**	**4.3**	**3.1**	**5**	**7**	**2.9**	**6.1**	**5.2**	**1.9**	**6.2**	**8.16**
P-27	12-14	7/24/2007	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECI Historical Soil Results																								
ECIA3B-1:4	4	7/21/2011	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECIA3B-1:12	12	7/21/2011	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECIA3B-2:8	8	7/21/2011	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECIA3B-2:12	12	7/21/2011	**31,000**	**2,600**	**14**	**96**	**58**	**154**	**1.5**	**11**	**2.4**	**29**	**7.3**	**ND**	**ND**	**0.3**	**0.61**	<ND	**0.91**	<ND	<ND	<ND	**0.61**	**0.13**
ECIA3B-2:16	16	7/21/2011	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECIA3B-2:17	17	7/21/2011	**250**	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECIA3B-2:20	20	7/21/2011	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECIA3B-3:12	12	7/21/2011	<50	**200**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECIA3B-3:16	16	7/21/2011	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
ECI 2019 Well Installation Soil Results																								
MW6-6	6	11/12/2019	<25	<50	<0.02	<0.02	<0.02	<0.02	--	--	--	--	--	--	--	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	--	<0.02
MW7-5	5	11/12/2019	**80**	**210**	<0.02	<0.02	<0.02	<0.02	--	--	--	--	--	--	--	**0.036**	**0.059**	**0.064**	<0.02	**0.039**	**0.097**	**0.022**	--	**0.06149**
MW8-5	5	11/12/2019	**27**	**120**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW8-15	15	11/12/2019	**11,000**	**5,700**	**18**	**130**	**90**	**238**	--	--	--	--	--	--	--	**6.4**	**11**	**2.6**	**0.86**	**3.1**	**1.2**	**0.8**	--	**4.396**
MW8-19	19	11/12/2019	<25	<50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9-11	11	11/12/2019	<25	<50	<0.02	<0.02	<0.02	<0.02	--	--	--	--	--	--	--	**0.041**	**0.063**	**0.096**	**0.03**	**0.043**	**0.043**	<0.020	--	**0.06463**
Laboratory Reporting Limit			25	50	0.020	0.020	0.020	--	0.020							0.020	0.020	0.020	0.020	0.020	0.020	0.020		--
Ecology MTCA Method A Cleanup Levels			2,000	2,000	5	5	5	5	NE	NE	NE	NE	NE	NE	NE	1.0	10	1.0	1.0	0.1	1.0	1.0	NE	0.1

Notes:

mg/kg = Milligrams per kilogram

MTCA = Model Toxics Control Act

-- = not analyzed for this constituent

< = not detected above laboratory detection limits

NE = Ecology has not designated a MTCA Method A cleanup level for this constituent

Bold indicates a detected concentration that is below Ecology MTCA Method A Cleanup Levels

Bold and Shaded indicates the detected concentration exceeds Ecology MTCA Method A or B Cleanup Levels

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Table 5: Summary of Area 3 Groundwater Results
Acrowood - Groundwater Monitoring Well Installation & Sampling
4425 S 3rd Avenue, Everett, Washington

Sample Number	Date Sampled	Total Petroleum Hydrocarbons (µg/l)		Polycyclic Aromatic Hydrocarbons (PAHs) (µg/l)																			cPAHs TEQ as Benzo (a) Pyrene
		Diesel (DRO)	Heavy Oil (ORO)	Naphthalene	2-Methyl naphthlene	1-Methyl naphthlene	Total Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h) anthracene	Benzo (g,h,i) perylene	
Adapt Engineering Historical Groundwater Results																							
P-20	4/17/00	--	--	--	--	--	**60**	**2.1**	**16**	**17**	**36**	**8.7**	**2.7**	**12**	**5.6**	**8.8**	**0.77**	<0.5	**1.6**	<0.5	<0.5	**0.94**	**2.33**
HA1-W	4/17/00	<ND	<ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HA2-W	4/17/00	<ND	<ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P23-GW	7/23/07	**52**	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P26-GW	7/24/07	**7,800**	**3,100**	--	--	--	**58**	<1	**17**	**16**	**43**	**11**	**4.9**	**18**	**7.4**	**13**	**5.4**	**2.3**	**6.2**	**3.4**	**1.1**	**4.4**	**8.29**
P27-GW	7/24/07	**160**	**510**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ECI Historical Groundwater Results																							
ECIA3B-1GW	7/21/2011	<250	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ECIA3B-2GW	7/21/2011	**920**	<500	**6**	**15**	**12**	**33**	**0.1**	**0.3**	**0.2**	--	<0.1	<0.1	--	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	**0.01**
ECIA3B-3GW	7/21/2011	<250	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ecology MTCA Method A Cleanup Levels		500	500	160	160	160	160	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.1	NE	NE	NE	NE	NE	0.1

Notes:
(µg/l) = micrograms per liter
-- Not analyzed for constituent
< or ND indicates Not detected above the laboratory reporting limit
Bold indicates the detected concentration is below Ecology MTCA Method A cleanup levels
Red Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level

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Table 6: Summary of Area 3 Monitoring Well Analytical Results
Acrowood - Groundwater Monitoring Well Installation & Sampling
4425 S 3rd Avenue, Everett, WA

Sample Number	Date Sampled	Total Petroleum Hydrocarbons (NWTPH-Dx) (µg/l)		Semivolatile Organic Compounds (EPA 8270 SIM) (µg/l)																		
		Diesel (DRO)	Heavy Oil (ORO)	Naphthalene	2-Methyl Naphthalene	1-Methyl Naphthalene	Total Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h) anthracene	Benzo (g,h,i) perylene	cPAHs TEQ as Benzo (a) Pyrene
MW1	8/10/00	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	11/15/00	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	2/23/01	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	6/5/01	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	6/20/07	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1/17/08	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/21/08	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/7/08	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/25/11	<130	<250	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	11/13/19	**150**	<250	<0.040	<0.040	<0.040	<0.040	--	--	--	--	--	--	--	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	--	<0.040
MW2	8/10/00	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	11/15/00	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	2/23/01	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	6/5/01	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	Well reported to be destroyed - was decomissioned by Adapt Engineering																						
MW3	8/10/00	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	11/15/00	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	2/23/01	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	6/5/01	<250	<500	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND	<ND
	Well reported to be destroyed - was decomissioned by Adapt Engineering																						
MW4	8/10/00	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/15/00	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2/23/01	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/5/01	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/13/19	<130	<250	<0.040	<0.040	<0.040	<0.040	--	--	--	--	--	--	--	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040		<0.040
MW5	8/25/11	<130	<250	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.036**	**0.034**	**0.03**	**0.041**	**0.048**	**0.03**	**0.032**	**0.028**	<0.02	**0.036**	**0.046**
	11/13/19	<130	<250	<0.040	<0.040	<0.040	<0.040	--	--	--	--	--	--	--	**0.16**	**0.21**	**0.31**	**0.13**	**0.16**	**0.13**	**0.054**	--	**0.2405**
MW6	11/13/19	<130	<250	<0.040	<0.040	<0.040	<0.040	--	--	--	--	--	--	--	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	--	<0.040
MW7	11/13/19	**320**	**400**	<0.040	<0.040	<0.040	<0.040	--	--	--	--	--	--	--	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	--	<0.040
MW8	11/14/19	**16,000**	**4,000**	**32**	**71**	**71**	**174**	--	--	--	--	--	--	--	**0.22**	**0.33**	**0.068**	<0.040	**0.079**	<0.040	<0.040	--	**0.1111**
MW9	11/13/19	**200**	<250	<0.040	**0.17**	**0.2**	**0.37**	--	--	--	--	--	--	--	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	--	<0.040
Laboratory Reporting Limit		130	250	0.040	0.040	0.040	0.040	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.02	0.04
Ecology MTCA Method A Cleanup Levels		500	500	160	160	160	160	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.1	NE	NE	NE	0.1

Notes:
(µg/l) = micrograms per liter
-- Not analyzed for constituent
< Not detected above the laboratory reporting limit
Dates in blue indicate current sampling event
Bold indicates the detected concentration is below Ecology MTCA Method A cleanup levels
Red Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level

Appendix C – Project Documentation

Well Installation Logs

Field Sampling Forms

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Offices In: Anchorage | Tacoma | Portland

Project:	Monitoring Well Installation
Location:	4425 S 3rd Avenue Everett, WA
Client:	Acrowood

Boring ID: MW6

Project Number: 0377-08

Date Start/Finish:	11/12/2019	**Drilling Method:**	Direct Push
Logged By:	S. Holt	**Auger ID/OD:**	--
Checked By:	D. Polivka	**Borehole ID/OD:**	2"
Contractor:	Standard Environmental Probe	**Sampler:**	Geoprobe
Operator:	Russell	**Hammer Wt./Fall:**	--
Boring Location:	NW of building corner	**Ground Elevation:**	
Coordinates:		**Water Depth:**	6'
Weather:	Rain	**Boring Depth:**	10'

Unified Soil Classification System

NON-COHESIVE SOILS	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
	GP	POORLY-GRADED GRAVEL
	GM	SILTY GRAVEL
	GC	CLAYEY GRAVEL
	SW	WELL-GRADED SAND, FINE TO COARSE SAND
	SP	POORLY-GRADED SAND
	SM	SILTY SAND
	SC	CLAYEY SAND
COHESIVE SOILS	ML	SILT
	CL	CLAY
	OL	ORGANIC SILT, ORGANIC CLAY
	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
	CH	CLAY OF HIGH PLASTICITY, FAT CLAY
	OH	ORGANIC CLAY, ORGANIC SILT
	PT	PEAT

Depth (ft bgs)	Sample No.	Time	PID Reading	Remarks: Odor, Sheen, Etc	Soil and Rock Description	Unified Classification	Well Construction Detail
0					0' to 2.5' Dark brown to black topsoil		
1							
2					2.5' to 4' Reddish brown SAND	SP	Bentonite
3							Sand
4					4' to 5' Medium brown SAND	SP	
5				ATD	Medium brown silty SAND, moist	SP	
6	MW6-6	8:45			6' to 10' Brown SAND with some gravel, wet	SP	
7							
8							
9							
10							
11							
12							
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Notes: Well Tag ID: BLS 084

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Offices In: Anchorage | Tacoma | Portland

Project:	Monitoring Well Installation
Location:	4425 S 3rd Avenue Everett, WA
Client:	Acrowood

Boring ID: MW7

Project Number: 0377-08

Date Start/Finish:	11/12/2019	**Drilling Method:**	Direct Push
Logged By:	S. Holt	**Auger ID/OD:**	--
Checked By:	D. Polivka	**Borehole ID/OD:**	2"
Contractor:	Standard Environmental Probe	**Sampler:**	Geoprobe
Operator:	Russell	**Hammer Wt./Fall:**	--
Boring Location:		**Ground Elevation:**	
Coordinates:		**Water Depth:**	5'
Weather:	Cloudy	**Boring Depth:**	10'

Unified Soil Classification System

NON-COHESIVE SOILS	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
	GP	POORLY-GRADED GRAVEL
	GM	SILTY GRAVEL
	GC	CLAYEY GRAVEL
	SW	WELL-GRADED SAND, FINE TO COARSE SAND
	SP	POORLY-GRADED SAND
	SM	SILTY SAND
	SC	CLAYEY SAND
COHESIVE SOILS	ML	SILT
	CL	CLAY
	OL	ORGANIC SILT, ORGANIC CLAY
	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
	CH	CLAY OF HIGH PLASTICITY, FAT CLAY
	OH	ORGANIC CLAY, ORGANIC SILT
	PT	PEAT

Depth (ft bgs)	Sample No.	Time	PID Reading	Remarks: Odor, Sheen, Etc	Soil and Rock Description	Unified Classification	Well Construction Detail
0					0' to 4' Dark brown silty SAND with organic matter	SP	
1							
2							Bentonite
3							Sand
4				ATD	4' to 5' Reddish brown silty SAND	SP	
5	MW7-5	9:30			5' to 10' Medium brown silty SAND, grades to sand with some gravel, wet	SP	
6							
7							
8							
9							
10							
11							
12							
13							
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30							

