FULCRUM
environmental consulting

Independent Soil Remediation
Smudge Pot Storage Area

Ranch 19 West
441 Williamson Road
Sunnyside, Washington

Project Number: 192902.15

January 5, 2021

Prepared for:

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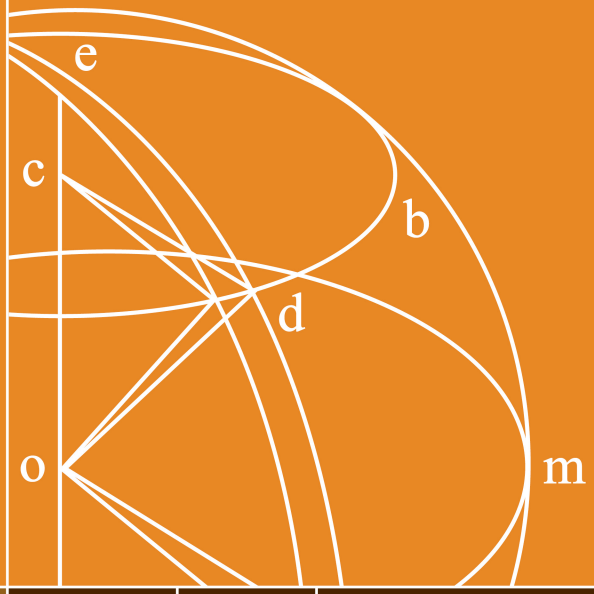

Report Title: Independent Soil Remediation, Smudge Pot Storage Area

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Site: Ranch 19 West
441 Williamson Road, Sunnyside, Washington
GPS coordinates: 46°23'25.92"N, 120° 0'45.48"W

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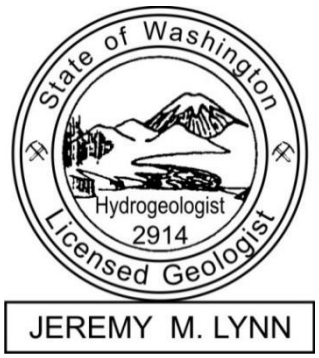

The professionals who completed site services, prepared, and reviewed this report include but are not limited to:

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Report Integrity:

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TABLE OF CONTENTS

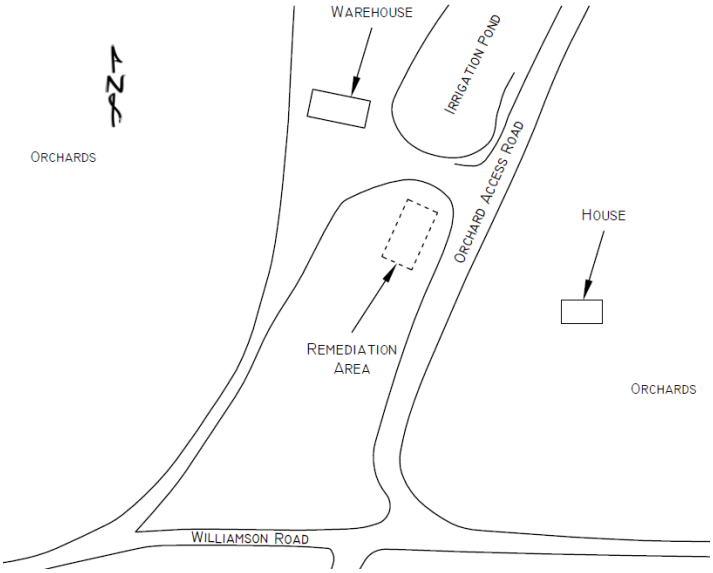
TABLES

FIGURES

APPENDICES

1.0 Introduction

Fulcrum Environmental Consulting, Inc. (Fulcrum) was retained by WA LAND MGMT, LLC to complete site characterization and remediation of one area of suspected petroleum contaminated soil (PCS) associated with historical smudge pot storage. See Figure 1 for the site location.



General Site Location – See Figure 2

Ranch 19 is located at 441 Williamson Road in Sunnyside, Washington. The former smudge pot area is located at coordinates 46°23'25.92"N, 120° 0'45.48"W in Township 11N, Range 22E, Section 36, Yakima County, Washington. The former smudge pot storage area is located north of Williamson Road and south of an earthen dam in a natural drainage area surrounded by an embankment. A second area of PCS associated with smudge pot storage is located in east portion of the ranch just north of Washout Road and is reported under separate cover. The site addressed in this report is referred to as Ranch 19 West. The site and surrounding area land-use consists of arable land, typically utilized as orchards or other crop use.

During a Phase I Environmental Site Assessment (ESA) site walk performed on behalf of a prospective buyer, visibly stained soils were observed in the smudge pot storage area. The prospective buyer notified WA LAND MGMT, LLC and requested additional investigation and remediation if necessary.

Fulcrum completed limited Phase II investigation activities at the site to evaluate constituents of concern and to approximate extents of impact and soil volumes. The investigation identified localized diesel fuel contamination at the site. The site was reported to the Washington State Department of Ecology (Ecology) on December 19, 2019 under the letter *Release Reporting at a Former Smudge Pot Storage Area – Ranch 19, 441 Williamson Road, Sunnyside, Washington.* Site remediation of the identified PCS occurred on October 19 through October 22, 2020.

See Section 5.0 for a summary of the site activities. See Figure 2 for the former smudge pot storage location. See Figure 3 for sampling locations.

All investigation and remediation activities were completed as provided in the Model Toxics Control Act (MTCA), Washington Administrative Code (WAC) 173-340. In our professional opinion, the use of the independent remediation process is appropriate.

2.0 Scope of Work

Fulcrum's scope of services consisted of the following tasks:

- Complete initial investigation and waste characterization sampling of suspect contaminated soils.
- Complete waste characterization evaluation and request for offsite treatment or disposal.
- Direct excavation of petroleum contaminated soils.
- Collect confirmatory samples at the excavation extents for identified contaminants of concern.
- Prepare documentation of remedial activities.

Investigation and remedial activities were limited to the area of impact by the former smudge pot storage releases and were guided through the use of field screening including color, odor, sheet, and head space volatile organic compounds (VOCs) evaluated through a photoionization detector (PID). Investigation and remediation activities were supervised by Nicole McPhee, a staff geologist with Fulcrum. Work was performed under the direction of Jeremy Lynn, Washington State Licensed Hydrogeologist, with Fulcrum. See Appendix A for Professional certification.

Excavation of test pits completed during initial investigation and waste characterization activities were completed by WA LAND MGMT, LLC. Subsequent remedial excavation of PCS was completed by Spokane Environmental Services (SES) under contract to Fulcrum. Fulcrum utilized Fremont Analytical, Inc. (Fremont), of Seattle, Washington to provide laboratory services. Fremont is an Ecology accredited laboratory (accreditation number C910).

The following project partners were retained by WA LAND MGMT, LLC:

- DTG Recycle (formerly Anderson Rock & Demolition Pit and Treatment Facility) of Yakima, Washington to provide transport and treatment of PCS.
- Tri-Valley Construction to transport soils to the selected disposal facility.
- DR Trucking Services, LLC to transport soils to the selected disposal facility.
- SD Construction to transport soils to the selected disposal facility.

No groundwater or surface water were encountered during remediation.

3.0 Discussion of Pertinent Regulations and Guidance

Fulcrum utilized applicable portions of the following guidance and Washington State regulations.

3.1 MTCA Regulations

In March of 1989, The Model Toxics Control Act (MTCA) went into effect in Washington State. The MTCA regulations, WAC 173-340-360, set standards to ensure quality of cleanup and protection of human health and the environment. A major portion of the MTCA regulation (completed in 1991) was the development of numerical cleanup standards and requirements for cleanup actions. Three options were established under

MTCA for site-specific cleanup levels: Method A, B, and C. Method A defines cleanup levels for 25 of the most common hazardous substances found at sites. Method B levels are set using a site risk assessment, which enables consideration of site-specific characteristics. Method C is similar to Method B; however, the individual substance's cancer risk portion of the assessment is set at 1 in 100,000 rather than 1 in 1,000,000.

Rule amendments to MTCA, which became effective August 15, 2001, changed the cleanup levels of petroleum hydrocarbon contamination. Whereas diesel and heavy oil concentrations were increased, the MTCA Method A cleanup levels for gasoline and gasoline components Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) were lowered significantly. Updates since 2001 have been primarily administrative in nature, although review and adjustment of cleanup levels are ongoing.

3.2 Cleanup Standard Selected

Ecology's MTCA Method A cleanup tables were developed to provide conservative cleanup levels for sites undergoing routine cleanup actions or those sites with relatively few hazardous substances. Method A cleanup levels are specifically designated as appropriate for residential facilities and are appropriate for a conservative approach at schools and public sites. Therefore, Fulcrum has determined that Ecology's MTCA Method A cleanup levels to be the most appropriate regulatory guidance for evaluating the need for site cleanup at the site. Where Method A cleanup levels are not published, Fulcrum utilized default published Method B values.

3.3 Sampling Guidance Criteria

Fulcrum has utilized applicable portions of the following documents as guidance criteria for confirmation sampling protocol:

1. Washington State Department of Ecology, *Guidance for Remediation of Petroleum Contaminated Soil*, revised June 2016.
2. American Petroleum Institute, *A Guide to the Assessment and Remediation of Underground Petroleum Releases*, publication 1628, dated July 1996.
3. Washington State Department of Ecology, *Guidance for Site Checks and Site Assessments for Underground Storage Tanks*, revised April 2003.

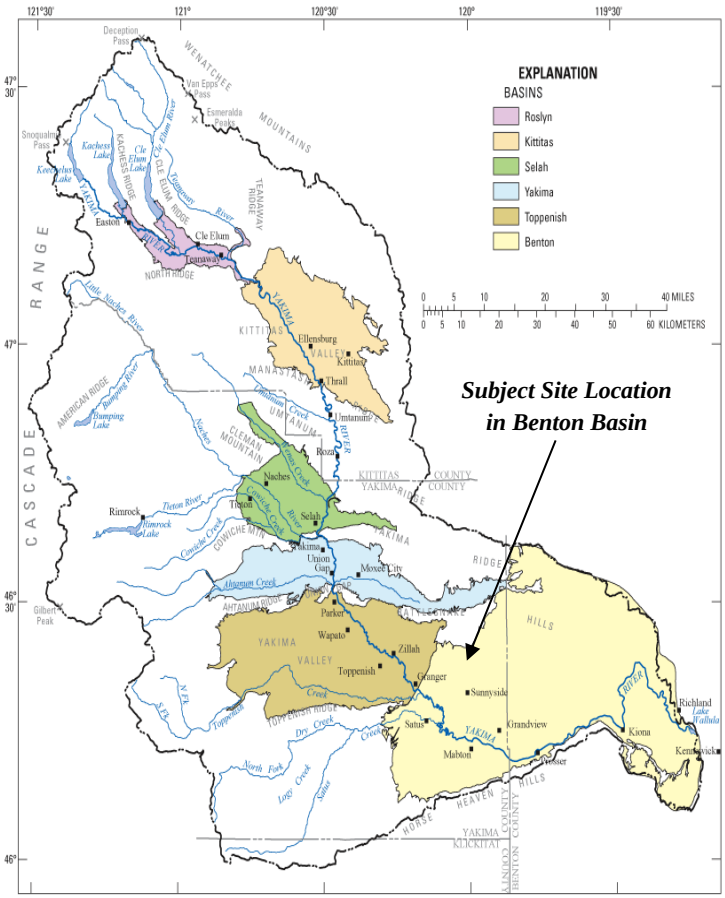
4.0 Environmental Setting

Contaminant transport within the subsurface and extent of impact is largely determined by the nature of the contaminant, as well as, regional and local geologic and hydrogeologic conditions. The following subsections describe regional and local subsurface site settings.

4.1 Regional Setting

From a regional setting, the subject site is located within the Yakima Folds Geomorphic Province (YFGP) on the western margin of the Columbia River Plateau. The Yakima Fold Belt is generally characterized by anticlinal ridge and synclinal valley structures; and valley lowlands are composed of erosional sedimentary deposits including: alluvium, lacustrine, glacial, and glacial-fluvial materials with localized areas of windblown loess. The Yakima River is located to the northeast.

The Yakima River Basin (YRB) is located within the boundaries of the YFGP and extends from the northeastern slopes of the Cascade Mountain Range in Kittitas County to the confluence of the Yakima and Columbia Rivers in Benton County. The YRB additionally incorporates portions of Benton County and the majority of Yakima County. The YRB consists of a total of six structural aquifer basins and occupies 6,200 square miles. The network of Yakima Basin aquifers is supplied by the headwaters of the eastern slopes of the Cascade Mountain Range.



Six Structural Aquifer Basins - Courtesy of USGS

The Subject Site is located within the Benton Basin. The Benton Basin comprises approximately 1,020-square miles in the southeast portion of the YRB and is bordered by the Rattlesnake Hills to the north and east, the Horse Haven Hills to the south, and the City of Granger and the Toppenish Basin to the west. The east extent is defined as the Columbia River. The basin is characterized by folds and faults striking in an east-west direction. The basin fill deposit stratigraphy is divided into two hydrogeologic subunits. The first unit consists of unconsolidated alluvial fan, loess, terrace, dune sand, Touchet, Missoula flood, and Ringold Formation sedimentary deposits with a thickness range of 0 to 870-feet. The second unit consists primarily of consolidated Ellensburg Formation and similar continental sedimentary deposits present in the southwestern portion of the basin and ranges in thickness from 0 to 680-feet. The Benton Basin ranges in total thickness from 0 to 870-feet with the greatest thickness present in the western and northeastern portions of the basin.

4.2 Local Geologic Setting

Site soils are identified by the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey at the smudge pot storage area as *Scoon silt loam.* According to the USDA Soil Survey, *Scoon silt loam* is well drained with a very low to moderately low capacity to transmit water.

Typical soil profile of *Scoon silt loam* consists of the following:

- *Silt loam* – 0 to 6 inches below ground surface (bgs);
- *Gravelly very fine sandy loam* – 6 to 16 inches bgs;
- *Cemented material* – 16 to 60 inches bgs;

While completing site activities, Fulcrum observed soil within the excavation pit at the smudge pot area to be composed of poorly graded sandy loam with gravel.

Groundwater was not encountered during remediation activities. Shallow groundwater wells are not generally present within the vicinity of the subject site. Fulcrum viewed Ecology's well viewer database within the same township and the range of well depths were from 8 feet to 633 feet bgs. Projected depths to groundwater are unknown at the smudge pot location; however, is estimated to be approximately 10 to 15 feet bgs.

5.0 Site Activities

Site activities consisted of an initial investigation for waste characterization and approximate contamination extent followed by two remediation events.

5.1 Initial Investigation and Waste Characterization

In September 2019, initial investigation and waste characterization activities were completed to evaluate the approximate vertical and horizontal extents of impact and to determine a potential treatment or disposal facility for remedial planning purposes. Fulcrum met with WA LAND MGMT, LLC and completed select test pits through the former smudge pot area. Fulcrum completed visual observation and field screening to evaluate general extents of impact in each test pit. Field screening included evaluation of odor, color, sheen, and VOCs with the use of a PID. At each location, Fulcrum collected one composite sample of near surface soils representative soils to evaluate level of petroleum impact. See Appendix C for site photographs.

The former smudge pot storage area, based on the presence of residual surface staining, was estimated to be approximately 110 feet north to south and 55 feet east to west. Three soil samples were collected from the areas of where petroleum impacts appeared to be the greatest. Samples included:

- R19W-91619-01.01: Northern Portion of Smudge Pot Storage Area, Surface to 1-foot bgs
- R19W-91619-02.01: Central Portion of Smudge Pot Storage Area, Surface to 1-foot bgs

- R19W-91619-03.01: Southern Portion of Smudge Pot Storage Area, Surface to 1-foot bgs

Each sample was collected into one, 4-ounce borosilicate jar with Teflon lined lids and two, 40-milliliter glass vials with Teflon lined lids. New, clean nitrile gloves were used during sampling. See Appendix B for a summary of Fulcrum's sample handling methodology. The soil samples were packaged on ice and shipped overnight via commercial carrier under chain-of-custody to Fremont for analysis.

Samples were laboratory composited for waste characterization. Samples were submitted for the following analyses:

- Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) Method 8082
- Diesel and heavy Oil by Northwest Total Petroleum Hydrocarbons (NWTPH) – Diesel Extended (Dx Ext)
- Polyaromatic Hydrocarbons (PAH) by EPA Method 8270 (SIM)
- Volatile Organic Compounds by EPA Method 8260D
- Mercury by EPA Method 7471
- Total Arsenic, Cadmium, Chromium and Lead by EPA Method 6020B

Results were reported under Fremont work order number 1909233. See Appendix E for Complete Laboratory Report.

Table 1: Waste Characterization Sample Results

Analyte	Result (mg/Kg)	MTCA Method A CUL	Exceeds MTCA Method A CUL	Dangerous Waste Level (mg/L)	Exceeds Dangerous Waste Level
Total PCBs [1]	<0.100	10[2]	No	-	-
Diesel	**233,000**	2,000	Yes	-	-
Heavy Oil	<50.4	2,000	No	-	-
Polyaromatic Hydrocarbons					
Benzo[a]pyrene	**0.267**	**0.1[2]**	**Yes**	-	-
Benz[a]anthracene	<0.385	NA	NA	-	-
Benzo[b]fluoranthene	0.628	NA	NA	-	-
Benzo[k]fluoranthene	0.491	NA	NA	-	-
Chrysene	1.27	NA	NA	-	-
Dibenz[a,h]anthracene	0.096	NA	NA	-	-
Indeno[1,2,3-cd]pyrene	0.541	NA	NA	-	-
PAH TTEC (Per WAC 173-340-708)	***0.4553***	***0.1[2]***	***Yes***	-	-
Pyrene	12.9	2,400	No	-	-
Benzo[g,h,i]perylene	0.556	NA	NA	-	-
Total PAH [Percentage Per WAC 173-303-100(6)]	*0.171%*	-	-	*1%*	*No*
Semi-Volatile Organic Compounds					
Naphthalene	0.443	5	No	-	-
2-Methylnaphthalene	1.32	320[3]	No	-	-
1-Methynaphthalene	0.879	340[3]	No	-	-
Volatile Organic Compounds					

Analyte	Result (mg/Kg)	MTCA Method A CUL	Exceeds MTCA Method A CUL	Dangerous Waste Level (mg/L)	Exceeds Dangerous Waste Level
Halogenated/Chlorinated VOCs [1]	-	-	-	-	-
Benzene	<0.021	0.03	No	0.5	No
Toluene	0.085	7	No	-	-
Ethylbenzene	0.048	6	No	-	-
Total Xylenes	0.202	9	No	-	-
n-Propylbenzene	0.045	8,000[3]	No	-	-
sec-Butylbenzene	0.080	8,000[3]	No	-	-
1,2,4-Trimethylbenzene	0.152	800[3]	No	-	-
Naphthalene	0.199	5	No	-	-
Metals					
Mercury	<0.250	2	No	0.2	No
Arsenic	2.41	20	No	5	No
Cadmium	0.416	2	No	1	No
Total Chromium	9.85	19 / 2,000[4]	No	5	No
Lead	16.1	250	No	5	No

All results, method reporting limits, and cleanup levels are presented in mg/Kg. Dangerous waste threshold values where published in WAC 173-303-090(8) are presented in milligrams per liter.

Results in **Bold** indicate a result above the MTCA Method cleanup level.

[1] The individual chemical constituents were not detected above the method reporting limit (MRL).

[2] The Unrestricted MTCA Method A cleanup level for Benzo[a]pyrene was used for waste characterization.

[3] Select constituents have established MTCA Method A cleanup level. When a MTCA Method A cleanup level is not available, the MTCA Method B Standard Value is utilized for evaluation.

[4] The MTCA Method A cleanup level for Chromium (III) is 2,000 mg/Kg and for Chromium (VI) is 19 mg/Kg.

The following data qualifiers were noted in the laboratory results:

D Dilution was required for diesel and PAHs
S Spike recovery outside accepted recovery limits for petroleum surrogate
Q Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF) for select VOCs

Dilution, spike recovery, and calibration drift are commonly associated with high levels of petroleum hydrocarbons. An analyte reported below the reporting limit is typically found where analytical sensitivity exceeds the method reporting requirements. A review of these notes indicates that laboratory QA/QC are satisfactory and should not affect project data or objectives.

The initial investigation confirmed the presence of diesel range petroleum hydrocarbons as the contaminants of concern for remediation.

The selected MTCA Method A threshold for PAHs was industrial land use as the treatment facility is an industrial site. PAHs are typically associated with diesel product and are expected to be remediated to below unrestricted land use threshold concentrations at the site with removal of the diesel impacted soil. However, based on discussions with Ecology associated with concurrent smudge pot remediation sites, screening for PAHs is appropriate for final site confirmation samples based on the waste characterization results.

5.2 Remedial Excavation

Remedial excavation of PCS began on October 19, 2019 and was completed on October 22, 2020. Soils were excavated utilizing an excavator and loaded directly into dump trucks for transport to the treatment facility.

Fulcrum utilized field screening methods, including visual observation for staining or discoloration, sheen on water, and use of a PID to guide the excavation. When visibly impacted soils were removed and field indications of contamination were absent, soil samples were collected to confirm completion of remediation. Field screening results are presented in Table 2.

Table 2: Field Screening – October 19 through October 22, 2020

Sample ID	Color	Odor	PID (ppm)	Sheen	Other
1	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
2	Light Brown	Slight	1	No	Sandy silt loam with gravel and cobbles
3	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
4	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
5	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
6	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
7	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
8	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
9	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
10	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
11	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
12	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles
13	Light Brown	No	0	No	Sandy silt loam with gravel and cobbles

ppm Parts Per Million in air

The former smudge pot staging area was excavated to a footprint approximately 157 feet in length (north-south), 69 feet wide (east-west), and ranging from 2 to 9.5 feet in depth with an average of about 3 feet deep. The central portion of the excavation was completed to approximately 4 to 9.5 feet bgs with the remaining portions extending to approximately 2 to 3 feet in depth.

Based on total area and linear extents of sidewalls exceeding 3 feet bgs, a total of twenty (20) samples were collected and included eleven from pit bottom and seven from excavation sidewalls.

Per the Sampling Analysis Plan (SAP), all soil samples were collected by hand where possible, and from the excavator bucket where indicated. Soil samples were placed within a 4-ounce borosilicate jars with Teflon-lined lid (Diesel, Heavy Oil, and PAHs) and two 40 milliliter glass vials (for BTEX analysis) with a Teflon-lined lid for each sample location. New, clean nitrile gloves were used for each sample set.

6.0 Laboratory Results

The samples were packed on ice and shipped overnight via commercial carrier under chain-of-custody to Fremont for analysis by the following:

- Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
- Volatile Organic Compounds (VOC) for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260D

Based on feedback from Ecology on concurrent smudge-pot remediation sites and as a screening approach, additional analysis for the following was completed on select samples:

- Polycyclic Aromatic Hydrocarbons (PAH) by EPA Method 8270 (SIM)

Fulcrum selected samples R19W-102120-10.7.5 and 102220-15.3 for additional PAH analysis.

Results were reported under Fremont Project No. 2010318, 2010350, and 2010388 and are summarized in Table 4. See Appendix E for Complete Laboratory Results.

