DRAFT Focused Feasibility Study

Coleman Oil Company Wenatchee, Washington

Prepared for:

Coleman Oil Company, LLC
335 Mill Road
Lewiston, Idaho 83501

October 28, 2019

Prepared by:

HydroCon

HydroCon, LLC
314 West 15th Street, Suite 300, Vancouver, Washington 98660
p: (360) 703-6079   f: (360) 703-6086
www.hydroconllc.net

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HydroCon Project No: 2017-074
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Prepared by:

____
Nick Varnum, LHG
Senior Geologist

Reviewed by:

____
Craig Hultgren, LHG
Principal Geologist

Reviewed by:

____
Patrick H. Wicks, PE
President
Environmental Engineering & Consulting, Inc.

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Acronyms

AST	Aboveground Storage Tank
bgs	below ground surface
BNSF	Burlington Northern – Santa Fe Railroad
BTEX	benzene, toluene, ethylbenzene, and total xylenes
cPAHs	carcinogenic polynuclear aromatic hydrocarbons
COC	Chemical of Concern
Coleman Oil	Coleman Oil Company
CUL	MTCA Method A Industrial cleanup level
CSM	conceptual site model
CVB	Control valve building
DRPH	diesel range petroleum hydrocarbons
Ecology	Washington Department of Ecology
EDB	1,2-dibromoethane
EDC	1,2-dichloroethane
EEC	Environmental Engineering & Consulting, Inc.
EPA	Environmental Protection Agency
GAC	Granular activated carbon
gpm	gallons per minute
GRPH	gasoline range petroleum hydrocarbons
HydroCon	HydroCon Environmental LLC
µg/L	micrograms per liter
mg/Kg	milligrams per Kilogram
LCS/LCSD	Laboratory Control Sample/ Laboratory Control Sample Duplicates
LNAPL	light nonaqueous-phase liquid
MDL	method detection limit
MNA	Monitored Natural Attenuation
MRL	method reporting limit
MTBE	Methyl tert-butyl ether
MTCA	Model Toxics Control Act
ORPH	oil range petroleum hydrocarbons
PAH	polynuclear aromatic hydrocarbons
PCS	petroleum contaminated soil
PID	photoionization detector
PUD	Public Utilities District (Chelan County Public Utility District)
R99	R99 Renewable Diesel
RAO	Remedial Action Objective

Acronyms (continued)

REC	recognized environmental concerns
ROW	Right of Way
SAP	Sampling and Analysis Plan
SCO	Sediment Cleanup Objective
SRI	Supplemental Remedial Investigation
SVE	soil vapor extraction
TEE	Terrestrial Ecological Evaluation
TEQ	Toxic Equivalent Concentration
UST	Underground Storage Tank

EXECUTIVE SUMMARY

The FFS is designed to provide an evaluation of the feasibility of proposed environmental cleanup alternatives at the Site and is a companion document for the previous Supplemental Remedial Investigation (SRI). This FFS is “focused” in that extensive interim remedial actions have been implemented at the Site, some of which (e.g., product recovery and pumping and treating groundwater, groundwater monitoring, frequent monitoring of river conditions) will continue to be implemented as selected alternatives. These interim remedial actions have been evaluated and documented in previous reports and will be summarized rather than extensively evaluated in this report. This report provides a list of remedial technologies that may be considered for use at the Site and provides a comparison of the alternatives.

Summary of Site Conditions

Diesel range and gasoline range petroleum hydrocarbons (DRPH and GRPH) exceeding MTCA Method A Industrial cleanup levels (CULs) are present in subsurface soil, groundwater, and shoreline soils. R99 Renewable Diesel (R99) in groundwater extends from the release area to the north-northeast to approximately MW21, a distance of 550 feet. Most soil within the groundwater interface (commonly referred to as the smear zone) is impacted primarily by DRPH and GRPH transported by groundwater.

GRPH in groundwater extends from the former Control Valve Building (CVB) and former Tank Farm B area (MW13R) to at least MW21 and is generally coincident with the R99 plume in downgradient areas. Gasoline releases are due to historic releases not associated with the R99 release. The area with the highest concentrations of GRPH near monitoring well MW13R is located within the footprint of former Tank Farm B and next to (north of) the former CVB. Both of these areas on the Site had historic handling of gasoline and other petroleum products.

An area of shoreline soil is impacted by DRPH and GRPH impacted groundwater discharging to the Columbia River approximately 400 feet north of the release area.

The extent of petroleum in river sediments has been defined and it appears that the sediments no longer have exceedances of sediment management standards in 2019.

Conceptual Site Model

A conceptual site model (CSM) has been developed for the Site. There is a complete exposure pathway for the soil-to-groundwater pathway since contaminated soil is impacting groundwater. The direct contact pathway is complete for areas where contaminated soil and/or groundwater is present at depths of 15 feet or less and includes the most of the northern half of the Property. The vapor pathway is potentially complete if the Property is developed in the future and COCs are still present above

CULs. The Public Utility District (PUD) buildings to the north of the Property may also be subject to vapor intrusion.

Remedial Alternatives Evaluation

Remedial measures evaluated in the FFS include the following:

- Alternative 1. No Action
- Alternative 2. Excavation and Disposal
- Alternative 3. Groundwater Pump and Treat
- Alternative 4. Biodegradable solvent
- Alternative 5. In-situ chemical oxidation
- Alternative 6. Monitored Natural Attenuation
- Alternative 7. Barrier Wall
- Alternative 8. Soil Vapor Extraction

Each of the alternatives were compared and rated with the following criteria:

- Protectiveness
- Permanence
- Long-term effectiveness
- Implementation risk
- Reasonableness of cost

Based on the results of the evaluation, soil vapor extraction (for the 2019 excavation area), groundwater pump and treat and MNA rated the highest and are recommended as the preliminary remedial actions. These alternatives appeared to be attractive, in part, because one year of monitoring indicates that contaminant volume is decreasing and is not migrating. Additionally, the more aggressive remedial actions have aspects that could chemically or physically change the state of the contaminant to be amenable to movement with water (Alternative 4 and 5) or are cost prohibitive due to physical and logistical aspects (Alternatives 2 and 7).

Restoration Time Frame

Diesel and gasoline are the predominant contaminants present at the Site. While gasoline is relatively volatile and typically degrades at a faster rate, diesel may degrade at a very slow rate. For these reasons the restoration time frame is expected to be lengthy. It is excessively costly and difficult to excavate or put in walls to control the contaminants. Diesel and oil range hydrocarbons are not strongly toxic and are present at depth helping to alleviate risks posed to human health and the environment. Offsite water supplies do not appear to be compromised by diesel.

1.0 INTRODUCTION

HydroCon Environmental, LLC (HydroCon), has prepared this Draft Focused Feasibility Study (FFS) Report on behalf of Coleman Oil Company (Coleman Oil) to present and evaluate cleanup alternatives at the Coleman Oil fuel storage facility at 3 Chehalis Street in Wenatchee, Washington (herein referred to as the Property). The FFS has been prepared to meet the requirements of Exhibit B – Scope of Work and Schedule of Agreed Order No. DE 15389 entered into by Coleman Oil Company, LLC; Coleman, Services IV, LLC; and Ecology with an effective date of October 30, 2017 (Agreed Order). The Agreed Order is a continuation of previous and ongoing significant oil spill response activities and removal actions conducted under the Administrative Order on Consent for Removal Activities issued by the U. S. Environmental Protection Agency (EPA) on May 5, 2017 (EPA Docket No. CWA-10-2017-0114).

The Site, as defined under the Washington State Model Toxics Control Act Cleanup Regulation (MTCA), Chapter 173-340 of the Washington Administrative Code (WAC §173-340-200), comprises the portion of the Property and adjacent properties where hazardous substances have come to be located in soil, groundwater, and surface water at concentrations suspected to exceed applicable cleanup levels as a result of releases at the Property.

1.1 Document Purpose and Objectives

The purpose of the FS is to evaluate alternatives for cleanup, taking into consideration the findings in the SRI and associated reports. The FS will be used by WDOE to solicit public and agency comments and select a cleanup action for the Site under WAC 173-340-360 and 173-340-390. The FS is one of the sequential requirements leading to Site cleanup under the Model Toxics Control Act (MTCA), and a task identified as a deliverable in the Agreed Order Scope of Work. This report provides further environmental information and evaluation of cleanup alternatives in support of the Agreed Order toward remedial action at the Site.

1.2 Document Organization

This FFS is organized in the following sections:

- **Section 2, Background Information**. This section discusses the Site location and description, property ownership and operations, the geologic and hydrogeologic setting of the Site, and a summary of contaminant distribution.
- **Section 3, Purpose and Scope.** The purpose and scope of the FFS is presented.
- **Section 4, Previous Investigations.** Environmental investigations and remedial actions conducted on the Site are summarized in this section.

- **Section 5, Nature and Extent of Contamination.** This section summarizes the nature and extent of soil, groundwater and sediment contamination.
- **Section 6, Conceptual Site Model.** An updated conceptual site model is presented included a summary of the areal and vertical extent of contamination, the chemicals and media of concern, presents a Site definition, provides a preliminary exposure assessment, and describes points of compliance.
- **Section 7, Remedial Alternatives Assessment.** This section develops and evaluates cleanup action alternatives and discusses cleanup regulations and levels, the screening of remedial technologies, and the recommended cleanup alternative.
- **Section 8, Conclusions.** This section presents the preliminary recommended alternatives for the Site.
- **Section 9, Qualifications.** This section discusses document limitations.
- **Section 10, References.** This section lists references used to prepare this document.

2.0 BACKGROUND INFORMATION

This section provides a summary of the Property location and description, geologic setting, historical land use, environmental history, and contaminants and media of concern at the Site. This section provides a summary of this information, additional information can be found in the referenced documents.

2.1 Site Description

The Property is located at 3 East Chehalis Street in Wenatchee, Washington (Figure 1). The Chelan County Assessor (2017) online records listed the street address as 600 South Worthen Street with a legal description of Manufacturers Amended Block 4 Lots 1-9, 1.27 acres. The Property was listed in the Chelan County Assessor (2017) online records as County Assessor Property Identification No. 10398, Treasurer Map Property Identification No. (Property ID) 55798, and Chelan County Assessor Parcel No. 222011693005 with a listed owner of Coleman Services V LLC.

The Site comprises the following four parcels:

- Chelan County Parcel No. 222011693005 with a listed owner of Coleman Services V LLC (Coleman property);
- Chelan County Parcel No. 222010693001 with a listed owner of Chelan County Public Utilities District (PUD) (substation to north of Coleman property);
- Chelan County Parcel No. 222011693105 with a listed owner of Chelan County PUD (shoreline east of Coleman Property); and
- Chelan County Parcel No. 222011693100 with a listed owner of Chelan County PUD (shoreline to northeast of Coleman property).

The property and adjacent properties are within the City of Wenatchee's industrial zoning district as of July 14, 2017[1].

[1] http://www.wenatcheewa.gov/home/showdocument?id=17440

2.2 Property Ownership and Operational History

The historical information provided herein regarding the Property was acquired from Blue Mountain Environmental Consulting (2007) and Farallon (2017b). Additional information can also be found in HydroCon 2018a.

The Property was first owned and occupied by Standard Oil Company and was a bulk fuel facility from 1921 to 2017. The Chelan County Assessor (2017) online records indicated that North Central Petroleum, Inc. purchased the Property in 1980. Coleman Services IV, LLC purchased the Property in January 2007 from North Central Petroleum, Inc. (Chelan County Assessor 2017).

The facilities have primarily consisted of different configurations of above ground storage tanks and associated equipment, offices, warehouse storage, loading racks, a UST and a card lock station.

Demolition of most of the Site features occurred during the period between 2010 and 2019. The bulk fuel facility was decommissioned in 2017 as part of Coleman Oil's spill response and remedial action. Currently, only the UST, card lock pump island, and a fenced truck parking area to the south of the card lock are used in fueling operations conducted at the Property. The configuration of the Site as of 2017 is shown on Figure 2.

2.3 Geologic & Hydrogeologic Setting

The Property is located in the Wenatchee Valley approximately 150 feet west south-west of the Columbia River at an elevation of approximately 660 feet above mean sea level (Figure 1). The topography of the Property slopes very gently to the north north-east parallel to the Columbia River.

The Site soils are consistent with ice-age alluvial deposits underlain by the Chumstick Formation bedrock. The alluvium consists primarily of silt and silty sand, with layers of clay, sand, gravel and cobbles. The thickness of the alluvial deposits ranges from 6 to 31.5 feet. Boring logs and drilling observations indicate that a more massive, well cemented sandstone layer is beneath thin layers of mudstone, shale and sandstone and the sandstone appears to be acting as an aquitard in this area. The groundwater level is within a few feet of the top of the Chumstick Formation and always above the sandstone layer. An exception is at MW22 where the groundwater is approximately 15 feet above the top of the Chumstick formation. This area has been disturbed by previous excavation and has been backfilled with construction and other debris. The MW22 area is not considered part of the Site.