Notes: Well Tag ID: BLS 085

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Offices In: Anchorage | Tacoma | Portland

Project:	Monitoring Well Installation
Location:	4425 S 3rd Avenue Everett, WA
Client:	Acrowood

Boring ID: MW8

Project Number: 0377-08

Date Start/Finish:	11/12/2019	**Drilling Method:**	Direct Push
Logged By:	S. Holt	**Auger ID/OD:**	--
Checked By:	D. Polivka	**Borehole ID/OD:**	2"
Contractor:	Standard Environmental Probe	**Sampler:**	Geoprobe
Operator:	Russell	**Hammer Wt./Fall:**	--
Boring Location:	In former contaminated area	**Ground Elevation:**	
Coordinates:		**Water Depth:**	12'
Weather:	Rain	**Boring Depth:**	20'

Unified Soil Classification System

NON-COHESIVE SOILS	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
	GP	POORLY-GRADED GRAVEL
	GM	SILTY GRAVEL
	GC	CLAYEY GRAVEL
	SW	WELL-GRADED SAND, FINE TO COARSE SAND
	SP	POORLY-GRADED SAND
	SM	SILTY SAND
	SC	CLAYEY SAND
COHESIVE SOILS	ML	SILT
	CL	CLAY
	OL	ORGANIC SILT, ORGANIC CLAY
	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
	CH	CLAY OF HIGH PLASTICITY, FAT CLAY
	OH	ORGANIC CLAY, ORGANIC SILT
	PT	PEAT

Depth (ft bgs)	Sample No.	Time	PID Reading	Remarks: Odor, Sheen, Etc	Soil and Rock Description	Unified Classification	Well Construction Detail
0					0' to 10' Black silty sandy FILL: streaks of orange and blue at 5'	FILL	
1							
2							Bentonite
3							
4							
5	MW8-5	10:45		Odor			
6							
7							
8							Sand
9							
10	MW8-10	10:45		Heavy odor, slight sheen	10' to 15' Black to gray/green silty SAND, with higher silt content, sheen on soil	SP	
11							
12				ATD			
13							
14							
15	MW8-15	10:45		Heavy odor, heavy sheen	15' to 20' sandy SILT: heavy sheen and odor on soil, green color grades to sand at 19'	ML	
16							
17							
18							
19	MW8-19	10:45		Slight odor, no sheen			
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

Notes: Well Tag ID: BLS 086

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Offices In: Anchorage | Tacoma | Portland

Project:	Monitoring Well Installation
Location:	4425 S 3rd Avenue Everett, WA
Client:	Acrowood

Boring ID: MW9

Project Number: 0377-08

Date Start/Finish:	11/12/2019	**Drilling Method:**	Direct Push
Logged By:	S. Holt	**Auger ID/OD:**	--
Checked By:	D. Polivka	**Borehole ID/OD:**	2"
Contractor:	Standard Environmental Probe	**Sampler:**	Geoprobe
Operator:	Russell	**Hammer Wt./Fall:**	--
Boring Location:	Inside building	**Ground Elevation:**	
Coordinates:		**Water Depth:**	12'
Weather:	Cloudy	**Boring Depth:**	20'

Unified Soil Classification System

NON-COHESIVE SOILS	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
	GP	POORLY-GRADED GRAVEL
	GM	SILTY GRAVEL
	GC	CLAYEY GRAVEL
	SW	WELL-GRADED SAND, FINE TO COARSE SAND
	SP	POORLY-GRADED SAND
	SM	SILTY SAND
	SC	CLAYEY SAND
COHESIVE SOILS	ML	SILT
	CL	CLAY
	OL	ORGANIC SILT, ORGANIC CLAY
	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
	CH	CLAY OF HIGH PLASTICITY, FAT CLAY
	OH	ORGANIC CLAY, ORGANIC SILT
	PT	PEAT

Depth (ft bgs)	Sample No.	Time	PID Reading	Remarks: Odor, Sheen, Etc	Soil and Rock Description	Unified Classification	Well Construction Detail
0					Top 3" of concrete		
1					0' to 7.5' Medium brown SAND with mottled organics: layer of anthracite at 2.5' to 3', layer of black organic sand at 7.5' to 8'	SP	
2							Bentonite
3							
4							
5							
6							
7					8' to 20' Medium brown to red SAND: wet at 12'	SP	
8							Sand
9							
10							
11	MW9-11	13:35		ATD			
12							
13							
14							
15							
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Notes: Well Tag ID: BLS 087

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Offices In: Anchorage | Tacoma | Portland

MONITORING WELL SAMPLING LOG

Date:11-13-19

Project Name: Acrowood	Project No.: 0377-08	Well No.: MW1
Field Personnel: CZL	Static Water Level: 12.76	
Water Level Measurement Method: E-Tape		
Time Start Purge: 2:40	Time End Purge: 3:00	Time Sampled: 3:02
Measuring Point Description: TOC		
Purge Method: Low Flow	Purge Depth: 1' from bottom	

Well Volume Calculation **(Fill in before purging)**	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in)			Casing Volume (gal)
	20.07	12.76					
	Notes:						

Time	2:40	2:45	2:50	2:55	3:00	
Depth to Water (ft)						
Volume Purged (mL)	0	500	1000	1500	2000	
pH (0.1)	7.71	6.03	5.89	5.88	5.87	
Temperature C. (3%)	15.8	16.50	16.55	16.50	16.50	
Conductivity uS/cm (3%)	198	174	161	159	170	
Turbidity (10%)	0	0	0	0	0	
Dissolved Oxygen (0.3)	3.01	0	47.22	47.22	0	
ORP	178	199	209	215	219	
Color	Clear	Clear	Clear	Clear	Clear	
Odor/Sheen	None	None	None	None	None	

Comments:

Percent Recovery: Depth to Water at Sampling (ft): Note(s):

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sample No.	Sample Quantity	Container Type 40 mL VOA/500 mL Amber / 1 L Amber / 250 mL Poly	Preservative / Field Filtered (FF)	Analysis Request	Visual Observation (Clear, Cloudy, Silty, Etc.)
MW1	2	500mL Amber	None	DRO/ORO PAH	Clear

Total Discharge (gal): 0.5gal	Disposal Method: Drum	Drum Designation(s)/Volume:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock): YES / NO Well Casing: YES / NO

Inside of Well Head and Outer Casing Dry: YES / NO

Comments:

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Offices In: Anchorage | Tacoma | Portland

MONITORING WELL SAMPLING LOG

Date:11-13-19

Project Name: Acrowood	Project No.:0377-08	Well No.: MW4
Field Personnel: CZL	Static Water Level: 4.70	
Water Level Measurement Method: E-Tape		
Time Start Purge: 11:20	Time End Purge: 11:40	Time Sampled: 11:42
Measuring Point Description: TOC		
Purge Method: Low Flow	Purge Depth: 1' from bottom	

Well Volume Calculation **(Fill in before purging)**	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in)			Casing Volume (gal)
	9.19	4.70					
	Notes:						

Time	11:20	11:25	11:30	11:35	11:40	
Depth to Water (ft)						
Volume Purged (mL)	0	500	1000	1500	2000	
pH (0.1)	6.76	--	--	--	--	
Temperature C. (3%)	14.23	14.10	14.00	14.00	14.00	
Conductivity uS/cm (3%)	177	188	077	194	164	
Turbidity (10%)	0	0	0	0	0	
Dissolved Oxygen (0.3)	14.13	49.59	49.60	49.70	49.70	
ORP	50	-580	-549	-568	-534	
Color	Cloudy	Cloudy	Clear	Clear	Clear	
Odor/Sheen	None	None	None	None	None	

Comments:

Percent Recovery: Depth to Water at Sampling (ft): Note(s):

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sample No.	Sample Quantity	Container Type 40 mL VOA/500 mL Amber / 1 L Amber / 250 mL Poly	Preservative / Field Filtered (FF)	Analysis Request	Visual Observation (Clear, Cloudy, Silty, Etc.)
MW4	2	500 mL Amber	None	DRO/ORO PAH	Clear

Total Discharge (gal):	Disposal Method: Drum	Drum Designation(s)/Volume:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock): YES / NO Well Casing: YES / NO

Inside of Well Head and Outer Casing Dry: YES / NO

Comments:

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Offices In: Anchorage | Tacoma | Portland

MONITORING WELL SAMPLING LOG

Date:11-13-19

Project Name: Acrowood	Project No.: 0377-08	Well No.: MW5
Field Personnel: CZL	Static Water Level: 13.41	
Water Level Measurement Method: E-Tape		
Time Start Purge: 3:45	Time End Purge: 4:05	Time Sampled: 4:07
Measuring Point Description: TOC		
Purge Method: Low Flow	Purge Depth: 1' from bottom	

Well Volume Calculation **(Fill in before purging)**	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in)			Casing Volume (gal)
	19.83	13.41					
	Notes:						

Time	3:45	3:50	3:55	4:00	4:05	
Depth to Water (ft)						
Volume Purged (mL)	0	500	1000	1500	2000	
pH (0.1)	5.96	5.83	5.81	5.91	7..43	
Temperature C. (3%)	15.17	15.80	15.70	15.60	15.50	
Conductivity uS/cm (3%)	185	183	186	186	184	
Turbidity (10%)	0	0	0	0	0	
Dissolved Oxygen (0.3)	48.08	2.29	47.88	48.08	48.18	
ORP	45	90	119	133	62	
Color	Cloudy	Clear	Clear	Clear	Clear	
Odor/Sheen	None	None	None	None	None	

Comments:

Percent Recovery: Depth to Water at Sampling (ft): Note(s):

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sample No.	Sample Quantity	Container Type 40 mL VOA/500 mL Amber / 1 L Amber / 250 mL Poly	Preservative / Field Filtered (FF)	Analysis Request	Visual Observation (Clear, Cloudy, Silty, Etc.)
MW5	2	500 mL Amber	None	DRO/ORO PAH	Clear

Total Discharge (gal): 0.5 gal	Disposal Method:	Drum Designation(s)/Volume:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock): YES / NO Well Casing: YES / NO

Inside of Well Head and Outer Casing Dry: YES / NO

Comments:

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MONITORING WELL SAMPLING LOG

Date:11-13-19

Project Name: Acrowood	Project No.: 0377-08	Well No.: MW6
Field Personnel: CZL	Static Water Level: 4.21	
Water Level Measurement Method: E-Tape		
Time Start Purge: 10:00	Time End Purge: 10:20	Time Sampled: 10:22
Measuring Point Description: TOC		
Purge Method: Low Flow	Purge Depth: 1' from bottom	

Well Volume Calculation **(Fill in before purging)**	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in)			Casing Volume (gal)
	10.41	4.21					
	Notes:						

Time	10:00	10:05	10:10	10:15	10:20	
Depth to Water (ft)						
Volume Purged (mL)	0	500	1000	150	2000	
pH (0.1)	8.16	12	--	--	--	
Temperature C. (3%)	16.38	14.20	14.20	14.20	14.20	
Conductivity uS/cm (3%)	155	141	140	137	138	
Turbidity (10%)	0	0	0	0	0	
Dissolved Oxygen (0.3)	1.60	0	0	0	0	
ORP	74	-239	-502	-694	-797	
Color	Cloudy	Cloudy	Cloudy	Cloudy	Clear	
Odor/Sheen	None	None	None	None	None	

Comments:

Percent Recovery: Depth to Water at Sampling (ft): Note(s):

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sample No.	Sample Quantity	Container Type 40 mL VOA/500 mL Amber / 1 L Amber / 250 mL Poly	Preservative / Field Filtered (FF)	Analysis Request	Visual Observation (Clear, Cloudy, Silty, Etc.)
MW6	2	500 mL Amber	None	DOR/ORO PAH	Clear

Total Discharge (gal): 0.5 gal	Disposal Method: Drum	Drum Designation(s)/Volume:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock): YES / NO Well Casing: YES / NO

Inside of Well Head and Outer Casing Dry: YES / NO

Comments:

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Offices In: Anchorage | Tacoma | Portland