Table 3: Former Smudge Pot Storage Area Laboratory Results

Sample ID and Location	Analyte					
	Diesel	Heavy Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes
Initial Event – December 12, 2019						
R19W-101920-01.5 North pit bottom, 5 feet bgs	<19.3	<48.2	<0.0248	<0.0248	<0.0309	<0.619
R19W-101920-02.4 Northwest pit bottom, 4 feet bgs	<21.4	<53.5	<0.0266	<0.0266	<0.0333	<0.0666
R19W-101920-03.1 North sidewall, 1 foot bgs	<18.7	<46.7	<0.0219	<0.0219	<0.0274	<0.0548
R19W-102020-04.3 Northeast pit bottom, 3 feet bgs	<19.5	<48.8	<0.0228	<0.0228	<0.0285	<0.0570
R19W-102020-05.1 East sidewall, 1 foot bgs	<17.9	<44.8	<0.0312	<0.0312	<0.0389	<0.0779
R19W-102020-06.2 East pit bottom, 2 feet bgs	<22.3	<55.6	<0.0268	<0.0268	<0.0335	<0.0669
R19W-102020-07.7 Pit bottom, 7 feet bgs	<24.2	<60.4	<0.0242	<0.0242	<0.0302	<0.0605
R19W-102020-08.1 Northwest sidewall, 1 foot bgs	<18.2	<455	<0.0287	<0.0287	<0.0359	<0.0717
R19W-102120-09.8 Central pit bottom, 8 feet bgs	<31.7	<79.3	<0.0494	<0.0494	<0.0618	<0.124
R19W-102120-10.7.5 West sidewall, 7.5 feet bgs	34.2	<77.7	<0.0382	<0.0382	<0.0478	<0.0956

Sample ID and Location	Analyte					
	Diesel	**Heavy Oil**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**
R19W-102220-11.3 Southwest pit bottom, 3 feet bgs	<17.9	<44.8	<0.0192	<0.0192	<0.0239	<0.0479
R19W-102220-12.3 Southwest pit bottom, 3 feet bgs	<19.2	<48.1	<0.0197	<0.0197	<0.0246	<0.0492
R19W-102220-13.3 Southeast pit bottom, 3 feet bgs	<19.3	<48.2	<0.0260	<0.0260	<0.0326	<0.0651
R19W-102220-14.2 Southeast sidewall, 2 feet bgs	<20.6	<51.6	<0.0243	<0.0243	<0.0303	<0.0607
R19W-102220-15.3 South pit bottom, 3 feet bgs	50.0	<49.8	<0.0198	<0.0198	<0.0248	<0.0496
R19W-102220-16.3.5 East sidewall, 3.5 feet bgs	<20.9	<52.4	<0.0229	<0.0229	<0.0287	<0.0574
R19W-102220-17.9.5 Pit bottom, 9.5-feet bgs	<37.5	<93.6	<0.0175	<0.0501	<0.0626	<0.125
R19W-102220-18.3 Southwest sidewall, 3 feet bgs	<18.9	<47.3	<0.0201	<0.0201	<0.0251	<0.0502
R19W-102220-19.3 Southwest sidewall, 3 feet bgs	<17.9	<44.8	<0.0209	<0.0209	<0.0262	<0.0523
R19W-102220-20.2 West pit bottom, 2 feet bgs	<19.6	<48.9	<0.0237	<0.0237	<0.0296	<0.0592
MTCA Method A Cleanup Level	**2,000**	**2,000**	**0.03**	**7**	**6**	**9**

Results in **Bold** indicate a result above the MTCA Method cleanup level.

Laboratory analysis identified the following sample locations with a detectable concentration of diesel range hydrocarbons:

- R19W-102120-10.7.5 at 7.5 feet bgs with 34.2 milligrams of analyte per kilogram of soil (mg/Kg)
- R19W-102220-15.3 at 3 feet bgs with 50 mg/Kg

Both samples with detectable diesel concentrations are below the MTCA Method A cleanup level. All other constituents including heavy oil and BTEX were non-detect for all samples collected.

Three of the samples reported with non-detect concentrations of benzene had analytical reporting limits slightly above the MTCA Method A cleanup level. Based on site use, the previous waste characterization sampling completed at the site, and consistency with other samples collected during site remediation, benzene has not been identified as a constituent of concern

The following data qualifiers were noted in the laboratory results:

- MDL – Analyte reported to Method Detection Limit (MDL) (WO#2010388)

The MDL qualifier indicates the analyte was reported to the MDL as opposed to the reporting limit in order to verify non-detect concentrations of BTEX were below MTCA Method A cleanup levels.

A review of these data qualifiers indicate that laboratory QA/QC are satisfactory and should not affect project data or objectives.

7.0 Soil Treatment

Columbia Asphalt completed a total of 50.5 trips during remedial activities on October 19 through October 22, 2020. A total of 1,425.12 tons of PCS was delivered to DTG Recycle facility in Yakima, Washington for treatment by land farming.

- October 19, 2020 – 12 trips
- October 20, 2020 – 15 trips
- October 21, 2020 – 13 trips
- October 22, 2020 – 10.5 trips

See Appendix D for copies of weight tickets from DTG Recycle.

8.0 Discussion

The completed waste characterization event for the smudge pot storage area confirmed the presence of diesel fuel in site soils at 233,000 mg/Kg which is above the MTCA Method A cleanup levels for diesel range petroleum hydrocarbons of 2,000 mg/Kg.

During the remediation event from October 19 through October 22, 2020, Fulcrum collected 20 representative confirmation samples from excavation pit bottom and sidewalls of the former smudge pot storage area. Results for two of the samples reported diesel concentrations at 34.2 mg/Kg to 50 mg/Kg and below the MTCA Method A Cleanup level. All other samples collected from the excavation area were documented with non-detect concentrations for all constituents analyzed.

8.1 PAH Screening Analysis

Following analysis of final confirmation samples, Fulcrum requested additional analysis of two samples from the final excavation (R19W-102120-10.7.5 and R19W-102220-15.3) for carcinogenic PAHs to assess human health risk pursuant to WAC 173-340-708(8)(e). Results were reported under Fremont work order 2010350 and 2010388. See Appendix E for complete laboratory results.

All samples reported carcinogenic PAH concentrations below the method reporting limit. Using ½ the practical quantitation limit (PQL) for the samples, method reporting limits are confirmed to be low enough to provide a maximum total technical equivalent concentration (TTEC) of 0.030 mg/Kg, which is below the MTCA Method A cleanup level of 0.1 mg/Kg for carcinogenic PAHs in soil.

8.2 Terrestrial Ecological Evaluation

The Terrestrial Ecological Evaluation (TEE) process is required to be completed as a portion of cleanup action alternative review under MTCA. The intent of the TEE is to determine if site soil conditions subsequent to development of remedial alternative(s) may pose a threat to the terrestrial environment, including soil biota, plants, and wildlife. The TEE procedures are presented in WAC 173-340-7490 through 7494.

Under the simplified TEE in WAC 173-340-7492, evaluation may be ended where residual concentrations are below threshold values in WAC 173-340-900, Table 749-2. Final confirmation sample results identified detectable concentration of diesel at a maximum concentration of 50.0 mg/Kg and below the Table 749-2 threshold value of 460 mg/Kg for unrestricted land use. Based on the final confirmation sample results, no further TEE is warranted.

9.0 Conclusions

In October 2020 Fulcrum performed waste characterization and soil remediation excavation services associated with a former smudge pot storage area located at Ranch 19 West located in Yakima County, Washington. The smudge pot storage area was impacted by diesel as a result of handling and storing of smudge pots containing diesel fuel.

A total of 1425.12 tons of soil was excavated from the former smudge pot storage location on the site. All excavated soils were transported to DTG Recycle for land farming.

Final post-remedial conditions were documented to meet Ecology regulatory criteria at the apparent smudge pot area and in Fulcrum's opinion no additional remediation is warranted associated with the Ranch 19 West area.

Fulcrum recommends that a copy of this remediation report be retained. A copy of this report should be provided to a prospective buyer or investor of this property.

10.0 Limitations

Fulcrum Environmental Consulting, Inc. has performed professional services in accordance with generally accepted professional consulting principles and practices. No other warranty, expressed or implies, is made. The conclusions and recommendations are based upon our field observations, field screening, and independent laboratory analysis. The scope of services for this project is limited to the investigation of one petroleum spill location associated with the site.

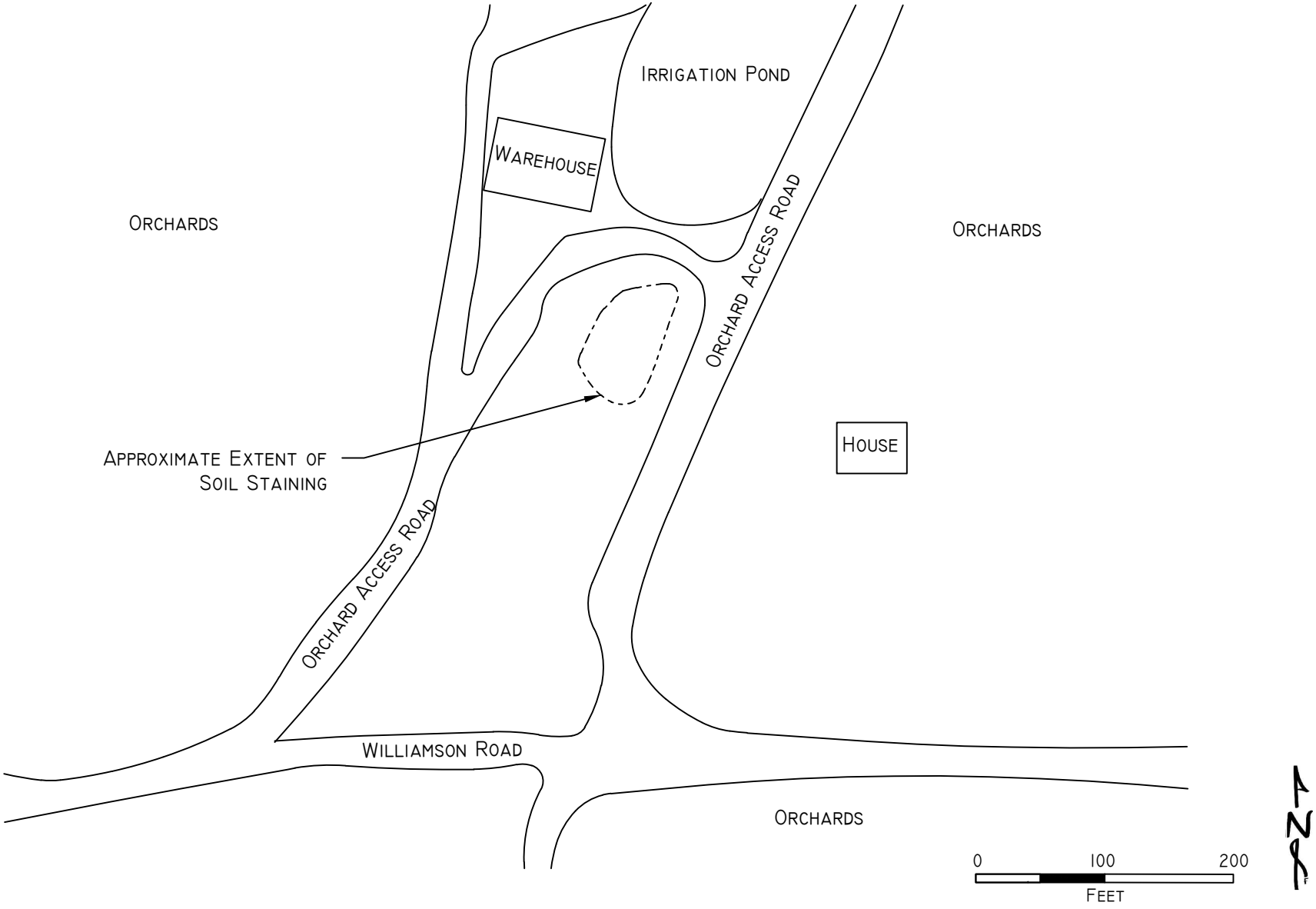
Fulcrum makes no warranties expressed or implied as to the accuracy or completeness of other's work included or referenced herein, nor the use of segregated portions of this report. This document does not imply that the property is free of other environmental concerns. This report is solely for the use and information of our client. Any reliance on this report by a third party is at that party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing at the time services were performed. Fulcrum Environmental Consulting, Inc. is not responsible for the impact of changes in environmental standards, practices, or regulations subsequent to the performance of services. Fulcrum Environmental Consulting, Inc. assumes no liability for conditions that were not included in our scope of services, or conditions not generally recognized as predictable when services were performed.

Figures

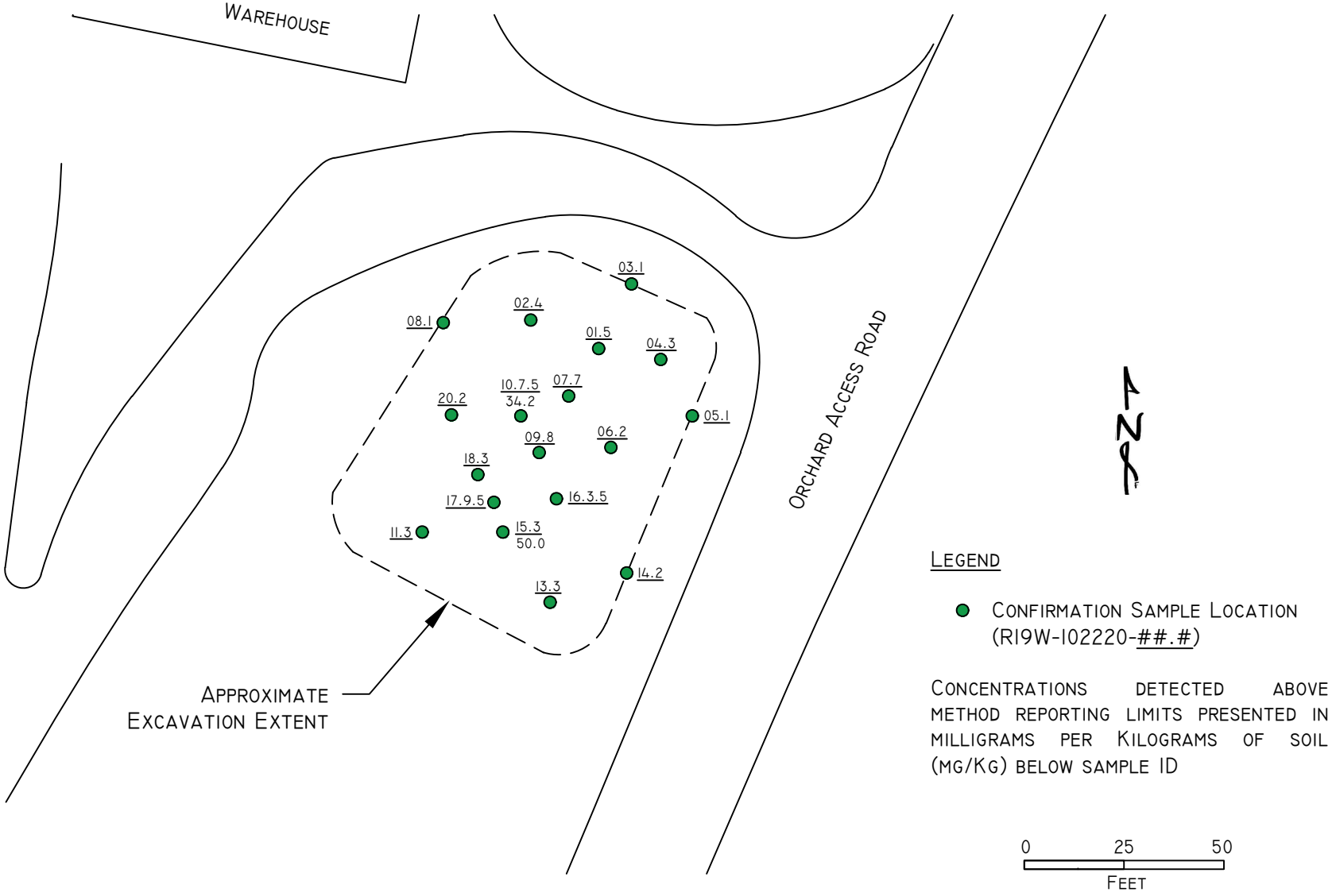
Fulcrum Environmental Consulting, Inc. 406 North Second Street, Yakima, Washington 98901 p: 509.574.0839 f: 509.575.8453 efulcrum.net Smudge Pot Remediation. 192902.15. KDA. 12/13/19	Ranch 19 West 441 Williamson Road Sunnyside, W	Site Location	FIGURE 1

FULCRUM environmental consulting



Fulcrum Environmental Consulting, Inc. 406 North Second Street, Yakima, Washington 98901 p: 509.574.0839 f: 509.575.8453 efulcrum.net Smudge Pot Remediation 192902.15. NLM. 12/17/20	Ranch 19 West 441 Williamson Road Sunnyside, Washington	Excavation Location	FIGURE 2

FULCRUM environmental consulting



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p: 509.574.0839 f: 509.575.8453 efulcrum.net
Smudge Pot Remediation. 192902.15. NLM. 12/17/20

Ranch 19 West
441 Williamson Road
Sunnyside, Washington

Sample Location Map

FIGURE
3

TOTAL HABITABLE AREA IS APPROXIMATELY 2.92 ACRES

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Smudge Pot Remediation. 192902.15. ALY. 1/5/21

Ranch 19 West
441 Williamson Road
Sunnyside, Washington

TEE Acreage Map

FIGURE
4

Appendix A

Professional Certifications

INSTITUTE OF HAZARDOUS MATERIALS MANAGEMENT

THIS CERTIFIES THAT

RYAN K. MATHEWS

HAS SUCCESSFULLY MET ALL THE REQUIREMENTS OF EDUCATION, EXPERIENCE AND EXAMINATION, AND IS HEREBY DESIGNATED A

CERTIFIED HAZARDOUS MATERIALS MANAGER
CHMM

January 31, 2007
DATE OF CERTIFICATION

14149
CREDENTIAL NUMBER

January 31, 2023
CERTIFICATION EXPIRES

EXECUTIVE DIRECTOR

VALID SO LONG AS THIS CREDENTIAL IS RENEWED ACCORDING TO SCHEDULE AND IS NOT OTHERWISE REVOKED.

ANSI Accredited Program PERSONNEL CERTIFICATION

Accredited by the American National Standards Institute and the Council of Engineering and Scientific Specialty Boards

STATE OF WASHINGTON

DEPARTMENT OF LICENSING – BUSINESS AND PROFESSIONS DIVISION

THIS CERTIFIES THAT THE PERSON OR BUSINESS NAMED BELOW IS AUTHORIZED AS A

GEOLOGIST
HYDROGEOLOGIST

JEREMY MATTHEW LYNN
1406 SUNSET DRIVE
PROSSER WA 99350

2914	12/05/2011	01/18/2019
License Number	Issued Date	Expiration Date

Pat Kohler

Pat Kohler, Director

PL-630-159 (R/3/16)

Appendix B

Remediation Work Plan

FULCRUM
environmental consulting

Remediation Work Plan
Smudge Pot Storage Area

Ranch 19
441 Williamson Road
Sunnyside, Washington

Project Number: 1992902.15

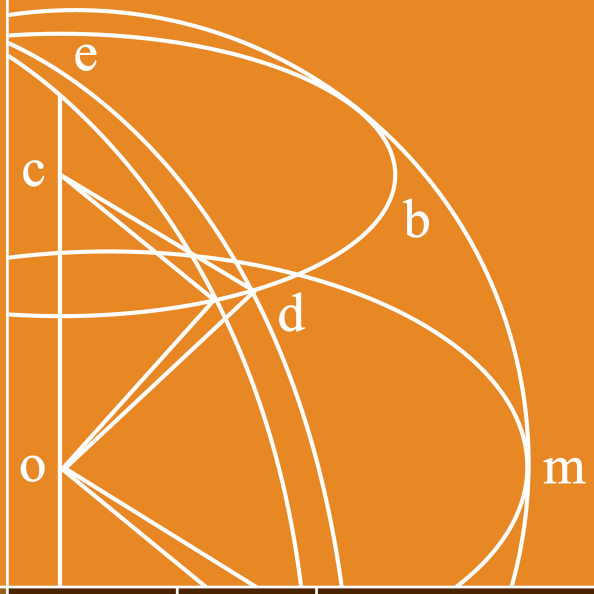
December 17, 2019

Prepared for:

WA LAND MGMT, LLC
c/o: Guy Kisling
22605 Southeast 56th Street #200
Issaquah, Washington 98029

Prepared by:

Fulcrum Environmental Consulting, Inc.
406 North 2nd Street
Yakima, Washington 98901



experience | balance | commitment

Report Title: Remediation Work Plan, Smudge Pot Storage Area

Project Number: 192902.15

Date: December 17, 2019

Site: Ranch 19, 441 Williamson Road
Sunnyside, Washington
GPS coordinates 19W: 46.390524, -120.012625 / 19E: 46.403126, -120.000132

Prepared for: WA LAND MGMT, LLC
c/o: Guy Kisling
22605 Southeast 56th Street #200
Issaquah, Washington 98029

Prepared by: Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901
509.574.0839

The professionals who completed site services, prepared, and reviewed this report include but are not limited to:

Authored by:  **Date:** 12.17.19

Nicole McPhee, Environmental Technician
Fulcrum Environmental Consulting, Inc.

Reviewed by:  **Date:** 12.17.19

Ryan K. Mathews, CIH, CHMM, Principal
Fulcrum Environmental Consulting, Inc.

Report Integrity:

Fulcrum Environmental Consulting, Inc.'s scope of service for this project was limited to those services as established in the proposal, contract, verbal direction, and/or agreement. This report is subject to applicable federal, state, and local regulations governing project-specific conditions and was performed using recognized procedures and standards of the industry. Scientific data collected in situ may document conditions that may be specific to the time and day of service, and subject to change as a result of conditions beyond Fulcrum's control or knowledge. Fulcrum makes no warranties, expressed or implied as to the accuracy or completeness of other's work included herein. Fulcrum has performed these services in accordance with generally accepted environmental science standards of care at the time of the inspection. No warranty, expressed or implied, is made.

TABLE OF CONTENTS

SECTION PAGE

TABLES

FIGURES

APPENDICES

1.0 Introduction

This Remediation Work Plan has been prepared on behalf of WA LAND MGMT, LLC by Fulcrum Environmental Consulting, Inc. (Fulcrum) to describe the remediation activities that will be conducted at Ranch 19, located at 441 Williamson Road, Sunnyside, WA. See Figure 1 for general site location.

The property is operated as irrigated permanent plantings of fruit trees. Property operated by WA LAND MGMT, LLC includes apples and soft fruits (peaches, apricots, etc.). Since first orchard use, smudge pots have been utilized as the primary frost protection system at the site. Typical of common regional practice, during off-season use in summer months, the smudge pots were removed from the field and stored at the site in a concentrated area(s).

During a Phase I Environmental Site Assessment (ESA) site walk performed on behalf of a prospective buyer, visibly stained soils were observed in the smudge pot storage area. The prospective buyer notified WA LAND MGMT, LLC and requested additional investigation and remediation if necessary.

Fulcrum completed limited Phase II investigation activities at the site to evaluate constituents of concern (COC); and to approximate extents of impact and soil volumes. Applicable results of the Phase II investigation are summarized in Section 3.

The intent is that all project activities were completed as provided in The Model Toxics Control Act (MTCA), Washington Administrative Code (WAC) 173-340. In our professional opinion, the use of the independent remediation process is appropriate given the current understanding of site conditions.

1.1 Purpose

The purpose of the work plan is to complete an independent remediation of site soils as provided under WAC 173-340-515. During this work, Fulcrum intends to consider all appropriate remedial strategies in accordance with the MTCA including engagement of Ecology under the Voluntary Cleanup Program and/or proceeding as an independent remedial action. These strategies may include calculating alternate cleanup levels under WAC 173-340-700 for petroleum hydrocarbons; completing a risk-based evaluation; using of monitored natural attenuation (MNA); applying institutional and engineering controls with a restrictive covenant; etc., or a combination of these methods.

1.2 Project Parties

This project is a coordination of the efforts of WA LAND MGMT, LLC, Fulcrum, and selected contractors. Fulcrum will lead remediation activities. Table 1 lists the people involved in this project, their respective organization, and their role.