Groundwater flow is generally parallel with the Chumstick formation. The groundwater flow direction and the dip of the sandstone surface are both to the north, northeast except in the area between the Site and the Columbia River where both are more to the east.

Contaminant transport and groundwater flow appears to follow the surface of the Chumstick formation and field observations paired with analytical data suggest that the petroleum contamination penetrates a few feet into the formation and travels laterally within the shaley sandstone and shale/siltstone/mudstone of the Chumstick formation. Beginning at the point of release, product migrated downward via gravity until it reached groundwater. Downgradient migration appears to be controlled by geology (bedrock) along preferential pathways within the subsurface that are likely fractured and/or channelized areas within the Chumstick Formation and areas of different porosity in the overlying alluvium. These pathways appear to be complex and localized based on the intermittent presence of light nonaqueous-phase liquid (LNAPL) in monitoring wells installed near the Columbia River near the area of observed sheens and where the four seeps are located. Limited aquifer testing performed in February and August 2018 demonstrated that none of the wells tested are hydraulically connected, except MW10R and MW24.

Based on the lack of observed product in the river since the installation of the current groundwater remediation system (see Section 4.10), it appears that the perched aquifer is not in contact with the Columbia River until the river level rises high enough to come in contact with the seeps.

2.4 Contaminant Distribution

The results of the Supplemental Remedial Investigation (SRI) [HydroCon 2018c] and subsequent investigations provided significant clarification to the understanding of contaminant distribution at the Site. Diesel range petroleum hydrocarbons (DRPH) and gasoline range petroleum hydrocarbons (GRPH) exceeding MTCA Method A Industrial cleanup levels are present in subsurface soil, groundwater, shoreline soils, and shoreline sediments. R99 in groundwater extends from the release area to the north-northeast to the area between MW21 and MW22, a distance of approximately 550 feet. Gasoline, diesel fuel, and motor oil impacted groundwater extends from the former Control Valve Building and former Tank Farm B and extends approximately 650 feet. Soil is impacted by R99 and other fuel products transported by groundwater. Shoreline soil and shoreline sediments are impacted by groundwater discharging to the Columbia River approximately 400 feet north of the release area. Over 200 gallons of R99 (based on product recovery totals) was recovered from the Columbia River with the apparent discharge points being west of monitoring wells BH-2 (south) to MW-10 (north). No product has been recovered from the river since August 2018 (HydroCon 2019a).

GRPH, DRPH, and PAHs commonly associated with coal tar have impacted soil and groundwater at MW22, the northernmost monitoring well. These impacts are interpreted to be due to a source not associated with the operations at Coleman Oil Company, such as the adjacent Chelan PUD Worthen Substation 500, Cleanup Site ID No.: 14795, Facility/Site ID No.: 44830.

3.0 PURPOSE AND SCOPE

The FFS is designed to provide an evaluation of the feasibility of proposed environmental cleanup alternatives at the Site and is a companion document for the previous Supplemental Remedial Investigation Report and related reports. This FFS is focused in that extensive interim remedial actions have been implemented at the Site, some of which will continue to be implemented as selected alternatives (e.g., product recovery and pumping and treating groundwater, groundwater monitoring, frequent monitoring of river conditions). These interim remedial actions have been evaluated and documented in previous reports and will be summarized rather than extensively evaluated in this report. This report provides a list of remedial technologies that may be considered for use at the Site and provides a comparison of the alternatives.

4.0 PREVIOUS INVESTIGATIONS

This section provides a brief summary of releases, environmental site investigations, and remedial actions implemented thus far. Additional site history is documented in the SRI and subsequent reports.

4.1 2010 to 2013 Environmental Investigations

A release of 180 gallons of unleaded gasoline occurred on June 2, 2010 from a pipe connection that is attached to the AST 15A fill valve. This release occurred outside the tank farm containments area. Contaminated soil was excavated to a depth of 2 feet. Subsequent investigations (Farallon 2014) resulting in the installation of five monitoring wells in 2010 (MW-1 through MW-5). Groundwater sampling between 2010 and 2013 resulted in detections of gasoline-range hydrocarbons (GRPH) and/or benzene above MTCA Method A Industrial cleanup levels (CULs) at MW-1 and MW-2 on at least one occasion, with no detections of GRPH or benzene, toluene, ethylbenzene, and xylenes (BTEX) in wells MW-3 through MW-5 above CULs.

On May 30, 2013, a 200 gallon gasoline spill occurred at the Site while the UST on the southeastern portion of the Site that supplied fuel to the retail sales card lock fuel island was being filled (Farallon 2017). A total of 90.08 tons of petroleum-impacted soil was removed from around the UST. Confirmation soil samples collected from the final limits of the excavation confirmed removal of petroleum-impacted soil to less than CULs. Ecology (2015) issued a No Further Action determination for the Property in a letter dated March 13, 2015 that included an Environmental Covenant.

4.2 2017 Environmental Investigations

A sheen on the Columbia River was reported north of the Property on March 17, 2017. Line tightness testing on March 24 revealed that the R99 fuel line and the B75 biodiesel fuel line did not hold pressure. These lines were subsequently decommissioned. Inventory records indicated the release was most likely entirely from the R99 fuel line. Coleman Oil's review of inventory records indicated a total loss of 4,543 gallons in 2016 and 2017 (HydroCon 20187b). The initial spill response activities included decommissioning the fuel lines and deployment of booms and sorbent pads in the area of the observed sheen on the Columbia River.

Site investigation and remedial activities conducted in 2017 by EPA, Farallon, and Coleman Oil Company included the installation of wells (BH-1 through BH-3, MW-1 through MW-11, and RW-1), exploratory test pits and trenches, installation of groundwater recovery sumps, and a 741.43 ton remedial excavation [Figure 2]) and soil removal. These activities confirmed that the release of R99 and other fuel products had resulted in soil and groundwater contamination at the Property and properties to the north and east and that the R99 release had impacted the Columbia River.

2017 interim actions included pumping water from some or all of the sumps (product recovery and maintaining a reduced head near the point of release), water/product level monitoring at wells MW-8 thru MW-10 (and presumably product recovery), and management of the boom area with product recovery utilizing hydrophobic pads and booms.

4.3 2018 Supplemental Remedial Investigation

HydroCon developed the Supplemental Remedial Investigation (SRI) Work plan, Sampling and Analysis Plan, and a Quality Assurance Project Plan for environmental investigations to be conducted at the Site in February 2018 (HydroCon 2018a). These documents were used to guide the field investigation and coordinate laboratory analysis.

The SRI (HydroCon 2018b) included the installation of fifteen borings at the Site including two temporary borings (HC01 and HC02), fourteen new 4-inch diameter monitoring wells (MW12 through MW23), and two shallow wells (MW1S and MW3S). MW1S and MW3S were installed to replace MW-1 and MW-3 due to improper screen placement in the original wells. A round of groundwater sampling was conducted on all wells.

The SRI also included sampling of shoreline soil near the hydrocarbon-impacted seeps on the riverbank (SL01 through SL04), the soil immediately under the discharge of the stormwater drain pipe emanating from Chehalis Street catch basin (SL05),and sediments in the Columbia River (sample locations SS01 through SS05).

The soil borings and wells greatly increased the understanding of the subsurface conditions by demonstrating that the Chumstick Formation largely controlled groundwater flow and the distribution of contaminants (see Sections 2.3 and 2.4). The results of slug and aquifer testing showed that some wells at the Site have a higher yield than others. In general, wells with higher flow also have had higher product recovery rates. This information shows that there are preferential pathways in the top of the formation in which groundwater and product flow. However, the pathways appear to be complex and are likely composed of localized fractures and channels.

Analytical testing of 55 soil samples resulted in detections and CUL exceedances of GRPH, DRPH, oil-range petroleum hydrocarbons (ORPH) and BTEX in both onsite and offsite samples. Five samples were analyzed for volatile organic compounds (VOCs, 66 compounds, not including BTEX) and no concentrations exceeded CULs.

Analytical testing of twenty-five groundwater samples from new and existing wells resulted in detections and CUL exceedances of GRPH, DRPH and BTEX. Naphthalene, MTBE, EDB, and EDC were analyzed for in three samples and there were no CUL exceedances. Total lead was analyzed in five samples and there were no exceedances of the CUL. Polynuclear aromatic hydrocarbons (PAHs) were analyzed in groundwater samples from MW21 and MW22. PAH Toxic Equivalent Concentrations (TEQ) did not exceed the benzo(a)pyrene reference cleanup level.

Shoreline samples were analyzed for GRPH, DRPH, ORPH and BTEX. GRPH and DRPH exceeded CULs in all of the samples collected from the seeps (SL01 through SL04). It's unknown whether ORPH concentrations exceed the CUL in the SL01 through SL04 samples as the laboratory method reporting limit (MRL) had to be elevated above the CUL due to the high concentration of other petroleum products. DRPH was the only analyte detected above the respect MRLs in the SL05 sample at a concentration below the CUL.

Sediment samples were analyzed for GRPH, DRPH, ORPH, and BTEX. DRPH exceeded Ecology's sediment cleanup objectives (SCO) at samples collected from SS01 and SS02.

The SRI included a Simplified Terrestrial Ecological Evaluation (TEE). Based on the MTCA scoring system the TEE was ended with no additional evaluation required.

A Conceptual Site Model (CSM) was developed for the Site in the SRI. The CSM described contaminant sources, the extent of impacted soil, groundwater and sediment, identified contaminant migration processes, identified the chemicals of concern, and conducted a preliminary exposure assessment. The CSM for the Site is further developed in Section 6.

Finally, the SRI identified data gaps for further investigation.

4.4 2018 Additional Interim Action #1 – Aquifer Testing and Groundwater/Product Recovery

Immediately following the SRI, step-drawdown aquifer testing was conducted to assess whether or not pumping in the existing monitoring wells could result in immediate cessation of the continued seepage to the river, and to assess if the water levels in target wells could be maintained at summertime levels to minimize seepage flow to the river.

The step-drawdown testing indicated that the average hydraulic conductivity of the formation in the screened intervals of BH-1, MW-9, and MW-10 is on the order of 2 ft/day. The testing also demonstrated that at a pumping rate of approximately 1.75 gallon per minute (gpm) that the water level in the wells could be sustained at the summertime levels.

Based on the testing described above, pumps were installed at monitoring wells MW-9, MW-10, and BH-1. Results of the pumping indicated that the goal of maintaining water levels at target depths and thereby reducing migration to the river was achieved. In addition, a remediation system was installed to recover groundwater and product from these three wells, treat the product/water to separate the recovered product, treat the groundwater and discharge it to the Wenatchee city sewer.

4.5 2018 Additional Interim Action #2 – Soil boring and Groundwater Well Installation

In August 2018, nine new monitoring wells (MW24 through MW32) were installed. Two existing wells (MW-9 and MW-10) were deepened and completed as 4-inch diameter monitoring/recovery wells. These wells were renamed MW09R and MW10R, respectively. All boreholes were advanced to a depth equal to the average elevation of the Columbia River.

Aquifer testing was performed to select wells for inclusion in the expansion of the Site remediation system and to develop a better understanding of the aquifer characteristics. Aquifer testing included slug testing and step draw down testing in selected wells.

Results of the aquifer testing, boring logs, and the soil analytical data were used to design an expansion of the remediation system. A primary design objective for upgrading the interim remediation system was to expand the product recovery capability of the system. The original system was capable of oil/groundwater extraction from three wells. The new design package included the expansion of the system to a total of nine wells.

The remediation system was expanded in late October 2018 and consists of three zones:

> The MW09R zone is located along the north Right of Way (ROW) of Chehalis street and includes three wells (MW09R, MW17 and MW32). All of these wells are operational, using dedicated AP-3 top loading pneumatic total fluids pumps. The pump intake on MW09R and MW32 is set at 28 feet bgs and the pump intake on MW17 is set at 25 feet bgs.,
>
> The MW10R zone includes MW10R, MW24, and MW28. This zone is located north of BH-1 along the east ROW of Worthen street. All of these wells are operational, using dedicated AP-3 top loading pneumatic total fluids pumps. Product has been measured in MW10R and MW24. The pumps in MW10R and MW24 are set with the intake set at 27 feet bgs. The pump intake in MW28 is set at 33 feet bgs.
>
> The BH-1 zone includes monitoring wells MW29, MW30, and BH-1 and is located in the eastern ROW of Worthen street beginning at BH-1 south to MW30. Product has been observed in BH-1 and recently at MW29. All three of these wells are operational using dedicated AP-3 top loading pneumatic pumps. The pumps in MW29 and MW30 are set with the intake set at 34 feet bgs and the pump intake in BH-1 is set at 27 feet bgs.