MONITORING WELL SAMPLING LOG

Date:11-13-19

Project Name: Acrowood	Project No.: 0377-08	Well No.: MW7
Field Personnel: CZL	Static Water Level: 4.58	
Water Level Measurement Method: E-Tape		
Time Start Purge: 10:42	Time End Purge: 11:02	Time Sampled: 11:05
Measuring Point Description: TOC		
Purge Method: Low Flow	Purge Depth: 1' from bottom	

Well Volume Calculation **(Fill in before purging)**	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in)			Casing Volume (gal)
	9.46	4.58					
	Notes:						

Time	10:42	10:47	10:52	10:57	11:02	
Depth to Water (ft)						
Volume Purged (mL)	0	500	1000	1500	2000	
pH (0.1)	6.35	11.06	--	--	--	
Temperature C. (3%)	14.60	14.43	14.33	14.30	14.35	
Conductivity uS/cm (3%)	235	219	231	233	231	
Turbidity (10%)	632	589	350	130	0	
Dissolved Oxygen (0.3)	59.17	49.28	49.28	49.38	49.28	
ORP	62.4	-264	-726	-804	-849	
Color	Cloudy	Cloudy	Semi-cloudy	Clear	Clear	
Odor/Sheen	None	None	None	None	None	

Comments:

Percent Recovery: Depth to Water at Sampling (ft): Note(s):

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sample No.	Sample Quantity	Container Type 40 mL VOA/500 mL Amber / 1 L Amber / 250 mL Poly	Preservative / Field Filtered (FF)	Analysis Request	Visual Observation (Clear, Cloudy, Silty, Etc.)
MW7	2	500 mL Amber	None	DRO/ORO PAH	Clear

Total Discharge (gal): 0.5 gal	Disposal Method:	Drum Designation(s)/Volume:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock): YES / NO Well Casing: YES / NO

Inside of Well Head and Outer Casing Dry: YES / NO

Comments:

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MONITORING WELL SAMPLING LOG

Date:11-14-19

Project Name: Acrowood	Project No.: 0377-08	Well No.: MW8
Field Personnel: CZL	Static Water Level: 13.39	
Water Level Measurement Method: TOC		
Time Start Purge: 8:35	Time End Purge: 8:55	Time Sampled: 8:57
Measuring Point Description: TOC		
Purge Method: Low Flow	Purge Depth: 1' from bottom	

Well Volume Calculation **(Fill in before purging)**	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in)			Casing Volume (gal)
	18.74	13.39					
	Notes:						

Time	8:35	8:40	8:45	8:50	8:55	
Depth to Water (ft)						
Volume Purged (mL)	0	5800	1000	1500	2000	
pH (0.1)	6.52	6.56	6.54	6.53	6.52	
Temperature C. (3%)	11.81	14.20	14.00	14.10	14.30	
Conductivity uS/cm (3%)	626	588	579	587	563	
Turbidity (10%)	0	0	0	0	0	
Dissolved Oxygen (0.3)	13.93	49.54	49.76	49.55	49.34	
ORP	-64	-67	-61	-66	-56	
Color	Cloudy	Cloudy	Cloudy	Cloudy	Clear	
Odor/Sheen	None	Some sheen	Some sheen	None	None	

Comments:

Percent Recovery: Depth to Water at Sampling (ft): Note(s):

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sample No.	Sample Quantity	Container Type 40 mL VOA/500 mL Amber / 1 L Amber / 250 mL Poly	Preservative / Field Filtered (FF)	Analysis Request	Visual Observation (Clear, Cloudy, Silty, Etc.)
MW8	2	500 mL	None	DRO/ORO PAH	Clear

Total Discharge (gal): 0.5 gal	Disposal Method: Drum	Drum Designation(s)/Volume:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock): YES / NO Well Casing: YES / NO

Inside of Well Head and Outer Casing Dry: YES / NO

Comments:

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MONITORING WELL SAMPLING LOG

Date:11-13-19

Project Name: Acrowood	Project No.: 0377-08	Well No.: MW9
Field Personnel: CZL	Static Water Level: 11.18	
Water Level Measurement Method: E-Tape		
Time Start Purge: 3:15	Time End Purge: 3:35	Time Sampled: 3:37
Measuring Point Description: TOC		
Purge Method: Low Flow	Purge Depth: 1' from bottom	

Well Volume Calculation **(Fill in before purging)**	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in)			Casing Volume (gal)
	16.59	11.18					
	Notes:						

Time	3:15	3:20	3:25	3:30	3:35	
Depth to Water (ft)						
Volume Purged (mL)	0	500	1000	1500	2000	
pH (0.1)	6.22	6.35	6.47	9.00	9.27	
Temperature C. (3%)	15.60	15.40	15.40	15.40	15.40	
Conductivity uS/cm (3%)	155	177	176	176	176	
Turbidity (10%)	0	0	0	0	0	
Dissolved Oxygen (0.3)	0.24	48.28	48.28	48.28	48.28	
ORP	156	104	39	-152	-187	
Color	Cloudy	Cloudy	Cloudy	Cloudy	Clear	
Odor/Sheen	None	None	None	None	None	

Comments:

Percent Recovery: Depth to Water at Sampling (ft): Note(s):

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sampling / Field Equipment (Manufacture / Model / Last Calibration): _____ / _____ / _____

Sample No.	Sample Quantity	Container Type 40 mL VOA/500 mL Amber / 1 L Amber / 250 mL Poly	Preservative / Field Filtered (FF)	Analysis Request	Visual Observation (Clear, Cloudy, Silty, Etc.)
MW9	2	500 mL Amber	None	DRO/ORO PAH	Clear

Total Discharge (gal): 0.5 Gal	Disposal Method: Drum	Drum Designation(s)/Volume:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock): YES / NO Well Casing: YES / NO

Inside of Well Head and Outer Casing Dry: YES / NO

Comments:

Appendix D – Project Analytical Results

Laboratory Analytical Report

Chain of Custody

December 4, 2019

Ms. Stephanie Holt
EcoCon, Inc.
PO Box 153
Fox Island, WA 98333

Dear Ms. Holt,

On November 14th, 14 samples were received by our laboratory and assigned our laboratory project number EV19110109. The project was identified as your 0377-08. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 9820 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Group USA, Corp dba ALS Environmental

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-01
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/12/2019 8:45:00 AM
CLIENT SAMPLE ID	MW6-6	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	11/19/2019	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	11/19/2019	EBS
Naphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
Chrysene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	UG/KG	11/20/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**103**	11/19/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**129**	11/20/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 9820 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Group USA, Corp dba ALS Environmental

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-02
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/12/2019 9:30:00 AM
CLIENT SAMPLE ID	MW7-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**80**	25	1	MG/KG	11/20/2019	EBS
TPH-Oil Range	NWTPH-DX	**210**	50	1	MG/KG	11/20/2019	EBS
Naphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	**36**	20	1	UG/KG	11/25/2019	JMK
Chrysene	EPA-8270 SIM	**59**	20	1	UG/KG	11/25/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	**64**	20	1	UG/KG	11/25/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	**39**	20	1	UG/KG	11/25/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	**97**	20	1	UG/KG	11/25/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	**22**	20	1	UG/KG	11/25/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**73.1**	11/20/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**101**	11/25/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains light oil/lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-03
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/12/2019 10:45:00 AM
CLIENT SAMPLE ID	MW8-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**27 HT07**	25	1	MG/KG	12/03/2019	EBS
TPH-Oil Range	NWTPH-DX	**120 HT07**	50	1	MG/KG	12/03/2019	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**113**	12/03/2019	EBS

HT07 -Sample holding time expired prior to sample receipt. It was analyzed at the request of the client. Results should be considered estimated. Chromatogram indicates that it is likely that sample contains an unidentified diesel range product and lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-05
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/12/2019 10:45:00 AM
CLIENT SAMPLE ID	MW8-15	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**11000**	120	5	MG/KG	11/20/2019	EBS
TPH-Oil Range	NWTPH-DX	**5700**	250	5	MG/KG	11/20/2019	EBS
Naphthalene	EPA-8270 SIM	**18000**	200	10	UG/KG	11/26/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	**130000**	6000	300	UG/KG	11/20/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	**90000**	6000	300	UG/KG	11/20/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	**6400**	200	10	UG/KG	11/26/2019	JMK
Chrysene	EPA-8270 SIM	**11000**	200	10	UG/KG	11/26/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	**2600**	200	10	UG/KG	11/26/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	**860**	200	10	UG/KG	11/26/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	**3100**	200	10	UG/KG	11/26/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	**1200**	200	10	UG/KG	11/26/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	**800**	200	10	UG/KG	11/26/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25 5X Dilution	NWTPH-DX	**224 SUR12**	11/20/2019	EBS
Terphenyl-d14 300X Dilution	EPA-8270 SIM	**139**	11/20/2019	JMK
Terphenyl-d14 10X Dilution	EPA-8270 SIM	**90.4**	11/26/2019	JMK

SUR12 -Surrogate recoveries were outside of the control limits due to matrix interference.
Chromatogram indicates that it is likely that sample contains bunker C.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 9820 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Group USA, Corp dba ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-06
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/12/2019 10:45:00 AM
CLIENT SAMPLE ID	MW8-19	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U, HT07	25	1	MG/KG	12/03/2019	EBS
TPH-Oil Range	NWTPH-DX	U, HT07	50	1	MG/KG	12/03/2019	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**90.9**	12/03/2019	EBS

HT07 -Sample holding time expired prior to sample receipt. It was analyzed at the request of the client. Results should be considered estimated.

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ALS Group USA, Corp dba ALS Environmental

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-07
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/12/2019 1:35:00 PM
CLIENT SAMPLE ID	MW9-11	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	11/20/2019	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	11/20/2019	EBS
Naphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	**41**	20	1	UG/KG	11/25/2019	JMK
Chrysene	EPA-8270 SIM	**63**	20	1	UG/KG	11/25/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	**96**	20	1	UG/KG	11/25/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	**30**	20	1	UG/KG	11/25/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	**43**	20	1	UG/KG	11/25/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	**43**	20	1	UG/KG	11/25/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	UG/KG	11/25/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**70.1**	11/20/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**113**	11/25/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-08
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/13/2019 10:22:00 AM
CLIENT SAMPLE ID	MW6	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	11/16/2019	EBS
Naphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Chrysene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**120**	11/16/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**123**	11/19/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-09
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/13/2019 11:05:00 AM
CLIENT SAMPLE ID	MW7	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**320**	130	1	UG/L	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	**400**	250	1	UG/L	11/16/2019	EBS
Naphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Chrysene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**123**	11/16/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**118**	11/19/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains light oil/lube oil.

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ALS Group USA, Corp dba ALS Environmental

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-10
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/13/2019 11:42:00 AM
CLIENT SAMPLE ID	MW4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	11/16/2019	EBS
Naphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Chrysene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**111**	11/16/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**126**	11/19/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-11
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/13/2019 3:02:00 PM
CLIENT SAMPLE ID	MW1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**150**	130	1	UG/L	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	11/16/2019	EBS
Naphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Chrysene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**123**	11/16/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**127**	11/19/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains an unidentified diesel range product.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-12
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/13/2019 4:07:00 PM
CLIENT SAMPLE ID	MW5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	11/16/2019	EBS
Naphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	**0.16**	0.040	1	UG/L	11/19/2019	JMK
Chrysene	EPA-8270 SIM	**0.21**	0.040	1	UG/L	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	**0.31**	0.040	1	UG/L	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	**0.13**	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	**0.16**	0.040	1	UG/L	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	**0.13**	0.040	1	UG/L	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	**0.054**	0.040	1	UG/L	11/19/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**112**	11/16/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**126**	11/19/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-13
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/13/2019 3:37:00 PM
CLIENT SAMPLE ID	MW9	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**200**	130	1	UG/L	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	11/16/2019	EBS
Naphthalene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	**0.17**	0.040	1	UG/L	11/19/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	**0.20**	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Chrysene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**121**	11/16/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**124**	11/19/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains an unidentified diesel range product.