Table 1: Organization of Project Staff and Responsibilities

Person/Agency or Firm	Role/Responsibility
Brett Calhoun, General Manager WA LAND MGMT, LLC Brett.Calhoun@pridepacking.com, 509.728.2772	Site General Manager: Responsible for assisting with site access.
Frank Winslow, Site Manager Washington State Department of Ecology frank.winslow@ecy.wa.gov, 509.454.7886	Provides local regulatory review of investigation findings and review of project documentation.
Ryan K. Mathews, CIH, CHMM Fulcrum Environmental Consulting, Inc. RMathews@efulcrum.net, 509.574.0839	Fulcrum Principal: Responsible for reviewing and managing project charter and contracting.
Jeremy M. Lynn, LHG, PMP Fulcrum Environmental Consulting, Inc. Jeremy.Lynn@efulcrum.net, 509.405.2450	Reviews the project scope, budget, and tracks progress. Provides supervision of onsite investigation activities and review of project geologic and hydrogeologic evaluation and documentation. All project documentation will be stamped by a Washington State Licensed Hydrogeologist.
Kyle Ames, GIT Fulcrum Environmental Consulting, Inc. Jeremy.Lynn@efulcrum.net, 509.574.0839	Assist with the site remediation and completes soil sampling under the direction of Fulcrum's Licensed Hydrogeologist.
Ashley Yellick, GIT Fulcrum Environmental Consulting, Inc. Jeremy.Lynn@efulcrum.net, 509.574.0839	Assist with the site remediation and completes soil sampling under the direction of Fulcrum's Licensed Hydrogeologist.
Mike Ridgeway Fremont Analytical, Inc. mridgeway@fremontanalytical.com; 206.352.3790	Project Laboratory: Responsible for completion of work tasks, including laboratory analysis, sample container provision, laboratory QA/QC, and review of project laboratory analysis.
Chris Smith Spokane Environmental Solutions, Inc. chris@spokaneenvironmental.com; 509.999.3600	Remedial Excavation Contractor Principal: Responsible for completion of excavation and soil transport activities.

1.3 Work Plan Organization

In addition to this Introduction, the Work Plan includes the following sections:

- Section 2: Site Description – describes the location, physical setting, and operational history at the Site.
- Section 3: Prior Investigation – summarizes the scope and results from previous environmental investigations that have been conducted at the Site in chronological order and describes the current

understanding of environmental site conditions based on the previous investigations and the operational history of the Site.

- Section 4: Remedial Objectives – describes the objectives of the soil remediation work.
- Section 5: Remediation Activities – provides a narrative of the work tasks that will be completed to accomplish soil removal.
- Section 6: Reporting and Schedule – describes the investigation report that will be prepared per MTCA requirements and the schedule for completion of significant investigation tasks.
- Section 7: References – provides a list of references cited in the Work Plan.
- Several appendices are included to provide information supporting the scope of the Work Plan.

1.4 Pertinent Regulations and Approach

In March of 1989, the Model Toxics Control Act (MTCA) went into effect in Washington State. The MTCA regulations set standards to ensure quality of cleanup and protection of human health and the environment. A major portion of the MTCA regulation (completed in 1991) was the development of numerical cleanup standards and requirements for cleanup actions. Three options were established under MTCA for site-specific cleanup levels: Method A, B and C. Method A defines cleanup levels for 25 of the most common hazardous substances found at sites. Method B levels are set using a site risk assessment, which enables consideration of site-specific characteristics. Method C is similar to Method B, however, the individual substance's cancer risk portion of the assessment is set at 1 in 100,000 rather than 1 in 1,000,000.

Ecology's MTCA Method A cleanup tables were developed to provide conservative cleanup levels for sites undergoing routine cleanup actions or those sites with relatively few hazardous substances. Method A cleanup levels are specifically designated as appropriate for residential facilities and are appropriate for a conservative approach at school, public and commercial sites. Therefore, Fulcrum has determined that Ecology's MTCA Method A cleanup levels will be used as site screening levels (SSLs) during the investigation. However, use of Method A levels does not limit the use of site-specific Method B levels in future remediation design or implementation. Where MTCA Method A cleanup levels are not provided, Fulcrum will utilize Method B levels as the SSL.

1.5 Wetlands Evaluation

Prior to initiation of remedial excavation, the site will be evaluated for the presence of wetlands. Evaluation will be completed using the following guidance criteria:

- US Army Corps of Engineers – Wetland Delineation Manual, January 1987.
- US Army Corps of Engineers – Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), September 2008.
- Eastern Washington Wetland Rating System, January 2015.

Should wetlands be identified, a wetlands mitigation plan will be completed under separate and appended to this remediation work plan.

1.6 SEPA Review

Due to projected remedial soil volume exceeding 500 cubic yards, review of proposed excavation will be completed under State Environmental Policy Act (SEPA) checklists, and if applicable public comment, prior to initializing excavation activities. The SEPA documentation will be completed under separate cover and is not included within this remediation.

2.0 Site Description

Ranch 19 site is located at 441 Williamson Road, in Sunnyside, WA and is located on Yakima County Assessor tax parcel 191321-24002.

2.1 Physical Setting

The physical setting of the Site in terms of climate, topography, regional geology, regional hydrogeology, and surface water is described in the following paragraphs.

2.1.1 Climate

The climate is semi-arid with cool winters and hot/dry summers. The average daily maximum temperature at the Site ranges from 36 to 88 degrees Fahrenheit and the average annual precipitation is 8.4 inches (NOAA, 2016).

2.1.2 Topography

Site topography is generally level and varies with an elevation of about 1225 feet above sea level.

2.1.3 Regional Geology

The Site is located in the Yakima Valley. The regional geology consists of Miocene basalt flows of the Columbian River Basalt Group overlain by the Ellensburg Formation, which is overlain by mostly Holocene alluvial deposits resulting from the adjacent Yakima River. Geologic information for the Site comes from the *Geologic Map of the Yakima Quadrangle, Washington* (Bentley, 1983) and the logs from nearby wells.

2.1.4 Regional Hydrogeology

The hydrogeologic units of the Yakima region can be split into the following two categories (Vaccaro, et al., 2009):

- Basin-Fill Units (including unconsolidated alluvial deposits and semi-consolidated to consolidated units of the Ellensburg Formation)
- Columbia River Basalt Group and interbedded units

The lithology and hydraulic characteristics of the basin-fill units are diverse and groundwater levels generally follow land surface contours. Groundwater generally flows towards the Yakima River in the shallow basin-fill units at the Site. The flow in the deeper units is controlled primarily by characteristics of the unit itself and the overlying units. Flowing artesian conditions exist in the Yakima basin where groundwater is present under confined conditions, described as "aerially extensive productive artesian zones."

2.1.5 Groundwater

A limited review of well logs on Washington State Department of Ecology Well Log Report indicates the first groundwater bearing zone is estimated to be present within the upper 50-feet but production wells are likely to be in excess of 300-feet.

2.2 Land Use

The current land use of Ranch 19 is designated by Yakima County as "agricultural". Presently the site is operated as irrigated permanent plantings of apples or soft fruits (including apricots, peaches, etc.).

3.0 Previously Completed Investigations

An initial investigation completed in September 2019 identified the following constituents of concern:

Table 2: Waste Characterization Sample Results – Ranch 19E & 19W

Analyte	Result (mg/Kg)		MTCA Method A CUL	Exceeds MTCA Method A CUL	Dangerous Waste Level (mg/L)	Exceeds Dangerous Waste Level
Total PCBs [1]	<0.101	<0.100	10[2]	No	-	-
Diesel	**86,000**	**233,000**	2,000	Yes	-	-
Heavy Oil	<503	<50.4	2,000	No	-	-
Polyaromatic Hydrocarbons						
Benzo[a]pyrene	<0.402	0.267	2.0[2]	No	-	-
Benz[a]anthracene	0.234	<0.385	NA	NA	-	-
Benzo[b]fluoranthene	0.356	0.628	NA	NA	-	-
Benzo[k]fluoranthene	0.292	0.491	NA	NA	-	-
Chrysene	0.762	1.27	NA	NA	-	-
Dibenz[a,h]anthracene	0.076	0.096	NA	NA	-	-
Indeno[1,2,3-cd]pyrene	0.225	0.541	NA	NA	-	-
PAH TTEC (Per WAC 173-340-708)	*0.1259*	*0.4553*	*2.0*[2]	*No*	-	-
Pyrene	8.19	12.9	2,400	No	-	-
Benzo[g,h,i]perylene	0.177	0.556	NA	NA	-	-
Total PAH [Percentage Per WAC 173-303-100(6)]	*0.107 %*	*0.171%*	-	-	*1%*	*No*
Semi-Volatile Organic Compounds						
Naphthalene	0.081	0.443	5	No	-	-
2-Methylnaphthalene	0.148	1.32	320[3]	No	-	-
1-Methynaphthalene	0.091	0.879	340[3]	No	-	-
Volatile Organic Compounds						
Halogenated/Chlorinated VOCs [1]	-	-	-	-	-	-
Benzene	<0.020	<0.021	0.03	No	0.5	No
Toluene	0.027	0.085	7	No	-	-
Ethylbenzene	<0.025	0.048	6	No	-	-
Total Xylenes	0.064	0.202	9	No	-	-
n-Propylbenzene	-	0.045	8,000[3]	No	-	-
sec-Butylbenzene	-	0.080	8,000[3]	No	-	-
1,2,4-Trimethylbenzene	0.040	0.152	800[3]	No	-	-
Naphthalene	-	0.199	5	No	-	-
Metals						
Mercury	<0.245	<0.250	2	No	0.2	No
Arsenic	3.07	2.41	20	No	5	No
Cadmium	0.281	*0.416*	2	No	1	No
Total Chromium	10.3	9.85	19 / 2,000[4]	No	5	No
Lead	8.63	16.1	250	No	5	No

All results, method reporting limits, and cleanup levels are presented in mg/Kg. Dangerous waste threshold values where published in WAC 173-303-090(8) are presented in milligrams per liter.

Results in **Bold** indicate a result above the MTCA Method cleanup level.

[1] The individual chemical constituents were not detected above the method reporting limit (MRL)

[2] Industrial MTCA Method A cleanup level

[3] Select constituents have established MTCA Method A cleanup level. When a MTCA Method A cleanup level is not available, the MTCA Method B Standard Value is utilized for evaluation.

[4] The MTCA Method A cleanup level for Chromium (III) is 2,000 mg/Kg and for Chromium (VI) is 19 mg/Kg

Depth of soil impact based on test pits completed during the initial investigation identified the following conditions:

- Ranch 19E – approximately 515 tons of soil estimated to be removed
- Ranch 19W – approximately 1,537 tons of soil estimated to be removed

Based on results of the initial investigation, groundwater is not anticipated to be encountered during remediation excavation. If groundwater is encountered, additional evaluation may be needed to meet MTCA regulatory requirements and applicable amendments to this remediation work plan will be required.

4.0 Remedial Objectives

4.1 Remedial Action Objectives

Remedial Action Objectives are narrative goals for a cleanup action that address how the cleanup fits into the overall MTCA cleanup process. The following Remedial Action Objectives have been identified for the primary contaminants found at the Site:

1. Petroleum contaminated soils (diesel range petroleum hydrocarbons) will be addressed to achieve MTCA Method A cleanup levels in accordance with MTCA, including engagement of Ecology under the Voluntary Cleanup Program and/or proceeding as an independent remedial action through use of remedial strategies that may include calculating alternate cleanup levels under WAC 173-340-700 for petroleum hydrocarbons; completing a risk-based evaluation; using of monitored natural attenuation (MNA); applying institutional and engineering controls with a restrictive covenant; etc., or a combination of these methods.

Guidance associated with remedial action evaluation is presented in WAC 173-340-360.

4.2 Basis for the Selected Remedy

The selected remedy also meets the other requirements for selection under WAC 173-340-360(2)(b), which include the following:

1. Using Permanent Solutions to the Maximum Extent Practicable. Excavation and offsite treatment or disposal is a permanent solution. Use of treatment technologies such as incineration for the full extent of impacted soil is not a permanent solutions to the maximum extent practicable because their costs are substantially disproportionate to their benefits compared to other options.

2. Providing for a Reasonable Restoration Time Frame. Cleanup goals will be achieved at the Site following excavation of accessible soils. Where soils cannot be fully excavated, the remedial solution is required to have reasonable restoration time frame. MTCA does not provide a definition for "reasonable restoration time frame" and this approach is best considered in evaluation with the toxicity, mobility, and accessibly of the contamination.

3. Considering Public Concerns. The public review process is not required for independently completed projects.

If in-place management of impacted soils is appropriate it must meet the following minimum requirement for selection of a cleanup action under WAC 173-340-360(2)(a):

1. Protect Human Health and the Environment. The selected remedy will protect human health and the environment in the short-term and long-term by removing discrete areas of localized soil contamination and preventing exposure to impacted soil via consolidation of such soil beneath impermeable concrete or asphalt structures.

2. Comply with Cleanup Standards. The selected remedy will comply with cleanup levels for soil.

3. Comply with Applicable State and Federal Laws. The selected remedy is expected to comply with applicable state and federal laws.

4. Provide Compliance Monitoring. If contamination remains, a compliance monitoring program will be required.

The Remediation Work Plan takes into consideration identified contaminants, project construction scope, regulatory guidance, and remediation objectives.

5.0 Remediation Activities

5.1 General Steps

Remedial activities will be performed in accordance with MTCA. Excavation extent will be determined based on the conditions encountered in the field and will be guided by field screening, including color, odor, sheen, and headspace volatile organic compounds (VOCs) measured with a photoionization detector (PID). The excavation extents, primarily the depth, will be informed by the initial investigation completed in September 2019.

Safety measures will be implemented at each property, as follows:

- Controlling traffic as needed during earthwork activities.
- Protecting the excavations on a daily basis, if the area is not backfilled immediately or a gentle slope (typically less than 1 to 4) cannot be achieved.
- Placing high-visibility fencing around each excavation area to provide a visual warning for the public, personnel, and/or trespassers, until the area is ready to be backfilled.
- Using warning tape or other barriers at the site during earthwork activities.

Only if the excavation exceeds 3-feet will backfill be placed. If PCS remains at the location, a landscaping geotextile fabric shall be placed prior to placement of clean backfill.

All excavated soils will be delivered to Anderson's Rock & Demolition Pits and PCS Facility for treatment. If debris or large rock are encountered and reasonably separable, these materials may be retained onsite or disposed as solid waste.

Given the fall conditions and generally moist soil conditions, dust abatement is not anticipated to be needed. However, if conditions occur and dust abatement is needed only the water needed to accomplish dust abatement will be used as wet soils are more difficult to excavate and transport and impair the use of field screening techniques.

If trucks cannot be placed in close proximity to the excavation area plastic sheeting or tarps will be placed under trucks during the loading activities.

5.2 Field Records

A record of all field work shall be kept on the field form included in Appendix A and in the field geologist log book. The field forms and log book shall be reviewed by the supervision Geologist on a daily basis.

5.3 Field Screening

All sample locations will be screened in the field using the following methods:

- Visual indicators of staining
- Odor
- Sheen test
- Photo-ionization detector (PID)

5.4 Confirmation Soil Sampling

Final discrete soil samples will be collected from the specific location that based on field screening suggests the highest potential for COCs. The confirmation sampling will be collected based on the following field criteria:

5.4.1 Pit Bottom Samples

- A minimum of 3 samples will be collected from the pit bottom from the excavation
- Where the total area of the excavation exceeds 500 square feet, then 1 additional pit bottom sample will be collected for every 1,000 additional square feet

5.4.2 Sidewall Samples

- Where the excavation depth exceed 3 feet below ground surface, a minimum of four sidewall samples will be collected
- Sidewall samples will be collected at a frequency of one sample per 50 linear feet of excavation sidewall

Sample labeling scheme shall consist of the following:

Ranch Number – Date – Unique Sample Number – Depth of Sample (e.g. R44 – 010120 – 01.01)

Sample locations within the established parameters above, will additionally use field indicators of impact to select sample locations with the greatest potential for residual impact. Soil samples at depths of up to 3-feet below ground surface where a safely accessed excavation is present shall be collected directly from the desired sample location. Where the sampling depth exceeds 3-feet, the soil sample shall be collected from the relatively undisturbed soil between the teeth of the excavator bucket.

Confirmation soil samples will be collected and analyzed by the following methodologies:

- Diesel and Heavy Oil by NWTPH-DxExt
- Benzene, Toluene, Ethylbenzene and Xylenes by Environmental Protection Agency (EPA) Method 8260C

All laboratory analysis shall be performed to demonstrate that the COCs are not present above the respective cleanup level.

5.4 Evaluation of Laboratory Results

Upon receipt of laboratory results review laboratory and method performance as provided in the QAPP.

6.0 Risk Screening Evaluation

This section describes the screening level risk assessment that will be conducted for the Site as part of the Remediation Work Plan if all PCS cannot be excavated. Sample locations or areas that do not meet MTCA cleanup levels will be described on tables and maps.

6.1 Potential Human Health Impacts

Data collected at the Site will be screened using Method A cleanup levels and standard Method B default values as developed by Ecology pursuant to Washington's MTCA Act (part VII of chapter 70.105D RCW) and released to stakeholders through the Cleanup Levels and Risk Calculation (CLARC) web site to determine whether concentrations of hazardous substances warrant further consideration with regard to potential human health impacts. Standard Method B cleanup levels will be adjusted for additive health effects associated with multiple hazardous substances and pathways of exposure in accordance with WAC 173-340-708. Locations that meet Method A or Method B cleanup levels may generally be used without future use restrictions on the property due to residual levels of contamination.

As described in WAC 173-340-700(6)(d), practical quantitation limits (PQLs) will also be considered during the screening level human health risk assessment. PQLs and Site screening levels that will be used

in the Work Plan are described in the QAPP in Appendix B. The importance of using laboratory methods that will provide PQLs at or below Site screening levels is acknowledged.

6.2 Potential Ecological Impacts

Potential ecological impacts will be evaluated by following the requirements for a terrestrial ecological evaluation (TEE) set forth in WAC 173-340-7491 through WAC 173-340-7493 to determine whether concentrations of hazardous substances warrant further consideration with regard to terrestrial receptors (including soil biota, plants, and wildlife), Site conditions identified through the Work Plan will be evaluated to determine whether the Site meets any of the no further evaluation criteria for a TEE in WAC 173-340-7491(1). The four no further evaluation criteria are:

- All soil contaminated with hazardous substances is, or will be, located below the point of compliance.
- All soil contaminated with hazardous substances is, or will be, covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed to the soil contamination.
- There is less than 1.5 acres of contiguous undeveloped land on the Site or within 500 feet of the Site contaminated with hazardous substances and there is less than ¼ acre of contiguous undeveloped land on or within 500 feet of the Site affected by specific hazardous substances known to pose ecological concern.
- Concentrations of hazardous substances in soil do not exceed natural background levels.

The results of this evaluation will be documented in the Investigation Report. It is acknowledged that the no further evaluation criteria are dependent on institutional controls and/or completion dates for future development that are acceptable to Ecology.

If an exclusion from a TEE cannot be documented, then Site conditions will be evaluated to determine whether the Site meets any of the criteria for a site-specific TEE as set forth in WAC 173-340-7491. In summary, the site-specific TEE criteria are:

- The site is located on, or directly adjacent to, an area where management or land use plans will maintain or restore native or semi-native vegetation.
- The site is used by a threatened or endangered species.
- The area of contamination is located on a property that contains at least ten acres of native. vegetation within 500 feet of the contamination, not including vegetation beyond the property boundaries.
- Ecology determines that the site may present a risk to significant wildlife populations.

If none of these site-specific criteria apply to the Site, then a simplified TEE will be conducted as set forth in WAC 173-340-7492 and the results will be summarized in the remediation report. If one or more of these site-specific criteria apply to the Site, then a site-specific TEE will be conducted as set forth in WAC 173-340-7493 and the results will be summarized in the remediation report. WAC Table 749-3 will be used for initial screening purposes using the COCs used in the remediation report.

7.0 Reporting & Scheduling

Fulcrum anticipates completing proposed remediation activities as follows:

Table 3: Projected Schedule of Events

Projected Completion Date	Tasks
March 30, 2020	Submit public utility request
March 30, 2020	Submit request for soil treatment to Yakima Health District
April 1, 2020	Complete private utility locate
April 6 to April 17, 2020	Complete soil excavation
About 7 days following sample collection	Receive laboratory results
Before May 15, 2020	Issue Soil Remediation Report

The proposed timeline is dependent upon subcontractor availability and currently scheduled onsite activities. Approximately 2 weeks following completion of receipt and review of laboratory analysis, a draft report of the investigation findings will be issued by Fulcrum. The proposed timeline is additionally based on an anticipated 5-business day turn-around-time for receipt of sample analytical results following completion of onsite activities.

8.0 References

EPA Requirements for Quality Assurance Project Plans, EAP QA/R-5, EPA/240/B-01/003, U. S. Environmental Protection Agency, March 2001.

Guidance for Quality Assurance Project Plans, EAP QA/G-5, EPA/240/R-02/009, U. S. Environmental Protection Agency, December 2002.

Guidance for Data Quality Assessment – Practical Methods for Data Analysis, U.S. Environmental Protection Agency, EPA 600/R-96/084, EPA EZ/G9, QA97 Version, January 1998.

Guidance for Remediation of Petroleum Contaminated Sites, Washington State Department of Ecology, Publication 10-09-057, November 2010, revised June 2016.

Incremental Sampling Methodology, Interstate Technology & Regulatory Council, https://www.itrcweb.org/ism-1/, February 2012.

Model Toxics Control Act, Washington State Department of Ecology, Washington Administrative Code 173-340.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. Environmental Protection Agency, EPA SW-846.