4.6 2019 SRI Addendum – Upland Soils Characterization

Data collected with the SRI identified an apparent GRPH source in the vicinity of MW13 (Figure 2). This contamination is a separate issue from the R99 release and required further characterization to identify the source and the extent of subsurface impact.

Activities for this investigation (HydroCon 2019x) were conducted in January 2019 and included:

- Demolition of the Control Valve Building (CVB) which was believed to be one of the primary sources of the GRPH.
- Excavation of 6 exploratory test pits (TP01 through TP06) to assess shallow soil quality near the former CVB and former Tank Farm B.
- Installing 10 temporary soil borings (HC03 through HC12) to the depth of bedrock in the vicinity of the CVB, former Tank Farm B and downgradient (to the north), and
- Deepening and constructing well BH-1 as a larger 4 inch diameter monitoring well to enhance the ability to extract petroleum contaminated groundwater and LNAPL (if present) in this area of the Site. This well was renamed BH01R.

Elevated concentrations of GRPH, DRPH, ORPH, and BTEX were been detected in the soil samples collected in the Uplands area near monitoring well MW13. The investigation identified shallow soil contamination (less than 2 feet bgs) under the CVB and former Tank Farm B. The lateral extent of this contamination was delineated except to the west (BNSF property line) and south (Tank Farm A). The contamination extended from the vadose zone down to the bedrock (approximately 12 to 13 feet bgs).

4.7 2019 SRI Addendum – Sediment Characterization

Five sediment samples were collected on April 23, 2018 as part of the SRI in the observed Sheen Discharge Area. The analytical results of the sediment samples were compared to the Sediment Cleanup Objectives (SCO, WAC 173-204) for TPH-diesel (DRPH, 340 mg/Kg) and TPH-residual (ORPH, 3,600 mg/kg). Two samples, (SS01 and SS02) had DRPH concentrations that exceed the DRPH SCO of 340 mg/kg. Additional sediment characterization was conducted to define the lateral and vertical extent of the DRPH near these sampling locations.

Five sediment samples were collected in March 2019 (HydroCon 2019x). Samples were collected at previous locations SS01 and SS02 and at new locations SS06, SS07, and SS08. Results of the sampling indicated that none of the samples had concentrations above the SCO. As a result, concentrations of DRPH in sediment are no longer at concentrations that exceed the SCO.

4.8 2019 Additional Interim Action #3 – Remedial Excavation

In May 2019, a remedial excavation was conducted in the MW13/CVB area to remove the majority of the source of soil contamination in the unsaturated (vadose) zone affecting groundwater in this area and areas downgradient of the Property. MW13 was abandoned for the excavation and reinstalled as MW13R.

The excavation was advanced to a total depth of approximately 12 to 13 feet bgs (at or near the bedrock interface). The excavation was advanced laterally until field screening results indicated the majority of petroleum contaminated soil (PCS) had been removed or that no further excavation could be done due to access issues (i.e., the property line with BNSF railroad to the west and Tank Farm A to the south). A total of 875 tons of soil was excavated and disposed of at the Greater Wenatchee Regional Landfill. Following excavation, two sets of 4-inch diameter slotted Schedule 40 PVC piping were placed inside the excavation at a depth of approximately 5 feet bgs for potential use in the future for soil vapor extraction (SVE) or application of an in-situ remediation process.

Soil field screening and analytical results indicate that residual contamination remains in the sidewalls and bottom of the excavation in the saturated zone, particularly in the west side wall (adjacent to the railway property) and excavation bottom, which was expected.

Two test pits were installed near the former loading rack and under a former pipe run where the first remedial excavation was performed in 2017 shortly after discovery of the R99 release. The purpose of the test pitting is to assess the quality of backfill soil used. Field observation and soil sampling results confirmed that the soil used to backfill the excavation was clean.

4.9 Remedial Actions

Extensive remedial actions have been conducted since the discovery of the R99 release to the Columbia River in March 2017. This section briefly summarizes these efforts. Additional details are found in the Operations and Maintenance Report – 2018 (HydroCon 2019x).

Decommissioned Fuel Lines. On March 26, 2017, Coleman Oil decommissioned the fuel lines that would not hold pressure. All fuel associated with the ASTs in Tank Farm A was subsequently removed from the Property and transported to other Coleman Oil facilities.

Removal of Truck Loading Rack and Associated Piping. On April 6 and 7, 2017 the truck fuel loading rack and subsurface piping leading to the rack were removed.

2017 Remedial Excavation. Between April 12, 2017 and June 19, 2017 a total of 741.43 tons of contaminated soil was excavated and removed from the Site. Coleman Oil also removed the former

Storage Building (Sump #5 area) and former Maintenance and Warehouse Building as they performed the trenching and remedial excavations.

Columbia River Product Recovery. Documentation of product recovery from the Columbia River has been recorded since product recovery efforts began on March 27, 2017. The total volume of product collected from the river through August 28, 2018 is 214.1 gallons. No product has been observed with daily observations or recovered from the river since August 29, 2018.

Initial Product Recovery – Uplands. Recovery sumps #1 through #3 were installed along the eastern side of the warehouse and office building, recovery sump #4 was installed in the excavation south of the warehouse and office building, and recovery sump #6 was installed north of the warehouse and office building. Recovery sump #5 was installed in the northeastern corner of the Property, where the former storage building was located (Figure 2). Product was also recovered from MW-06, MW-08, MW-09, MW-10, MW-11, BH-1 and BH-2. Total product recovery from these wells through mid-2018 was 102 gallons.

Current Product Recovery – Uplands. An additional nine 4-inch diameter monitoring wells (MW24 through MW32) were installed and two of the pumping wells (MW-9 and MW-10) were deepened and completed as 4-inch diameter wells and renamed MW09R and MW10R in August 2018. BH-1 was deepened and constructed as a 4-inch diameter well in January 2019 and renamed BH01R. Nine wells were incorporated into current groundwater remediation system. A total of 205,092 gallons of water had been recovered, treated and discharged to the City system at the Site between July 10 and December 31, 2018. An additional 290,880 gallons of groundwater has been treated and discharged to the City sewer in 2019 through October 14, 2019.

2018 Barrel Spill. A spill from a 55-gallon drum near the northwest corner of Tank Farm A occurred in September 2018. Remedial excavations were conducted in stages in September and October, resulting in the removal of 16.83 tons of PCS. The excavation was complicated by the presence of a large boulder and Tank Farm A. All PCS from the spill may not have been removed.

2019 Remedial Excavation. A total of 875 tons of petroleum-contaminated soil was excavated and transported offsite in May 2019. Soil contamination was left in place along the western sidewall due to the property line with BNSF and the floor of the excavation due to the uneven surface of the bedrock. HydroCon placed 2 sets of 4-inch diameter slotted PVC piping for potential futures use for alternative remedial action (SVE and/or application piping for an in-situ remediation product).

4.10 Groundwater Monitoring

Groundwater sampling has been conducted in monitoring wells since 2010 with the installation of MW-1 through M-5 and groundwater samples were collected on an approximately quarterly basis until 2013.

Following the R99 spill, MW-6 though MW-11 were installed in March and April 2017. Monitoring wells MW01S, MW03S and MW12 through MW23 were installed in April 2018, and wells MW09R, MW10R, and MW24 through MW32 we installed in August 2018. MW13 was abandoned and MW13R was installed July 2019.

Groundwater sampling of all Site wells began in August 2018 and there have been four sampling events completed (August 30, 2018, November 27, 2018, March 28, 2019, and August 27, 2019). A summary of the most recent groundwater monitoring is provided in Section 5.3

5.0 NATURE AND EXTENT OF CONTAMINATION

During the SRI, HydroCon primarily used the sonic drilling method to advance borings at the Site. This method produced excellent sample recovery that allowed the field geologist to examine the geologic composition of the subsurface as well as field screen the soils for the presence of petroleum hydrocarbon contamination using visual, olfactory, sheen testing, and PID monitoring. Typically a minimum of three soil samples were collected from each boring to assess the lateral extent of contamination. The sample cores produced by the sonic drilling method allowed high resolution examination of the geologic composition of the subsurface which revealed that alluvial soils are underlain by bedrock which has been identified as the Chumstick Formation. This was key to Site characterization as previous work performed at the Site in 2017 and earlier utilized drilling and sampling methodology that had poor sample recovery, particularly as the depth increased. This resulted in an improperly characterized Site where the controlling geologic feature (Chumstick Formation) was not identified.

The results of the SRI (HydroCon 2018b) provided significant clarification to the understanding of contaminant distribution at the Site. With the exception of some localized area at the Site, the majority of soil contamination was found in a relatively narrow depth range beginning near the groundwater interface and extending downward and terminating in the underlying bedrock (Chumstick Formation). Groundwater levels fluctuate seasonally with late winter and spring having the highest water levels and late summer and fall having the lowest. The Columbia River does not appear to be connected to the aquifer perched on top of the bedrock until the spring thaw occurs, raising water levels in the river high enough to come into contact with the seeps located along the shoreline. These seeps have been identified as discharge locations where R99 and contaminated groundwater have left the Site and entered the Columbia River. A series of booms have been deployed to mitigate the discharge of product into the river. Due to recovery efforts including the installation of a groundwater and product capture system at the Site, daily observations of river conditions indicate that there has been no product discharge to the river since August 2018. Through daily monitoring it has been observed that the only time sheens appear on the Columbia River in the sheen discharge area is when the river level rises to a level at or above the elevation of the seeps.

Results of the SRI indicated that DRPH and GRPH exceeding their respective CUL are present in subsurface soil, groundwater, shoreline soil, and shoreline sediments. Shoreline soil and shoreline sediments are impacted by groundwater discharging to the Columbia River approximately 400 feet north of the release area. A discussion of each matrix is provided below.

5.1 Soil Characteristics and Quality

The soils beneath the Site are consistent with ice-age alluvial flood deposits underlain by the Chumstick Formation bedrock. The alluvium consists primarily of silt and silty sand, with layers of clay, sand, gravel, cobbles and boulders. The thickness of the alluvial deposits ranges from 6 to 31.5 feet. Boring logs and drilling observations indicate that a more massive, well cemented sandstone layer is beneath thin layers of mudstone, shale and sandstone and the sandstone appears to be acting as an aquitard in this area. The groundwater level is within a few feet of the top of the Chumstick Formation and always above the sandstone layer. Downgradient of the onsite source areas, soil is impacted by diesel and gasoline transported by groundwater.

An exception is at MW22, where the groundwater is approximately 15 feet above the top of the Chumstick formation. This area has been disturbed by previous excavation and has been backfilled with construction and other debris; it is not considered part of the Site.

Shoreline soil and shoreline sediments are impacted by groundwater discharging to the Columbia River approximately 400 feet north of the release area. Four seeps (identified as SL01, SL02, SL03, and SL04) have been identified at the Site. Soil in these seeps has been sampled and is impacted with high concentrations of DRPH and GRPH. The elevation of the seeps has been measured and compared with the level of the Columbia River as part of the daily monitoring program.

The primary sources of soil contamination at the Site included the fuel that used to be stored in the ASTs located in Tank Farm A and former Tank Farm B; the USTs that supply fuel to the cardlock facility; the loading rack and associated piping (location of the R99 release); the Control Valve Building and associated pumps and piping (primary source of the uplands contamination along with former Tank Farm B); and fuel handling and storage at multiple locations at the Site (including the recent drum spill). Considering that the Site has been operated as a bulk fuel facility for approximately 100 years, there may be other sources of contamination no longer visible at the Site.

Nearby historical adjacent operations, the PUD Wenatchee Substation and the BNSF Wenatchee Rail Yard, may have contributed to soil contamination within the area investigated by the SRI. Operations at BNSF resulted in a confirmed diesel release and subsequent cleanup. As noted above, soil contamination at MW22 does not appear to be related to releases from Coleman Oil, but is directly downgradient of the Substation.

As discussed above, two remedial excavations occurred at the Site (in 2017 near the release of R99 and the 2019 uplands remedial excavation). Both excavations removed contaminated soil including some from sampling locations (shown with shading in Table 1). In addition, results of the SRI concluded that contamination at monitoring well MW22 is not part of the Site. Therefore, the discussion below of each contaminant only includes soil that still remains at the Site and is located within the defined area of the Coleman Oil plume.