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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE: ALS JOB#: ALS SAMPLE#:	12/4/2019 EV19110109 EV19110109-14
CLIENT CONTACT:	Stephanie Holt	DATE RECEIVED:	11/14/2019
CLIENT PROJECT:	0377-08	COLLECTION DATE:	11/14/2019 8:57:00 AM
CLIENT SAMPLE ID	MW8	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**16000**	1300	10	UG/L	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	**4000**	2500	10	UG/L	11/16/2019	EBS
Naphthalene	EPA-8270 SIM	**32**	0.20	10	UG/L	11/20/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	**71**	0.20	10	UG/L	11/20/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	**71**	0.20	10	UG/L	11/20/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	**0.22**	0.040	1	UG/L	11/19/2019	JMK
Chrysene	EPA-8270 SIM	**0.33**	0.040	1	UG/L	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	**0.068**	0.040	1	UG/L	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	**0.079**	0.040	1	UG/L	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.040	1	UG/L	11/19/2019	JMK

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25 10X Dilution	NWTPH-DX	**98.3**	11/16/2019	EBS
Terphenyl-d14	EPA-8270 SIM	**109**	11/19/2019	JMK
Terphenyl-d14 10X Dilution	EPA-8270 SIM	**136**	11/20/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT: EcoCon, Inc.
PO Box 153
Fox Island, WA 98333
CLIENT CONTACT: Stephanie Holt
CLIENT PROJECT: 0377-08

DATE: 12/4/2019
ALS SDG#: EV19110109
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-111919S - Batch 147747 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	MG/KG	25	11/19/2019	EBS
TPH-Oil Range	NWTPH-DX	U	MG/KG	50	11/19/2019	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-120219S - Batch 148243 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	MG/KG	25	12/02/2019	EBS
TPH-Oil Range	NWTPH-DX	U	MG/KG	50	12/02/2019	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-111519W2 - Batch 147697 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	UG/L	130	11/16/2019	EBS
TPH-Oil Range	NWTPH-DX	U	UG/L	250	11/16/2019	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-111819S - Batch 147709 - Soil by EPA-8270 SIM

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Naphthalene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
2-Methylnaphthalene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Chrysene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK
Benzo[G,H,I]Perylene	EPA-8270 SIM	U	UG/KG	20	11/18/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

MB-111919W - Batch 147768 - Water by EPA-8270 SIM

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Naphthalene	EPA-8270 SIM	U	UG/L	0.020	11/19/2019	JMK

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 9820 | PHONE 425-356-2600 | FAX 425-356-2626
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CERTIFICATE OF ANALYSIS

CLIENT:	EcoCon, Inc. PO Box 153 Fox Island, WA 98333	DATE:	12/4/2019
		ALS SDG#:	EV19110109
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Stephanie Holt		
CLIENT PROJECT:	0377-08		

LABORATORY BLANK RESULTS

MB-111919W - Batch 147768 - Water by EPA-8270 SIM

2-Methylnaphthalene	EPA-8270 SIM	U	UG/L	0.020	11/19/2019	JMK
1-Methylnaphthalene	EPA-8270 SIM	U	UG/L	0.020	11/19/2019	JMK
Benzo[A]Anthracene	EPA-8270 SIM	U	UG/L	0.040	11/19/2019	JMK
Chrysene	EPA-8270 SIM	U	UG/L	0.040	11/19/2019	JMK
Benzo[B]Fluoranthene	EPA-8270 SIM	U	UG/L	0.040	11/19/2019	JMK
Benzo[K]Fluoranthene	EPA-8270 SIM	U	UG/L	0.040	11/19/2019	JMK
Benzo[A]Pyrene	EPA-8270 SIM	U	UG/L	0.040	11/19/2019	JMK
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	UG/L	0.040	11/19/2019	JMK
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	UG/L	0.040	11/19/2019	JMK
Benzo[G,H,I]Perylene	EPA-8270 SIM	U	UG/L	0.020	11/19/2019	JMK

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: EcoCon, Inc.
PO Box 153
Fox Island, WA 98333
CLIENT CONTACT: Stephanie Holt
CLIENT PROJECT: 0377-08

DATE: 12/4/2019
ALS SDG#: EV19110109
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 147747 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**91.0**			75.5	122.1	11/19/2019	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**97.5**	**7**		75.5	122.1	11/19/2019	EBS

ALS Test Batch ID: 148243 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**111**			75.5	122.1	12/02/2019	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**102**	**9**		75.5	122.1	12/02/2019	EBS

ALS Test Batch ID: 147697 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**89.5**			67	125.2	11/16/2019	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**89.4**	**0**		67	125.2	11/16/2019	EBS

ALS Test Batch ID: 147709 - Soil by EPA-8270 SIM

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
Naphthalene - BS	EPA-8270 SIM	**90.7**			20	150	11/18/2019	JMK
Naphthalene - BSD	EPA-8270 SIM	**95.6**	**5**		20	150	11/18/2019	JMK
2-Methylnaphthalene - BS	EPA-8270 SIM	**86.6**			20	150	11/18/2019	JMK
2-Methylnaphthalene - BSD	EPA-8270 SIM	**92.0**	**6**		20	150	11/18/2019	JMK
1-Methylnaphthalene - BS	EPA-8270 SIM	**86.9**			20	150	11/18/2019	JMK
1-Methylnaphthalene - BSD	EPA-8270 SIM	**92.0**	**6**		20	150	11/18/2019	JMK
Benzo[A]Anthracene - BS	EPA-8270 SIM	**95.4**			20	150	11/18/2019	JMK
Benzo[A]Anthracene - BSD	EPA-8270 SIM	**105**	**10**		20	150	11/18/2019	JMK
Chrysene - BS	EPA-8270 SIM	**117**			20	150	11/18/2019	JMK
Chrysene - BSD	EPA-8270 SIM	**123**	**5**		20	150	11/18/2019	JMK
Benzo[B]Fluoranthene - BS	EPA-8270 SIM	**90.2**			20	150	11/18/2019	JMK
Benzo[B]Fluoranthene - BSD	EPA-8270 SIM	**97.2**	**7**		20	150	11/18/2019	JMK
Benzo[K]Fluoranthene - BS	EPA-8270 SIM	**101**			20	150	11/18/2019	JMK
Benzo[K]Fluoranthene - BSD	EPA-8270 SIM	**106**	**5**		20	150	11/18/2019	JMK
Benzo[A]Pyrene - BS	EPA-8270 SIM	**85.3**			20	150	11/18/2019	JMK
Benzo[A]Pyrene - BSD	EPA-8270 SIM	**92.0**	**8**		20	150	11/18/2019	JMK
Indeno[1,2,3-Cd]Pyrene - BS	EPA-8270 SIM	**86.3**			20	150	11/18/2019	JMK
Indeno[1,2,3-Cd]Pyrene - BSD	EPA-8270 SIM	**92.4**	**7**		20	150	11/18/2019	JMK
Dibenz[A,H]Anthracene - BS	EPA-8270 SIM	**85.1**			20	150	11/18/2019	JMK
Dibenz[A,H]Anthracene - BSD	EPA-8270 SIM	**91.0**	**7**		20	150	11/18/2019	JMK
Benzo[G,H,I]Perylene - BS	EPA-8270 SIM	**85.4**			20	150	11/18/2019	JMK

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CERTIFICATE OF ANALYSIS

CLIENT: EcoCon, Inc.
PO Box 153
Fox Island, WA 98333
CLIENT CONTACT: Stephanie Holt
CLIENT PROJECT: 0377-08

DATE: 12/4/2019
ALS SDG#: EV19110109
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
Benzo[G,H,I]Perylene - BSD	EPA-8270 SIM	**90.4**	**6**		20	150	11/18/2019	JMK

ALS Test Batch ID: 147768 - Water by EPA-8270 SIM

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
Naphthalene - BS	EPA-8270 SIM	**65.1**			36	118	11/20/2019	JMK
Naphthalene - BSD	EPA-8270 SIM	**68.4**	**5**		36	118	11/20/2019	JMK
2-Methylnaphthalene - BS	EPA-8270 SIM	**66.4**			20	150	11/20/2019	JMK
2-Methylnaphthalene - BSD	EPA-8270 SIM	**68.4**	**3**		20	150	11/20/2019	JMK
1-Methylnaphthalene - BS	EPA-8270 SIM	**67.8**			20	150	11/20/2019	JMK
Benzo[A]Anthracene - BS	EPA-8270 SIM	**110**			20	150	11/20/2019	JMK
Benzo[A]Anthracene - BSD	EPA-8270 SIM	**116**	**5**		20	150	11/20/2019	JMK
Chrysene - BS	EPA-8270 SIM	**116**			20	150	11/20/2019	JMK
Chrysene - BSD	EPA-8270 SIM	**123**	**5**		20	150	11/20/2019	JMK
Benzo[B]Fluoranthene - BS	EPA-8270 SIM	**97.3**			20	150	11/20/2019	JMK
Benzo[B]Fluoranthene - BSD	EPA-8270 SIM	**104**	**7**		20	150	11/20/2019	JMK
Benzo[K]Fluoranthene - BS	EPA-8270 SIM	**96.1**			20	150	11/20/2019	JMK
Benzo[K]Fluoranthene - BSD	EPA-8270 SIM	**105**	**9**		20	150	11/20/2019	JMK
Benzo[A]Pyrene - BS	EPA-8270 SIM	**86.4**			20	150	11/20/2019	JMK
Benzo[A]Pyrene - BSD	EPA-8270 SIM	**91.9**	**6**		20	150	11/20/2019	JMK
Indeno[1,2,3-Cd]Pyrene - BS	EPA-8270 SIM	**74.7**			20	150	11/20/2019	JMK
Indeno[1,2,3-Cd]Pyrene - BSD	EPA-8270 SIM	**78.0**	**4**		20	150	11/20/2019	JMK
Dibenz[A,H]Anthracene - BS	EPA-8270 SIM	**75.2**			20	150	11/20/2019	JMK
Dibenz[A,H]Anthracene - BSD	EPA-8270 SIM	**78.3**	**4**		20	150	11/20/2019	JMK
Benzo[G,H,I]Perylene - BS	EPA-8270 SIM	**72.8**			43	140	11/20/2019	JMK
Benzo[G,H,I]Perylene - BSD	EPA-8270 SIM	**76.1**	**4**		43	140	11/20/2019	JMK

APPROVED BY

Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 9820 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Group USA, Corp dba ALS Environmental

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1911O109

Date 11·14·19 Page 1 Of 2

PROJECT ID:	0377-08
REPORT TO COMPANY:	ECI
PROJECT MANAGER:	Stephanie Holt
ADDRESS:	P.O. Box 153
	Fox Island, WA
PHONE:	479-426-1489 P.O. #: 0377-08
E-MAIL:	Stephanie@alleci.com
INVOICE TO COMPANY:	ECI
ATTENTION:	Kelly Melland
ADDRESS:	

ANALYSIS REQUESTED — OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA 8021 ☐ BTEX by EPA 8260 ☐	MTBE by EPA 8021 ☐ MTBE by EPA 8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA 8270 SIM (PAH & Naph)	PCB by EPA 8082 ☐ Pesticides by EPA 8081 ☐	Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. MW6-6	11·12·19	8:45	Soil	1		X									X						
2. MW7-5		9:30	Soil	2		X									X						
3. MW8-5		10:45	Soil	3		(X)															
4. MW8-10		10:45	Soil	4																	
5. MW8-15		10:45	Soil	5		X									X						
6. MW8-19		10:45	Soil	6		(X)															
7. MW9-11	V	13:35	Soil	7		X									X						
8. MW6	11·13·19	10:22	H_2O	8		X									X						
9. MW7	11·13·19	11:05	H_2O	9		X									X						
10. MW4	11·13·19	11:42	H_2O	10		X									X						

SPECIAL INSTRUCTIONS: (X) Added 11/27/19 per Stephanie Stadard TAT out of hold time.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [signature] 11-14-19 13:56
   Received By: [signature] ALS 11/14/19 13:56
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: ☒ 10 Standard ☐ 5 ☐ 3 ☐ 2 ☐ 1 ☐ SAME DAY