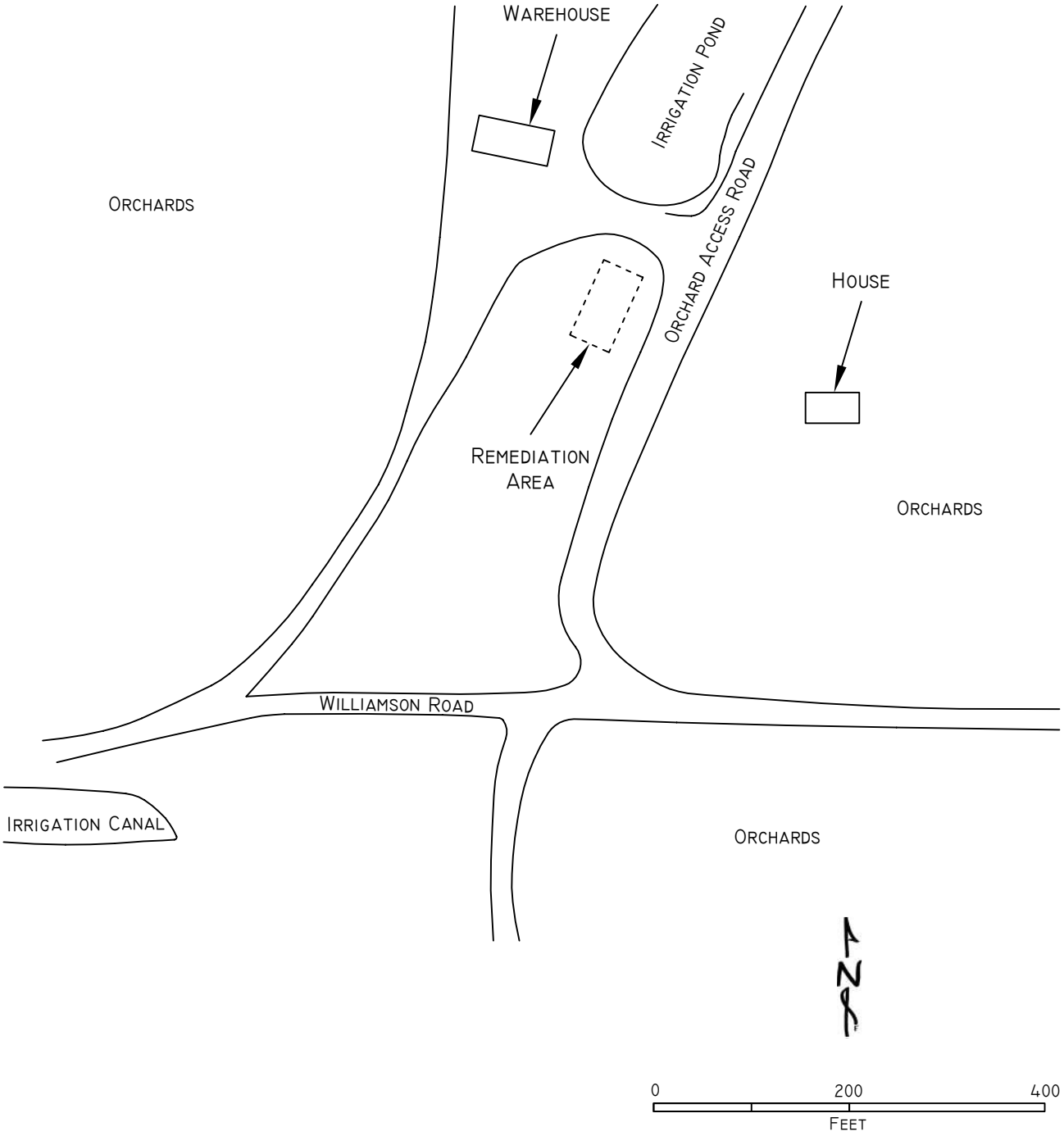
Figures

Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
Soil Remediation Ranch 19. 192902.15. KDA. 121319

Ranch 19
441 Williamson Road
Sunnyside, WA

Site Location

FIGURE
1

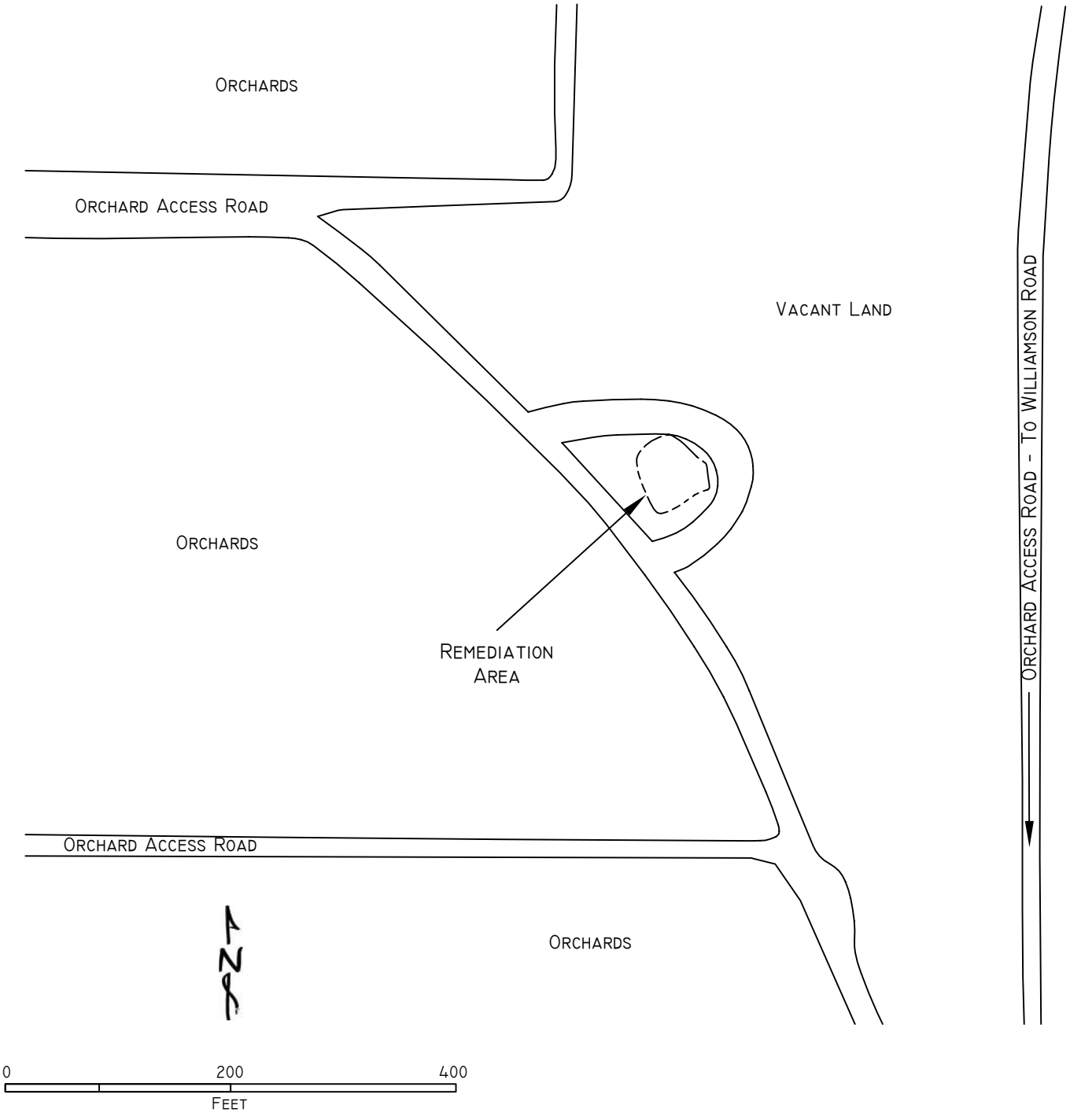


Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
Smudge Pot Work Plan. 192902.15. NLM. 12/17/19

Ranch 19 West
441 Williamson Road
Sunnyside, Washington

Site Location

FIGURE
2



Fulcrum Environmental Consulting, Inc. 406 North Second Street, Yakima, Washington 98901 p: 509.574.0839 f: 509.575.8453 efulcrum.net Smudge Pot Work Plan. 192902.15. NLM. 12/17/19	Ranch 19 East 441 Williamson Road Sunnyside, Washington	Site Location	FIGURE 3

Appendix A

Field Form

Ranch ____ Address _____ Field Lead:_____ Start Date/Time: _____ End Date/Time:_____

Table 1: Laboratory Results

Contaminant	Present (Y/N)
Diesel	
Heavy Oil	
Metals	
PAHs	

Table 2: PCS

Dimension (approx.)	Feet
Length	
Width	
Depth	

Estimated Volume of PCS: _____ Trucks or Trucks & Trailer: _____ Loads (Est.)

Truck No.	Driver	Left (time)	How Full	Returned (time)

Sample Plan

Collect pit bottom samples at 1 per 500-square feet

AND If depth is 3-ft or more collect sidewalls at rate of 1 per 50-linear feet of sidewall

AND *Duplicates at 10% of laboratory samples*

Container	Per Location	Planned For Ranch	Actual Collected
4-ounce jars			
40-ml voa vials			

Laboratory Analysis

- Diesel and heavy oil by NWPTH – Diesel Extended (Dx)
- BTEX by EPA Method 8260
- PAHs by EPA Method 8270 – PM selection following review Dx results

Notes:_____

1
2
3
4
5
6

1
2
3
4
5
6

Ranch ____ Address ____ Field Lead:________________________________ Start Date/Time: ______________ End Date/Time:_______________

Table 3: Field Screening and Samples Collected

Sample	Color	Odor	Sheen	VOCs (ppm)	Description	Soil Sample Y/N	Sample Number (R##-MMDDYY-##.Depth)	# of Jars	# of Voas	Duplicate Collected Here	Other

Appendix B

Project SAP / QAPP

Sampling & Analysis Plan
Quality Assurance Project Plan
Former Smudge Pot Storage Area Remediation

Ranch 19
441 Williamson Road
Sunnyside, Washington

Project Number: 192902.15

December 17, 2019

Prepared for:

WA LAND MGMT, LLC
c/o: Guy Kisling
22605 Southeast 56th Street #200
Issaquah, Washington 98029

Prepared by:

Fulcrum Environmental Consulting, Inc.
406 North 2nd Street
Yakima, Washington 98901

TABLE OF CONTENTS

TABLES

1.0 Data Quality Objectives

The primary goal of this project is to accurately define magnitudes and extents of impact of petroleum hydrocarbons and other constituents in site soils post-remedial excavation. To do this, samples collected must be representative of site soil conditions. Variations in the level of site soil impact can occur due to natural environmental heterogeneity or may be caused by the sampling and analytical procedures, or sample collection and handling methods.

For this project to succeed, the precision (random error) and bias (systematic error) of the sample results must be low to reveal variability in concentrations between samples. Standard procedures will be used when collecting and handling soil samples to minimize any bias caused by the sampling process.

The precision and bias routinely obtained by the project laboratory for the selected analytical methods will meet the measurements quality objectives (MQOs) for this project. Table 1 lists the MQOs for assessing project data quality. Recovery limits (RL) and method reporting limit (MRL) are a function of the analytical methodology, laboratory equipment and concentration of other analytes in the sample. For instance, a sample with an appropriate methodology, sensitive laboratory equipment and very low or non-detect concentrations of analytes will typically achieve an exceptionally low MRL, often more than an order of magnitude below the MTCA cleanup regulations as the selected regulatory cleanup values. However, the same sample with a mixture of similar analytes may result in interferences among like analytes or sample dilution may result in significantly higher MRLs. As such, MRLs on samples collected during an investigation are likely to vary in RL and MRL.

These MQOs are based on adequacy and completeness of field sampling and performance characteristics of measurements done by the project laboratory.

Table 1: Laboratory Analyte MQOs for Soil Analysis

Analyte	Reporting Limit (mg/Kg)	LCS % Recovery Limits		Duplicate % RPD Limits	MS / MSD % recovery limits	
Petroleum Range Hydrocarbons						
Diesel by NWTPH-DxExt	20	65	135	30	65	135
Heavy Oil by NWTPH-DxExt	50	NA	NA	NA	NA	NA
Volatile Organic Compounds by EPA Method 8260						
Benzene	0.02	64.3	133	30	63.5	133
Ethylbenzene	0.025	74	129	30	54.5	134
m,p-Xylene	0.05	70	124	30	53.1	132
o-Xylene	0.025	68.1	139	30	53.3	139
Toluene	0.02	67	144	30	63.4	132

mg/Kg milligrams per kilogram
LCS Laboratory Control Standard
RPD Relative Percent Difference
NA Not Applicable

Should additional analysis beyond those specified in Table 1 be required, all additional analysis will be completed within applicable MQOs as appropriate for the selected methodologies to meet both analysis method and regulatory requirements.

2.0 Sampling Procedures

Soil sampling procedures were selected based upon observed and anticipated field conditions. Sampling will be consistent with Environmental Protection Agency (EPA) protocols as set forth in the document titles, *Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies.* Additionally, all soil samples for volatile analysis will be collected per Ecology's *Technical Memorandum #5: Collecting and Preserving Soil Samples for VOC Analysis.* Specific analytes will be selected based on Ecology's published document titled, *Guidance for Remediation of Petroleum Contaminated Sites, Publication 10-09-057*, Revised June 2016.

The following is a summary of collection procedures anticipated for soil sampling and a summary of sample preparation for sample analysis and decontamination procedures.

2.1 Sampling Procedure for Soils

Soil samples collected from excavation extents will be obtained by direct collection from the desired location if accessible, otherwise collected from the excavator bucket. Samples will be collected at locations and elevations with the highest field indicators of impact during remedial excavation. All samples will be collected by hand using new nitrile gloves.

Samples will be collected into labeled, 4-ounce borosilicate sample jars. The number of sample containers at each location will be determined by sample location and analyses to be performed.

Each 40-milliliter vial sample utilized for EPA Method 8260 analysis will be collected using an impinger sampler to minimize loss of volatile organic compounds. Disposable, single-use impingers are utilized to collect a measured soil sample of undisturbed soil. Following each sample collection, the sample will be immediately placed into a new 40-milliliter glass vial with Teflon-lined lid. Consistent with Ecology guidance, sample preparation, including extraction by Methanol will be completed at the laboratory within 48-hours of sample collection. If laboratory provided methanol preserved sample vials are used, samples will be analyzed within 14-days of collection.

Field collected samples will be divided into two portions. The first portion will be placed in a clean, appropriately sized sample jar or vial and immediately placed on ice for laboratory analysis. The second portion of the sample will be placed in a re-closeable plastic bag for field screening.

Field screening will include observation, sheen analysis and/or headspace sampling. Observation refers to visual/olfactory observation of the sample for obvious indications of contamination. Sheen analysis involves dropping a small volume of sample into a container of clean water and observing any resulting sheen produced on the water surface. Headspace sampling is a measurement of the relative concentration

of volatile organic carbons (VOCs) in the soil sample headspace. For headspace sampling, the sample will remain in the sealed plastic bag for approximately 10 minutes in a warm area to promote volatilization. The probe of a photo-ionization detector (PID) will then be inserted into the bag and the highest response will be recorded for each sample. The intent of field screening for VOCs is limited to identification of presence of elevated concentrations only in order to assist with efficient selection of soil samples for laboratory analysis and is not intended to be utilized to document VOC concentrations, absence of impact or correlation of field screening data with laboratory analysis results.

Record of physical description of the soil including grain proportions, color, odor, location, condition, etc. will be completed in the field.

2.2 Sample Preparation for Various Analytical Methods

The following general procedures will be used during sample collection and preparation. Wear new disposable protective gloves during sampling activities. Preserve samples and adhere to holding times as described in Table 2 as required by the analytical method being requested. Check the sample lid to ensure cleanliness and that it is secured. Carefully label the sample container with the appropriate information. Use only waterproof ink to complete sample container labels. After label information has been completed, secure labels to the sample container by wrapping clear tape over the label and around the container. Transfer samples to a cooler. Preserve samples in the field on ice at 4° Celsius pending preparation for field analysis or shipping to the analytical laboratory.

At a minimum, the following information will be recorded in the field logbook:

1. Sample location designation
2. Sampling location condition and pertinent observations of surrounding area
3. Weather conditions
4. Manufacturer, model number and calibration results of meters/instruments used to measure field parameters
5. Soil color, grain size, and visual and olfactory indications of contamination
6. Soil sample interval/depth
7. Time of sample collection
8. Initials of samplers
9. Laboratory analysis to be performed
10. Any miscellaneous comments or observations

The following field information will additionally be included on the chain-of-custody forms:

1. Sample identification
2. Time of sample collection
3. Initials of samplers
4. Laboratory analysis to be performed
5. Any miscellaneous comments or observations

2.3 Decontamination

Every effort will be made to minimize the need for decontamination of sampling equipment through the use of dedicated sampling equipment (i.e. bowls, spoons, etc.): however, the use of non-dedicated sampling equipment (i.e., hand trowels, hand augers, split spoons, etc.) may be required in some locations. In these cases, the non-dedicated sampling equipment will be decontaminated prior to each use. Field equipment, that directly contacts samples or sample containers, will be decontaminated prior to use and between each sampling event. The following procedures will be used to prevent cross contamination of samples collected during this project.

Gross contamination will be removed by dry brushing or wiping the equipment with disposable toweling. Field equipment will then be washed in a solution of Alconox™, Liquinox™ or comparable non-hazardous laboratory detergent product and deionized water. Washed equipment will be double rinsed with deionized water. Rinsate will be discharged to the sample collection location. Field equipment will then be placed on clean aluminum foil or similar material.

All sample containers will be pre-cleaned as required by EPA guidance titled, *Test Methods for Evaluating Solid Waste* (SW-846); Standard Methods for the Examination of Water and Wastewater; and laboratory QA/QC protocol by the container manufacturer or selected analytical laboratory prior to shipping for sample collection. Sample containers will not be used for sample collection and storage without being certified clean by the manufacturer or analytical laboratory.

After the sample is collected and the container lids are tightly sealed, the exterior portion of the sample container will be cleaned. Care will be taken to ensure that sample labels remain legible during the exterior container cleaning.

2.4 Soil Sample Containers, Preservation, and Holding Time Requirements

Required sample containers, preservation methods, and holding times for the analytical parameters selected are summarized in Table 2. Analytical precision and accuracy are defined by the analytical test methodology and the project laboratory's QA/QC program. All analytical method accuracy, precision, and detection limits are within laboratory certification requirements and below the associated selected contaminant concentration cleanup values as established under MTCA Method A, or default Method B levels where Method A levels have not been established.

Table 2 presents the sample types, location, analytical parameters and methods, sample preservation, and specific requirements for sample container size and type for sample collected. Table 3 summarizes the number of QA/QC samples to be submitted according to method requirements.

Table 2: Soil Sample Type, Analytical Parameters, Preservation and Holding Times

Analytical Parameter and Method	Sample Preservation	Sample Containers, Other Comments	Maximum Holding Time
Diesel and Heavy Oil by NWTPH-DxExt	Cool to 4° C	4 oz. glass jar with Teflon lined lid	Preserve within 14 days, Analyze within 40 days
Volatile Organic Compounds by EPA Method 8260	Cool to 4° C	Two, 40-millimeter glass with septum lid	Preserve with 48-hours, Analyze within 14-days

Table 3: QA/QC Requirements for Soil Analysis

Analytical Parameter and Method	Total Field Samples[a] /Containers	QA/QC Sample Summary Analyses/Containers			
		Organic MS/MSD	Inorganic MS/MSD	Rinsate Blanks[b]	Trip Blanks
Diesel by NWTPH-Dx	# + d	2/2	NA	None	None
Volatile Organic Compounds by EPA Method 8260	# + d	1/1	NA	None	None

[a] Total number of field samples are estimated.

[b] Rinsate blanks only required for 1 in 20 samples per non-dedicated sampling device.

NA Not Applicable

d Duplicate Sample

One duplicate sample will be collected for each analytical methodology at the ranch.

2.5 Investigation Derived Wastes

Every effort will be made to minimize generation of investigation derived wastes (IDW) that cannot be disposed of as solid waste. All extra soil volume collected for a sample will remain at the sampling location. Disposable personal protective equipment and sampling equipment will double bagged in plastic garbage bags, labeled and disposed of at an approved solid waste facility.

2.6 Sample Handling and Custody Requirements

The project laboratory will provide sample containers for sample collection, and chain-of-custody forms. Each sample will be placed in the appropriate documented clean, laboratory provided container and sealed. Disposable nitrile gloves will be worn during the sampling process. Gloves will be changed between sample areas or if the gloves have been damaged in any manner. Sample documentation will be completed immediately following sample collection. The chain-of-custody forms will be filled out in ink and placed in a re-sealable plastic bag to avoid damage. Duplicates will be maintained in Fulcrum's files. The original will be sent to the analytical laboratory. The forms will include the date, site designation, sample designation, analysis required, turn-around-time, preservation and authorized signatures.

Each sample will have a unique identification number. The specific designation for sample codes is presented in Table 4 and is based on the date, sample location identification, sample matrix and consecutive sample number. At a minimum, label information will include:

1. Initials of the collector
2. Date and time of collection
3. Location
4. Sample number

A chain-of-custody record will be filled out and accompany each sample to document sample possession from collection through analytical reporting. A copy of this record will be maintained with analytical results and be included in subsequent data reporting.

Table 4: Sample Coding

Ranch Number	Sample Type	Consecutive Sample Number (assigned sequentially)	Sample Interval (depth in feet below ground surface)	Example
##	Date	01-20	0.01 (1-foot), .02 (2-feet), etc. bgs	R##-010120-01.01

Samples destined for analysis by an offsite laboratory will be cold transported in a cooler. Packaging and shipping of sample for analyses and storage will be per the following protocol:

1. Roughly 2 inches of cushioning material will be placed in the bottom of the cooler
2. Sample containers will be placed in the cooler in a manner to prevent breakage
3. Glass jars will be placed in re-sealable plastic bags and centered in the cooler to prevent breakage
4. Samples will be packaged with ice enclosed in re-sealable plastic bags or freeze packs ("blue ice")
5. QA/QC samples will be packaged with the samples that were collected that day
6. Free space in the cooler will be filled with cushioning material
7. Chain-of-custody paper work will be placed in plastic bags and placed inside the cooler
8. Cooler will be wrapped with strapping tape and signed custody seal(s) will be used to secure the cooler lid
9. Samples will be shipped by commercial carrier for next day delivery. However, samples will not be shipped on Fridays, weekends, or immediately preceding a holiday, due to next day delivery limitations
10. Use of separate coolers to protect more delicate sample containers, such as 40 milliliter vials, is encouraged

When delivery for a sample set is scheduled, the shipper will receive a copy of the shipping manifest/tracking number. The documentation will be placed in the project file.

Upon receipt of the shipping container, the laboratory will inspect the integrity of the shipping container seal. The cooler will be opened and the shipment checked against the chain-of-custody record. Any inconsistencies or problems with a sample shipment will be noted and resolved. Once at the laboratory, the samples will be tracked through the laboratory by internal custody procedures and the laboratory's QA/QC procedures will be followed.

2.7 Inspection/Acceptance Requirements for Supplies and Consumables

Upon receipt, all supplies and consumable will be inspected for damage, including the shipping carton, individual packages and product integrity. Any product that is cracked, leaking or otherwise damaged or whose individual package is torn or opened to the environment will be discarded or returned.

A certificate indicating the sample container lot and statement that they have been cleaned in accordance to applicable standards will accompany each carton of new sample containers. A statement of cleaning will also be provided for sample containers that have been pre-cleaned and pre-preserved by the laboratory.

All reasonable effort will be made to ensure all sampling supplies and consumable are acquired prior to initiating field activities.

The following is a minimum list of supplies and consumable that will be required to conduct soil sampling:

1. Field notebook
2. Disposable nitrile gloves
3. Sampling equipment for soils (Hydraulic-push sampler, hand coring sampler, plastic spoons and bowls, stainless steel shovel, color chart for soil and water)
4. Camera
5. Sample containers: 4-ounce borosilicate with Teflon lined lids and 40 milliliter glass vials with septum lids
6. Sample labels
7. Ice or "Blue Ice" reusable packages
8. Chain-of-custody forms
9. Decontamination equipment (buckets, spray bottles, brushes, soap, etc.)
10. Deionized water
11. Insulated shipping containers (coolers or ice chests)

3.0 Measurement Procedures

3.1 Data Acquisition Requirements (Non-direct Measurements)

Non-direct data measurements are those items that require a subjective assessment. Items such as weather, problems with sample collection, etc. will be logged in the field notebook.

3.2 Data Management

Field data will be recorded in the field notebooks by, or under the supervision of a licensed Geologist. Daily observation reports will be generated by Fulcrum and submitted for internal review. Laboratory analytical reports will be transmitted to Fulcrum electronically. The project laboratory will review and validate analytical data in accordance with their internal QA/QC program.

All field notebooks and the project laboratory's analytical data will be reviewed by Fulcrum to assure that all pertinent information is accounted for and is correlated. Fulcrum will complete review of sample collection and laboratory analytical data and summarize the information in a database or report format.

Hard copies of all field notebooks, chain-of-custody forms, analytical data, laboratory reports, assessment reports and all electronic databases will be maintained by Fulcrum until project completion. Support and backup data will be archived for 5 years beyond completion of the project.

4.0 Sample Quality Control Requirements

4.1 Field QC Requirements

Field quality control will be maintained through the use of standard operating procedures for sample collection, handling and documentation. Any problems occurring during the sample process will be recorded in the field notebook or field datasheets.

Duplicate samples will be collected as part of sampling activities. The number, type and handling of QA/QC samples are specified in Table 3 for soil samples.

Duplicate samples are used to check the precision of field collection or laboratory analyses and verifies repeatability of the sample data. Duplicates are collected at the same time as the sample. The duplicate sample will be collected by evenly splitting the collected sample such that the both sub-samples are comparable and representative of the single sample. Duplicate soil samples will be collected from a sample location that is believed to have elevated levels of a particular compound.

4.2 Laboratory QA/QC Requirements

The selected project laboratory will be appropriately Ecology and EPA certified to complete the selected analysis.

Laboratory quality control tests consist of method blanks, matrix spikes, as well as duplicate and check standards (laboratory control standards). Surrogate recoveries will also be included for the organic analyses. Surrogate recoveries will be used to judge the accuracy for analysis of similar target analytes. Analytical precision can be estimated from duplicate and check standards, duplicate sample analysis and duplicate spiked sample analyses. Analytical bias will be estimated from matrix spikes, matrix spike duplicates and check standards. Recoveries from check standards provide an estimate of bias due to calibration. Mean percent recoveries of spiked sample analyses provide an estimate of bias due to interference.

The laboratory staff will report results of quality control analyses in the same units as expressed for the MQOs. They will also conduct quality assurance review of all analytical data generated at the project laboratory prior to releasing the data to the project manager.