5.1.1 **Gasoline Range Petroleum Hydrocarbons**

A total of 69 soil samples have GRPH concentrations that exceed the CUL of 30 mg/kg (Table 1). Sixteen of the samples have concentrations equal to or greater than 2,000 mg/kg. The highest concentration of GRPH (15,000 mg/kg) was collected at approximately 16 feet bgs at monitoring well MW-9 (sample MW-9-15.6).

5.1.2 **Diesel Range Petroleum Hydrocarbons**

A total of 15 soil samples have DRPH concentrations that exceed the CUL cleanup level of 2,000 mg/kg (Table 1). Six of the samples have concentrations greater than 5,000 mg/kg. The highest concentration of DRPH (10,100 mg/kg) was collected at 13 feet bgs in a floor sample of the 2019 uplands remedial excavation (sample B03-13).

5.1.3 **Oil Range Petroleum Hydrocarbons**

One soil sample collected in 2019 from the uplands remedial excavation had ORPH above the CUL of 2,000 mg/kg. Sample SW Corner 01-08 was collected at 8 feet bgs and had a concentration of 12,900 mg/kg.

5.1.4 **Benzene**

A total of 3 soil samples have benzene concentrations that exceed the CUL of 5 mg/kg. The highest concentration (3.16 mg/kg) was collected at 13 feet bgs in the uplands remedial excavation (sample B03-13).

5.1.5 **Toluene**

None of the samples collected at the Site have toluene above the CUL of 7 mg/kg.

5.1.6 **Ethylbenzene**

A total of 2 soil samples have ethylbenzene concentrations that exceed the CUL of 6 mg/kg. The highest concentration (9.8 mg/kg) was collected at 8 feet bgs from the uplands remedial excavation (sample WSW01-08).

5.1.7 **Total Xylenes**

A total of 7 soil samples have total xylenes concentrations above the CUL of 9 mg/kg. The highest concentration (93.1 mg/kg) was collected in the upland remedial excavation (sample WSW01-08).

5.2 **Extent of Soil Contamination**

Prior to the SRI, two spills occurred at the Site near the USTs in 2010 and 2013. Remedial actions were taken and the majority of soil contamination was removed. Further site investigation was prompted by the release of R99 in 2017. Multiple borings were drilled and a minimum of three soil samples were collected from each to assess the lateral extent of contamination in the subsurface. Results of those investigations indicated that the majority of soil contamination at the Site was found in a relatively narrow depth range beginning near the groundwater surface. This supports the conceptual model that groundwater is the primary mechanism for contaminant transport at the Site.

The two primary COCs at the Site are GRPH and DRPH. A discussion of the extent of DRPH and GRPH at the Site is provided below. The locations of soil samples exceeding CULs for DRPH and GRPH are shown on Figures 3 and 4.

5.2.1 **Diesel Range Petroleum Hydrocarbons**

The extent of DRPH in soil above the CUL is primarily found in the uplands area near the former CVB and former Tank Farm B, near the release point of R99, the former dry well, and the drum spill area (Figure 2). Only two soil samples collected downgradient of the Coleman Oil facility (from monitoring wells MW19 and MW32) have DRPH above the CUL. The four seeps also have DRPH above the CUL.

Based on the distribution of DRPH in soil at the Site, it appears that R99 travelled quickly through the subsurface without leaving a high concentration residue in soil. The remaining soil concentrations are relatively low and are expected to naturally attenuate.

5.2.2 **Gasoline Range Petroleum Hydrocarbons**

The extent of GRPH in soil above the CUL appears to be relatively wide spread laterally but limited in the vertical direction as discussed above. Two known releases of gasoline occurred near the USTs that provide fuel to the cardlock and were cleaned up prior to the release of R99. One other notable area of GRPH at the Site was found near the CVB and former Tank Farm B. This area of contamination is mixed with other fuel products, primarily DRPH. A remedial excavation was performed in this area in June 2019. Much of the extent of contamination was removed but some was left in place due to the property boundary with the BNSF railroad to the west and Tank Farm A to the south. Some of the highest concentrations of GRPH and DRPH in soil were found in the sidewalls and floor of the excavation cavity. Some additional remedial action in this area of the Site would accelerate the cleanup process.

It's unlikely that all the GRPH in soil at the Site is solely attributable to these areas of known GRPH contamination. Considering the fact that a large release of R99 occurred it's possible that DRPH affected the GRPH results. It should be noted that laboratory flagged many of the GRPH results as being overlap from DRPH.

5.3 Groundwater Characteristics and Quality

Groundwater flow is generally parallel with the top of the Chumstick formation. The groundwater flow direction and the dip of the sandstone surface are both to the north, northeast except in the region between the Site and the Columbia River where both are more to the east. The groundwater elevation contour plot for the August 2019 groundwater monitoring event is shown on Figure 5. The location of the observed seeps 300 feet north of the Property is consistent with the observed groundwater flow direction and gradient.

DRPH and GRPH in groundwater extend from Tank Farm A to the north-northeast to the area between MW21 and MW22, a distance of approximately 650 feet.

The most recent groundwater monitoring event occurred in August 2019. Laboratory analytical results are reported as micrograms per liter (µg/L) or parts per billion. The results are provided on Table 2. A summary of the results for each constituent sampled for that sampling event is provided below.

5.3.1 Gasoline Range Petroleum Hydrocarbons

GRPH was detected in the groundwater above the laboratory's MRL in 14 wells including MW-6, MW-8, MW09R, MW10R, MW-11, MW13R, MW14, MW17, MW20, MW21, MW28, BH01R, BH-2, and BH-3. The GRPH concentration ranged up to 3,510 µg/L with the highest concentration at MW14. The CUL for GRPH is 800 µg/L and was exceeded in the samples collected from MW-8, MW09R, MW10R, MW-11, MW13R, and MW14. A significant reduction in the GRPH concentration is seen in the sample collected from MW-13R compared to the previous groundwater monitoring event in March 2019. This is attributed to the remedial excavation performed in June 2019 near the former Control Valve Building and former Tank Farm B.

5.3.2 Diesel Range Petroleum Hydrocarbons

DRPH was detected in the groundwater above the MRL in 26 wells with concentrations ranging up to 6,730 µg/L. The highest DRPH concentration was detected at MW17. The only wells that did not have a detection of DRPH above the MRL were MW12 and MW31. The CUL for DRPH of 500 µg/L was exceeded in the samples collected from MW-6, MW-8, MW09R, MW10R, MW-11, MW13R, MW14, MW17, MW20, MW21, MW23, MW24, MW28, and MW30. It should be noted that 0.12 feet of product was measured in MW29 and no sample was collected from that well.

5.3.3 **Oil Range Petroleum Hydrocarbons**

ORPH was not detected in the groundwater above the MRL in any of the samples. It should be noted that the MRL in the MW10R sample (1,510 ug/L) exceeds the CUL of 500 µg/L. Therefore it is unknown if the results comply with the cleanup standard.

5.3.4 **Benzene**

Benzene was detected in the groundwater above the MRL in 5 wells including MW-8, MW13R, MW14, MW17, and BH01R at concentrations ranging up to 96.4 µg/L. The highest concentration was seen in MW13R. The CUL for benzene (5 µg/L) was exceeded in the samples collected from MW13R and MW14.

5.3.5 **Toluene**

Toluene was not detected in the groundwater above the MRL in any of the samples.

5.3.6 **Ethylbenzene**

Ethylbenzene was detected in the groundwater in 4 wells above the MRL including MW-8, MW10R, MW13R, and MW14 at concentrations up to 8.52 µg/L. None of the concentrations exceed the CUL of 700 µg/L.

5.3.7 **Total Xylenes**

Total xylenes were detected in the groundwater above the MRL in the samples collected from 3 wells including MW-8, MW10R, and MW13R at a concentration up to 28.5 µg/L. None of the concentrations exceed the CUL of 1,000 µg/L.

5.3.8 **Polynuclear Aromatic Hydrocarbons**

Polynuclear Aromatic Hydrocarbons (PAHs) were not analyzed in the groundwater samples from any of the wells during this sampling event. Historical results are provided in Table 3. When establishing and determining compliance with cleanup levels and remediation levels for mixtures of carcinogenic PAHs (cPAHs) under MTCA Cleanup Regulation (WAC 173-340-708(8)(e)), the mixture is considered a single hazardous substance. The Toxic Equivalent Concentration (TEQ) was calculated for the groundwater PAH samples per Ecology's Focus Sheet[2]. One-half the detection limit used for non-detected concentrations. The TEQs are shown on Table 3. The samples do not exceed the benzo(a)pyrene reference cleanup level of 0.1 µg/L.

5.4 Monitored Natural Attenuation Parameters

The August 2019 groundwater sampling event included analysis of geochemical parameters used to monitor natural attenuation (MNA) at petroleum contaminated sites (Table 4). This sampling event was done to establish a baseline from which to assess if natural attenuation is occurring at the Site. The use of MNA will be considered as a method to use to monitor post-remediation groundwater quality at the Site.

In general, a plume of petroleum hydrocarbons that is undergoing natural attenuation should have decreasing amounts of dissolved oxygen, nitrate, sulfate, and redox potential and an increase in ferrous iron, methane, manganese, and alkalinity (Ecology 2005a).

Dissolved Oxygen – The dissolved oxygen content in the samples collected from the Site ranged from 0.18 to 2.77 mg/L. These values indicate that groundwater at the Site has a low oxygen content (Ecology 2005b).

Redox Potential – Redox potential is a measure of the tendency of a chemical species to acquire or lose electrons. It is measured in millivolts (mV). The more positive the redox potential, the more readily a molecule can acquire electrons and be reduced. The redox potential in the samples collected from the Site ranged from -196 mV to 128.4 mV. A total of 19 samples had a negative reading, 6 had a positive reading, and 1 had a reading of 0 mV.

pH – pH is a measure of the acidity or alkalinity of a solution. The pH scale ranges from 0 to 14. A pH less than 7 is considered to be acidic. A pH greater than 7 is considered to be basic or alkaline. The pH in the samples collected at the Site ranged from 5.97 to 7.43.

Nitrate – Nitrate was detected above the MRL in only three wells (MW01S, MW16, and MW32) ranging from 0.35 to 2.0 mg/L. Nitrate concentrations below background in areas with dissolved contamination is evidence for biodegradation (Ecology 2005b).

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[2] https://fortress.wa.gov/ecy/clarc/FocusSheets/tef.pdf

Sulfate – Sulfate was detected above the MRL in each well except MW-8, MW-11, and MW-4 at concentrations ranging from 0.18 to 78.4 mg/L. Sulfate concentrations less than background in areas with dissolved contamination provide evidence for biodegradation (Ecology 2005b).

Manganese – Manganese was detected in each well ranging from 52.8 to an estimated 10,700 mg/L.

Alkalinity – Alkalinity ranged from 148 to 619 mg/L in the samples collected from the Site.

Methane – Methane was detected in the samples collected from every well except MW-16. Detections ranged from 3.1 µg/L to 8,100 µg/L.

Ferrous Iron – Ferrous iron ranged from 0.0 to 6.5 mg/L in the samples collected from the Site.

While future testing of these parameters is needed to adequately evaluate the presence and progress of natural attenuation, there are preliminary indications that biodegradation is active at the Site.

5.5 Extent of Groundwater Contamination

Iso-concentration contours of DRPH and GRPH concentrations were prepared to illustrate the magnitude and extent of each contaminant at the Site (Figure 6 and 7). Red colored shading was used to graphically display the plume boundary. Areas of higher concentration are shaded in darker red. The seep area (shoreline soil samples SL01 through SL04) are included on the figures since the seep water is in contact with impacted soil and shows the location of this area relative to areas of impacted groundwater.

5.5.1 Diesel Range Petroleum Hydrocarbons

The extent of DRPH contamination in groundwater is illustrated on Figure 6. A plume of DRPH impacted groundwater with DRPH levels greater than the 500 µg/L CUL is present at the Site from south of MW13R and extends northeast slightly beyond monitoring well MW21. There are four areas within the plume that have had consistent elevated DRPH concentrations above 2,000 µg/L:

- The area near monitoring wells MW13R and MW14. The highest concentration of DRPH (2,180 µg/L) occurs in MW13R which is located within the footprint of the former Tank Farm B and the former Control Valve Building.
- The area encompassing monitoring wells MW17 to BH-2, which also includes MW09R. The concentration of DRPH ranges from 5,880 to 6,730 µg/L. Wells MW17 and MW09R are currently being used to extract product and groundwater from the Site.

- The area of monitoring wells MW19, MW20, BH01R, MW28 and MW29. The highest DRPH concentration (4,300 µg/L) occurred in MW19 and monitoring well MW29 had 0.12 feet of LNAPL during the August 2019 groundwater monitoring. Wells BH01R, MW28 and MW29 are being used to extract product and groundwater from the Site.
- The area near well MW10R. MW10R had a DRPH concentration of 3,620 µg/L. Monitoring wells MW21 and MW24 have DRPH levels above the CUL. Wells MW10R and MW24 are being used to extract product and groundwater from the Site.