Fuels & Hydrocarbon Analysis: ☒ 5* Standard ☐ 3 ☐ 1 ☐ SAME DAY

OTHER: Specify:

*Turnaround request less than standard may incur Rush Charges

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1910109

Date 11-14-19 Page 2 Of 2

PROJECT ID:	0377-08
REPORT TO COMPANY:	ECI
PROJECT MANAGER:	Stephanie Hall
ADDRESS:	
PHONE:	P.O. #:
E-MAIL:	
INVOICE TO COMPANY:	
ATTENTION:	
ADDRESS:	

ANALYSIS REQUESTED

OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA 8021 ☐ BTEX by EPA 8260 ☐	MTBE by EPA 8021 ☐ MTBE by EPA 8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA 8270 SIM	PCB by EPA 8082 ☐ Pesticides by EPA 8081 ☐	Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. MW1	11-13-19	15:02	H_2O	11		X									X						
2. MW5	11-13-19	16:07	↓	12		X									X						
3. MW9	11-13-19	15:37	↓	13		X									X						
4. MW8	11-14-19	8:57	↓	14		X									X						
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					

cPAH & Naph

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Stephanie Hall / 11-14-19 / 13:56
   Received By: Jack Byrd ALS 11/14/19 13:56
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: ~~10~~ Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: ~~5~~ Standard | 3 | 1 | SAME DAY

OTHER: Specify:

*Turnaround request less than standard may incur Rush Charges

MONITORING WELL EXHIBIT

PROPERTY INFORMATION

OWNER: ACROWOOD CORPORATION
ADDRESS: 4425 S 3RD ST
EVERETT, WA 98203
PARCEL: 29053200200100

LEGEND

SITE BENCHMARK
MONITORING WELL

BASIS OF BEARING

WASHINGTON COORDINATE SYSTEM, NAD83(2011)(EPOCH:2010), NORTH ZONE, DERIVED FROM GPS OBSERVATIONS UTILIZING THE WASHINGTON STATE REFERENCE NETWORK (WSRN).

VERTICAL DATUM

NAVD 88

PROJECT BENCHMARK

DERIVED FROM GPS OBSERVATIONS UTILIZING THE WASHINGTON STATE REFERENCE NETWORK (WSRN).

SITE BENCHMARK

TBM: TOP OF RAILROAD SPIKE WITH FILED "X" ±11.5' NORTH AND ±17.5 WEST OF FIRE HYDRANT IN SHED.
EL=59.14'

N
0 10 20
SCALE: 1" = 20'

MONITORING WELLS

MW1-W:
N:354097.90 E:1306718.03
TOP OF MONUMENT=58.68' (N RIM)
TOP OF PVC CASING=58.25' (N RIM)

MW4-W:
N:354078.64 E:1306768.15
TOP OF MONUMENT=48.41' (N RIM)
TOP OF PVC CASING=48.12' (N RIM)

MW5-W:
N:354071.33 E:1306739.15
TOP OF MONUMENT=58.61' (N RIM)
TOP OF PVC CASING=57.86' (N RIM)

MW6-W:
N:354127.20 E:1306768.73
TOP OF MONUMENT=49.03' (N RIM)
TOP OF PVC CASING=48.82' (N RIM)

MW6A-W:
N:354128.70 E:1306767.25
TOP OF MONUMENT=49.11' (N RIM)
TOP OF PVC CASING=48.72' (N RIM)

MW7-W:
N:354102.461 E:1306771.11
TOP OF MONUMENT=48.67' (N RIM)
TOP OF PVC CASING=48.50' (N RIM)

MW8-W:
N:354109.39 E:1306749.34
TOP OF MONUMENT=58.46' (N RIM)
TOP OF PVC CASING=58.07' (N RIM)

MW9-W:
N:354132.49 E:1306715.66
TOP OF MONUMENT=58.83' (N RIM)
TOP OF PVC CASING=58.60' (N RIM)

DAVID MICHAEL LEMKE
STATE OF WASHINGTON
46317
REGISTERED
PROFESSIONAL LAND SURVEYOR
12/01/23

SURVEY NOTES

(1) AN "X" WAS STAMPED ON THE MONUMENT RIM FROM WHICH THE REPORTED ELEVATIONS WERE MEASURED.
(2) PROVIDED MONITORING WELL COORDINATES ARE TO THE MARKED "X" POSITION OF MONUMENT RIM.
(3) THERE WERE 2 MONITORING WELLS LOCATED IN CLOSE VICINITY TO ONE ANOTHER NEAR EXPECTED MW6-W POSITION. THEY WERE BOTH LOCATED AND ARE LABELED AS MW6-W AND MW6A-W. MW6-W WAS NOTED AS APPEARING NEWER OF THE 2.

HARMSEN
LAND SURVEYING • CIVIL ENGINEERING • LAND USE PLANNING
sUAS AERIAL MAPPING • WETLAND SERVICES
2822 COLBY AVE, SUITE 300
EVERETT, WA 98201
(425) 252-1884
(360) 794-7811

DATE: 12/01/23
JOB: 23-368
SHEET: 1 OF 1
PREP: DML

APPENDIX III

Laboratory Results with Chain-of-Custody

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

November 8, 2023

Ben Carlson, Project Manager
Stratum Group
2102 Young St
Bellingham, WA 98225

Dear Mr Carlson:

Included are the results from the testing of material submitted on October 26, 2023 from the Acrowood, F&BI 310489 project. There are 11 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
STG1108R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 26, 2023 by Friedman & Bruya, Inc. from the Stratum Group Acrowood, F&BI 310489 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stratum Group
310489 -01	MW1
310489 -02	MW5
310489 -03	MW8
310489 -04	MW9
310489 -05	MW4
310489 -06	MW7
310489 -07	MW6

Both containers for sample MW7 and one container for sample MW8 were received broken. Also, the PAH analysis of sample MW4 needed to be reextracted due to insufficient volume. The results for those samples will be issued under sample delivery group number 311066.

All quality control requirements were acceptable.

Date of Report: 11/08/23
Date Received: 10/26/23
Project: Acrowood, F&BI 310489
Date Extracted: 10/27/23
Date Analyzed: 10/27/23

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
MW1 310489-01	<50	<250	108
MW5 310489-02	<50	<250	107
MW9 310489-04	<50	<250	114
MW4 310489-05	<50	<250	110
MW6 310489-07	<50	<250	111
Method Blank 03-2580 MB2	<50	<250	114

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW1	Client:	Stratum Group
Date Received:	10/26/23	Project:	Acrowood, F&BI 310489
Date Extracted:	10/27/23	Lab ID:	310489-01
Date Analyzed:	10/30/23	Data File:	103016.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	70	15	144
Terphenyl-d14	113	41	138

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW5	Client:	Stratum Group
Date Received:	10/26/23	Project:	Acrowood, F&BI 310489
Date Extracted:	10/27/23	Lab ID:	310489-02 1/2
Date Analyzed:	10/30/23	Data File:	103017.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	79	15	144
Terphenyl-d14	115	41	138

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
Benz(a)anthracene	0.048
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	0.054
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

Total 0.0102 mg/kg

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW8	Client:	Stratum Group
Date Received:	10/26/23	Project:	Acrowood, F&BI 310489
Date Extracted:	10/27/23	Lab ID:	310489-03
Date Analyzed:	10/30/23	Data File:	103018.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	73	15	144
Terphenyl-d14	109	41	138

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.41
Benz(a)anthracene	0.14
Chrysene	0.17
Benzo(a)pyrene	0.088
Benzo(b)fluoranthene	0.063
Benzo(k)fluoranthene	<0.02
Indeno(1,2,3-cd)pyrene	0.028
Dibenz(a,h)anthracene	<0.02

Total 0.1128 mg/kg

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW9	Client:	Stratum Group
Date Received:	10/26/23	Project:	Acrowood, F&BI 310489
Date Extracted:	10/27/23	Lab ID:	310489-04 1/2
Date Analyzed:	10/30/23	Data File:	103019.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	82	15	144
Terphenyl-d14	111	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW6	Client:	Stratum Group
Date Received:	10/26/23	Project:	Acrowood, F&BI 310489
Date Extracted:	10/27/23	Lab ID:	310489-07 1/2
Date Analyzed:	10/30/23	Data File:	103021.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	82	15	144
Terphenyl-d14	112	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Stratum Group
Date Received:	Not Applicable	Project:	Acrowood, F&BI 310489
Date Extracted:	10/27/23	Lab ID:	03-2582 mb2
Date Analyzed:	10/30/23	Data File:	103006.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	80	15	144
Terphenyl-d14	112	41	138

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

Date of Report: 11/08/23
Date Received: 10/26/23
Project: Acrowood, F&BI 310489

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

Laboratory Code: 310462-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	<50	124	112	50-150	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	96	65-151	0

Date of Report: 11/08/23
Date Received: 10/26/23
Project: Acrowood, F&BI 310489

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	77	82	50-104	6
Benz(a)anthracene	ug/L (ppb)	5	87	94	66-131	8
Chrysene	ug/L (ppb)	5	90	96	66-129	6
Benzo(a)pyrene	ug/L (ppb)	5	96	99	66-129	3
Benzo(b)fluoranthene	ug/L (ppb)	5	93	92	55-144	1
Benzo(k)fluoranthene	ug/L (ppb)	5	98	95	58-139	3
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	95	116	62-136	20
Dibenz(a,h)anthracene	ug/L (ppb)	5	95	115	55-146	19

Data Qualifiers & Definitions

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

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

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

310489

SAMPLE CHAIN OF CUSTODY

10/26/23 C3

Page # 1 of 1

Report To Bev Carlson
Company Stratum Group
Address 2102 Yang St.
City, State, ZIP Bellingham, WA 98225
Phone 360-714-9409 Email bev@stratumgroup.net

SAMPLERS (*signature*)

PROJECT NAME: Acrowood — PO #: Acrowood

REMARKS: Project specific RLs? - Yes / No

INVOICE TO: Stratum Group

TURNAROUND TIME
☑ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Naphthalene	cPAHs			Notes
						ANALYSES REQUESTED											
MW1	01 A-B	10/25/23	1103	Water	2	X							X	X			
MW5	02		1131		2	X							X	X			
MW8	03 A-B		1215		2	X							X	X			
MW9	04		1235		2	X							X	X			
MW4	05 A-B		1330		2	X							X	X			
MW7	06		1405		2	X							X	X			
MW6	07 A-B		1435		2	X							X	X			
							Samples received at 4 °C										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Bev Carlson	Stratum Group	10/26/23	1640
Received by:		Fedex		
Relinquished by:				
Received by:	ANH PHAN	F & B	10/26/23	13:53

Friedman & Bruya, Inc.
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

November 9, 2023

Ben Carlson, Project Manager
Stratum Group
2102 Young St
Bellingham, WA 98225

Dear Mr Carlson:

Included are the results from the testing of material submitted on November 3, 2023 from the Acrowood, F&BI 311066 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
STG1109R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 3, 2023 by Friedman & Bruya, Inc. from the Stratum Group Acrowood, F&BI 311066 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stratum Group
311066 -01	MW4
311066 -02	MW7
311066 -03	MW8

All quality control requirements were acceptable.