The laboratory will be responsible for following their established QA/QC procedures and those required by the analytical methods. The following minimum QA/QC procedures will apply:

1. Sample holding and preservation requirements will be in accordance with analytical method reference parameters
2. Instrument tuning and calibration will be performed as required by the analytical method and equipment manufacturer
3. Laboratory QA/QC samples (duplicates) will be analyzed at frequencies specified by EPA, Ecology, and analytical reference methods
4. The laboratory will review the data package for performance, quality, and completeness
5. The method detection limit for the parameter analyzed will be below regulatory guidance levels
6. All laboratory parameters (recoveries, spikes, duplicates, etc.) are within their stated limits

Laboratory instrumentation will meet applicable calibration requirements to ensure that the instrumentation is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable quantitative performance at the onset of analysis. Calibration during operation verifies acceptable performance of the instrument on a day-to-day basis. Tuning and instrument performance criteria will also be established, as appropriate, to ensure that instrument measurements may be interpreted correctly.

Laboratory calibration procedures are specified in the protocol for the specific analytical methods used. When there are no previously defined specifications, the calibration procedures will include:

- An initial and final three-point calibration before and after a run.
- A mid-range calibration after every tenth sample.

5.0 Data Management Procedures

At the completion of each sampling event, all field data and laboratory analytical data will be compiled and evaluated against the project MQOs.

Field methods and forms will be reviewed to ensure consistency. Field datasheets will be checked for missing or improbable measurements before leaving each site. Field data entered into spreadsheets or databases will be checked against the field datasheets for errors or omissions. Missing or unusual field parameter data will be omitted from the data set.

Field replicate variability will be evaluated by calculating the relative percent difference (RPD) for each duplicate set of samples and compared to the MQOs listed in Table 1.

Laboratory-generated data review and reporting will follow the procedures outlined in the laboratory's quality assurance program. Results will be checked for missing or questionable data. Individual data which fails to achieve QA/QC objectives will be flagged with appropriate qualifiers and their use restricted as

appropriate. A standard case narrative of laboratory QA/QC results will be issued by the laboratory for each sampling event.

If the data review and verification suggest significant problems with QA/QC for a sample event, the sample event or individual sample may be reanalyzed by the laboratory or resampled as necessary.

6.0 Audits and Reports

The project laboratory participates in performance and system audits of their routine procedures and is an environmental laboratory accredited by the Washington State Department of Ecology as of July 9, 2019. See the following link for accreditations associated with Fremont Analytical:

https://fortress.wa.gov/ecy/laboratorysearch/SearchLabName.aspx

Results of the laboratory's performance and system audits of their routine procedures are available from the laboratory on request.

7.0 Data Verification and Validation

As part of data review, field notes and data from the laboratory will be reviewed for errors and omissions and to ensure that data are correct, complete, meet investigation objectives, and are consistent. Other items that will be reviewed include:

- Results for quality control samples described in Quality Control section of this document accompany sample results
- Quality control results indicate that acceptance criteria were met
- Data qualifiers are properly assigned where necessary
- Data specified in the Sampling Design section above were obtained
- Methods and protocols specified in this QAPP were followed

After receiving the data package, Fulcrum will verify that the results have met the MQOs for bias, precision and accuracy. Precision will be estimated by calculating the RPD for the field duplicate results. Analytical bias is assumed to be within acceptable limits if laboratory quality control limits are met for blanks, matrix spikes and check standards. Overall accuracy will be assessed by comparing the measured result with the true value of the blind reference sample. If appropriate, sampling procedures, quality control steps or analytical procedures will be modified to address identified problems.

Once the data have been reviewed, verified and validated, the project manager will determine if the data can be used toward the project goals and objectives. A technical report will be prepared at the completion of all sampling and will include the following:

- Maps of the investigation area showing site features, soil and groundwater sample locations, water levels, groundwater flow direction, contaminant concentrations and distribution
- Description of field and laboratory methods
- Discussion of data quality and the significance of any problems encountered
- Summary tables of field and analytical data
- Discussion of water quality results. Significant or potentially significant findings
- Recommendations based on project goals if appropriate

8.0 References

D3370-18: Standard Practices for Sampling Water, ASTM Standards on Environmental Sampling, Designation: Pages 110-116, 2018.

EPA Requirements for Quality Assurance Project Plans, EAP QA/R-5, EPA/240/B-01/003, U. S. Environmental Protection Agency, March 2001.

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Guidance for Data Quality Assessment – Practical Methods for Data Analysis, U.S. Environmental Protection Agency, EPA 600/R-96/084, EPA EZ/G9, QA97 Version, January 1998.

Guidance for Remediation of Petroleum Contaminated Sites, Washington State Department of Ecology, Publication 10-09-057, November 2010, revised June 2016.

Model Toxics Control Act, Washington State Department of Ecology, Washington Administrative Code 173-340.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. Environmental Protection Agency, EPA SW-846.

Appendix C

Site Photographs

Looking northwest - northern portion of excavation. Average depth of approximately 1 to 20 feet bgs.

Looking south - excavation extent within embankment.

Looking northwest - excavation observed with localized areas in central portion excavated to approximately 4 to 9 feet bgs.

Looking north - final excavation extent.

Appendix D

Soil Treatment Receipts

JUN 2 9 2020

Yakima Health District
1210 Ahtanum Ridge Drive
Union Gap, Washington 98903
Phone (509) 575-4040

June 18, 2020

Mr. Jeremy Lynn
C\O Fulcrum Environmental Services
406 North 2nd Street
Yakima, WA 98901

RE: WA Land Management, Ranches 16 East, 19 East, 19 West, 36 and 47, Yakima County, WA : Petroleum Contaminated Soil

Mr. Jeremy Lynn,

This office has reviewed the data on the above mentioned project. The data submitted indicates that the contaminant which requires remediation is diesel. Based on the data submitted it has been determined that the soil may be processed as one batch at the Anderson PCS Facility provided that all handling is in accordance with the procedure that has been approved by this office and Washington State Department of Ecology. This letter is to notify you that currently the soil will be considered to be stored on the property and no treatment can begin until the total fee is paid. Waste material may be stored for up to 90 days. Anderson PCS Facility will notify me of the total number of tons delivered for treatment and I will bill you for the remainder of the fee at that time.

FEE ACCOUNT:	Fulcrum Environmental Services
PROJECT NAME: 19 East, 19 West, 36 and 47	WA Land Management, Ranches 16 East, Yakima County , WA
PRE-TREATMENT AUTHORIZATION:	(Based on time spent prior to soil delivery to the site at $141/hour)
TONNAGE FEE AT $0.60 PER TON:	To be determined after delivery
BALANCE OWED:	To be billed after delivery

If you have any questions regarding this letter, please contact me at (509) 249-6562.

Sincerely,

Ted Silvestri, RS
Environmental Health Specialist

cc: Anderson PCS Facility

DTG Enterprises Inc.

PO Box 14203
Mill Creek, WA 98082
425-549-3000

Invoice

Date	Invoice #
10/19/2020	130380

Bill To:

WA. LAND MGMT. LLC.
22605 SE 56TH Street
Suite 200
Issaquah,WA 98029

Please make checks payable to "DTG Enterprises Inc."

Terms	Due Date
Net 30	11/18/2020

E-mail

accounting@dtgrecycle.com

All Past Due Invoices Are Subject to Finance Charges & Late Fees Computed at 1.5% Per Month 18% Per Annum

Item	Date	Description	Quantity	Rate	Amount
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522798 / RANCH 19	18.85	30.00	565.50T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522799 / RANCH 19	25.62	30.00	768.60T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522809 / RANCH 19	27.56	30.00	826.80T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522820 / RANCH 19	30.53	30.00	915.90T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522832 / RANCH 19	28.1	30.00	843.00T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522810 / RANCH 19	25.8	30.00	774.00T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522837 / RANCH 19	34.26	30.00	1,027.80T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522844 / RANCH 19	35.37	30.00	1,061.10T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522854 / RANCH 19	33.66	30.00	1,009.80T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522846 / RANCH 19	35.92	30.00	1,077.60T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522874 / RANCH 19	32.67	30.00	980.10T
PCS - Petroleu...	10/19/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522871 / RANCH 19	23.9	30.00	717.00T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522968 / RANCH 19	23.85	30.00	715.50T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522969 / RANCH 19	28.82	30.00	864.60T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522957 / RANCH 19	30.85	30.00	925.50T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522935 / RANCH 19	31.01	30.00	930.30T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522931 / RANCH 19	29.95	30.00	898.50T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522927 / RANCH 19	25.25	30.00	757.50T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522906 / RANCH 19	28.55	30.00	856.50T

In September 2020, DTG produced enough renewable biomass fuel from recycled urban wood waste to power 2,149 homes for an entire year

Total

DTG Enterprises Inc.

PO Box 14203
Mill Creek, WA 98082
425-549-3000

Invoice

Date	Invoice #
10/19/2020	130380

Bill To:

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Item	Date	Description	Quantity	Rate	Amount
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522914 / RANCH 19	29.51	30.00	885.30T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522902 / RANCH 19	26.62	30.00	798.60T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522903 / RANCH 19	30.11	30.00	903.30T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522908 / RANCH 19	31.38	30.00	941.40T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522926 / RANCH 19	30.44	30.00	913.20T
PCS - Petroleu...	10/20/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522938 / RANCH 19	28.76	30.00	862.80T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523046 / RANCH 19	22.2	30.00	666.00T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523033 / RANCH 19	29.3	30.00	879.00T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523029 / RANCH 19	30.89	30.00	926.70T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523014 / RANCH 19	24.99	30.00	749.70T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523013 / RANCH 19	29.8	30.00	894.00T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522999 / RANCH 19	28.86	30.00	865.80T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#522998 / RANCH 19	27.64	30.00	829.20T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523056 / RANCH 19	28.3	30.00	849.00T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523067 / RANCH 19	28.03	30.00	840.90T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523044 / RANCH 19	31.48	30.00	944.40T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523069 / RANCH 19	26.34	30.00	790.20T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523080 / RANCH 19	31.04	30.00	931.20T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523083 / RANCH 19	24.68	30.00	740.40T

In September 2020, DTG produced enough renewable biomass fuel from recycled urban wood waste to power 2,149 homes for an entire year

Total

DTG Enterprises Inc.

PO Box 14203
Mill Creek, WA 98082
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Item	Date	Description	Quantity	Rate	Amount
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523043 / RANCH 19	30.06	30.00	901.80T
PCS - Petroleu...	10/21/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523009 / RANCH 19	29.54	30.00	886.20T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523124 / RANCH 19	28.45	30.00	853.50T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523123 / RANCH 19	28.93	30.00	867.90T
PCS - Petroleu...	10/22/2002	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523119 / RANCH 19	26.32	30.00	789.60T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523113 / RANCH 19	27.53	30.00	825.90T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523115 / RANCH 19	31.57	30.00	947.10T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523145 / RANCH 19	26.25	30.00	787.50T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523136 / RANCH 19	28.55	30.00	856.50T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523153 / RANCH 19	20.3	30.00	609.00T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523154 / RANCH 19	21.63	30.00	648.90T
PCS - Petroleu...	10/22/2020	Petroleum contaminated soil per ton or $1,500 minimum - TKT#523160	23.33	30.00	699.90T

In September 2020, DTG produced enough renewable biomass fuel from recycled urban wood waste to power 2,149 homes for an entire year

Total $46,807.10

10/22/20 with Quantity of 23.33 is equally split between West and East.

Appendix E

Laboratory Results

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Fulcrum Environmental
Jeremy Lynn
406 N. 2nd Street
Yakima, WA 98901

RE: Ranch 19 West
Work Order Number: 2010318

October 27, 2020

Attention Jeremy Lynn:

Fremont Analytical, Inc. received 3 sample(s) on 10/20/2020 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Sample Moisture (Percent Moisture)
Volatile Organic Compounds by EPA Method 8260D

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *10/27/2020*

CLIENT: Fulcrum Environmental
Project: Ranch 19 West
Work Order: 2010318

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2010318-001	R19W-101920-01.5	10/19/2020 11:25 AM	10/20/2020 9:15 AM
2010318-002	R19W-101920-02.4	10/19/2020 11:45 AM	10/20/2020 9:15 AM
2010318-003	R19W-101920-03.1	10/19/2020 12:05 PM	10/20/2020 9:15 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2010318**
Date: **10/27/2020**

CLIENT: Fulcrum Environmental
Project: Ranch 19 West

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2010318**
Date Reported: **10/27/2020**

Client: Fulcrum Environmental
Collection Date: 10/19/2020 11:25:00 AM
Project: Ranch 19 West
Lab ID: 2010318-001
Matrix: Soil
Client Sample ID: **R19W-101920-01.5**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	19.3		mg/Kg-dry	1	10/26/2020 7:03:05 PM
Heavy Oil	ND	48.2		mg/Kg-dry	1	10/26/2020 7:03:05 PM
Surr: 2-Fluorobiphenyl	101	50 - 150		%Rec	1	10/26/2020 7:03:05 PM
Surr: o-Terphenyl	87.7	50 - 150		%Rec	1	10/26/2020 7:03:05 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30121		Analyst: CR
Benzene	ND	0.0248		mg/Kg-dry	1	10/22/2020 7:29:03 PM
Toluene	ND	0.0248		mg/Kg-dry	1	10/22/2020 7:29:03 PM
Ethylbenzene	ND	0.0309		mg/Kg-dry	1	10/22/2020 7:29:03 PM
m,p-Xylene	ND	0.0619		mg/Kg-dry	1	10/22/2020 7:29:03 PM
o-Xylene	ND	0.0309		mg/Kg-dry	1	10/22/2020 7:29:03 PM
Surr: Dibromofluoromethane	97.7	85.2 - 113		%Rec	1	10/22/2020 7:29:03 PM
Surr: Toluene-d8	101	88.5 - 110		%Rec	1	10/22/2020 7:29:03 PM
Surr: 1-Bromo-4-fluorobenzene	100	88.6 - 109		%Rec	1	10/22/2020 7:29:03 PM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	12.5	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010318**
Date Reported: **10/27/2020**

Client: Fulcrum Environmental
Collection Date: 10/19/2020 11:45:00 AM
Project: Ranch 19 West
Lab ID: 2010318-002
Matrix: Soil
Client Sample ID: **R19W-101920-02.4**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	21.4		mg/Kg-dry	1	10/26/2020 7:32:40 PM
Heavy Oil	ND	53.5		mg/Kg-dry	1	10/26/2020 7:32:40 PM
Surr: 2-Fluorobiphenyl	99.7	50 - 150		%Rec	1	10/26/2020 7:32:40 PM
Surr: o-Terphenyl	87.9	50 - 150		%Rec	1	10/26/2020 7:32:40 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30121		Analyst: CR
Benzene	ND	0.0266		mg/Kg-dry	1	10/23/2020 5:02:25 AM
Toluene	ND	0.0266		mg/Kg-dry	1	10/23/2020 5:02:25 AM
Ethylbenzene	ND	0.0333		mg/Kg-dry	1	10/23/2020 5:02:25 AM
m,p-Xylene	ND	0.0666		mg/Kg-dry	1	10/23/2020 5:02:25 AM
o-Xylene	ND	0.0333		mg/Kg-dry	1	10/23/2020 5:02:25 AM
Surr: Dibromofluoromethane	102	85.2 - 113		%Rec	1	10/23/2020 5:02:25 AM
Surr: Toluene-d8	104	88.5 - 110		%Rec	1	10/23/2020 5:02:25 AM
Surr: 1-Bromo-4-fluorobenzene	100	88.6 - 109		%Rec	1	10/23/2020 5:02:25 AM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	13.0	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010318**
Date Reported: **10/27/2020**

Client: Fulcrum Environmental
Collection Date: 10/19/2020 12:05:00 PM
Project: Ranch 19 West
Lab ID: 2010318-003
Matrix: Soil
Client Sample ID: **R19W-101920-03.1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	18.7		mg/Kg-dry	1	10/26/2020 9:01:36 PM
Heavy Oil	ND	46.7		mg/Kg-dry	1	10/26/2020 9:01:36 PM
Surr: 2-Fluorobiphenyl	74.4	50 - 150		%Rec	1	10/26/2020 9:01:36 PM
Surr: o-Terphenyl	65.1	50 - 150		%Rec	1	10/26/2020 9:01:36 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30121		Analyst: CR
Benzene	ND	0.0219		mg/Kg-dry	1	10/23/2020 5:32:35 AM
Toluene	ND	0.0219		mg/Kg-dry	1	10/23/2020 5:32:35 AM
Ethylbenzene	ND	0.0274		mg/Kg-dry	1	10/23/2020 5:32:35 AM
m,p-Xylene	ND	0.0548		mg/Kg-dry	1	10/23/2020 5:32:35 AM
o-Xylene	ND	0.0274		mg/Kg-dry	1	10/23/2020 5:32:35 AM
Surr: Dibromofluoromethane	101	85.2 - 113		%Rec	1	10/23/2020 5:32:35 AM
Surr: Toluene-d8	104	88.5 - 110		%Rec	1	10/23/2020 5:32:35 AM
Surr: 1-Bromo-4-fluorobenzene	100	88.6 - 109		%Rec	1	10/23/2020 5:32:35 AM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	6.72	0.500		wt%	1	10/26/2020 11:15:51 AM

Work Order: 2010318
CLIENT: Fulcrum Environmental
Project: Ranch 19 West

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **MB-30162**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **MBLKS**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261974**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	18.7		20.00		93.7	50	150				
Surr: o-Terphenyl	16.2		20.00		81.1	50	150				

Sample ID: **LCS-30162**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **LCSS**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261975**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	451	20.0	500.0	0	90.2	65	135				
Surr: 2-Fluorobiphenyl	19.3		20.00		96.6	50	150				
Surr: o-Terphenyl	18.6		20.00		93.1	50	150				

Sample ID: **2010318-002AMS**	SampType: **MS**	Units: **mg/Kg-dry**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **R19W-101920-02.4**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261978**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	491	21.5	538.4	0	91.1	65	135				
Surr: 2-Fluorobiphenyl	23.1		21.54		107	50	150				
Surr: o-Terphenyl	21.8		21.54		101	50	150				

Sample ID: **2010318-002AMSD**	SampType: **MSD**	Units: **mg/Kg-dry**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **R19W-101920-02.4**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261979**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	513	20.2	504.8	0	102	65	135	490.7	4.45	30	
Surr: 2-Fluorobiphenyl	22.4		20.19		111	50	150		0		
Surr: o-Terphenyl	22.2		20.19		110	50	150		0		

Work Order: 2010318
CLIENT: Fulcrum Environmental
Project: Ranch 19 West

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **2010350-002ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/26/2020** RunNo: **62871**
Client ID: **BATCH** Batch ID: **30162** Analysis Date: **10/26/2020** SeqNo: **1261983**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	17.3						0		30	
Heavy Oil	ND	43.3						0		30	
Surr: 2-Fluorobiphenyl	16.4		17.31		94.9	50	150		0		
Surr: o-Terphenyl	14.6		17.31		84.2	50	150		0		

Work Order: 2010318
CLIENT: Fulcrum Environmental
Project: Ranch 19 West

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **LCS-30121** SampType: **LCS** Units: **mg/Kg** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **LCSS** Batch ID: **30121** Analysis Date: **10/22/2020** SeqNo: **1260522**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	1.08	0.0200	1.000	0	108	79.4	116				
Toluene	1.09	0.0200	1.000	0	109	80.5	115				
Ethylbenzene	1.10	0.0250	1.000	0	110	81.6	116				
m,p-Xylene	2.19	0.0500	2.000	0	110	83.2	115				
o-Xylene	1.08	0.0250	1.000	0	108	82.5	114				
Surr: Dibromofluoromethane	1.32		1.250		106	85.2	113				
Surr: Toluene-d8	1.28		1.250		103	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	1.27		1.250		102	88.6	109				

Sample ID: **MB-30121** SampType: **MBLK** Units: **mg/Kg** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **MBLKS** Batch ID: **30121** Analysis Date: **10/22/2020** SeqNo: **1260523**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0200									
Toluene	ND	0.0200									
Ethylbenzene	ND	0.0250									
m,p-Xylene	ND	0.0500									
o-Xylene	ND	0.0250									
Surr: Dibromofluoromethane	1.20		1.250		95.8	85.2	113				
Surr: Toluene-d8	1.26		1.250		101	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	1.25		1.250		100	88.6	109				

Sample ID: **2010318-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **R19W-101920-01.5** Batch ID: **30121** Analysis Date: **10/22/2020** SeqNo: **1260497**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0248						0		30	
Toluene	ND	0.0248						0		30	
Ethylbenzene	ND	0.0309						0		30	

Work Order: 2010318
CLIENT: Fulcrum Environmental
Project: Ranch 19 West

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2010318-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **R19W-101920-01.5** Batch ID: **30121** Analysis Date: **10/22/2020** SeqNo: **1260497**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	ND	0.0619						0		30	
o-Xylene	ND	0.0309						0		30	
Surr: Dibromofluoromethane	1.53		1.547		99.1	85.2	113		0		
Surr: Toluene-d8	1.56		1.547		101	88.5	110		0		
Surr: 1-Bromo-4-fluorobenzene	1.53		1.547		99.1	88.6	109		0		

Sample ID: **2010319-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **BATCH** Batch ID: **30121** Analysis Date: **10/22/2020** SeqNo: **1260501**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0460						0		30	
Toluene	ND	0.0460						0		30	
Ethylbenzene	ND	0.0575						0		30	
m,p-Xylene	ND	0.115						0		30	
o-Xylene	ND	0.0575						0		30	
Surr: Dibromofluoromethane	2.82		2.874		98.3	85.2	113		0		
Surr: Toluene-d8	2.91		2.874		101	88.5	110		0		
Surr: 1-Bromo-4-fluorobenzene	2.87		2.874		100	88.6	109		0		

Sample ID: **2010319-005BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **BATCH** Batch ID: **30121** Analysis Date: **10/23/2020** SeqNo: **1260506**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	2.18	0.0392	1.961	0	111	74.6	126				
Toluene	2.13	0.0392	1.961	0	109	72.6	127				
Ethylbenzene	2.14	0.0490	1.961	0	109	77.3	126				
m,p-Xylene	4.23	0.0980	3.922	0	108	78.5	126				
o-Xylene	2.12	0.0490	1.961	0.01640	107	79.4	123				
Surr: Dibromofluoromethane	2.65		2.451		108	85.2	113				

Work Order: 2010318
CLIENT: Fulcrum Environmental
Project: Ranch 19 West

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2010319-005BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **BATCH** Batch ID: **30121** Analysis Date: **10/23/2020** SeqNo: **1260506**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Toluene-d8	2.58		2.451		105	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	2.47		2.451		101	88.6	109				

Sample ID: **2010319-005BMSD** SampType: **MSD** Units: **mg/Kg-dry** Prep Date: **10/22/2020** RunNo: **62801**
Client ID: **BATCH** Batch ID: **30121** Analysis Date: **10/23/2020** SeqNo: **1260507**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	2.72	0.0480	2.398	0	114	74.6	126	2.184	21.9	30	
Toluene	2.68	0.0480	2.398	0	112	72.6	127	2.135	22.6	30	
Ethylbenzene	2.71	0.0600	2.398	0	113	77.3	126	2.139	23.6	30	
m,p-Xylene	5.34	0.120	4.796	0	111	78.5	126	4.229	23.2	30	
o-Xylene	2.65	0.0600	2.398	0.01640	110	79.4	123	2.120	22.4	30	
Surr: Dibromofluoromethane	3.24		2.998		108	85.2	113		0		
Surr: Toluene-d8	3.13		2.998		104	88.5	110		0		
Surr: 1-Bromo-4-fluorobenzene	3.03		2.998		101	88.6	109		0		

Sample Log-In Check List

Client Name:	**FE**	Work Order Number:	**2010318**
Logged by:	**Gabrielle Coeuille**	Date Received:	**10/20/2020 9:15:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No ☐	Not Present	☐
2.	How was the sample delivered?	UPS				