Groundwater with DRPH levels greater than the 500 µg/L CUL was also present in August 2019 at monitoring wells MW-6, MW-8 and MW-11.

Areas with DRPH concentrations less than 500 µg/L (Method A Industrial cleanup level) include the area of the Property south of Tank Farm A, most of the east half of the Property and adjacent Worthen Street, the northwest portion of Chehalis Street, and the line of wells east of Worthen Street including and between MW25 and RW-1, except BH-3. This latter area is near the observed seep areas and reinforces the role of preferential pathways in the distribution of subsurface contaminants.

5.5.2 **Gasoline Range Petroleum Hydrocarbons**

The extent of GRPH contamination in groundwater is illustrated on Figure 7. A plume of GRPH impacted groundwater is present from the Coleman Oil facility near MW13R and extends northwest towards monitoring well MW21. There are six localized areas within the plume that have elevated GRPH concentrations above the MTCA Method A Industrial CUL of 800 µg/L:

- The area near monitoring wells MW13R and MW14 has the highest concentration of GRPH. 3,510 µg/L is present in MW14, which is located immediately downgradient of the former Tank Farm B and former Control Valve Building. A significant reduction in GRPH concentration in this area of the Site is present compared to the previous quarter and is attributed to the remedial excavation that occurred in June 2019.
- The area near monitoring wells MW-11 and MW-8 have GRPH ranging from 899 to 1,230 µg/L. This area is located within the 2017 remedial excavation area where sump #5 was located. Sump #5 had one of the highest amounts of recovered product at the Site.
- The area near monitoring wells MW17 and MW09R have GRPH concentrations ranging from 655 to 1,080 µg/L. Monitoring wells MW09R and MW17 are currently used to extract product and contaminated groundwater from the Site.
- The area near BH01R has slightly elevated GRPH concentrations (518 ug/L). Although no sample was collected from MW29 due to the presence of LNAPL in the well, it is presumed that

elevated GRPH concentration is present at this location. Both of these wells are used to extract product and contaminated groundwater from the Site.

- The area near monitoring well MW10R has an elevated GRPH concentration (1,270 µg/L). This well is used to extract product and contaminated groundwater from the Site. Well MW21 farther to the north has an elevated GRPH concentration of 453 µg/L, that does not exceed the CUL.
- Monitoring well BH-3 has a GRPH concentration (816 µg/L) that slightly exceeds the CUL. This well is located upgradient of the seeps. This reinforces the role of preferential pathways in the distribution of subsurface contaminants, as stated above.

The overall distribution of GRPH in groundwater is similar to the DRPH distribution and areas with concentrations less than 800 µg/L (Method A Industrial cleanup level) are very similar to areas below the DRPH cleanup level.

5.6 Sediment Characteristics and Quality

HydroCon performed sediment sampling on two different dates during the investigation to assess the nature and extent of contamination in the shallow sediment in the Columbia River in the observed sheen discharge area where the spill containment booms are deployed (Figure 2). The sediment consisted of Silty Sand (SM) which was composed predominantly with fine sand with some low plastic fines and trace to 10% black colored organic material. Local gravels and cobbles were observed within the sediment.

Five sediment samples were collected on April 23, 2018 as part of the SRI in the area of observed sheens. The analytical results of the sediment samples were compared to the Sediment Cleanup Objectives (WAC 173-204) for TPH-diesel (DRPH, 340 mg/Kg) and TPH-residual (ORPH, 3,600 mg/kg) Two samples, (SS01 and SS02) had DRPH concentrations that exceed the DRPH Sediment Cleanup Objective (SCO) of 340 mg/kg (Table 5).

After the 2018 sediment sampling was completed an exploratory exercise was conducted to assess if a hydrocarbon sheen could be produced in the surface sediment along the river by agitating it with a steel rod. The rod was approximately 6 feet in length. This exercise began downstream of the boat launch at Wenatchee Riverfront Park and ended at the at the Senator George Sellar bridge. The field technician agitated the sediment as the boat slowly floated downstream (controlled by motor) and watched for a sheen to be produced. No sheen was observed in any of the estimated 300 near-shore (in water less than 6 feet deep) probe locations.

In March 2019 HydroCon performed a follow up investigation to define the lateral and vertical extent of contamination. Deeper samples were collected at locations SS01 and SS02. Shallow and deeper samples were collected from three additional sample locations (SS06 through SS08) north and east of SS01 and SS02 to define the lateral extent of DRPH contamination as shown on Figure 3. It should be noted that multiple attempts were made to collect sediment sample SS06. The first location (western-most) encountered bedrock with no sediment present. The sampler was moved into deeper water (east) and another attempt was made. Large concrete fragments were encountered at this location with no apparent sediment present. The sampler was again moved into deeper water (east) and another attempt was made. Large cobbles were present in this location preventing the collection of sediment samples. The boat was moved into deeper water, approximately 20 feet from the initial location and the fourth attempt at collecting a sediment sample was successful. Figure 3 shows the location of all sampling locations including the unsuccessful ones. The analytical testing of the sediment samples in March 2019 indicated that none of the samples exceeded the SCO, including samples collected at SS01 and SS02 which had previously exceeded the SCO.

5.7 Extent of Sediment Contamination

Based on the results of the sediment investigation, the 2018 extent of sediment contamination exceeding the SCO as determined by sample analytical results is limited to the shallow samples at and near locations SS01 and SS02. Subsequent sampling in 2019 indicated that none of the samples having concentrations above the SCO. As a result, concentrations of DRPH in sediment are no longer at concentrations that exceed the SCO.

6.0 CONCEPTUAL SITE MODEL

This section presents a conceptual understanding of the Site and identifies potential or suspected sources of hazardous substances, types and concentrations of hazardous substances, potentially contaminated media, and actual and potential exposure pathways and receptors.

6.1 Areal and Vertical Extent of Soil, Groundwater and Sediment Impacts

This section reviews the areal contaminant distribution and subsurface migration pathways.

6.1.1 Areal Contaminant Distribution

The CSM focuses on contamination of soil and groundwater as the impacted media arising from the release of petroleum fuels. The presence of impacted media at the interface between groundwater and soil is the driving force behind this FFS.

DRPH and GRPH exceeding CULs are present in subsurface soil, groundwater, and shoreline soils. R99 in groundwater extends from the release area to the north-northeast to approximately MW21, a distance of 550 feet. Most soil within the groundwater interface (commonly referred to as the smear zone) is impacted primarily by DRPH and GRPH transported by groundwater.

GRPH in groundwater extends from the former CVB and former Tank Farm B area (MW13R) to at least MW21 and is generally coincident with the R99 plume in downgradient areas. Gasoline releases are due to historic releases not associated with the R99 release. The area with the highest concentrations of GRPH near monitoring well MW13R is located within the footprint of former Tank Farm B and next to (north of) the former CVB. Both of these site areas had historic handling of gasoline and other petroleum products.

Shoreline soil is impacted by DRPH and GRPH impacted groundwater discharging to the Columbia River approximately 400 feet north of the release area.

The extent of petroleum in river sediments has been defined and it appears that the sediments no longer have exceedances of sediment management standards in 2019 (HydroCon 2019x).

Gasoline and diesel impacts to soil and groundwater at MW22, the northernmost monitoring well, are interpreted to be due to a source not associated with the operations at Coleman Oil Company.

6.1.2 Contamination Sources

The primary source addressed with this FFS is the R99 release discovered as a sheen in the Columbia River on March 17, 2017. This source is likely entirely attributable to a failed underground pipeline.

Localized areas of the Site had relatively shallow soil contamination (above the water table). HydroCon interpreted this to be source areas. This is based on the fact that other than the USTs, all other sources of contamination at the Site are from above ground equipment such as ASTs, drums, product stored in former warehouses, above ground pumps and piping, as well as fuel handling. Shallow underground piping was the source of the R99 release.

Shallower areas of impacted soil above the saturated zone were discovered during exploration including the former fuel line excavation (R99 release), the former dry well, the Uplands area near the former CVB and former Tank Farm B, and the drum spill area.

The other major source of soil and groundwater contamination is historical operations involving handling and distribution of gasoline and other petroleum fuel products, with a primary source in the central eastern portion of the Property with the highest GRPH concentrations observed at MW13.

Sources of contamination at the Site can be placed into 4 separate categories (known releases, suspected releases, historic releases, offsite sources). Most of these releases or sources are shown on Figure 2. Details of known contamination and potential offsite sources have been discussed in previous sections. A discussion of each category is provided below.

Recent Known Releases

- In June 2010, 180 gallons of unleaded gasoline were released from a leaking valve control box on the southern portion of Tank Farm A.
- In May 2013, 200 gallons of gasoline were released while the UST on the southeastern portion of the Site that supplied fuel to the retail sales card lock fuel island was being filled. Ecology issued an NFA determination in March 13, 2015 for the Site. It should be noted that improper monitoring well construction in two of the wells installed to monitor the gasoline releases (MW-1 and MW-3) may have provided groundwater data that wasn't representative of actual groundwater conditions. This instigated the installation of monitoring wells MW1-S and MW3-S in 2018. It is possible that gasoline impacted soil remains at the Site near the 2010 and 2013 releases and may require further remediation.
- On March 17, 2017, the Wenatchee Fire Department reported the presence of a sheen and petroleum odor on the Columbia River near the Site. Results of investigation and line tightness testing indicated that an estimated 4,543 gallons of R99 biodiesel was released from a broken

fuel line. Ongoing characterization and product recovery measures are being implemented at the Site for this release.

- A spill from a 55-gallon drum near the northeast corner of Tank Farm A occurred in September 2018. This drum held fluids recovered from onsite monitoring wells. Remedial excavations were conducted in stages in September and October, resulting in the removal of 16.83 tons of PCS. The excavation was complicated by the presence of a large boulder and Tank Farm A. All PCS from the spill may not have been removed.

Historic Releases

The Property has operated as a bulk fuel facility since 1921. Little is known about historic operations. However, it is likely that handling, storage, and distribution of fuel resulted in spills, leaks, and accidents over the operational history of this bulk fuel facility and potentially, operations at adjacent industrial facilities (BNSF railroad to the west and the Chelan County PUD operation to the north). This is supported by forensic review of chromatograms that identified several petroleum fuels types in the subsurface other than R99 including degraded diesel, gasoline, bunker C, and oil.

A high concentration of GRPH and benzene has been observed in soil and groundwater samples collected at monitoring well MW13R. This well is located within the footprint of former Tank Farm B and adjacent to (north) and downgradient of the CVB that housed pumps used to load fuel into the storage tanks. A 2019 remedial excavation removed 875 tons of PCS in this area. While it appears that the majority of vadose zone PCS was removed, residual contamination remains in the sidewalls and bottom of the excavation in the saturated zone.

A dry well, located in the east-central portion of the Site, was sampled on April 3, 2017. Five samples were collected at depths of 3-5 feet. The deepest sample collected at the bottom of the excavation had a concentration of 2,400 mg/Kg DRPH and 2,000 mg/kg ORPH. HydroCon installed monitoring well MW23 at the presumed location of the dry well based on Farallon figures. Soil samples collected at 8 and 12 feet bgs in the boring had GRPH concentrations above the CUL.

Potential Offsite Sources

Two adjacent properties that have had known releases and/or handled petroleum products near the subject Site include the PUD property to the north and the BNSF railroad to the west.

6.1.3 Contaminant Migration within the Subsurface

Alluvial deposits are underlain by the Chumstick Formation bedrock. The thickness of the alluvial deposits ranges from 6 to 31.5 feet. Boring logs and drilling observations indicate that a more massive, well cemented sandstone layer is beneath thin layers of mudstone, shale and sandstone and the sandstone appears to be acting as an aquitard in this area. Cross sections are included as Figures 8 through 11 and show the contact between the alluvial deposits and the underlying Chumstick Formation, groundwater levels in April 2018, and the distribution of contamination based on field observations (PID, odor, sheen). These figures demonstrate that the groundwater level is within a few feet of the top of the Chumstick Formation and always above the sandstone layer. An exception is at MW22 where the groundwater is approximately 15 feet above the top of the Chumstick Formation. This area has been disturbed by previous excavation and has been backfilled with construction and other debris. The MW22 area is not considered part of the Site.

Groundwater flow is generally parallel with the Chumstick Formation. The groundwater flow direction and the dip of the Chumstick sandstone surface are both to the north, northeast except in the region between the Property and the Columbia River where both are more to the east. Groundwater levels are approximately 10 feet above the Sandstone. The depth of the top of the sandstone estimated in the easternmost wells (MW15 and MW18) as the boreholes did come in contact with the top of the formation, but not the underlying the sandstone.