Date of Report: 11/09/23
Date Received: 11/03/23
Project: Acrowood, F&BI 311066
Date Extracted: 11/06/23
Date Analyzed: 11/06/23

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
MW7 311066-02	180 x	420 x	95
MW8 311066-03	1,500 x	610 x	105
Method Blank 03-2680 MB	<50	<250	102

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW4	Client:	Stratum Group
Date Received:	11/03/23	Project:	Acrowood, F&BI 311066
Date Extracted:	11/07/23	Lab ID:	311066-01
Date Analyzed:	11/07/23	Data File:	110713.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	64	11	173
Terphenyl-d14	94	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW7	Client:	Stratum Group
Date Received:	11/03/23	Project:	Acrowood, F&BI 311066
Date Extracted:	11/07/23	Lab ID:	311066-02
Date Analyzed:	11/07/23	Data File:	110714.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	71	11	173
Terphenyl-d14	97	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Stratum Group
Date Received:	Not Applicable	Project:	Acrowood, F&BI 311066
Date Extracted:	11/07/23	Lab ID:	03-2681 mb
Date Analyzed:	11/07/23	Data File:	110708.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	77	11	173
Terphenyl-d14	96	50	150

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

Date of Report: 11/09/23
Date Received: 11/03/23
Project: Acrowood, F&BI 311066

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	100	112	72-139	11

Date of Report: 11/09/23
Date Received: 11/03/23
Project: Acrowood, F&BI 311066

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	68	78	62-97	14
2-Methylnaphthalene	ug/L (ppb)	5	74	86	64-101	15
1-Methylnaphthalene	ug/L (ppb)	5	74	85	64-103	14
Benz(a)anthracene	ug/L (ppb)	5	93	94	70-130	1
Chrysene	ug/L (ppb)	5	93	95	70-130	2
Benzo(a)pyrene	ug/L (ppb)	5	91	94	70-130	3
Benzo(b)fluoranthene	ug/L (ppb)	5	86	92	70-130	7
Benzo(k)fluoranthene	ug/L (ppb)	5	88	94	70-130	7
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	104	99	70-130	5
Dibenz(a,h)anthracene	ug/L (ppb)	5	106	100	70-130	6

Data Qualifiers & Definitions

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

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

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

SAMPLE CHAIN OF CUSTODY

311066 11/03/23 F2

Page # 1 of 1

Report To Ben Carlson
Company Stratum Group
Address 2102 Yang St.
City, State, ZIP Bellingham, WA 98225
Phone 360-714-9409 Email bencstratumgroup.net

SAMPLERS (*signature*)

PROJECT NAME: Acrowood (addl volume)
PO #: Acrowood

REMARKS
Project specific RLs? - Yes / No

INVOICE TO: Stratum

TURNAROUND TIME
☑ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Naphthalene	cPAHs	NWTPH-D		Notes
MW4	01	11/2/23	1025	Water	1								X	X			
MW7	02 A-B	↓	940	↓	2	X							X	X	X		
MW8	03	↓	1135	↓	1	X									X		
								Samples received at 3 °C									

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Ben Carlson	Stratum Group	11/3/23	
Received by:	ERIC Yoder	F&B	11/3/23	1100
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

March 4, 2024

Ben Carlson, Project Manager
Stratum Group
2102 Young St
Bellingham, WA 98225

Dear Mr Carlson:

Included are the results from the testing of material submitted on February 27, 2024 from the Acrowood, F&BI 402382 project. There are 16 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
STG0304R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 27, 2024 by Friedman & Bruya, Inc. from the Stratum Group Acrowood, F&BI 402382 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stratum Group
402382 -01	MW1
402382 -02	MW4
402382 -03	ECIMW5
402382 -04	ECIMW6
402382 -05	ECIMW7
402382 -06	ECIMW8
402382 -07	ECIMW9
402382 -08	ECIMW8-DUP

An 8270E internal standard failed the acceptance criteria for samples ECIMW8 and ECIMW8-DUP. The samples were diluted and reanalyzed with acceptable results. Both data sets were reported.

All other quality control requirements were acceptable.

Date of Report: 03/04/24
Date Received: 02/27/24
Project: Acrowood, F&BI 402382
Date Extracted: 02/28/24
Date Analyzed: 02/29/24

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
MW1 402382-01	<50	<250	110
MW4 402382-02	<50	<250	116
ECIMW5 402382-03	<50	<250	116
ECIMW6 402382-04	<50	<250	117
ECIMW7 402382-05	470 x	<250	112
ECIMW8 402382-06	1,400 x	<250	ip
ECIMW9 402382-07	<50	<250	113
ECIMW8-DUP 402382-08	1,200 x	<250	ip
Method Blank 04-475 MB	<50	<250	94

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW1	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-01
Date Analyzed:	02/28/24	Data File:	022806.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	77	11	173
Terphenyl-d14	78	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.2
Benz(a)anthracene	<0.02
Chrysene	<0.02
Benzo(a)pyrene	<0.02
Benzo(b)fluoranthene	0.025
Benzo(k)fluoranthene	<0.02
Indeno(1,2,3-cd)pyrene	<0.02
Dibenz(a,h)anthracene	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW4	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-02
Date Analyzed:	02/28/24	Data File:	022807.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	79	11	173
Terphenyl-d14	79	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW5	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-03
Date Analyzed:	02/28/24	Data File:	022808.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	81	11	173
Terphenyl-d14	79	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW6	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-04
Date Analyzed:	02/28/24	Data File:	022809.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	79	11	173
Terphenyl-d14	77	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW7	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-05
Date Analyzed:	02/28/24	Data File:	022810.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	75	11	173
Terphenyl-d14	67	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW8	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-06
Date Analyzed:	02/28/24	Data File:	022811.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	78	11	173
Terphenyl-d14	76	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	2.7
Benz(a)anthracene	0.021
Chrysene	0.024
Benzo(a)pyrene	<0.02 J
Benzo(b)fluoranthene	<0.02 J
Benzo(k)fluoranthene	<0.02 J
Indeno(1,2,3-cd)pyrene	<0.02 J
Dibenz(a,h)anthracene	<0.02 J

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW8	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24 14:20	Lab ID:	402382-06 1/10
Date Analyzed:	02/29/24	Data File:	022915.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	76 d	11	173
Terphenyl-d14	66 d	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW9	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-07
Date Analyzed:	02/28/24	Data File:	022812.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	81	11	173
Terphenyl-d14	81	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW8-DUP	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-08
Date Analyzed:	02/28/24	Data File:	022813.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	70	11	173
Terphenyl-d14	73	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	2.3
Benz(a)anthracene	0.027
Chrysene	0.035
Benzo(a)pyrene	<0.02 J
Benzo(b)fluoranthene	<0.02 J
Benzo(k)fluoranthene	<0.02 J
Indeno(1,2,3-cd)pyrene	<0.02 J
Dibenz(a,h)anthracene	<0.02 J

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW8-DUP	Client:	Stratum Group
Date Received:	02/27/24	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	402382-08 1/10
Date Analyzed:	02/29/24	Data File:	022914.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	64 d	11	173
Terphenyl-d14	62 d	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Stratum Group
Date Received:	Not Applicable	Project:	Acrowood, F&BI 402382
Date Extracted:	02/28/24	Lab ID:	04-476 mb
Date Analyzed:	02/28/24	Data File:	022807.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	77	15	144
Terphenyl-d14	85	41	138

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

Date of Report: 03/04/24
Date Received: 02/27/24
Project: Acrowood, F&BI 402382

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	80	72-139	18

Date of Report: 03/04/24
Date Received: 02/27/24
Project: Acrowood, F&BI 402382

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	73	67	50-104	9
Benz(a)anthracene	ug/L (ppb)	5	82	84	66-131	2
Chrysene	ug/L (ppb)	5	85	88	66-129	3
Benzo(a)pyrene	ug/L (ppb)	5	98	101	66-129	3
Benzo(b)fluoranthene	ug/L (ppb)	5	89	94	55-144	5
Benzo(k)fluoranthene	ug/L (ppb)	5	97	100	58-139	3
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	102	92	62-136	10
Dibenz(a,h)anthracene	ug/L (ppb)	5	100	91	55-146	9

Data Qualifiers & Definitions

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

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

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

402382

SAMPLE CHAIN OF CUSTODY

02/27/24

Report To Ben Carlson
Company Stratum Group
Address 2102 Yang St.
City, State, ZIP Bellingham, WA 98225
Phone 360-714-9409 Email ben@stratumgroup.net

SAMPLERS (signature)

PROJECT NAME: Arrowood
PO #: Arrowood

REMARKS
Project specific RLs? - Yes / No

INVOICE TO: Stratum

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Naph. Kislee	cPAHs			Notes
						ANALYSES REQUESTED											
MW1	01 AB	2/22/24	1330	Wtr	2	X							X	X			
MW4	02		1116		2	X							X	X			
ECI MW5	03		1205		2	X							X	X			
ECI MW6	04		955		2	X							X	X			
ECI MW7	05		1025		2	X							X	X			
ECI MW8	06		1455		2	X							X	X			
ECI MW9	07	↓	1356	↓	2	X							X	X			
ECI MW8-DUP	08	↓	1500	↓	2	A							A	A			A-per BC 02/28/24 ME

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Ben Carlson	Stratum	2/26/24	0930
Received by:	Nhan Phan	FEBI	2/27/24	1440
Relinquished by:				
Received by:		Samples received at 4 °C		

Friedman & Bruya, Inc.
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

June 10, 2024

Ben Carlson, Project Manager
Stratum Group
2102 Young St
Bellingham, WA 98225

Dear Mr Carlson:

Included are the results from the testing of material submitted on May 31, 2024 from the Acrowood, F&BI 405505 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
STG0610R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 31, 2024 by Friedman & Bruya, Inc. from the Stratum Group Acrowood, F&BI 405505 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stratum Group
405505 -01	ECIMW6
405505 -02	ECIMW7
405505 -03	MW4
405505 -04	ECIMW5
405505 -05	MW1
405505 -06	ECIMW8
405505 -07	ECIMW8-Dup
405505 -08	ECIMW9

All quality control requirements were acceptable.

Date of Report: 06/10/24
Date Received: 05/31/24
Project: Acrowood, F&BI 405505
Date Extracted: 06/03/24
Date Analyzed: 06/04/24

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
ECIMW6 405505-01	<50	<250	83
ECIMW7 405505-02	89 x	<250	66
MW4 405505-03	<50	<250	80
ECIMW5 405505-04	<50	<250	86
MW1 405505-05	<50	<250	83
ECIMW8 405505-06	1,100 x	<250	84
ECIMW8-Dup 405505-07	780 x	<250	72
ECIMW9 405505-08	<50	<250	89
Method Blank 04-1276 MB	<50	<250	82

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW6	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-01
Date Analyzed:	06/05/24	Data File:	060512.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	95	15	144
Terphenyl-d14	90	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW7	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-02
Date Analyzed:	06/05/24	Data File:	060513.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	96	15	144
Terphenyl-d14	90	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW4	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-03
Date Analyzed:	06/05/24	Data File:	060514.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	103	15	144
Terphenyl-d14	97	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW5	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-04
Date Analyzed:	06/05/24	Data File:	060515.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	102	15	144
Terphenyl-d14	98	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW1	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-05
Date Analyzed:	06/05/24	Data File:	060516.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	98	15	144
Terphenyl-d14	105	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW8	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-06
Date Analyzed:	06/05/24	Data File:	060517.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	93	15	144
Terphenyl-d14	92	41	138

Compounds:	Concentration ug/L (ppb)
Naphthalene	2.3
Benz(a)anthracene	<0.02
Chrysene	<0.02
Benzo(a)pyrene	<0.02
Benzo(b)fluoranthene	<0.02
Benzo(k)fluoranthene	<0.02
Indeno(1,2,3-cd)pyrene	<0.02
Dibenz(a,h)anthracene	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW8-Dup	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-07
Date Analyzed:	06/05/24	Data File:	060518.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	94	15	144
Terphenyl-d14	87	41	138

Compounds:	Concentration ug/L (ppb)
Naphthalene	2.1
Benz(a)anthracene	<0.02
Chrysene	<0.02
Benzo(a)pyrene	<0.02
Benzo(b)fluoranthene	<0.02
Benzo(k)fluoranthene	<0.02
Indeno(1,2,3-cd)pyrene	<0.02
Dibenz(a,h)anthracene	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECIMW9	Client:	Stratum Group
Date Received:	05/31/24	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	405505-08
Date Analyzed:	06/05/24	Data File:	060519.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	107	15	144
Terphenyl-d14	104	41	138

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Stratum Group
Date Received:	Not Applicable	Project:	Acrowood, F&BI 405505
Date Extracted:	06/05/24	Lab ID:	04-1281 mb
Date Analyzed:	06/05/24	Data File:	060512.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	96	11	173
Terphenyl-d14	102	50	150