Log In

3.	Coolers are present?	Yes	☑	No ☐	NA	☐
4.	Shipping container/cooler in good condition?	Yes	☑	No ☐		
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No ☐	Not Present	☑
6.	Was an attempt made to cool the samples?	Yes	☑	No ☐	NA	☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No ☐	NA	☐
8.	Sample(s) in proper container(s)?	Yes	☑	No ☐		
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No ☐		
10.	Are samples properly preserved?	Yes	☑	No ☐		
11.	Was preservative added to bottles?	Yes	☐	No ☑	NA	☐
12.	Is there headspace in the VOA vials?	Yes	☐	No ☐	NA	☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No ☐		
14.	Does paperwork match bottle labels?	Yes	☑	No ☐		
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No ☐		
16.	Is it clear what analyses were requested?	Yes	☑	No ☐		
17.	Were all holding times able to be met?	Yes	☑	No ☐		

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☐	No ☐	NA	☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	6.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/19/20 Page: 1 of: 1

Laboratory Project No (internal): 2010318

Project Name: RANCH 19 WEST

Special Remarks:

Client: Fulcrum Environmental

Project No: 192902.15

Address: 406 North 2nd Street

Collected by: NM

City, State, Zip: Yakima, Washington 98901

Location:

Telephone: 509.574.0839

Report To (PM): JEREMY LYNN

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax:

PM Email: JEREMY.LYNN@EFULCRUM.NET

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624) GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1 R19W-101920-01.5	10/19/20	11:25	S	X		X									HOLD FOR PAH
2 R19W-101920-02.4	↓	11:45	↓	X		X									
3 R19W-101920-03.1	↓	12:05	↓	X		X									
4															
5															
6															
7															
8															
9															
10															

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x Nicole McPhil	10/19/20	x	10/20/20 @ 0915
Relinquished	Date/Time	Received	Date/Time
x		x	

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Fulcrum Environmental
Jeremy Lynn
406 N. 2nd Street
Yakima, WA 98901

RE: RANCH 19 W
Work Order Number: 2010350

November 03, 2020

Attention Jeremy Lynn:

Fremont Analytical, Inc. received 7 sample(s) on 10/22/2020 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)
Volatile Organic Compounds by EPA Method 8260D

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *11/03/2020*

CLIENT: Fulcrum Environmental
Project: RANCH 19 W
Work Order: 2010350

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2010350-001	R19W-102020-04.3	10/20/2020 1:30 PM	10/22/2020 9:19 AM
2010350-002	R19W-102020-05.1	10/20/2020 1:45 PM	10/22/2020 9:19 AM
2010350-003	R19W-102020-06.2	10/20/2020 1:50 PM	10/22/2020 9:19 AM
2010350-004	R19W-102020-07.7	10/20/2020 1:50 PM	10/22/2020 9:19 AM
2010350-005	R19W-102020-08.1	10/20/2020 2:00 PM	10/22/2020 9:19 AM
2010350-006	R19W-102120-09.8	10/21/2020 1:10 PM	10/22/2020 9:19 AM
2010350-007	R19W-102120-10.7.5	10/21/2020 1:15 PM	10/22/2020 9:19 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2010350**
Date: **11/3/2020**

CLIENT: Fulcrum Environmental
Project: RANCH 19 W

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/20/2020 1:30:00 PM
Project: RANCH 19 W
Lab ID: 2010350-001
Matrix: Soil
Client Sample ID: **R19W-102020-04.3**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	19.5		mg/Kg-dry	1	10/26/2020 9:31:09 PM
Heavy Oil	ND	48.8		mg/Kg-dry	1	10/26/2020 9:31:09 PM
Surr: 2-Fluorobiphenyl	82.9	50 - 150		%Rec	1	10/26/2020 9:31:09 PM
Surr: o-Terphenyl	81.1	50 - 150		%Rec	1	10/26/2020 9:31:09 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30189		Analyst: KT
Benzene	ND	0.0228		mg/Kg-dry	1	10/28/2020 12:11:14 PM
Toluene	ND	0.0228		mg/Kg-dry	1	10/28/2020 12:11:14 PM
Ethylbenzene	ND	0.0285		mg/Kg-dry	1	10/28/2020 12:11:14 PM
m,p-Xylene	ND	0.0570		mg/Kg-dry	1	10/28/2020 12:11:14 PM
o-Xylene	ND	0.0285		mg/Kg-dry	1	10/28/2020 12:11:14 PM
Surr: Dibromofluoromethane	98.1	85.2 - 113		%Rec	1	10/28/2020 12:11:14 PM
Surr: Toluene-d8	99.0	88.5 - 110		%Rec	1	10/28/2020 12:11:14 PM
Surr: 1-Bromo-4-fluorobenzene	97.9	88.6 - 109		%Rec	1	10/28/2020 12:11:14 PM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	4.68	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/20/2020 1:45:00 PM
Project: RANCH 19 W
Lab ID: 2010350-002
Matrix: Soil
Client Sample ID: **R19W-102020-05.1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	17.9		mg/Kg-dry	1	10/26/2020 10:01:00 PM
Heavy Oil	ND	44.8		mg/Kg-dry	1	10/26/2020 10:01:00 PM
Surr: 2-Fluorobiphenyl	98.6	50 - 150		%Rec	1	10/26/2020 10:01:00 PM
Surr: o-Terphenyl	83.0	50 - 150		%Rec	1	10/26/2020 10:01:00 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30189		Analyst: KT
Benzene	ND	0.0312		mg/Kg-dry	1	10/28/2020 1:12:01 PM
Toluene	ND	0.0312		mg/Kg-dry	1	10/28/2020 1:12:01 PM
Ethylbenzene	ND	0.0389		mg/Kg-dry	1	10/28/2020 1:12:01 PM
m,p-Xylene	ND	0.0779		mg/Kg-dry	1	10/28/2020 1:12:01 PM
o-Xylene	ND	0.0389		mg/Kg-dry	1	10/28/2020 1:12:01 PM
Surr: Dibromofluoromethane	97.1	85.2 - 113		%Rec	1	10/28/2020 1:12:01 PM
Surr: Toluene-d8	98.0	88.5 - 110		%Rec	1	10/28/2020 1:12:01 PM
Surr: 1-Bromo-4-fluorobenzene	97.9	88.6 - 109		%Rec	1	10/28/2020 1:12:01 PM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	2.85	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/20/2020 1:50:00 PM
Project: RANCH 19 W
Lab ID: 2010350-003
Matrix: Soil
Client Sample ID: **R19W-102020-06.2**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	22.3		mg/Kg-dry	1	10/26/2020 11:00:10 PM
Heavy Oil	ND	55.6		mg/Kg-dry	1	10/26/2020 11:00:10 PM
Surr: 2-Fluorobiphenyl	74.8	50 - 150		%Rec	1	10/26/2020 11:00:10 PM
Surr: o-Terphenyl	65.3	50 - 150		%Rec	1	10/26/2020 11:00:10 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30189		Analyst: KT
Benzene	ND	0.0268		mg/Kg-dry	1	10/28/2020 1:42:22 PM
Toluene	ND	0.0268		mg/Kg-dry	1	10/28/2020 1:42:22 PM
Ethylbenzene	ND	0.0335		mg/Kg-dry	1	10/28/2020 1:42:22 PM
m,p-Xylene	ND	0.0669		mg/Kg-dry	1	10/28/2020 1:42:22 PM
o-Xylene	ND	0.0335		mg/Kg-dry	1	10/28/2020 1:42:22 PM
Surr: Dibromofluoromethane	97.2	85.2 - 113		%Rec	1	10/28/2020 1:42:22 PM
Surr: Toluene-d8	98.0	88.5 - 110		%Rec	1	10/28/2020 1:42:22 PM
Surr: 1-Bromo-4-fluorobenzene	97.6	88.6 - 109		%Rec	1	10/28/2020 1:42:22 PM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	11.8	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/20/2020 1:50:00 PM
Project: RANCH 19 W
Lab ID: 2010350-004
Matrix: Soil
Client Sample ID: **R19W-102020-07.7**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	24.2		mg/Kg-dry	1	10/26/2020 11:29:45 PM
Heavy Oil	ND	60.4		mg/Kg-dry	1	10/26/2020 11:29:45 PM
Surr: 2-Fluorobiphenyl	93.9	50 - 150		%Rec	1	10/26/2020 11:29:45 PM
Surr: o-Terphenyl	82.7	50 - 150		%Rec	1	10/26/2020 11:29:45 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30189		Analyst: KT
Benzene	ND	0.0242		mg/Kg-dry	1	10/28/2020 2:12:44 PM
Toluene	ND	0.0242		mg/Kg-dry	1	10/28/2020 2:12:44 PM
Ethylbenzene	ND	0.0302		mg/Kg-dry	1	10/28/2020 2:12:44 PM
m,p-Xylene	ND	0.0605		mg/Kg-dry	1	10/28/2020 2:12:44 PM
o-Xylene	ND	0.0302		mg/Kg-dry	1	10/28/2020 2:12:44 PM
Surr: Dibromofluoromethane	98.0	85.2 - 113		%Rec	1	10/28/2020 2:12:44 PM
Surr: Toluene-d8	97.2	88.5 - 110		%Rec	1	10/28/2020 2:12:44 PM
Surr: 1-Bromo-4-fluorobenzene	96.4	88.6 - 109		%Rec	1	10/28/2020 2:12:44 PM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	22.7	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/20/2020 2:00:00 PM
Project: RANCH 19 W
Lab ID: 2010350-005
Matrix: Soil
Client Sample ID: **R19W-102020-08.1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	18.2		mg/Kg-dry	1	10/26/2020 11:59:19 PM
Heavy Oil	ND	45.5		mg/Kg-dry	1	10/26/2020 11:59:19 PM
Surr: 2-Fluorobiphenyl	101	50 - 150		%Rec	1	10/26/2020 11:59:19 PM
Surr: o-Terphenyl	86.2	50 - 150		%Rec	1	10/26/2020 11:59:19 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30189		Analyst: KT
Benzene	ND	0.0287		mg/Kg-dry	1	10/28/2020 2:43:12 PM
Toluene	ND	0.0287		mg/Kg-dry	1	10/28/2020 2:43:12 PM
Ethylbenzene	ND	0.0359		mg/Kg-dry	1	10/28/2020 2:43:12 PM
m,p-Xylene	ND	0.0717		mg/Kg-dry	1	10/28/2020 2:43:12 PM
o-Xylene	ND	0.0359		mg/Kg-dry	1	10/28/2020 2:43:12 PM
Surr: Dibromofluoromethane	97.5	85.2 - 113		%Rec	1	10/28/2020 2:43:12 PM
Surr: Toluene-d8	98.5	88.5 - 110		%Rec	1	10/28/2020 2:43:12 PM
Surr: 1-Bromo-4-fluorobenzene	97.2	88.6 - 109		%Rec	1	10/28/2020 2:43:12 PM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	3.02	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/21/2020 1:10:00 PM
Project: RANCH 19 W
Lab ID: 2010350-006
Matrix: Soil
Client Sample ID: **R19W-102120-09.8**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	ND	31.7		mg/Kg-dry	1	10/27/2020 12:28:52 AM
Heavy Oil	ND	79.3		mg/Kg-dry	1	10/27/2020 12:28:52 AM
Surr: 2-Fluorobiphenyl	87.8	50 - 150		%Rec	1	10/27/2020 12:28:52 AM
Surr: o-Terphenyl	77.7	50 - 150		%Rec	1	10/27/2020 12:28:52 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30189		Analyst: KT
Benzene	ND	0.0494		mg/Kg-dry	1	10/28/2020 3:13:33 PM
Toluene	ND	0.0494		mg/Kg-dry	1	10/28/2020 3:13:33 PM
Ethylbenzene	ND	0.0618		mg/Kg-dry	1	10/28/2020 3:13:33 PM
m,p-Xylene	ND	0.124		mg/Kg-dry	1	10/28/2020 3:13:33 PM
o-Xylene	ND	0.0618		mg/Kg-dry	1	10/28/2020 3:13:33 PM
Surr: Dibromofluoromethane	98.7	85.2 - 113		%Rec	1	10/28/2020 3:13:33 PM
Surr: Toluene-d8	98.2	88.5 - 110		%Rec	1	10/28/2020 3:13:33 PM
Surr: 1-Bromo-4-fluorobenzene	97.4	88.6 - 109		%Rec	1	10/28/2020 3:13:33 PM
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	44.5	0.500		wt%	1	10/26/2020 11:15:51 AM

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/21/2020 1:15:00 PM
Project: RANCH 19 W
Lab ID: 2010350-007
Matrix: Soil
Client Sample ID: **R19W-102120-10.7.5**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30162		Analyst: IH
Diesel (Fuel Oil)	34.2	31.1		mg/Kg-dry	1	10/27/2020 12:58:26 AM
Heavy Oil	ND	77.7		mg/Kg-dry	1	10/27/2020 12:58:26 AM
Surr: 2-Fluorobiphenyl	87.9	50 - 150		%Rec	1	10/27/2020 12:58:26 AM
Surr: o-Terphenyl	82.5	50 - 150		%Rec	1	10/27/2020 12:58:26 AM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 30233		Analyst: SB
Naphthalene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
2-Methylnaphthalene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
1-Methylnaphthalene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Acenaphthylene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Acenaphthene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Fluorene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Phenanthrene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Anthracene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Fluoranthene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Pyrene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Benz(a)anthracene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Chrysene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Benzo(b)fluoranthene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Benzo(k)fluoranthene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Benzo(a)pyrene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Indeno(1,2,3-cd)pyrene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Dibenz(a,h)anthracene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Benzo(g,h,i)perylene	ND	64.6		µg/Kg-dry	1	10/31/2020 4:28:41 AM
Surr: 2-Fluorobiphenyl	73.0	16.9 - 122		%Rec	1	10/31/2020 4:28:41 AM
Surr: Terphenyl-d14 (surr)	91.3	38.4 - 153		%Rec	1	10/31/2020 4:28:41 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30189		Analyst: KT
Benzene	ND	0.0382		mg/Kg-dry	1	10/28/2020 3:43:59 PM
Toluene	ND	0.0382		mg/Kg-dry	1	10/28/2020 3:43:59 PM
Ethylbenzene	ND	0.0478		mg/Kg-dry	1	10/28/2020 3:43:59 PM
m,p-Xylene	ND	0.0956		mg/Kg-dry	1	10/28/2020 3:43:59 PM
o-Xylene	ND	0.0478		mg/Kg-dry	1	10/28/2020 3:43:59 PM
Surr: Dibromofluoromethane	98.0	85.2 - 113		%Rec	1	10/28/2020 3:43:59 PM
Surr: Toluene-d8	98.1	88.5 - 110		%Rec	1	10/28/2020 3:43:59 PM
Surr: 1-Bromo-4-fluorobenzene	97.6	88.6 - 109		%Rec	1	10/28/2020 3:43:59 PM

Analytical Report

Work Order: **2010350**
Date Reported: **11/3/2020**

Client: Fulcrum Environmental
Collection Date: 10/21/2020 1:15:00 PM
Project: RANCH 19 W
Lab ID: 2010350-007
Matrix: Soil
Client Sample ID: **R19W-102120-10.7.5**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R62839		Analyst: RL
Percent Moisture	40.2	0.500		wt%	1	10/26/2020 11:15:51 AM

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **MB-30162**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **MBLKS**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261974**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	18.7		20.00		93.7	50	150				
Surr: o-Terphenyl	16.2		20.00		81.1	50	150				

Sample ID: **LCS-30162**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **LCSS**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261975**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	451	20.0	500.0	0	90.2	65	135				
Surr: 2-Fluorobiphenyl	19.3		20.00		96.6	50	150				
Surr: o-Terphenyl	18.6		20.00		93.1	50	150				

Sample ID: **2010318-002AMS**	SampType: **MS**	Units: **mg/Kg-dry**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **BATCH**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261978**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	491	21.5	538.4	0	91.1	65	135				
Surr: 2-Fluorobiphenyl	23.1		21.54		107	50	150				
Surr: o-Terphenyl	21.8		21.54		101	50	150				

Sample ID: **2010318-002AMSD**	SampType: **MSD**	Units: **mg/Kg-dry**	Prep Date: **10/26/2020**	RunNo: **62871**
Client ID: **BATCH**	Batch ID: **30162**		Analysis Date: **10/26/2020**	SeqNo: **1261979**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	513	20.2	504.8	0	102	65	135	490.7	4.45	30	
Surr: 2-Fluorobiphenyl	22.4		20.19		111	50	150		0		
Surr: o-Terphenyl	22.2		20.19		110	50	150		0		

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **2010350-002ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/26/2020** RunNo: **62871**
Client ID: **R19W-102020-05.1** Batch ID: **30162** Analysis Date: **10/26/2020** SeqNo: **1261983**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	17.3						0		30	
Heavy Oil	ND	43.3						0		30	
Surr: 2-Fluorobiphenyl	16.4		17.31		94.9	50	150		0		
Surr: o-Terphenyl	14.6		17.31		84.2	50	150		0		

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **MB-30233** SampType: **MBLK** Units: **µg/Kg** Prep Date: **10/30/2020** RunNo: **63038**
Client ID: **MBLKS** Batch ID: **30233** Analysis Date: **10/31/2020** SeqNo: **1265289**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	556		500.0		111	16.9	122				
Surr: Terphenyl-d14 (surr)	558		500.0		112	38.4	153				

Sample ID: **LCS-30233** SampType: **LCS** Units: **µg/Kg** Prep Date: **10/30/2020** RunNo: **63038**
Client ID: **LCSS** Batch ID: **30233** Analysis Date: **10/31/2020** SeqNo: **1265290**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	882	40.0	1,000	0	88.2	57.2	127				
2-Methylnaphthalene	900	40.0	1,000	0	90.0	55.1	134				
1-Methylnaphthalene	868	40.0	1,000	0	86.8	56.9	136				
Acenaphthylene	879	40.0	1,000	0	87.9	58.5	132				
Acenaphthene	913	40.0	1,000	0	91.3	57.9	132				

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **LCS-30233** SampType: **LCS** Units: **µg/Kg** Prep Date: **10/30/2020** RunNo: **63038**
Client ID: **LCSS** Batch ID: **30233** Analysis Date: **10/31/2020** SeqNo: **1265290**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	892	40.0	1,000	0	89.2	59.2	134				
Phenanthrene	838	40.0	1,000	0	83.8	57.1	135				
Anthracene	819	40.0	1,000	0	81.9	55.7	137				
Fluoranthene	808	40.0	1,000	0	80.8	58.1	134				
Pyrene	846	40.0	1,000	0	84.6	59.6	136				
Benz(a)anthracene	790	40.0	1,000	0	79.0	51.5	139				
Chrysene	850	40.0	1,000	0	85.0	58.3	130				
Benzo(b)fluoranthene	733	40.0	1,000	0	73.3	53.4	138				
Benzo(k)fluoranthene	883	40.0	1,000	0	88.3	50.9	140				
Benzo(a)pyrene	738	40.0	1,000	0	73.8	50.4	143				
Indeno(1,2,3-cd)pyrene	836	40.0	1,000	0	83.6	52.3	138				
Dibenz(a,h)anthracene	879	40.0	1,000	0	87.9	53	140				
Benzo(g,h,i)perylene	843	40.0	1,000	0	84.3	51.7	139				
Surr: 2-Fluorobiphenyl	560		500.0		112	16.9	122				
Surr: Terphenyl-d14 (surr)	545		500.0		109	38.4	153				

Sample ID: **2010350-007AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63038**
Client ID: **R19W-102120-10.7.5** Batch ID: **30233** Analysis Date: **10/31/2020** SeqNo: **1265292**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,030	64.3	1,607	0	63.9	46	106				
2-Methylnaphthalene	1,020	64.3	1,607	0	63.8	45.3	117				
1-Methylnaphthalene	1,020	64.3	1,607	0	63.7	48.6	116				
Acenaphthylene	1,020	64.3	1,607	0	63.2	50	114				
Acenaphthene	1,060	64.3	1,607	0	66.0	54.9	108				
Fluorene	1,050	64.3	1,607	0	65.1	54.3	110				
Phenanthrene	931	64.3	1,607	0	57.9	48.9	114				
Anthracene	974	64.3	1,607	0	60.6	53.1	111				
Fluoranthene	1,050	64.3	1,607	0	65.6	48.5	117				
Pyrene	1,080	64.3	1,607	11.63	66.6	48.5	121				

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2010350-007AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63038**
Client ID: **R19W-102120-10.7.5** Batch ID: **30233** Analysis Date: **10/31/2020** SeqNo: **1265292**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	1,010	64.3	1,607	0	63.0	39.9	125				
Chrysene	938	64.3	1,607	0	58.3	46.8	112				
Benzo(b)fluoranthene	853	64.3	1,607	0	53.1	42.4	123				
Benzo(k)fluoranthene	994	64.3	1,607	0	61.8	41.7	122				
Benzo(a)pyrene	858	64.3	1,607	0	53.4	48.2	121				
Indeno(1,2,3-cd)pyrene	930	64.3	1,607	0	57.9	43.6	114				
Dibenz(a,h)anthracene	979	64.3	1,607	0	60.9	43.7	116				
Benzo(g,h,i)perylene	931	64.3	1,607	0	57.9	43.7	115				
Surr: 2-Fluorobiphenyl	544		803.5		67.7	16.9	122				
Surr: Terphenyl-d14 (surr)	621		803.5		77.3	38.4	153				

Sample ID: **2010350-007AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63038**
Client ID: **R19W-102120-10.7.5** Batch ID: **30233** Analysis Date: **10/31/2020** SeqNo: **1265293**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,090	63.0	1,575	0	69.1	46	106	1,027	5.80	30	
2-Methylnaphthalene	1,120	63.0	1,575	0	70.9	45.3	117	1,025	8.59	30	
1-Methylnaphthalene	1,060	63.0	1,575	0	67.6	48.6	116	1,024	3.85	30	
Acenaphthylene	1,090	63.0	1,575	0	69.2	50	114	1,015	7.16	30	
Acenaphthene	1,130	63.0	1,575	0	72.0	54.9	108	1,060	6.68	30	
Fluorene	1,120	63.0	1,575	0	70.9	54.3	110	1,045	6.57	30	
Phenanthrene	1,010	63.0	1,575	0	64.1	48.9	114	930.8	8.19	30	
Anthracene	1,080	63.0	1,575	0	68.8	53.1	111	974.4	10.6	30	
Fluoranthene	1,130	63.0	1,575	0	72.0	48.5	117	1,055	7.24	30	
Pyrene	1,170	63.0	1,575	11.63	73.2	48.5	121	1,082	7.44	30	
Benz(a)anthracene	1,100	63.0	1,575	0	69.9	39.9	125	1,013	8.39	30	
Chrysene	1,000	63.0	1,575	0	63.6	46.8	112	937.6	6.70	30	
Benzo(b)fluoranthene	1,030	63.0	1,575	0	65.6	42.4	123	853.0	19.1	30	
Benzo(k)fluoranthene	937	63.0	1,575	0	59.5	41.7	122	993.8	5.93	30	
Benzo(a)pyrene	942	63.0	1,575	0	59.8	48.2	121	857.8	9.36	30	

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2010350-007AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63038**
Client ID: **R19W-102120-10.7.5** Batch ID: **30233** Analysis Date: **10/31/2020** SeqNo: **1265293**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	1,010	63.0	1,575	0	64.2	43.6	114	930.0	8.33	30	
Dibenz(a,h)anthracene	1,050	63.0	1,575	0	66.7	43.7	116	978.6	7.13	30	
Benzo(g,h,i)perylene	1,010	63.0	1,575	0	63.9	43.7	115	930.5	7.79	30	
Surr: 2-Fluorobiphenyl	536		787.6		68.0	16.9	122		0		
Surr: Terphenyl-d14 (surr)	656		787.6		83.3	38.4	153		0		