Six recovery sumps were installed prior to backfilling the remedial excavations during April to June 2017. The remedial excavation was reportedly advanced to bedrock and then backfilled. The total depth of the sumps ranges from 13 to 20 feet bgs. Pumps were installed in the sumps to recover R99 and maintain a cone of depression in groundwater near the point of release. Initially, the highest recovery of product was at Sump #1 and Sump #2 which are both downgradient and nearest the point of release. Both of these sumps are 13 feet deep. As the water level dropped by pumping (and seasonally) product recovery became more prevalent in the deeper sumps (Sump #2, Sump #5 and Sump #6). The sumps with the most consistent recovery of product was Sump #5 and Sump #6, both of which are located the furthest downgradient from the point of release and are the deepest (20 and 18 feet, respectively). The observation and recovery of product in the sumps follows a similar pattern as what is seen in the downgradient wells with product following the top of the bedrock (Chumstick Formation).

Using the survey information of the wells, a plot of the top of the Chumstick Formation, the total amount of product recovered from the wells, and the relative flow rates of the wells obtained from the hydraulic testing at the Site. A correlation can be made between the contours of the bedrock and the presence of LNAPL in individual wells downgradient (north) of the loading rack (point of the release). Wells with higher flow rates have generally had the most product recovered.

Contaminant transport and groundwater flow appears to follow the surface of the Chumstick Formation and field observations paired with analytical data suggest that the petroleum contamination penetrates a few feet into the formation and travels laterally within the shaley sandstone and shale/siltstone/mudstone of the Chumstick Formation. Beginning at the point of release, product migrated downward via gravity until it reached groundwater. Downgradient migration appears to be controlled by geology (bedrock) along preferential pathways within the subsurface that are likely fractured and/or channelized areas within the Chumstick Formation and areas of different porosity in the overlying alluvium. These pathways appear to be complex and localized based on the intermittent presence of LNAPL in monitoring wells installed near the Columbia River near the area of observed sheens and where the four seeps are located. Groundwater flow velocities (and contaminant transport) are relatively high, with the average hydraulic conductivity of the formation screened by BH-1, MW-9, and MW-10 being on the order of 2 ft/day. This is reinforced by the aquifer testing performed in February 2018 that demonstrated that none of the wells tested are hydraulically connected. However, over 200 gallons of R99 (based on product recovery totals) has made its way into the Columbia River with the apparent discharge points being west of monitoring wells BH-2 (south) to MW-10 (north).

Cross Section B-B' (Figure 10) shows the spatial relationship of the seep samples (SL01), the sediment samples (SS03, SS04, and SS08), and groundwater and river elevations.

Based on the elevation data presented in Cross Section B-B', it appears evident that the sediment impacts are the result of shoreline seepage that has settled beneath the water column as opposed to upward migration of contaminated groundwater. The data supporting this conclusion include:

- Elevations of groundwater in monitoring wells and elevations of the seeps and the river would not suggest any groundwater coming into the river from below, only laterally. Although some seepage discharge below river level evidently occurs when some shoreline seeps are submerged (typically during the spring thaw), such seepage appears to be only in close proximity to the shoreline bank.

- Concentrations of DRPH in sediment samples generally decrease with depth, and higher concentrations were only exhibited in the shallowest samples collected at SS01 and SS02.

Natural attenuation of DRPH in sediments would be expected to include mechanisms such as biodegradation, sediment bioturbation and sediment transport (and hence dilution), and dissolution (transfer of DRPH to the aqueous phase).

Any transfer of DRPH from sediments to the aqueous phase would not be expected to be of significant concern due to:

- The relatively small amount of sediment that was impacted by DRPH (approximately 7 cubic yards) in 2018.

- The tremendous dilution that takes place from the volume of water flowing within the Columbia River.

- The lack of persistent of DRPH in the aqueous environment (mechanisms such as photolysis would be expected to result in destruction of dissolved phase DRPH).
- The lack of DRPH concentrations above SCOs in 2019.

The extent of petroleum in river sediments has been defined and it appears that the sediments no longer have exceedances of sediment management standards in 2019.

6.2 Chemicals and Media of Concern and Cleanup Levels

The COCs for the Site are those compounds that were detected at concentrations exceeding their respective CULs. The COCs and the media where the COCs were detected above the respective CULs are listed below:

- GRPH, DRPH, and BTEX in soil
- GRPH, DRPH, ORPH, benzene, toluene, and xylenes in groundwater
- Petroleum constituents in surface water.

The selected cleanup alternative must comply with the MTCA cleanup regulations specified in WAC §173-340 and with applicable state and federal laws. The CULs selected for the Site are equivalent and consistent with the remedial action objectives (RAOs), which require that the ultimate RAO is to reduce risks to human health and the environment to levels suitable for Ecology to make a determination of NFA for the Site. Achieving the interim RAO will enable Ecology to issue a Property-Specific NFA. The associated media-specific CULs for the identified COCs are summarized in the following sections.

The proposed CULs for soil and groundwater beneath the Site are generally the MTCA Method A CULs for Industrial Land Use (see Section 2.1) for COCs that have a Method A cleanup level. If there is no promulgated Method A cleanup level for a given chemical or medium, the proposed cleanup level is the MTCA Method B Standard Formula Value for carcinogenic or non-carcinogenic compounds, depending on the carcinogenic properties of the compound.

The CULs for the media and COCs include those that have been detected in soil (Table 1) and groundwater (Tables 2 and 3) above the CULs. The soil and groundwater CULs are summarized in the tables below, including the source of the cleanup level.

Proposed CULs for Soil

Chemicals of Concern	Cleanup Level (mg/kg)	Source
GRPH[1]	30	MTCA Method A, Industrial; WAC §173-340-745(3)(b)(i)
DRPH	2,000	
Benzene	0.03	
Toluene	7	
Ethylbenzene	6	
Xylenes[2]	9	

[1]For all gasoline mixtures with benzene included
[2]For total xylenes: ortho-, meta-, and para-isomers

Proposed CULs for Groundwater

Chemicals of Concern	Cleanup Level (µg/L)	Source
GRPH[1]	800	MTCA Method A; §173-340-720(3)(b)(i)
DRPH	500	
ORPH	500	
Benzene	5	
Toluene	1,000	
Ethylbenzene	700	
Xylenes[2]	1,000	
Naphthalenes[3]	160	

[1]When benzene is present in groundwater
[2]For total xylenes: ortho-, meta-, and para-isomers
[3]Value is for total of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene

6.3 Site Definition

Based on the findings from the investigations conducted by HydroCon and others, the Site is defined as petroleum-contaminated soil and groundwater exceeding the MTCA Method A Industrial CULs and as shown in Figure 12.

6.4 Preliminary Exposure Assessment

The following is a review of exposure pathways and receptors identified for the Site based on currently available data.

6.4.1 Soil-to-Groundwater Pathway

Analytical testing of groundwater samples indicates that contamination of groundwater via the soil leaching pathway and is considered to be complete.

6.4.2 **Direct Contact Pathway**

Direct contact with soil and groundwater exhibiting concentrations of petroleum hydrocarbons in excess of the CULs is limited to human receptors who come into close contact with the media via direct exposure, including dermal contact or ingestion of excavated soil or groundwater. The standard point of compliance for soil contamination beneath a Site is approximately 15 feet bgs, which represents a reasonable estimate of the depth that could be accessed during normal Site redevelopment activities (WAC §173-340-740[6][d]).

Areas where laboratory analytical results exceeded the Method A Industrial CUL(s) at depths of less than 15 feet include (the areas with potential exposure to direct contact) include most of the Property north of Tank Farm A. Areas where contamination exceeds 15 feet include all of Worthen Street (with the exception of shoreline samples and FB-9 and MW20). This distribution of areas with potential direct contact exposure is consistent with the northward dip of the top of Chumstick Formation where contamination is generally encountered, which is encountered at greater depths to the north. The distribution suggests that direct contact exposure is also not present beneath most of the adjacent PUD facility, however this area contains no data.

Until such time as the contaminated soil and groundwater are removed or remediated, or an institutional control limiting direct contact is implemented, the direct contact pathway is a potentially viable exposure pathway.

6.4.3 **Vapor Pathway**

Volatile COCs have been identified in soil, however no soil gas samples have been collected. There are no current structures on the Coleman Oil property, except two small sheds, but structures could be built in the future. The vapor intrusion exposure pathway is considered to be potentially complete at the Site.

A telephone conversation with the PUD on September 3, 2018 revealed that a portion of one of the buildings has a basement used for equipment storage. With product observed in MW-9 at a depth of 21.5 feet bgs, the bottom of the basement is likely less than 15 feet (EPA screening guidance adopted by Ecology) above the product level. As such, this building may be subject to vapor intrusion.

6.4.4 **Surface Water/Sediment Pathway**

Migration of contaminants to the Columbia River via groundwater discharge has been demonstrated at the Site. Concentrations in two sediment samples collected in 2018 exceeded the Freshwater Sediment Cleanup Objectives and Cleanup Screening Levels for protection of the benthic community for Diesel. In March 2019 sediment samples were collected at the same locations with 2018 exceedances at roughly the same depth. As noted in Section 6.1.3, the extent of petroleum in river sediments has been defined and it appears that the sediments no longer had exceedances of sediment management standards in 2019.

Surface water in the Columbia River has been impacted by Site releases, with 214.1 gallons of product recovered through August 29, 2018. No product has been observed (from daily observations) or recovered since August 28, 2018.

6.4.5 Groundwater/Drinking Water Pathway

Groundwater in the vicinity of the Site is not developed as a drinking water resource and is not likely to be developed in the future due to a well-established municipal water supply system. HydroCon reviewed registered water wells on the Ecology website, which revealed that there are no water supply wells in the vicinity of the Site. While adverse impacts to shallow groundwater in the immediate vicinity of the Site have been confirmed, there is no potential for adverse impacts to the municipal water supply or private wells from contaminants migrating from the Property. However, there is a potential for future nearby potable water supply development since it cannot be eliminated by criteria of salinity or yield as specified under MTCA.

6.5 Points of Compliance

6.5.1 Soil Points of Compliance

Soil points of compliance for the soil exposure pathways must be considered, which include direct contact, soil leaching to groundwater, soil protection of vapor migration and protection of terrestrial species. The standard point of compliance for soil is defined as throughout the Site from the surface to 15 feet below ground surface. As discussed in Section 6.4.2, most of the Property north of Tank Farm A has contamination in soil at a depth of less than 15 ft.

6.5.2 Groundwater Points of Compliance

Points of compliance will be set for groundwater. The standard point of compliance for groundwater consists of the groundwater throughout the Site from the uppermost level to the lowest depth that could have been affected by contaminants. As such, existing monitoring wells represent on Property compliance points.

A conditional point of compliance is also needed for offsite groundwater near the Columbia River. Existing wells have been located as close the river as is technically possible, so some or all of these wells to the east of Worthen Street can be groundwater points of compliance.

7.0 REMEDIAL ALTERNATIVES EVALUATION PROCESS AND SELECTION

This section describes the remedial alternative evaluation and selection for contaminated groundwater and soils at the Site. The purpose, in support of the FFS, is to develop and evaluate cleanup action alternatives to enable a cleanup action to be selected for the Site. Further, the purpose is to protect human health and the environment by implementing an effective alternative. The technologies and process options identified for each general response action will be subjected to an initial evaluation (screening) to reduce the number of potential remedies.

7.1.1 Alternative 1: No Action

A "No Action" alternative is evaluated as a remedial action alternative. Alternative 1 would involve no further remedial action activities and no institutional controls. Under this alternative, current conditions at the Site would remain without any change, without restrictions being placed on future operations or redevelopment and with no further remedial costs incurred.

7.1.2 Alternative 2: Excavation and Disposal

This alternative has been implemented at the Site resulting in the excavation and disposal of a total of approximately 1,723 tons of PCS and includes a 2013 excavation responding to a gasoline spill at the UST (90 tons), the 2017 excavation in the area of the R99 release (741 tons), the 2019 excavation in the area of the former CVB and Tank Farm B areas (875 tons), and the 2019 drum spill excavation (17 tons). The locations of the remedial excavations are shown on Figure 2. Confirmation sampling of the 2013 excavations confirmed the soil exceeding CULs was removed. The 2017 excavation was not sampled, but sampling that occurred during the 2019 excavation confirmed that the soil used to backfill the excavation did not have detections of hydrocarbons. Sampling of the 2019 excavation indicated that residual contamination remains in the western sidewalls and bottom of the excavation in the saturated zone.