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

Date of Report: 06/10/24
Date Received: 05/31/24
Project: Acrowood, F&BI 405505

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	72	65-151	5

Date of Report: 06/10/24
Date Received: 05/31/24
Project: Acrowood, F&BI 405505

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	10	78	81	58-93	4
Benz(a)anthracene	ug/L (ppb)	10	93	97	70-130	4
Chrysene	ug/L (ppb)	10	93	95	70-130	2
Benzo(a)pyrene	ug/L (ppb)	10	98	100	70-130	2
Benzo(b)fluoranthene	ug/L (ppb)	10	98	103	70-130	5
Benzo(k)fluoranthene	ug/L (ppb)	10	99	100	70-130	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	103	99	70-130	4
Dibenz(a,h)anthracene	ug/L (ppb)	10	101	102	70-130	1

Data Qualifiers & Definitions

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

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

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

405505

SAMPLE CHAIN OF CUSTODY

05/31/24 F3

Page # 1 of 1

Report To Ben Carlson
Company Stratum Group
Address 2102 Yang St
City, State, ZIP Bellingham, WA 98225
Phone 360-714-9409 Email benc@stratumgroup.net

SAMPLERS (*signature*)

PROJECT NAME	PO #
Acrowood	Acrowood
REMARKS Project specific RLs? - Yes / No	INVOICE TO Stratum

TURNAROUND TIME
☑ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Naphthalene	cPAHs			Notes
ECIMW6	01 A-B	5/30/24	1015	Water	2	X							X	X			
ECIMW7	02		1045		2	X							X	X			
MW4	03		1135		2	X							X	X			
ECIMW5	04		1215		2	X							X	X			
MW1	05		1325		2	X							X	X			
ECIMW8	06		1500		2	X							X	X			
ECIMW8-DUP	07		1510		2	X							X	X			
ECIMW9	08		1400		2	X							X	X			
						Samples received at 5 °C											

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	~~Stratum Group~~ Ben Carlson	Stratum Group	5/30/24	1650
Received by:	Kim Ninemann	Stratum Grp	5/30/24	1650
Relinquished by:	Kim Ninemann	Stratum Grp	5/31/24	1531
Received by:	Alex Goldberg	FTBL	5/31/24	1531

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 405505 CLIENT STG INITIALS/ DATE: M 6/31

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 6 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ Date: AP 05/31/24
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 1 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☐ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ **Number of unused TO17 tubes** _____

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

October 28, 2024

Ben Carlson, Project Manager
Stratum Group
2102 Young St
Bellingham, WA 98225

Dear Mr Carlson:

Included are the additional results from the testing of material submitted on October 9, 2024 from the Acrowood, F&BI 410197 project. There are 4 pages included in this report.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
STG1028R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 9, 2024 by Friedman & Bruya, Inc. from the Stratum Group Acrowood, F&BI 410197 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stratum Group
410197 -01	ECI MW6
410197 -02	ECI MW7
410197 -03	MW4
410197 -04	ECI MW5
410197 -05	MW1
410197 -06	ECI MW9
410197 -07	ECI MW8
410197 -08	ECI MW8-DUP

All quality control requirements were acceptable.

Date of Report: 10/28/24
Date Received: 10/09/24
Project: Acrowood, F&BI 410197
Date Extracted: 10/10/24
Date Analyzed: 10/24/24

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

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
ECI MW7 410197-02	<50	<250	109
Method Blank 04-2490 MB	<50	<250	105

Date of Report: 10/28/24
Date Received: 10/09/24
Project: Acrowood, F&BI 410197

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

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	92	65-151	4

Data Qualifiers & Definitions

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

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

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

410197

SAMPLE CHAIN OF CUSTODY

10/09/24 C4/J4

Page # 1 of 1

Report To Ben Carlson
Company Stratum Group
Address 2102 Young St.
City, State, ZIP Bellingham, WA 98225
Phone 360-717-9409 Email ben@stratumgroup.net

SAMPLERS (*signature*)

PROJECT NAME: Acrowood
PO #: Acrowood

REMARKS
Project specific RLs? - Yes / No

INVOICE TO: Stratum

TURNAROUND TIME
☑ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars AP 10/10	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	MTCA 5 Metals	Naph Ms Lev cPAHs	Dx w/SG	Notes
EC1 MW6	01 A-C	10/9/24	1010	Water	3	X							X	X	X		(X) per BC
EC1 MW7	02		1045		3	X							X	X	X	(X)	10/21/24 ME
MW4	03		1135		3	X							X	X	X		
EC1 MW5	04		1220		3	X							X	X	X		
MW1	05		1330		3	X							X	X	X		
EC1 MW9	06		1400		3	X							X	X	X		
EC1 MW8	07		1440		3	X							X	X	X		
EC1 MW8-DUP	08		1450		3	X							X	X	X		

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Ben Carlson	Stratum	10/9/24	1630
Received by:	Anh Phan	FBI	10/09/24	16:30
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 410197 CLIENT Stratum INITIALS/ DATE: AP 10/09/24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 2 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP Date: 10/10/24
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory Ø days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☐ Yes ☑ No Rec 3 containers for each sample	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ Number of unused TO17 tubes _____

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

October 17, 2024

Ben Carlson, Project Manager
Stratum Group
2102 Young St
Bellingham, WA 98225

Dear Mr Carlson:

Included are the results from the testing of material submitted on October 9, 2024 from the Acrowood, F&BI 410197 project. There are 26 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
STG1017R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 9, 2024 by Friedman & Bruya, Inc. from the Stratum Group Acrowood, F&BI 410197 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stratum Group
410197 -01	ECI MW6
410197 -02	ECI MW7
410197 -03	MW4
410197 -04	ECI MW5
410197 -05	MW1
410197 -06	ECI MW9
410197 -07	ECI MW8
410197 -08	ECI MW8-DUP

All quality control requirements were acceptable.

Date of Report: 10/17/24
Date Received: 10/09/24
Project: Acrowood, F&BI 410197
Date Extracted: 10/10/24
Date Analyzed: 10/10/24

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
ECI MW6 410197-01	<50	<250	106
ECI MW7 410197-02	590 x	<250	115
MW4 410197-03	<50	<250	111
ECI MW5 410197-04	<50	<250	117
MW1 410197-05	<50	<250	122
ECI MW9 410197-06	<50	<250	114
ECI MW8 410197-07	790	<250	123
ECI MW8-DUP 410197-08	1,000	370 x	112
Method Blank 04-2490 MB	<50	<250	95

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECI MW6	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-01
Date Analyzed:	10/15/24	Data File:	101516.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	89	11	173
Terphenyl-d14	93	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECI MW7	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-02
Date Analyzed:	10/15/24	Data File:	101517.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	85	11	173
Terphenyl-d14	113	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW4	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-03
Date Analyzed:	10/15/24	Data File:	101518.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	87	11	173
Terphenyl-d14	95	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECI MW5	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-04
Date Analyzed:	10/15/24	Data File:	101519.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	84	11	173
Terphenyl-d14	94	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	MW1	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-05
Date Analyzed:	10/15/24	Data File:	101520.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	83	11	173
Terphenyl-d14	90	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECI MW9	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-06
Date Analyzed:	10/15/24	Data File:	101521.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	85	11	173
Terphenyl-d14	88	50	150

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

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECI MW8	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-07
Date Analyzed:	10/15/24	Data File:	101522.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	81	11	173
Terphenyl-d14	110	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.2
2-Methylnaphthalene	<0.2
1-Methylnaphthalene	2.4
Benz(a)anthracene	0.070
Chrysene	0.16
Benzo(a)pyrene	0.061
Benzo(b)fluoranthene	0.041
Benzo(k)fluoranthene	<0.02
Indeno(1,2,3-cd)pyrene	0.026
Dibenz(a,h)anthracene	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	ECI MW8-DUP	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	410197-08
Date Analyzed:	10/15/24	Data File:	101523.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	86	11	173
Terphenyl-d14	104	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.2
2-Methylnaphthalene	<0.2
1-Methylnaphthalene	2.3
Benz(a)anthracene	0.031
Chrysene	0.055
Benzo(a)pyrene	0.020
Benzo(b)fluoranthene	<0.02
Benzo(k)fluoranthene	<0.02
Indeno(1,2,3-cd)pyrene	<0.02
Dibenz(a,h)anthracene	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Stratum Group
Date Received:	Not Applicable	Project:	Acrowood, F&BI 410197
Date Extracted:	10/14/24	Lab ID:	04-2535 mb
Date Analyzed:	10/14/24	Data File:	101415.D
Matrix:	Water	Instrument:	GCMS12
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	85	11	173
Terphenyl-d14	90	50	150

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

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW6	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-01
Date Analyzed:	10/12/24	Data File:	410197-01.324
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	1.9
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW7	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-02
Date Analyzed:	10/12/24	Data File:	410197-02.325
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	1.2
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW4	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-03
Date Analyzed:	10/12/24	Data File:	410197-03.326
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	1.1
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW5	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-04
Date Analyzed:	10/12/24	Data File:	410197-04.327
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	3.1
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW1	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-05
Date Analyzed:	10/12/24	Data File:	410197-05.328
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	1.3
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW9	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-06
Date Analyzed:	10/14/24	Data File:	410197-06.109
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	1.5
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW8	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-07
Date Analyzed:	10/14/24	Data File:	410197-07.111
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	11
Cadmium	<1
Lead	1.1
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW8	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-07 x2
Date Analyzed:	10/14/24	Data File:	410197-07 x2.166
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Chromium	2.7

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW8-DUP	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-08
Date Analyzed:	10/14/24	Data File:	410197-08.112
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	10
Cadmium	<1
Lead	1.2
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	ECI MW8-DUP	Client:	Stratum Group
Date Received:	10/09/24	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	410197-08 x5
Date Analyzed:	10/15/24	Data File:	410197-08 x5.215
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Chromium	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Stratum Group
Date Received:	NA	Project:	Acrowood, F&BI 410197
Date Extracted:	10/11/24	Lab ID:	I4-867 mb
Date Analyzed:	10/11/24	Data File:	I4-867 mb.161
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Date of Report: 10/17/24
Date Received: 10/09/24
Project: Acrowood, F&BI 410197

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	88	65-151	5

Date of Report: 10/17/24
Date Received: 10/09/24
Project: Acrowood, F&BI 410197

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	10	71	77	58-93	8
2-Methylnaphthalene	ug/L (ppb)	10	80	85	63-97	6
1-Methylnaphthalene	ug/L (ppb)	10	80	85	62-99	6
Benz(a)anthracene	ug/L (ppb)	10	94	95	70-130	1
Chrysene	ug/L (ppb)	10	95	101	70-130	6
Benzo(a)pyrene	ug/L (ppb)	10	101	112	70-130	10
Benzo(b)fluoranthene	ug/L (ppb)	10	97	110	70-130	13
Benzo(k)fluoranthene	ug/L (ppb)	10	99	105	70-130	6
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	88	108	70-130	20
Dibenz(a,h)anthracene	ug/L (ppb)	10	88	101	70-130	14

Date of Report: 10/17/24
Date Received: 10/09/24
Project: Acrowood, F&BI 410197

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

Laboratory Code: 410222-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	1.63	98	96	75-125	2
Cadmium	ug/L (ppb)	5	<1	93	88	75-125	6
Chromium	ug/L (ppb)	20	<1	100	98	75-125	2
Lead	ug/L (ppb)	10	<1	102	101	75-125	1
Mercury	ug/L (ppb)	5	<1	96	95	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	95	80-120
Cadmium	ug/L (ppb)	5	99	80-120
Chromium	ug/L (ppb)	20	95	80-120
Lead	ug/L (ppb)	10	94	80-120
Mercury	ug/L (ppb)	5	93	80-120

Data Qualifiers & Definitions

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

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

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

410197

SAMPLE CHAIN OF CUSTODY

10/09/24 C4/J4

Report To Ben Carlson
Company Stratum Group
Address 2102 Young St.
City, State, ZIP Bellingham, WA 98225
Phone 360-717-9409 Email ben@stratumgroup.net

SAMPLERS (*signature*)

PROJECT NAME	PO #
Acrowood	Acrowood
REMARKS Project specific RLs? - Yes / No	INVOICE TO Stratum

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TURNAROUND TIME
☑ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars AP 10/10	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	MTCA 5 Metals	Naph. Histone	cPAHs		Notes
EC1MW6	01A-C	10/9/24	1010	Water	3	X							X	X	X		
EC1MW7	02		1045		3	X							X	X	X		
MW4	03		1135		3	X							X	X	X		
EC1MW5	04		1220		3	X							X	X	X		
MW1	05		1330		3	X							X	X	X		
EC1MW9	06		1400		3	X							X	X	X		
EC1MW8	07		1440		3	X							X	X	X		
EC1MW8-DUP	08		1450		3	X							X	X	X		

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Ben Carlson	Stratum	10/9/24	1630
Received by:	Anh Phan	FBI	10/09/24	16:30
Relinquished by:		Samples received at 2 °C		
Received by:				

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 410197 CLIENT Stratum INITIALS/ DATE: AP 10/09/24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 2 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP Date: 10/10/24
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☐ Yes ☑ No	Rec 3 containers for each sample
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ **Number of unused TO17 tubes** _____

APPENDIX IV

Stratum Group Field Procedures

STRATUM GROUP FIELD PROCEDURES

Site Preparatory Activities

Prior to the completion of subsurface exploration activities on the subject property, Stratum Group obtains approval for planned activities from the property owner and obtains or facilitates the public agency permits required for the desired work. Stratum Group marks the location of planned excavations or borings on the subject property with white paint and contacts the local one-call utility locating service at least two business days prior to the onset of exploration activities. Stratum Group also engages the services of a professional private utility locating company to survey the proposed exploration area(s) and conduct ground penetrating radar services to minimize the potential for exploration activities to encounter and/or damage buried utilities or objects.