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **LCS-30189** SampType: **LCS** Units: **mg/Kg** Prep Date: **10/28/2020** RunNo: **62942**
Client ID: **LCSS** Batch ID: **30189** Analysis Date: **10/28/2020** SeqNo: **1263356**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.971	0.0200	1.000	0	97.1	79.4	116				
Toluene	0.959	0.0200	1.000	0	95.9	80.5	115				
Ethylbenzene	0.984	0.0250	1.000	0	98.4	81.6	116				
m,p-Xylene	1.96	0.0500	2.000	0	98.2	83.2	115				
o-Xylene	0.981	0.0250	1.000	0	98.1	82.5	114				
Surr: Dibromofluoromethane	1.29		1.250		103	85.2	113				
Surr: Toluene-d8	1.25		1.250		99.9	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	1.34		1.250		107	88.6	109				

Sample ID: **MB-30189** SampType: **MBLK** Units: **mg/Kg** Prep Date: **10/28/2020** RunNo: **62942**
Client ID: **MBLKS** Batch ID: **30189** Analysis Date: **10/28/2020** SeqNo: **1263357**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0200									
Toluene	ND	0.0200									
Ethylbenzene	ND	0.0250									
m,p-Xylene	ND	0.0500									
o-Xylene	ND	0.0250									
Surr: Dibromofluoromethane	1.20		1.250		96.3	85.2	113				
Surr: Toluene-d8	1.22		1.250		97.9	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	1.22		1.250		97.5	88.6	109				

Sample ID: **2010350-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/28/2020** RunNo: **62942**
Client ID: **R19W-102020-04.3** Batch ID: **30189** Analysis Date: **10/28/2020** SeqNo: **1263331**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0228						0		30	
Toluene	ND	0.0228						0		30	
Ethylbenzene	ND	0.0285						0		30	

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2010350-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/28/2020** RunNo: **62942**
Client ID: **R19W-102020-04.3** Batch ID: **30189** Analysis Date: **10/28/2020** SeqNo: **1263331**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	ND	0.0570						0		30	
o-Xylene	ND	0.0285						0		30	
Surr: Dibromofluoromethane	1.37		1.425		96.4	85.2	113		0		
Surr: Toluene-d8	1.39		1.425		97.3	88.5	110		0		
Surr: 1-Bromo-4-fluorobenzene	1.39		1.425		97.7	88.6	109		0		

Sample ID: **2010371-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/28/2020** RunNo: **62942**
Client ID: **BATCH** Batch ID: **30189** Analysis Date: **10/28/2020** SeqNo: **1263340**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0186						0		30	
Toluene	ND	0.0186						0		30	
Ethylbenzene	ND	0.0232						0		30	
m,p-Xylene	0.199	0.0465						0.1935	2.83	30	
o-Xylene	0.0623	0.0232						0.06240	0.138	30	
Surr: Dibromofluoromethane	1.12		1.162		96.7	85.2	113		0		
Surr: Toluene-d8	1.14		1.162		97.7	88.5	110		0		
Surr: 1-Bromo-4-fluorobenzene	1.14		1.162		97.8	88.6	109		0		

Sample ID: **2010350-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/28/2020** RunNo: **62942**
Client ID: **R19W-102020-05.1** Batch ID: **30189** Analysis Date: **10/28/2020** SeqNo: **1263333**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	1.57	0.0312	1.558	0	101	74.6	126				
Toluene	1.50	0.0312	1.558	0	96.6	72.6	127				
Ethylbenzene	1.56	0.0389	1.558	0	100	77.3	126				
m,p-Xylene	3.14	0.0779	3.116	0	101	78.5	126				
o-Xylene	1.56	0.0389	1.558	0	100	79.4	123				
Surr: Dibromofluoromethane	2.01		1.947		103	85.2	113				

Work Order: 2010350
CLIENT: Fulcrum Environmental
Project: RANCH 19 W

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2010350-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/28/2020** RunNo: **62942**
Client ID: **R19W-102020-05.1** Batch ID: **30189** Analysis Date: **10/28/2020** SeqNo: **1263333**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Toluene-d8	1.93		1.947		99.2	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	2.03		1.947		104	88.6	109				

Sample Log-In Check List

Client Name:	FE	Work Order Number:	2010350
Logged by:	Gabrielle Coeuille	Date Received:	10/22/2020 9:19:00 AM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	4.3

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/21/20 Page: 1 of: 1
Project Name: RANCH 19 W
Project No: 192902.15
Collected by: NM
Location:
Report To (PM): JEREMY LYNN
PM Email: JEREMY.LYNN@efulcrum.net

Laboratory Project No (internal): 2010350
Special Remarks:
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Client: Fulcrum Environmental
Address: 406 North 2nd Street
City, State, Zip: Yakima, Washington 98901
Telephone: 509.574.0839
Fax:

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	R19W-102020-04.3	10/20/20	13:30	S			X			X								
2	R19W-102020-05.1		13:45															
3	R19W-102020-06.2		13:50															HOLD FOR PAHS
4	R19W-102020-07.7		13:55															
5	R19W-102020-08.1		14:00															
6	R19W-102020-09.8	10/21/20	13:10															
7	R19W-102120-10.7.5	10/21/20	13:15															
8																		
9																		
10																		

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
- [x] Standard
- [ ] 3 Day
- [ ] 2 Day
- [ ] Next Day
- Same Day ____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x Nicole McPhee	10/21/20	x	10/22/20 @ 0919
Relinquished x	Date/Time	Received x	Date/Time

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/21/20 Page: 1 of: 1
Project Name: RANCH 19 W
Project No: 192902.15
Collected by: NM
Location:
Report To (PM): JEREMY LYNN
PM Email: JEREMY.LYNN@EFULCRUM.NET

Laboratory Project No (internal): 2010350
Special Remarks: Add analysis 10/29/20 per NM- gac
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Client: Fulcrum Environmental
Address: 406 North 2nd Street
City, State, Zip: Yakima, Washington 98901
Telephone: 509.574.0839
Fax:

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	R19W-102020-04.3	10/20/20	13:30	S			X			X									
2	R19W-102020-05.1		13:45																HOLD FOR PAHS
3	R19W-102020-06.2		13:50																
4	R19W-102020-07.7		13:55																
5	R19W-102020-08.1		14:00																
6	R19W-102020-09.8	10/21/20	13:10																
7	R19W-102120-10.7.5	10/21/20	13:15									X							
8																			
9																			
10																			

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
- [x] Standard
- [ ] 3 Day
- [ ] 2 Day
- [ ] Next Day
- Same Day ____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished x [signature]	Date/Time 10/21/20	Received x [signature]	Date/Time 10/22/20 @ 0919
Relinquished x	Date/Time	Received x	Date/Time

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Fulcrum Environmental
Jeremy Lynn
406 N. 2nd Street
Yakima, WA 98901

RE: Ranch 19 W
Work Order Number: 2010388

November 06, 2020

Attention Jeremy Lynn:

Fremont Analytical, Inc. received 10 sample(s) on 10/23/2020 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)
Volatile Organic Compounds by EPA Method 8260D

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *11/06/2020*

CLIENT: Fulcrum Environmental
Project: Ranch 19 W
Work Order: 2010388

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2010388-001	R19W-102220-11.3	10/22/2020 11:10 AM	10/23/2020 9:42 AM
2010388-002	R19W-102220-12.3	10/22/2020 11:15 AM	10/23/2020 9:42 AM
2010388-003	R19W-102220-13.3	10/22/2020 11:20 AM	10/23/2020 9:42 AM
2010388-004	R19W-102220-15.3	10/22/2020 11:30 AM	10/23/2020 9:42 AM
2010388-005	R19W-102220-14.2	10/22/2020 11:40 AM	10/23/2020 9:42 AM
2010388-006	R19W-102220-16.3.5	10/22/2020 11:55 AM	10/23/2020 9:42 AM
2010388-007	R19W-102220-18.3	10/22/2020 12:00 PM	10/23/2020 9:42 AM
2010388-008	R19W-102220-17.9.5	10/22/2020 12:05 PM	10/23/2020 9:42 AM
2010388-009	R19W-102220-19.3	10/22/2020 12:10 PM	10/23/2020 9:42 AM
2010388-010	R19W-102220-20.2	10/22/2020 12:15 PM	10/23/2020 9:42 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2010388**
Date: **11/6/2020**

CLIENT: Fulcrum Environmental
Project: Ranch 19 W

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

11/6/2020: Revision 1 includes additional analysis requested by client.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 11:10:00 AM
Project: Ranch 19 W
Lab ID: 2010388-001
Matrix: Soil
Client Sample ID: R19W-102220-11.3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	17.9		mg/Kg-dry	1	10/28/2020 12:53:32 AM
Heavy Oil	ND	44.8		mg/Kg-dry	1	10/28/2020 12:53:32 AM
Surr: 2-Fluorobiphenyl	77.9	50 - 150		%Rec	1	10/28/2020 12:53:32 AM
Surr: o-Terphenyl	81.6	50 - 150		%Rec	1	10/28/2020 12:53:32 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0192		mg/Kg-dry	1	10/30/2020 4:09:26 PM
Toluene	ND	0.0192		mg/Kg-dry	1	10/30/2020 4:09:26 PM
Ethylbenzene	ND	0.0239		mg/Kg-dry	1	10/30/2020 4:09:26 PM
m,p-Xylene	ND	0.0479		mg/Kg-dry	1	10/30/2020 4:09:26 PM
o-Xylene	ND	0.0239		mg/Kg-dry	1	10/30/2020 4:09:26 PM
Surr: Dibromofluoromethane	98.9	85.2 - 113		%Rec	1	10/30/2020 4:09:26 PM
Surr: Toluene-d8	99.3	88.5 - 110		%Rec	1	10/30/2020 4:09:26 PM
Surr: 1-Bromo-4-fluorobenzene	99.6	88.6 - 109		%Rec	1	10/30/2020 4:09:26 PM
Sample Moisture (Percent Moisture)				Batch ID: R62874		Analyst: CJ
Percent Moisture	4.48	0.500		wt%	1	10/27/2020 10:27:36 AM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 11:15:00 AM
Project: Ranch 19 W
Lab ID: 2010388-002
Matrix: Soil
Client Sample ID: R19W-102220-12.3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	19.2		mg/Kg-dry	1	10/28/2020 1:23:10 AM
Heavy Oil	ND	48.1		mg/Kg-dry	1	10/28/2020 1:23:10 AM
Surr: 2-Fluorobiphenyl	73.6	50 - 150		%Rec	1	10/28/2020 1:23:10 AM
Surr: o-Terphenyl	77.2	50 - 150		%Rec	1	10/28/2020 1:23:10 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0197		mg/Kg-dry	1	10/30/2020 5:10:25 PM
Toluene	ND	0.0197		mg/Kg-dry	1	10/30/2020 5:10:25 PM
Ethylbenzene	ND	0.0246		mg/Kg-dry	1	10/30/2020 5:10:25 PM
m,p-Xylene	ND	0.0492		mg/Kg-dry	1	10/30/2020 5:10:25 PM
o-Xylene	ND	0.0246		mg/Kg-dry	1	10/30/2020 5:10:25 PM
Surr: Dibromofluoromethane	97.2	85.2 - 113		%Rec	1	10/30/2020 5:10:25 PM
Surr: Toluene-d8	98.1	88.5 - 110		%Rec	1	10/30/2020 5:10:25 PM
Surr: 1-Bromo-4-fluorobenzene	94.7	88.6 - 109		%Rec	1	10/30/2020 5:10:25 PM
Sample Moisture (Percent Moisture)				Batch ID: R62874		Analyst: CJ
Percent Moisture	4.85	0.500		wt%	1	10/27/2020 10:27:36 AM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 11:20:00 AM
Project: Ranch 19 W
Lab ID: 2010388-003
Matrix: Soil
Client Sample ID: R19W-102220-13.3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	19.3		mg/Kg-dry	1	10/28/2020 1:52:50 AM
Heavy Oil	ND	48.2		mg/Kg-dry	1	10/28/2020 1:52:50 AM
Surr: 2-Fluorobiphenyl	105	50 - 150		%Rec	1	10/28/2020 1:52:50 AM
Surr: o-Terphenyl	108	50 - 150		%Rec	1	10/28/2020 1:52:50 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0260		mg/Kg-dry	1	10/30/2020 5:40:52 PM
Toluene	ND	0.0260		mg/Kg-dry	1	10/30/2020 5:40:52 PM
Ethylbenzene	ND	0.0326		mg/Kg-dry	1	10/30/2020 5:40:52 PM
m,p-Xylene	ND	0.0651		mg/Kg-dry	1	10/30/2020 5:40:52 PM
o-Xylene	ND	0.0326		mg/Kg-dry	1	10/30/2020 5:40:52 PM
Surr: Dibromofluoromethane	98.1	85.2 - 113		%Rec	1	10/30/2020 5:40:52 PM
Surr: Toluene-d8	97.9	88.5 - 110		%Rec	1	10/30/2020 5:40:52 PM
Surr: 1-Bromo-4-fluorobenzene	97.9	88.6 - 109		%Rec	1	10/30/2020 5:40:52 PM
Sample Moisture (Percent Moisture)				Batch ID: R62874		Analyst: CJ
Percent Moisture	9.86	0.500		wt%	1	10/27/2020 10:27:36 AM

Client: Fulcrum Environmental
Collection Date: 10/22/2020 11:30:00 AM
Project: Ranch 19 W
Lab ID: 2010388-004
Matrix: Soil
Client Sample ID: **R19W-102220-15.3**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	50.0	19.9		mg/Kg-dry	1	10/28/2020 2:22:31 AM
Heavy Oil	ND	49.8		mg/Kg-dry	1	10/28/2020 2:22:31 AM
Surr: 2-Fluorobiphenyl	77.7	50 - 150		%Rec	1	10/28/2020 2:22:31 AM
Surr: o-Terphenyl	82.7	50 - 150		%Rec	1	10/28/2020 2:22:31 AM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 30278		Analyst: SB
Naphthalene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
2-Methylnaphthalene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
1-Methylnaphthalene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Acenaphthylene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Acenaphthene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Fluorene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Phenanthrene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Anthracene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Fluoranthene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Pyrene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Benz(a)anthracene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Chrysene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Benzo(b)fluoranthene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Benzo(k)fluoranthene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Benzo(a)pyrene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Indeno(1,2,3-cd)pyrene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Dibenz(a,h)anthracene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Benzo(g,h,i)perylene	ND	39.2		µg/Kg-dry	1	11/5/2020 7:42:54 PM
Surr: 2-Fluorobiphenyl	77.6	16.9 - 122		%Rec	1	11/5/2020 7:42:54 PM
Surr: Terphenyl-d14 (surr)	79.9	38.4 - 153		%Rec	1	11/5/2020 7:42:54 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0198		mg/Kg-dry	1	10/30/2020 6:11:14 PM
Toluene	ND	0.0198		mg/Kg-dry	1	10/30/2020 6:11:14 PM
Ethylbenzene	ND	0.0248		mg/Kg-dry	1	10/30/2020 6:11:14 PM
m,p-Xylene	ND	0.0496		mg/Kg-dry	1	10/30/2020 6:11:14 PM
o-Xylene	ND	0.0248		mg/Kg-dry	1	10/30/2020 6:11:14 PM
Surr: Dibromofluoromethane	97.9	85.2 - 113		%Rec	1	10/30/2020 6:11:14 PM
Surr: Toluene-d8	98.5	88.5 - 110		%Rec	1	10/30/2020 6:11:14 PM
Surr: 1-Bromo-4-fluorobenzene	98.1	88.6 - 109		%Rec	1	10/30/2020 6:11:14 PM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 11:30:00 AM
Project: Ranch 19 W
Lab ID: 2010388-004
Matrix: Soil
Client Sample ID: R19W-102220-15.3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R62874		Analyst: CJ
Percent Moisture	4.47	0.500		wt%	1	10/27/2020 10:27:36 AM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 11:40:00 AM
Project: Ranch 19 W
Lab ID: 2010388-005
Matrix: Soil
Client Sample ID: R19W-102220-14.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	20.6		mg/Kg-dry	1	10/28/2020 2:52:13 AM
Heavy Oil	ND	51.6		mg/Kg-dry	1	10/28/2020 2:52:13 AM
Surr: 2-Fluorobiphenyl	81.3	50 - 150		%Rec	1	10/28/2020 2:52:13 AM
Surr: o-Terphenyl	85.7	50 - 150		%Rec	1	10/28/2020 2:52:13 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0243		mg/Kg-dry	1	10/30/2020 6:41:31 PM
Toluene	ND	0.0243		mg/Kg-dry	1	10/30/2020 6:41:31 PM
Ethylbenzene	ND	0.0303		mg/Kg-dry	1	10/30/2020 6:41:31 PM
m,p-Xylene	ND	0.0607		mg/Kg-dry	1	10/30/2020 6:41:31 PM
o-Xylene	ND	0.0303		mg/Kg-dry	1	10/30/2020 6:41:31 PM
Surr: Dibromofluoromethane	97.6	85.2 - 113		%Rec	1	10/30/2020 6:41:31 PM
Surr: Toluene-d8	98.4	88.5 - 110		%Rec	1	10/30/2020 6:41:31 PM
Surr: 1-Bromo-4-fluorobenzene	99.0	88.6 - 109		%Rec	1	10/30/2020 6:41:31 PM
Sample Moisture (Percent Moisture)				Batch ID: R62874		Analyst: CJ
Percent Moisture	9.21	0.500		wt%	1	10/27/2020 10:27:36 AM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 11:55:00 AM
Project: Ranch 19 W
Lab ID: 2010388-006
Matrix: Soil
Client Sample ID: R19W-102220-16.3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	20.9		mg/Kg-dry	1	10/28/2020 3:21:55 AM
Heavy Oil	ND	52.4		mg/Kg-dry	1	10/28/2020 3:21:55 AM
Surr: 2-Fluorobiphenyl	73.7	50 - 150		%Rec	1	10/28/2020 3:21:55 AM
Surr: o-Terphenyl	80.0	50 - 150		%Rec	1	10/28/2020 3:21:55 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0229		mg/Kg-dry	1	10/30/2020 7:11:47 PM
Toluene	ND	0.0229		mg/Kg-dry	1	10/30/2020 7:11:47 PM
Ethylbenzene	ND	0.0287		mg/Kg-dry	1	10/30/2020 7:11:47 PM
m,p-Xylene	ND	0.0574		mg/Kg-dry	1	10/30/2020 7:11:47 PM
o-Xylene	ND	0.0287		mg/Kg-dry	1	10/30/2020 7:11:47 PM
Surr: Dibromofluoromethane	97.9	85.2 - 113		%Rec	1	10/30/2020 7:11:47 PM
Surr: Toluene-d8	97.8	88.5 - 110		%Rec	1	10/30/2020 7:11:47 PM
Surr: 1-Bromo-4-fluorobenzene	98.7	88.6 - 109		%Rec	1	10/30/2020 7:11:47 PM
Sample Moisture (Percent Moisture)				Batch ID: R62874		Analyst: CJ
Percent Moisture	12.1	0.500		wt%	1	10/27/2020 10:27:36 AM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 12:00:00 PM
Project: Ranch 19 W
Lab ID: 2010388-007
Matrix: Soil
Client Sample ID: R19W-102220-18.3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	18.9		mg/Kg-dry	1	10/28/2020 3:51:39 AM
Heavy Oil	ND	47.3		mg/Kg-dry	1	10/28/2020 3:51:39 AM
Surr: 2-Fluorobiphenyl	74.1	50 - 150		%Rec	1	10/28/2020 3:51:39 AM
Surr: o-Terphenyl	78.3	50 - 150		%Rec	1	10/28/2020 3:51:39 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0201		mg/Kg-dry	1	10/30/2020 7:42:03 PM
Toluene	ND	0.0201		mg/Kg-dry	1	10/30/2020 7:42:03 PM
Ethylbenzene	ND	0.0251		mg/Kg-dry	1	10/30/2020 7:42:03 PM
m,p-Xylene	ND	0.0502		mg/Kg-dry	1	10/30/2020 7:42:03 PM
o-Xylene	ND	0.0251		mg/Kg-dry	1	10/30/2020 7:42:03 PM
Surr: Dibromofluoromethane	97.0	85.2 - 113		%Rec	1	10/30/2020 7:42:03 PM
Surr: Toluene-d8	97.2	88.5 - 110		%Rec	1	10/30/2020 7:42:03 PM
Surr: 1-Bromo-4-fluorobenzene	98.0	88.6 - 109		%Rec	1	10/30/2020 7:42:03 PM
Sample Moisture (Percent Moisture)				Batch ID: R62874		Analyst: CJ
Percent Moisture	6.70	0.500		wt%	1	10/27/2020 10:27:36 AM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 12:05:00 PM
Project: Ranch 19 W
Lab ID: 2010388-008
Matrix: Soil
Client Sample ID: R19W-102220-17.9.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	37.5		mg/Kg-dry	1	10/28/2020 4:21:21 AM
Heavy Oil	ND	93.6		mg/Kg-dry	1	10/28/2020 4:21:21 AM
Surr: 2-Fluorobiphenyl	73.8	50 - 150		%Rec	1	10/28/2020 4:21:21 AM
Surr: o-Terphenyl	78.3	50 - 150		%Rec	1	10/28/2020 4:21:21 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0175	MDL	mg/Kg-dry	1	10/30/2020 8:12:20 PM
Toluene	ND	0.0501		mg/Kg-dry	1	10/30/2020 8:12:20 PM
Ethylbenzene	ND	0.0626		mg/Kg-dry	1	10/30/2020 8:12:20 PM
m,p-Xylene	ND	0.125		mg/Kg-dry	1	10/30/2020 8:12:20 PM
o-Xylene	ND	0.0626		mg/Kg-dry	1	10/30/2020 8:12:20 PM
Surr: Dibromofluoromethane	98.1	85.2 - 113		%Rec	1	10/30/2020 8:12:20 PM
Surr: Toluene-d8	98.1	88.5 - 110		%Rec	1	10/30/2020 8:12:20 PM
Surr: 1-Bromo-4-fluorobenzene	98.5	88.6 - 109		%Rec	1	10/30/2020 8:12:20 PM
Sample Moisture (Percent Moisture)				Batch ID: R62910		Analyst: RL
Percent Moisture	49.4	0.500		wt%	1	10/28/2020 9:57:43 AM

NOTES:
MDL - Analyte reported to Method Detection Limit (MDL)

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 12:10:00 PM
Project: Ranch 19 W
Lab ID: 2010388-009
Matrix: Soil
Client Sample ID: R19W-102220-19.3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30175		Analyst: IH
Diesel (Fuel Oil)	ND	17.9		mg/Kg-dry	1	10/28/2020 4:51:06 AM
Heavy Oil	ND	44.8		mg/Kg-dry	1	10/28/2020 4:51:06 AM
Surr: 2-Fluorobiphenyl	76.0	50 - 150		%Rec	1	10/28/2020 4:51:06 AM
Surr: o-Terphenyl	80.0	50 - 150		%Rec	1	10/28/2020 4:51:06 AM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0209		mg/Kg-dry	1	10/30/2020 8:42:42 PM
Toluene	ND	0.0209		mg/Kg-dry	1	10/30/2020 8:42:42 PM
Ethylbenzene	ND	0.0262		mg/Kg-dry	1	10/30/2020 8:42:42 PM
m,p-Xylene	ND	0.0523		mg/Kg-dry	1	10/30/2020 8:42:42 PM
o-Xylene	ND	0.0262		mg/Kg-dry	1	10/30/2020 8:42:42 PM
Surr: Dibromofluoromethane	97.5	85.2 - 113		%Rec	1	10/30/2020 8:42:42 PM
Surr: Toluene-d8	98.8	88.5 - 110		%Rec	1	10/30/2020 8:42:42 PM
Surr: 1-Bromo-4-fluorobenzene	95.4	88.6 - 109		%Rec	1	10/30/2020 8:42:42 PM
Sample Moisture (Percent Moisture)				Batch ID: R62910		Analyst: RL
Percent Moisture	4.51	0.500		wt%	1	10/28/2020 9:57:43 AM