Soil contamination downgradient of the R99 release and CVB and Tank Farm B areas has been demonstrated with soil borings to be limited to the soils within the saturated zone at depths of 8 feet or greater. Removal of the contaminated vadose zone soils would be expected to enhance and accelerate natural attenuation in downgradient areas where excavation is not cost effective and/or accessible (e.g., the PUD facility located north of the property).

7.1.3 Alternative 3: Groundwater Pump and Treat

This alternative has been implemented at the Site and is being used to remove contaminated groundwater and to control groundwater elevations and thereby reduce the potential for contaminated groundwater to discharge to the Columbia River. The current remedial system is described in Sections 4.4 and 4.5 and consists of groundwater being pumped from three zones using top loading pumps to maintain groundwater elevations below seep elevations. Effluent from these wells was routed through three oil/water separators and then through filtration and granular activated carbon (GAC) treatment prior to permitted discharge in batches into the City of Wenatchee's sanitary sewer system.

Modifications to this system are recommended including automation and monthly compliance sampling instead of batch sampling. The City of Wenatchee has agreed in principle to changing the compliance sampling protocols to accommodate such a move.

7.1.4 Alternative 4: Biodegradable Solvent

Site investigations of soil and groundwater conditions indicate that soils in the saturated zone at the top of the Chumstick Formation are highly transmissive and groundwater flow occurs along preferential pathways. A biodegradable solvent, such as isopropyl alcohol could act as a surfactant and potentially be used to dissolve and reduce the viscosity of the fuel product. It is expected that this remedial method could work in groundwater and reduce the hydrophobic bond to soil, allowing the fuel to mobilize (with water) and be pumped from the groundwater system.

7.1.5 Alternative 5: In Situ Chemical Oxidation

In situ chemical oxidation has been tested at other sites for the remedial action of fuels. Favorable results have been achieved in degradation of petroleum concentration and thickness. This method is similar to Alternative 4 above, except that no surfactants are used and as such, less contaminant byproduct groundwater transport is expected.

Chemicals such as sodium persulfate ($NA_2S_2O_8$), activated and catalyzed by hydrogen peroxide (H_2O_2), are examples of oxidizers that could provide for the oxidation of the contaminants. Fenton's reagent and an induced hydroxyl radical (iron as Fe^{+3}) can also be used to increase the oxidizing power toward accomplishment of this alternative.

It is expected that the existing well network and the PVC piping that was placed inside the 2019 remedial excavation would be effective in introducing chemicals into the subsurface for Alternatives 4 and 5.

7.1.6 Alternative 6: Monitored Natural Attenuation

Natural processes can be used to decrease or "attenuate" concentrations of contaminants in soil and groundwater. Groundwater conditions are monitored to make sure natural attenuation is occurring. Monitoring typically involves collecting soil and groundwater samples to analyze them for the presence of contaminants and other site characteristics. The entire process is called "monitored natural attenuation" or "MNA." Natural attenuation occurs at most contaminated sites. However, the right conditions must exist in the subsurface to allow for the natural attenuation process to occur. MNA can be used in conjunction with more active remedial alternatives, such as groundwater pump and/or treat and in-situ chemical oxidation.

MNA also includes continued monitoring of the Columbia River surface for petroleum sheen or product. Monitoring of the river for sheens has been conducted daily since March 2107. The lack of observed product on the river for approximately a year indicates that river monitoring could be conducted on a less frequent basis, and/or only conducted at times of high river levels.

7.1.7 Alternative 7: Barrier Wall

A barrier wall, either at the north edge of the Property and/or to the east of Worthen Street near the seeps, may be effective in containing contaminants and reducing or eliminating releases to the Columbia River. A wall may also be effective in aiding pump and treat efforts. As described in later sections, this alternative would be very difficult to implement due to the nature of the subsurface flood deposits with large rocks, back filled material, and the presence of subsurface utilities.

7.1.8 Soil Vapor Extraction

Soil vapor extraction SVE) uses vacuum pressure to remove volatile and some semi-volatile contaminants (VOCs and SVOCs) from the soil. The gas leaving the soil may be treated or destroyed, depending on local and state air discharge regulations. SVE is more effective for GRPH than it is for DRPH due to the relatively lower volatility of DRPH. SVE is an appropriate technology for vadose zone soils, but not saturated soils unless the water table can be lowered to expose soil to SVE technologies. As noted in previous sections, most of the remaining Site contamination is in the saturated zone. One area with contamination in the vadose zone is in the area of the 2019 remedial excavation were post excavation sidewall samples had concentrations in excess of CULs. Before the excavation was backfilled, PVC piping was installed in the excavation bottom to facilitate potential SVE application in this area.

7.2 Comparison of Remedial Action Alternatives

This section includes a comparison of the alternatives in terms of the remedy selection factors, as required by WAC 173-340-350. The alternative review process will provide evaluation in terms of protectiveness, permanence, long-term effectiveness, implementability, implementation risk and cost. A final screening parameter incorporating “the degree to which community concerns are addressed” will be addressed after comments concerning the Site are received. The findings of the comparative evaluation are summarized below for each of the remedy selection factors.

7.2.1 Protectiveness

The overall protectiveness of each alternative is evaluated as follows:

7.2.1.1 Alternative 1: No Action

This alternative does not address future potential exposure pathways or reduce Site contaminant concentrations. This alternative would not provide for future protection through institutional controls or provide an avenue for future monitoring to check for contaminant movement with groundwater. This alternative has the least protectiveness compared to other alternatives.

7.2.1.2 Alternative 2: Excavation and Disposal

Most of the identified contaminated vadose soil has been excavated and disposed of. Excavation of contaminated soil is the most protective alternative in that this action removes the most contamination. Further excavation of contaminated soil from within the soil/groundwater smear zone would require access to offsite areas. In addition, a large volume of clean overburden would need to be removed to access the thin zone of contaminated soil. Dewatering and treatment of petroleum impacted groundwater would likely be required as well.

7.2.1.3 Alternative 3: Groundwater Pump and Treat

Groundwater pump and treat is being implemented at the Site and effectively removes subsurface contaminants. It is a protective alternative and effectively removes subsurface contaminants.

7.2.1.4 Alternative 4: Biodegradable Solvent

Existing wells at the Site could be utilized to provide access for completing biodegradable solvent/oxidant remediation. Applying a solvent to the hydrocarbons would support mobilization, making the product more pump-able for remediation above ground. This technology could potentially be protective by reducing the total volume of contaminants, but could also make the contaminants more soluble with water and exacerbate downgradient movement, reducing protectiveness.

7.2.1.5 Alternative 5: In Situ Chemical Oxidation

This technology could be protective by reducing the total volume of contaminant. This method would also form water soluble breakdown components of the contaminant and oxidizers, which, could affect downgradient groundwater chemical characteristics. The breakdown of DRPH by oxidizers typically creates polar organic compounds which are quantified in the DRPH analysis. High concentrations of polar organics (whether naturally occurring or from the breakdown of TPH by oxidation) can be impediments towards achieving regulatory closure. Unless Ecology is willing to allow the use of silica gel cleanup, this method would likely frustrate the cleanup process.

7.2.1.6 Alternative 6: Monitored Natural Attenuation

The protectiveness of MNA is similar to that of the No Action and Groundwater Monitoring alternatives in that it does not achieve a reduction of toxicity, mobility, and volume through treatment.

7.2.1.7 Alternative 7: Barrier Wall

Although a barrier wall would provide for no further permanent destruction of contamination, this alternative provides a regimen for monitoring and isolation. It would only be as permanent as the commitment to monitoring.

7.2.1.8 Soil Vapor Extraction.

SVE directly removes contaminants from the subsurface. This technology could be protective by reducing the total volume of contaminant.

7.2.2 Permanence

The permanence of the contaminant destruction is evaluated for each alternative is as follows:

7.2.2.1 Alternative 1: No Action

This alternative provides no contaminant destruction beyond natural biodegradation.

7.2.2.2 Alternative 3: Excavation and Disposal

This alternative provides the greatest amount of permanence for final destruction of onsite contamination. A significant amount of contaminant removal and source control has already completed through interim remedial actions

7.2.2.3 Alternative 4: Groundwater Pump and Treat

Groundwater pump and treat provides permanence for the destruction of onsite and offsite contamination. Contaminant removal with this alternative is currently in operation.

7.2.2.4 Alternative 5: Biodegradable Solvent

This alternative would undoubtedly provide some permanent destruction of contamination, but may result in some secondary product contamination or accelerated product migration.

7.2.2.5 Alternative 6: In Situ Chemical Oxidation

This technology would permanently reduce the total volume of contaminant. Any amount of contaminant oxidized would not be available for further contamination, but some secondary product contamination is expected. Also, the resulting polar compounds created by the oxidation of DRPH will be quantifiable by the NWTPH-Dx method, possibly preventing regulatory closure.

7.2.2.6 Alternative 7: Monitored Natural Attenuation

As with the No Action alternative, the MNA alternative by its self provides no contaminant destruction beyond natural biodegradation.

7.2.2.7 Alternative 8: Barrier Wall

Although Alternative 8 would provide for no further permanent destruction of contamination, this alternative may provide a regimen for enhancing contaminant removal with groundwater pump and treat.

7.2.2.8 Soil Vapor Extraction

This technology would permanently reduce the total volume of contaminant.

7.2.3 Long-term Effectiveness

The long-term effectiveness of each alternative is as follows:

7.2.3.1 Alternative 1: No Action

The no-action alternative does not eliminate or reduce the potential for exposure.

7.2.3.2 Alternative 2: Excavation and Disposal

Excavation of contaminated soil from within the soil/groundwater smear zone has had a significant positive effect. It is not effective in removing all of the remaining soil and groundwater contamination but provides the most long-term effectiveness of all the alternatives.

7.2.3.3 Alternative 3: Groundwater Pump and Treat

This alternative is effective in permanently removing contaminants from groundwater and is currently operating at the Site.

7.2.3.4 Alternative 4: Biodegradable Solvent

This technology is not expected to remediate all of the contamination and therefore would be limited in long-term reliability.

7.2.3.5 Alternative 5: In Situ Chemical Oxidation

Any amount of hydrocarbon removed by this technology would be permanently removed and would assist in long-term reliability. It typically does not remove all of the contaminants and does create polar compounds during the oxidation of DRPH.

7.2.3.6 Alternative 6: Monitored Natural Attenuation

MNA does not actively remove contaminants, but does monitor the volume and rate of contaminant destruction by natural processes.

7.2.3.7 Alternative 7: Barrier Wall

If installed, a barrier wall can serve as a permanent alternative for containment and to aid in the collection and removal of subsurface contaminants.

7.2.3.8 Soil Vapor Extraction

SVE would have a positive effect in that contaminants are permanently removed from the subsurface and provides long-term effectiveness. By limiting SVE to the 2019 remedial excavation area, not all vadose zone soil will be affected, but it does reduce the volume of contamination.

7.2.4 Implementability

Technical and administrative implementability would increase as the complexity of the action increases. The relative implementability of each alternative is described below.

7.2.4.1 Alternative 1: No Action

This alternative can be readily implemented, as it involves no action; Site conditions would not be modified from their current state.

7.2.4.2 Alternative 2: Excavation and Disposal

A significant amount of excavation of vadose zone soil has been completed at the Site. Most of the remaining contaminated soil is in the saturated zone, is present at depths of 8 feet or more, and present at offsite locations. Implementation of this alternative in the saturated zone would involve excavations up to 20 feet in depth and access to offsite areas.

7.2.4.3 Alternative 3: Groundwater Pump and Treat

This technology is currently being implemented at the Site and has been proven to be effective in contaminant removal and containment.

7.2.4.4 Alternative 4: Biodegradable Solvent

Existing wells at the Site could provide access for completing biodegradable solvent remediation within the contaminated zone. Implementing this technology would be an involved process. Significant testing would be required to determine the best surfactant to mobilize the contaminant. Not all of the contamination could be removed by this alternative.

7.2.4.5 Alternative 5: In Situ Chemical Oxidation

This technology is dependent on different chemicals working together to oxidize and reduce contamination. The theory is simple; oxidation reduces contaminant volume and produces water and carbon dioxide as byproducts. There are many potential complications with chemical oxidation, with other elements and molecules present within the contaminants and the oxidants used in the process.

In Situ Chemical Oxidation could certainly be completed at the Site using the existing well network to introduce the oxidants. The introduced oxidants should migrate through the subsurface in a manner similar to the contaminants. However, since offsite areas such as the PUD facility do not have wells, it may have limited implementability.

7.2.4.6 Alternative 6: Monitored Natural Attenuation

MNA is easily implemented since an adequate monitoring well system is installed at the Site.