Soil Borings & Soil Sampling

Stratum Group engages a licensed professional drilling company to complete subsurface soil borings with a drill rig, unless hand auguring or hand-dug test pits are proposed for the site. Continuous soil cores are typically collected using Geoprobe/push probe samplers. The boring method(s) selected are indicated on the boring logs completed for the project. Stratum Group chooses the sample locations based upon researched site history and project goals with some variability based upon utility locate/GPR findings and/or conditions identified in the field.

Field Screening

Soils recovered from the borehole are examined and field screened for odor, hydrocarbon sheen, discoloration, or other obvious indications of contamination. Any such obvious indicators, if observed, are recorded on the boring logs.

A MiniRAE 3000 photoionization detector (PID) equipped with a 10.6eV lamp is utilized to field scan samples for volatile organic compounds (VOCs). To evaluate for VOCs with the PID, soil is placed into a sealed plastic bag and allowed to sit for approximately 5 minutes. The PID sampler tip is then inserted into the headspace of the plastic bag to retrieve a parts per million (ppm) concentration of VOCs. Measurements obtained from the PID are recorded on the boring log. The PID is calibrated regularly in accordance with the manufacturer's specifications using a hexane or isobutylene standard.

Soils collected from the borings are described according to the Unified Soil Classification System (USCS), with particular note to presence of colors, moisture content, presence of debris and/or indicators of contamination. These descriptions are recorded on the boring log.

Soil Sampling (from borehole)

Soil collected via soil cores from push probe equipment is sampled where contaminants are determined to be most likely based on field indications and background knowledge, such as sample depths where discoloration or odors were noted, the top of the groundwater table, or at depths associated with the suspected base of tanks or piping. Soil samples are labeled with the boring number followed by the depth of the sample. For example, sample B1-5 would have been collected from Boring B1 at 5 feet bgs (below ground surface).

Soil samples are placed into labeled laboratory supplied containers. Sample container selection is based upon laboratory recommendations for volume, container type, and preservation, if necessary. Sampling equipment is either disposable or washed with Alconox and triple-rinsed between samples. Samples are placed into an ice-chilled cooler immediately after sampling and delivered to a Washington State Department of Ecology approved laboratory for analysis. The samples are transferred under chain-of-custody protocol.

Borehole Completion

If no temporary or permanent monitoring well is going to be installed, the soil boring is backfilled with bentonite chips to approximately 1 foot below the ground surface (bgs). The rest of the hole is filled and finished to the surface with material to match the surrounding surface (e.g., asphalt, concrete, dirt, etc.). The borehole is backfilled by the licensed well driller consistent with WAC 173-360 and overseen by Stratum Group.

Soil Sampling (from excavation)

Stratum group engages a licensed excavation contractor to complete excavation activities. As in borehole sampling, soils from the sidewalls and base of the excavation area are regularly examined and field screened for obvious indications of contamination (e.g., odor, hydrocarbon sheen, discoloration, etc.). This field examination in combination with PID screening is used to direct excavation activities.

When field screening indicates that contaminant concentrations in residual soils have fallen below the cleanup standards established for the subject property, soil samples are collected from the base and sidewalls of the excavation. Where possible, samples are collected directly using hand tools that are washed with Alconox and triple-rinsed between each sample. For deeper samples, where the excavation depth is too great for Stratum Group personnel to access directly, samples are collected from the excavator bucket. Overburden slough material that collects on top of soils in the bucket is removed prior to sampling so sampled soils are representative of the desired sampling location. Samples are subsequently handled according to procedures outlined above for borehole samples.

Monitoring Well Construction & Groundwater Sampling

If groundwater is encountered during soil boring completion, samples may be collected as either a grab sample from a temporary well or from a permanent monitoring well. Prior to well purging or sample collection, the depth of the groundwater table in the borehole or monitoring well is measured using a depth-to-water meter. Prior to sample collection, water is purged from the well. For a temporary well, water is purged until the water becomes clear or turbidity is significantly reduced. For a developed monitoring well, at least three well volumes are purged prior to sampling or until field parameters as measured with a field meter (e.g., temperature, dissolved oxygen, pH, conductivity) stabilize. If low water levels or low conductivity aquifers result in the wells pumping dry during purging, purging is halted and the well is allowed to recharge until it can be purged again. Multiple rounds of purging and recharging may be completed to allow for turbidity to decrease significantly, in the case of a temporary well, or for field parameters to stabilize, in the case of a permanent monitoring well. For a developed monitoring well, at least three well volumes are purged prior to sampling or until field parameters stabilize. Total well purge volumes prior to sampling may only be reduced (i.e., less than three well volumes) if several rounds of purging and recharge do not result in sufficient purge volume within a reasonable time frame. In such cases, the reduced purge volumes will be documented. Obvious indications of contamination observed in purge water such as odors or petroleum sheens are noted on the boring logs.

In the event of low water volumes or slow recharge of the wells, less water may be purged to allow for sample collection within reasonable time frames. Obvious indications of contamination observed in purge water such as odors or petroleum sheens are noted on the boring logs.

Both well purging and subsequent water sampling are accomplished using a low-flow, peristaltic pump, as recommended by the U.S. EPA. Low-flow pumping is utilized because it is more likely to produce a sample representative of actual groundwater conditions due to its relatively low impact on aquifer characteristics and chemistry. Tubing used for well purging and sample collection is single-use and is discarded after sample collection is complete.

Groundwater samples are placed into labeled laboratory supplied containers. Sample container selection is based upon laboratory recommendations for volume, container type, and preservation, if necessary. Samples are immediately placed into an ice-chilled cooler for storage until delivery to a Washington State Department of Ecology approved laboratory.

Temporary & Monitoring Well Construction

Temporary wells are constructed using single-use slotted PVC pipe placed in the depth range of desired groundwater sampling. Blank pipe rises from the top of the screen to the surface. The screen length and placement depth are noted on the boring logs or within report text. Any reusable materials are washed and triple rinsed between uses.

Permanent monitoring wells are similarly constructed with a slotted PVC screen placed at the

desired sampling depth with non-slotted PVC to the surface. The annular space between the PVC and the borehole is filled with a silica sand filter pack, which extends approximately one to two feet above the screen. Hydrated bentonite is used to fill the annular space from the filter pack to approximately one to two feet below the ground surface to form a seal. The surface is finished with concrete surrounding a steel flush-mount or above-grade monument to protect the well and protect against surface water infiltration or placement of substances down the well casing. Well construction details are noted in the boring logs.

After construction, Stratum Group recommends engaging the services of a licensed professional land surveyor to establish the location and elevation of permanent monitoring wells. Markings are made on the north side of the well casing to establish a consistent point for collecting depth-to-water measurements. Established well casing elevations combined with depth-to-water measurements collected during groundwater sampling may then be used to model groundwater flow directions.

Well Development

After construction of a permanent monitoring well, the well is developed using either a submersible pump or disposable bailer. An agitation apparatus that consists of a stainless-steel rod with neoprene washers the diameter of the inside of the well casing is periodically dropped into the well casing to generate additional pressure and suction through the sand filter pack and further remove fine-grained sediment from the well and surrounding filter. The submersible pump and agitator rod are thoroughly washed and rinsed between wells. Well pumping and agitation proceed until purge water turbidity has reduced and stabilized. The volume of water purged during development is recorded.

Air Sampling

Air samples are commonly collected to help assess the vapor intrusion pathway for contamination into nearby structures. Air samples may be collected either as subsurface soil gas, sub-slab air, or indoor air. Sampling equipment including tubing and valve assemblies are single-use and disposable. After sampling collection, samples are delivered to a Washington State Department of Ecology approved laboratory for analysis. The samples are transferred under chain-of-custody protocol.

Sub-slab Vapor Sampling

Stratum Group engages a professional drilling contractor to install permanent and temporary sub-slab vapor pins. For a permanent pin with a flush-mount installation, first a 1.5-inch hole is drilled approximately 1.75 inches into the concrete slab of the structure. A 5/8-inch diameter hole is then drilled through the bottom of the slab and approximately 1 inch into the underlying soil. The vapor pin is then hammered into the open hole. At least 20 minutes is allowed to pass before beginning the sample collection process to allow for equilibration. Prior to assembling the sampling apparatus, the laboratory supplied and cleaned 1L Summa canister and ~5-minute flow

controller used for sample collection are subjected to a shut-in test to look for leaks in the sampling equipment setup and the initial vacuum is recorded.

To collect a sample, tubing recommended by the vapor pin manufacturer is attached to the barb on the pin and attached to a valve assembly provided by the laboratory. Tubing also runs from the valve assembly to the Summa canister assembly. Prior to sample collection, a leak test and shut-in test are conducted on the sampling apparatus. The leak test is conducted using either a water dam (temporary pin) or by pouring water directly into the flush-mount hole (permanent) and looking for bubbling around the vapor pin or intrusion of water into the sample tubing. A shut-in test of the sampling apparatus involves manually applying a vacuum to the canister via the purge line of the apparatus and verifying that no leaks are allowing the vacuum to rapidly disappear.

Immediately before sampling, the sampling apparatus is purged using a manually applied vacuum sufficiently to remove ambient air from the tubing. The canister valve is then opened and the sample is collected over approximately 5 minutes or until the vacuum reading on the canister is approximately 5 in/Hg, being sure to not allow the vacuum to reach zero. The canister is then closed, and the vapor pin is either removed (temporary) and the hole patched or the pin is capped and covered (permanent) for future sampling.

Indoor Air Sampling

Indoor air samples are collected using laboratory-supplied and cleaned 6L Summa canister attached to either an 8-hour or 24-hour flow controller, depending upon whether the site's use is residential or commercial, per Department of Ecology guidance. Prior to sampling, the canisters and flow controllers are subjected to a shut-in test to look for leaks in the sampling equipment setup and the initial vacuum is recorded. Sampling canisters are placed within the general breathing height zone (4 to 6 feet above the ground surface).

At the same time as indoor air sampling collection, at least one outdoor (ambient) air sample is collected of the same time period as the indoor sample(s). Contaminant concentrations detected in the ambient air samples are subtracted from contaminant concentrations detected in the indoor air samples to assess the contribution of vapor intrusion into site structures more directly.

Sampling Results Quality Assurance

The laboratory that conducts analysis of the samples collected by Stratum Group conducts their own quality assurance procedures, which typically include surrogate recovery, method blank, laboratory blank, and blank spike duplicate tests. The results of these test are reviewed by Stratum Group and any significant non-conformances or problems identified that limit our ability to use the data is addressed in the body of this report.