Analytical Report

Work Order: **2010388**
Date Reported: **11/6/2020**

Client: Fulcrum Environmental
Collection Date: 10/22/2020 12:15:00 PM
Project: Ranch 19 W
Lab ID: 2010388-010
Matrix: Soil
Client Sample ID: R19W-102220-20.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 30176		Analyst: IH
Diesel (Fuel Oil)	ND	19.6		mg/Kg-dry	1	10/27/2020 6:57:09 PM
Heavy Oil	ND	48.9		mg/Kg-dry	1	10/27/2020 6:57:09 PM
Surr: 2-Fluorobiphenyl	113	50 - 150		%Rec	1	10/27/2020 6:57:09 PM
Surr: o-Terphenyl	91.5	50 - 150		%Rec	1	10/27/2020 6:57:09 PM
Volatile Organic Compounds by EPA Method 8260D				Batch ID: 30228		Analyst: CR
Benzene	ND	0.0237		mg/Kg-dry	1	10/30/2020 9:13:03 PM
Toluene	ND	0.0237		mg/Kg-dry	1	10/30/2020 9:13:03 PM
Ethylbenzene	ND	0.0296		mg/Kg-dry	1	10/30/2020 9:13:03 PM
m,p-Xylene	ND	0.0592		mg/Kg-dry	1	10/30/2020 9:13:03 PM
o-Xylene	ND	0.0296		mg/Kg-dry	1	10/30/2020 9:13:03 PM
Surr: Dibromofluoromethane	96.8	85.2 - 113		%Rec	1	10/30/2020 9:13:03 PM
Surr: Toluene-d8	98.9	88.5 - 110		%Rec	1	10/30/2020 9:13:03 PM
Surr: 1-Bromo-4-fluorobenzene	94.9	88.6 - 109		%Rec	1	10/30/2020 9:13:03 PM
Sample Moisture (Percent Moisture)				Batch ID: R62910		Analyst: RL
Percent Moisture	8.09	0.500		wt%	1	10/28/2020 9:57:43 AM

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **MB-30175**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **10/27/2020**	RunNo: **62917**
Client ID: **MBLKS**	Batch ID: **30175**		Analysis Date: **10/27/2020**	SeqNo: **1262906**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	17.5		20.00		87.4	50	150				
Surr: o-Terphenyl	17.7		20.00		88.4	50	150				

Sample ID: **LCS-30175**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **10/27/2020**	RunNo: **62917**
Client ID: **LCSS**	Batch ID: **30175**		Analysis Date: **10/27/2020**	SeqNo: **1262907**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	466	20.0	500.0	0	93.2	65	135				
Surr: 2-Fluorobiphenyl	18.5		20.00		92.7	50	150				
Surr: o-Terphenyl	19.0		20.00		95.2	50	150				

Sample ID: **MB-30176**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **10/27/2020**	RunNo: **62915**
Client ID: **MBLKS**	Batch ID: **30176**		Analysis Date: **10/27/2020**	SeqNo: **1262822**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	21.7		20.00		109	50	150				
Surr: o-Terphenyl	17.6		20.00		87.8	50	150				

Sample ID: **2010371-003AMS**	SampType: **MS**	Units: **mg/Kg-dry**	Prep Date: **10/27/2020**	RunNo: **62917**
Client ID: **BATCH**	Batch ID: **30175**		Analysis Date: **10/27/2020**	SeqNo: **1262911**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	505	20.2	503.8	0	100	65	135				
Surr: 2-Fluorobiphenyl	19.7		20.15		97.6	50	150				
Surr: o-Terphenyl	20.5		20.15		102	50	150				

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **2010371-003AMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/27/2020** RunNo: **62917**
Client ID: **BATCH** Batch ID: **30175** Analysis Date: **10/27/2020** SeqNo: **1262911**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **LCS-30176** SampType: **LCS** Units: **mg/Kg** Prep Date: **10/27/2020** RunNo: **62915**
Client ID: **LCSS** Batch ID: **30176** Analysis Date: **10/27/2020** SeqNo: **1262823**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	453	20.0	500.0	0	90.5	65	135				
Surr: 2-Fluorobiphenyl	21.7		20.00		108	50	150				
Surr: o-Terphenyl	19.7		20.00		98.5	50	150				

Sample ID: **2010371-003AMSD** SampType: **MSD** Units: **mg/Kg-dry** Prep Date: **10/27/2020** RunNo: **62917**
Client ID: **BATCH** Batch ID: **30175** Analysis Date: **10/27/2020** SeqNo: **1262912**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	495	20.4	510.0	0	97.1	65	135	504.7	1.90	30	
Surr: 2-Fluorobiphenyl	18.7		20.40		91.9	50	150		0		
Surr: o-Terphenyl	19.3		20.40		94.8	50	150		0		

Sample ID: **2010397-002AMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/27/2020** RunNo: **62915**
Client ID: **BATCH** Batch ID: **30176** Analysis Date: **10/27/2020** SeqNo: **1262827**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	939	24.0	600.8	561.2	62.9	65	135				S
Surr: 2-Fluorobiphenyl	26.4		24.03		110	50	150				
Surr: o-Terphenyl	26.3		24.03		109	50	150				

NOTES:
S - Spike recovery indicates a possible matrix effect.

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **2010397-002AMSD** SampType: **MSD** Units: **mg/Kg-dry** Prep Date: **10/27/2020** RunNo: **62915**
Client ID: **BATCH** Batch ID: **30176** Analysis Date: **10/27/2020** SeqNo: **1262828**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	1,590	22.7	567.6	561.2	182	65	135	938.9	51.7	30	RS
Surr: 2-Fluorobiphenyl	22.8		22.70		100	50	150		0		
Surr: o-Terphenyl	26.2		22.70		115	50	150		0		

NOTES:
S - Spike recovery indicates a possible matrix effect.
R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID: **2010385-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/27/2020** RunNo: **62917**
Client ID: **BATCH** Batch ID: **30175** Analysis Date: **10/27/2020** SeqNo: **1262917**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	21.6						0		30	
Heavy Oil	ND	53.9						0		30	
Surr: 2-Fluorobiphenyl	17.5		21.56		81.0	50	150		0		
Surr: o-Terphenyl	17.8		21.56		82.7	50	150		0		

Sample ID: **2010400-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/27/2020** RunNo: **62915**
Client ID: **BATCH** Batch ID: **30176** Analysis Date: **10/27/2020** SeqNo: **1262833**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	18.9						0		30	
Heavy Oil	ND	47.2						0		30	
Surr: 2-Fluorobiphenyl	22.0		18.89		117	50	150		0		
Surr: o-Terphenyl	17.9		18.89		94.6	50	150		0		

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **MB-30278** SampType: **MBLK** Units: **µg/Kg** Prep Date: **11/4/2020** RunNo: **63185**
Client ID: **MBLKS** Batch ID: **30278** Analysis Date: **11/5/2020** SeqNo: **1268083**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	387		500.0		77.4	16.9	122				
Surr: Terphenyl-d14 (surr)	400		500.0		80.0	38.4	153				

Sample ID: **LCS-30278** SampType: **LCS** Units: **µg/Kg** Prep Date: **11/4/2020** RunNo: **63185**
Client ID: **LCSS** Batch ID: **30278** Analysis Date: **11/5/2020** SeqNo: **1268084**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	921	40.0	1,000	0	92.1	57.2	127				
2-Methylnaphthalene	967	40.0	1,000	0	96.7	55.1	134				
1-Methylnaphthalene	949	40.0	1,000	0	94.9	56.9	136				
Acenaphthylene	1,020	40.0	1,000	0	102	58.5	132				
Acenaphthene	985	40.0	1,000	0	98.5	57.9	132				

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **LCS-30278** SampType: **LCS** Units: **µg/Kg** Prep Date: **11/4/2020** RunNo: **63185**
Client ID: **LCSS** Batch ID: **30278** Analysis Date: **11/5/2020** SeqNo: **1268084**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	934	40.0	1,000	0	93.4	59.2	134				
Phenanthrene	927	40.0	1,000	0	92.7	57.1	135				
Anthracene	926	40.0	1,000	0	92.6	55.7	137				
Fluoranthene	917	40.0	1,000	0	91.7	58.1	134				
Pyrene	938	40.0	1,000	0	93.8	59.6	136				
Benz(a)anthracene	953	40.0	1,000	0	95.3	51.5	139				
Chrysene	908	40.0	1,000	0	90.8	58.3	130				
Benzo(b)fluoranthene	928	40.0	1,000	0	92.8	53.4	138				
Benzo(k)fluoranthene	925	40.0	1,000	0	92.5	50.9	140				
Benzo(a)pyrene	911	40.0	1,000	0	91.1	50.4	143				
Indeno(1,2,3-cd)pyrene	961	40.0	1,000	0	96.1	52.3	138				
Dibenz(a,h)anthracene	979	40.0	1,000	0	97.9	53	140				
Benzo(g,h,i)perylene	922	40.0	1,000	0	92.2	51.7	139				
Surr: 2-Fluorobiphenyl	400		500.0		80.1	16.9	122				
Surr: Terphenyl-d14 (surr)	396		500.0		79.2	38.4	153				

Sample ID: **2010388-004AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **11/4/2020** RunNo: **63185**
Client ID: **R19W-102220-15.3** Batch ID: **30278** Analysis Date: **11/5/2020** SeqNo: **1268086**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	845	40.1	1,002	0	84.3	46	106				
2-Methylnaphthalene	879	40.1	1,002	0	87.8	45.3	117				
1-Methylnaphthalene	864	40.1	1,002	0	86.3	48.6	116				
Acenaphthylene	924	40.1	1,002	0	92.2	50	114				
Acenaphthene	883	40.1	1,002	0	88.2	54.9	108				
Fluorene	844	40.1	1,002	0	84.3	54.3	110				
Phenanthrene	849	40.1	1,002	0	84.7	48.9	114				
Anthracene	845	40.1	1,002	0	84.3	53.1	111				
Fluoranthene	851	40.1	1,002	0	85.0	48.5	117				
Pyrene	863	40.1	1,002	0	86.2	48.5	121				

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2010388-004AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **11/4/2020** RunNo: **63185**
Client ID: **R19W-102220-15.3** Batch ID: **30278** Analysis Date: **11/5/2020** SeqNo: **1268086**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	884	40.1	1,002	0	88.2	39.9	125				
Chrysene	837	40.1	1,002	0	83.5	46.8	112				
Benzo(b)fluoranthene	1,000	40.1	1,002	0	100	42.4	123				
Benzo(k)fluoranthene	835	40.1	1,002	0	83.4	41.7	122				
Benzo(a)pyrene	943	40.1	1,002	0	94.1	48.2	121				
Indeno(1,2,3-cd)pyrene	794	40.1	1,002	11.26	78.2	43.6	114				
Dibenz(a,h)anthracene	809	40.1	1,002	12.51	79.5	43.7	116				
Benzo(g,h,i)perylene	769	40.1	1,002	0	76.7	43.7	115				
Surr: 2-Fluorobiphenyl	353		500.9		70.5	16.9	122				
Surr: Terphenyl-d14 (surr)	368		500.9		73.5	38.4	153				

Sample ID: **2010388-004AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **11/4/2020** RunNo: **63185**
Client ID: **R19W-102220-15.3** Batch ID: **30278** Analysis Date: **11/5/2020** SeqNo: **1268087**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	811	37.2	930.5	0	87.2	46	106	844.9	4.06	30	
2-Methylnaphthalene	840	37.2	930.5	0	90.3	45.3	117	879.4	4.55	30	
1-Methylnaphthalene	825	37.2	930.5	0	88.7	48.6	116	864.3	4.66	30	
Acenaphthylene	878	37.2	930.5	0	94.4	50	114	923.5	5.03	30	
Acenaphthene	844	37.2	930.5	0	90.7	54.9	108	883.1	4.54	30	
Fluorene	808	37.2	930.5	0	86.9	54.3	110	844.3	4.36	30	
Phenanthrene	803	37.2	930.5	0	86.3	48.9	114	848.6	5.50	30	
Anthracene	815	37.2	930.5	0	87.6	53.1	111	844.9	3.58	30	
Fluoranthene	808	37.2	930.5	0	86.9	48.5	117	851.2	5.19	30	
Pyrene	817	37.2	930.5	0	87.8	48.5	121	863.3	5.49	30	
Benz(a)anthracene	836	37.2	930.5	0	89.9	39.9	125	884.0	5.53	30	
Chrysene	812	37.2	930.5	0	87.3	46.8	112	836.8	3.03	30	
Benzo(b)fluoranthene	813	37.2	930.5	0	87.3	42.4	123	1,005	21.2	30	
Benzo(k)fluoranthene	726	37.2	930.5	0	78.1	41.7	122	835.5	14.0	30	
Benzo(a)pyrene	812	37.2	930.5	0	87.2	48.2	121	942.5	14.9	30	

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2010388-004AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **11/4/2020** RunNo: **63185**
Client ID: **R19W-102220-15.3** Batch ID: **30278** Analysis Date: **11/5/2020** SeqNo: **1268087**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	830	37.2	930.5	11.26	88.0	43.6	114	794.2	4.47	30	
Dibenz(a,h)anthracene	854	37.2	930.5	12.51	90.4	43.7	116	809.1	5.35	30	
Benzo(g,h,i)perylene	810	37.2	930.5	0	87.1	43.7	115	768.6	5.27	30	
Surr: 2-Fluorobiphenyl	342		465.2		73.4	16.9	122		0		
Surr: Terphenyl-d14 (surr)	348		465.2		74.9	38.4	153		0		

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **LCS-30228** SampType: **LCS** Units: **mg/Kg** Prep Date: **10/30/2020** RunNo: **63025**
Client ID: **LCSS** Batch ID: **30228** Analysis Date: **10/30/2020** SeqNo: **1265068**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.980	0.0200	1.000	0	98.0	79.4	116				
Toluene	0.950	0.0200	1.000	0	95.0	80.5	115				
Ethylbenzene	0.974	0.0250	1.000	0	97.4	81.6	116				
m,p-Xylene	1.95	0.0500	2.000	0	97.4	83.2	115				
o-Xylene	0.975	0.0250	1.000	0	97.5	82.5	114				
Surr: Dibromofluoromethane	1.31		1.250		105	85.2	113				
Surr: Toluene-d8	1.26		1.250		101	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	1.34		1.250		107	88.6	109				

Sample ID: **MB-30228** SampType: **MBLK** Units: **mg/Kg** Prep Date: **10/30/2020** RunNo: **63025**
Client ID: **MBLKS** Batch ID: **30228** Analysis Date: **10/30/2020** SeqNo: **1265055**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0200									
Toluene	ND	0.0200									
Ethylbenzene	ND	0.0250									
m,p-Xylene	ND	0.0500									
o-Xylene	ND	0.0250									
Surr: Dibromofluoromethane	1.23		1.250		98.5	85.2	113				
Surr: Toluene-d8	1.22		1.250		97.4	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	1.25		1.250		100	88.6	109				

Sample ID: **2010388-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63025**
Client ID: **R19W-102220-11.3** Batch ID: **30228** Analysis Date: **10/30/2020** SeqNo: **1265030**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0192						0		30	
Toluene	ND	0.0192						0		30	
Ethylbenzene	ND	0.0239						0		30	

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2010388-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63025**
Client ID: **R19W-102220-11.3** Batch ID: **30228** Analysis Date: **10/30/2020** SeqNo: **1265030**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	ND	0.0479						0		30	
o-Xylene	ND	0.0239						0		30	
Surr: Dibromofluoromethane	1.17		1.197		98.0	85.2	113		0		
Surr: Toluene-d8	1.17		1.197		98.1	88.5	110		0		
Surr: 1-Bromo-4-fluorobenzene	1.15		1.197		96.1	88.6	109		0		

Sample ID: **2010475-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63025**
Client ID: **BATCH** Batch ID: **30228** Analysis Date: **10/30/2020** SeqNo: **1265042**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0187						0		30	
Toluene	ND	0.0187						0		30	
Ethylbenzene	ND	0.0234						0		30	
m,p-Xylene	ND	0.0467						0		30	
o-Xylene	ND	0.0234						0		30	
Surr: Dibromofluoromethane	1.14		1.168		97.8	85.2	113		0		
Surr: Toluene-d8	1.14		1.168		97.7	88.5	110		0		
Surr: 1-Bromo-4-fluorobenzene	1.12		1.168		95.6	88.6	109		0		

Sample ID: **2010388-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63025**
Client ID: **R19W-102220-12.3** Batch ID: **30228** Analysis Date: **10/30/2020** SeqNo: **1265032**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	1.19	0.0197	0.9833	0	121	74.6	126				
Toluene	1.15	0.0197	0.9833	0	117	72.6	127				
Ethylbenzene	1.16	0.0246	0.9833	0	118	77.3	126				
m,p-Xylene	2.33	0.0492	1.967	0	119	78.5	126				
o-Xylene	1.14	0.0246	0.9833	0	116	79.4	123				
Surr: Dibromofluoromethane	1.28		1.229		104	85.2	113				

Work Order: 2010388
CLIENT: Fulcrum Environmental
Project: Ranch 19 W

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260D

Sample ID: **2010388-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **10/30/2020** RunNo: **63025**
Client ID: **R19W-102220-12.3** Batch ID: **30228** Analysis Date: **10/30/2020** SeqNo: **1265032**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Toluene-d8	1.22		1.229		99.5	88.5	110				
Surr: 1-Bromo-4-fluorobenzene	1.28		1.229		104	88.6	109				

Sample Log-In Check List

Client Name:	**FE**	Work Order Number:	**2010388**
Logged by:	**Clare Griggs**	Date Received:	**10/23/2020 9:42:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No ☐	Not Present	☐
2.	How was the sample delivered?	UPS				

Log In

3.	Coolers are present?	Yes	☑	No ☐	NA	☐
4.	Shipping container/cooler in good condition?	Yes	☑	No ☐		
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No ☐	Not Present	☑
6.	Was an attempt made to cool the samples?	Yes	☑	No ☐	NA	☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No ☐	NA	☐
8.	Sample(s) in proper container(s)?	Yes	☑	No ☐		
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No ☐		
10.	Are samples properly preserved?	Yes	☑	No ☐		
11.	Was preservative added to bottles?	Yes	☐	No ☑	NA	☐
12.	Is there headspace in the VOA vials?	Yes	☐	No ☐	NA	☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No ☐		
14.	Does paperwork match bottle labels?	Yes	☐	No ☑		
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No ☐		
16.	Is it clear what analyses were requested?	Yes	☑	No ☐		
17.	Were all holding times able to be met?	Yes	☑	No ☐		

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☑	No ☐	NA	☐

Person Notified:	Nicole McPhee	Date:	10/23/2020
By Whom:	Clare Griggs	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirming sample names.		
Client Instructions:	See revised COC.		

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	3.6

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 10/22/20 | Page: 1 of: 1 | Laboratory Project No (internal): 2010388

Project Name: RANCH 19 W | Special Remarks:

Client: Fulcrum Environmental

Project No: 192902.15

Address: 406 North 2nd Street

Collected by: NM

City, State, Zip: Yakima, Washington 98901

Location:

Telephone: 509.574.0839

Report To (PM): JEREMY.LYNN@FULCRUM.NET | Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax:

PM Email:

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1 R19W-102220-	10/22/20	11:10	S			X			X								
2 R19W-102220-		11:15															
3 R19W-102220-		11:20															
4 R19W-102220-		11:30															
5 R19W-102220-		11:40															HOLD FOR PAHS
6 R19W-102220-		11:55															
7 R19W-102220-		12:00															
8 R19W-102220-		12:05															
9 R19W-102220-		12:10															
10 R19W-102220-		12:15															

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x Nicole	10/22/20	x	10/23/20 @ 0942
Relinquished	Date/Time	Received	Date/Time
x		x	

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 10/22/20 | Page: 1 of: 1 | Laboratory Project No (internal): 2010388

Project Name: RANCH 19 W | Special Remarks: edits per NM 10/23/20 -CG

Client: Fulcrum Environmental | Project No: 192902.15

Address: 406 North 2nd Street | Collected by: NM

City, State, Zip: Yakima, Washington 98901 | Location:

Telephone: 509.574.0839 | Report To (PM): JEREMY.LYNN@FULCRUM.NET | Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax: | PM Email:

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1 R19W-102220 - 11.3	10/22/20	11:10	S			X			X									
2 R19W-102220 - 12.3		11:15																
3 R19W-102220 - 13.3		11:20																
4 R19W-102220 - 15.3		11:30																
5 R19W-102220 - 14.2		11:40																HOLD FOR PAHS
6 R19W-102220 - 16.3.5		11:55																
7 R19W-102220 - 18.3		12:00																
8 R19W-102220 - 17.9.5		12:05																
9 R19W-102220 - 19.3		12:10																
10 R19W-102220 - 20.2		12:15																

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Turn-around Time:
- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x Nicole	10/22/20	x	10/23/20 @ 0942
x		x	

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/22/20 Page: 1 of: 1
Project Name: RANCH 19 W
Project No: 192902.15
Collected by: NM
Location:
Report To (PM): JEREMY.LYNN@FULCRUM.NET
PM Email:

Laboratory Project No (internal): 2010388
Special Remarks: edits per NM 10/23/20 -CG
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Client: Fulcrum Environmental
Address: 406 North 2nd Street
City, State, Zip: Yakima, Washington 98901
Telephone: 509.574.0839
Fax:

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1 R19W-102220 - 11.3	10/22/20	11:10	S			X			X							
2 R19W-102220 - 12.3		11:15														
3 R19W-102220 - 13.3		11:20														
4 R19W-102220 - 15.3		11:30								X						PAHs added by N.M. 10/30/2020,STD TAT -BB
5 R19W-102220 - 14.2		11:40														HOLD FOR PAHS
6 R19W-102220 - 16.3.5		11:55														
7 R19W-102220 - 18.3		12:00														
8 R19W-102220 - 17.9.5		12:05														
9 R19W-102220 - 19.3		12:10														
10 R19W-102220 - 20.2		12:15														

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x Nicole	10/22/20	x	10/23/20 @ 0942
x		x	

Turn-around Time:
- [x] Standard
- [ ] 3 Day
- [ ] 2 Day
- [ ] Next Day
- Same Day ____ (specify)

Appendix F

TEE Form

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Terrestrial-ecological-evaluation.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: Ranch 19 West	
Facility/Site Address: 441 Williamson Road, Sunnyside, Washington	
Facility/Site No:	VCP Project No.:

Step 2: IDENTIFY EVALUATOR			
Please identify below the person who conducted the evaluation and their contact information.			
Name: Jeremy Lynn			Title: Hydrogeologist
Organization: Fulcrum Environmental Consulting, Inc.			
Mailing address: 406 North 2nd Street			
City: Yakima		State: WA	Zip code: 98901
Phone: 509-574-0839	Fax:		E-mail: Jeremy.lynn@efulcrum.net

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2**.*

☒ No or Unknown *If you answered **"NO" or "UNKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☐ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 3** below.*

☐ No *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☐ Yes *If you answered **"YES,"** then answer **Question 4** below.*

☒ No *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☐ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☒ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

- ☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*
- ☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

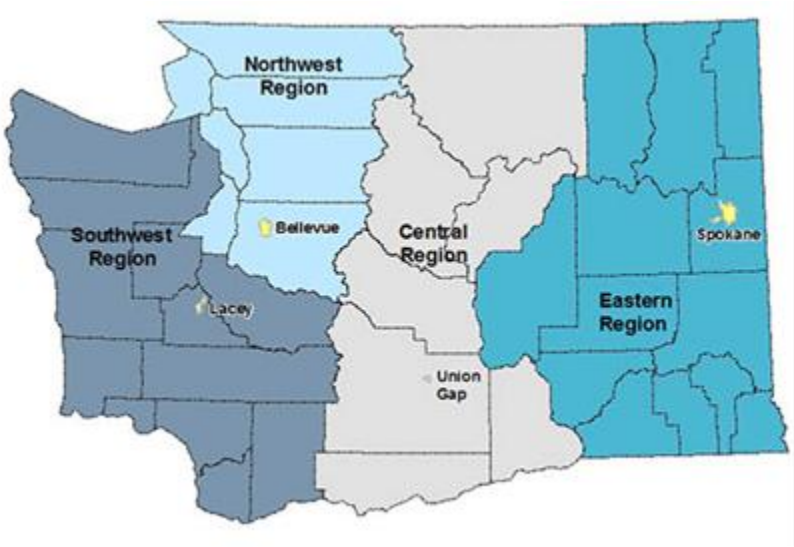
5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call 877-833-6341.