7.2.4.7 Alternative 7: Barrier Wall

A barrier wall at either the downgradient northern Site boundary or below Worthen Street near the river seeps would be very difficult to implement. The large alluvial boulders that have been encountered in Site excavations will likely preclude the installation of a sheet pile wall or a narrow trench that would be filled with sheet piling or a material such as low density concrete. Underground utilities and backfilled materials are also present in these areas. This alternative would also require considerable monitoring down gradient and of the lateral wall endpoints to assure that contaminates were not migrating beneath or around the wall. Also, given that contaminants flow along preferential pathways at or near the surface of the underlying bedrock, getting a good bottom seal may not be obtainable or verifiable without subsequent monitoring.

7.2.4.8 Soil Vapor Extraction

As noted above, most of the remaining contamination at the Site is present in the saturated zone and therefore not an effective alternative. However, vadose zone contamination is present in the sidewalls of the 2019 remedial excavation and PVC piping was installed prior to backfilling to facilitate SVE. Applying SVE to this area is highly implementable.

7.2.5 Implementation Risk

The relative short term implementation risk of each alternative is provided as follows:

7.2.5.1 Alternative 1: No Action

There is no implementation risk associated with this alternative.

7.2.5.2 Alternative 2: Excavation and Disposal

Further excavation of contaminated soil from within the soil/groundwater smear zone would clean up contamination. Short term worker risk would increase due to opening up the excavation and potential worker exposure to the contaminants. Some implementation risk is expected in that if excavation to below the smear zone occurs, some contaminant could be released to areas downgradient of the excavation. Higher horizontal hydraulic conductivity is possible at the greater depth causing the remaining contaminant to travel with groundwater.

7.2.5.3 Alternative 3: Groundwater Pump and Treat

No further implementation risk is expected from pumping and treating, because the monitoring wells have already been installed at the Site.

7.2.5.4 Alternative 4: Biodegradable Solvent

No short term implementation risk is expected from introducing solvent if the existing wells are used. However, introducing solvent could lead to accelerated contaminant migration which may not be containable by the existing well system, potentially leading to releases to the Columbia River.

7.2.5.5 Alternative 5: In Situ Chemical Oxidation

No short term implementation risk is expected from introducing oxidants if the existing wells are used.

7.2.5.6 Alternative 6: Monitored Natural Attenuation

There is no implementation risk associated with this alternative.

7.2.5.7 Alternative 7: Barrier Wall

Short term worker risk would be increased due to potential worker exposure to contamination. Since the barrier wall would produce little or no contaminated media, less worker risk would be present than in Excavation and Disposal.

7.2.5.8 Soil Vapor Extraction

With the presence of PVC piping in the 2019 remedial excavation backfill, short-term implementation risk is minimal since worker exposure is minimized. Depending on exhaust concentrations, treatment of the vapors before discharging to the atmosphere may be required.

7.2.6 Cost Comparison

7.2.6.1 Alternative 1: No Action

There are no costs associated with implementing this alternative.

7.2.6.2 Alternative 2: Excavation and Disposal

Further excavation of contaminated soil from within the soil/groundwater smear zone would clean up a contamination, but costs could be prohibitive. Contaminants in the saturated zone at the north, downgradient edge of the property extend to depths of 25 feet (MW17) and 30 feet beneath South Worthen Street near the seeps (BH-3). Previous excavations have encountered large unmovable alluvial boulders that are likely to further complicate excavation at both onsite and offsite areas. Excavation beneath the PUD facilities would require demolition and likely reconstructing the facility. The cost of implementing this alternative onsite could exceed $1,000,000. Implementation beyond the Property would likely be in the tens of millions of dollars.

7.2.6.3 Alternative 3: Groundwater Pump and Treat

With the current groundwater pump and treat system in place since October 2018, continued operation should be considered reasonable. Based on current operations and one sample per month, costs will be approximately $9,600 per month for an automated operation.

Automation of the system will cost approximately $17,000 and includes labor, supplies (pump, piping, water meter), electrician, WiFi driver*, and* wireless cameras. This would result in a long-term cost savings as it would reduce labor hours and could reduce compliance sampling costs. Instead of doing batch sampling for compliance, EEC will sample on a routing basis (beginning monthly and then transitioning to quarterly) to demonstrate compliance with the City of Wenatchee discharge agreement.

7.2.6.4 Alternative 4: Biodegradable Solvent

If the existing well network and remediation system is used to introduce solvents, costs are somewhat ameliorated, however a considerable amount of testing would be necessary to choose the best and safest solvent to mobilize contamination. Additional wells for monitoring and capture of the mobilized contaminates may also be needed, as well as an agreement with the City of Wenatchee to continue to dispose of treated groundwater impacted by the surfactants. Additional permitting (i.e., underground injection) would be required. Although these variables have not been thoroughly assessed, the costs of implementing the alternative could easily be in the 100’s of thousands of dollars. These costs are very high for a cleanup method that could cause uncontrolled mobilization of the contaminants.

7.2.6.5 Alternative 5: In Situ Chemical Oxidation

As with Alternative 4, use of the existing well network to introduce oxidants reduces costs for implementation. Testing and monitoring will be required to identify the optimum oxidation compounds and multiple applications may be necessary. Additional permitting will likely be required. Unlike Alternative 4, oxidation is not likely to mobilize contaminants. Implementation of this technology is expected to be in the $100,000 to $300,000 range.

7.2.6.6 Alternative 6: Monitored Natural Attenuation

MNA costs are based on the cost of groundwater monitoring and reporting. The current quarterly groundwater monitoring program has been in place for a year and costs should be considered reasonable. Using the currently established or somewhat reduced monitoring network, monitoring MNA will be approximately $xxx per year for quarterly monitoring. This monitoring cost can be reduced by the following:

- Reduce the number of monitoring wells sampled at the Site. This would require negotiations with and approval from Ecology.
- Reduce the sampling frequency to a semi-annual basis until all COCs at the Site are below their respective CULs.
- Initiate quarterly groundwater monitoring to obtain four consecutive quarters of all COCs remaining below their respective CULs.

7.2.6.7 Alternative 7: Barrier Wall

Due to the same subsurface complications as described for the Excavation and Disposal alternative, installing a barrier wall at the northern Site boundary or under South Worthen Street the costs of implementing this option are likely to be prohibitive and it is likely to be unsuccessful. Permitting and bonding will also be required. Costs of implementation of this alternative could exceed $1,000,000.

7.2.6.8 Soil Vapor Extraction

Limiting the SVE alternative to the 2019 remedial excavation via the installed PVC piping, implementation should be cost effective. Costs include installing the necessary vacuum pumps and related equipment and potentially vapor treatment such as activated carbon.

7.2.7 Consideration of Public Concerns

The consideration of public concerns will be completed a later date after review by Ecology. This section of the FS cannot be completed without public notification and comment concerning the Site. Results of consideration of public concerns will be addressed in the final FFS.

7.3 Comparative Analysis of Remedial Action Alternatives

This section includes a more focused comparison of the alternatives to support selection of a preliminary alternative. A review of each of the seven alternatives, including No Action, Excavation and Disposal, Groundwater Pump and Treat, Biodegradable Solvent, In Situ Chemical Oxidation, Monitored Natural Attenuation, and Barrier Wall is provided. Taking into consideration protectiveness, permanence, long-term effectiveness, implementability, implementation risk, and cost, each of the alternatives will be considered in this section.

In support of the comparison, Table 6 was prepared to screen the alternatives. In an effort to make the best choice, the comparison may take elements out of several of the alternatives to form a best fit for the preliminary chosen remedial alternative. In accordance with WAC 173- 340-360 the preferred order of alternative choices incorporate contaminant recycling, destruction/detoxification, immobilization/solidification, on-site/off-site disposal (in a lined facility), on-site isolation/containment (with engineering controls) and institutional controls, with monitoring.

Table 6 sums each of the alternatives on the basis of protectiveness, permanence, long-term effectiveness, implementability, implementation risk and reasonableness of cost. The sums are provided for the total of all of the components. For each alternative, the above criteria are assigned a value of 1 to 5. The values are weighted in that where there is a large difference between the criteria for each alternative, there is a corresponding large difference in the value assigned (e.g., the difference in cost for MNA verses excavation and disposal is reflected in a large difference in the value assigned). The results provided are based on the best judgment of HydroCon.

Based on the results of the evaluation, SVE (for the 2019 excavation area), groundwater pump and treat and MNA have the highest number of points. These alternatives appeared to be attractive, in part, because one year of monitoring indicates that contaminate volume is decreasing and is not migrating. Additionally, the more aggressive remedial actions have aspects that could chemically or physically change the state of the contaminant to be amenable to movement with water (Alternative 4 and 5) or are cost prohibitive due to physical and logistical aspects (Alternatives 2 and 7).

Groundwater pump (Alternative 3) and treat and MNA (Alternative 6) scored very similarly because the technical aspects, implementability and costs of the alternatives are very similar. The differences between the two are primarily in protectiveness (MNA does not directly provide protectiveness).

7.4 Preliminary Recommended Remedial Action Alternative

In accordance with the requirements of Exhibit B – Scope of Work and Schedule of Agreed Order No. DE 15389, this study has evaluated the feasibility of the alternatives listed above. Based on the comparative evaluation of the remedial action alternatives Alternative 3 (Groundwater Pump and Treat), and Alternative 6 (MNA) rate the highest, based on points received. These preliminary recommended alternatives are chosen, in part, based on their demonstrated effectiveness over the last year. A year of monitoring has indicated that contaminant concentrations are decreasing and migration to the river is being controlled. Alternative 6 (MNA), includes quarterly groundwater monitoring of existing onsite and offsite wells and adds analysis of attenuation parameters to the testing for contaminant. The cost of adding Alternative 6 to Alternative 3 is minimal and provides important information to help assess the rate of attenuation. Alternative 8 (SVE) , as it applies to the 2019 remedial excavation area, also rates high and is cost effective. HydroCon's preliminary recommendation for site remediation is to continue Groundwater Pump and treat, implement additional testing for MNA and conduct SVE at the 2019 remedial excavation area.

While relative costs of all the alternatives have been developed in this FFS, the details of implementing the preliminary recommend alternatives will be developed once the alternatives have been approved. These details may include, at least in part, the frequency and numbers of wells pumped for pump and treat, the frequency and number of wells used for monitoring, and the frequency and methods used for river monitoring. As noted in the following section, the restoration time frame is expected to be lengthy and reducing costs while being protective will play an important role in developing the implementation of these recommended alternatives.

7.5 Restoration Time Frame

A further feasibility study evaluation of the Site considers restoration time frame (WAC 173-340-360). Factors reviewed in evaluation through this section included: risks to human health and the environment; practicality of achieving a shorter restoration time frame; current use of the Site; area resources that could be affected by the release; potential future Site use; availability of alternative water supplies; reliability of institutional controls; ability to monitor hazardous substances from the Site; toxicity of hazardous substances and natural processes that may reduce Site contamination.

Diesel and gasoline are the predominant contaminants present at the Site. While gasoline is relatively volatile and typically degrades at a faster rate, diesel oil may degrade at a very slow rate. For these reasons the restoration time frame is expected to be lengthy. It is excessively costly and difficult to excavate or put in walls to control the contaminants. The oil is not strongly toxic and it is buried at depth helping to alleviate risks posed to human health and the environment. Offsite water supplies do not appear to be compromised by the contaminant. Groundwater pumping and generally decreasing concentrations over the last year has been demonstrated to control releases to the river.

Lastly, groundwater and river monitoring (Alternative 6) is expected to be effective at observations for any future movement of the contamination.

Limited excavation/disposal, source control and groundwater pumping and treat and monitoring measures have already been implemented at the Site. Groundwater pump and treat is further prescribed along with MNA for control of contamination on the Site, along with SVE at the 2019 remedial excavation area. Based on review of the actions already taken (and those prescribed), HydroCon feels that the restoration time frame should not present a significant issue for the preliminary alternative regime selected.

8.0 CONCLUSIONS

Alternatives 3 (groundwater pump and treat) and 6 (MNA) have been chosen as the preliminary recommended alternatives for the Site. The preliminary selected alternatives are the best option for the Site and represents a plan for long term control of the contaminant. Alternative 8 (SVE) , as it applies to the 2019 remedial excavation area, also rates high and is cost effective. We understand that the WDOE will make the final determination of environmental cleanup at the Site, taking into consideration public comment and their environmental processes review. We understand that the next step for the FFS is review by the WDOE and the Public.

9.0 QUALIFICATIONS

HydroCon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. HydroCon makes no warranties, either expressed or implied, regarding the findings, conclusions or recommendations. Please note that HydroCon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report.

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

This report is intended for the sole use of **Coleman Oil Company** to meet the requirements of Exhibit B – Scope of Work and Schedule of the Agreed Order. This report may not be used or relied upon by any other party without the written consent of HydroCon or as mandated by the Agreed Order. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

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

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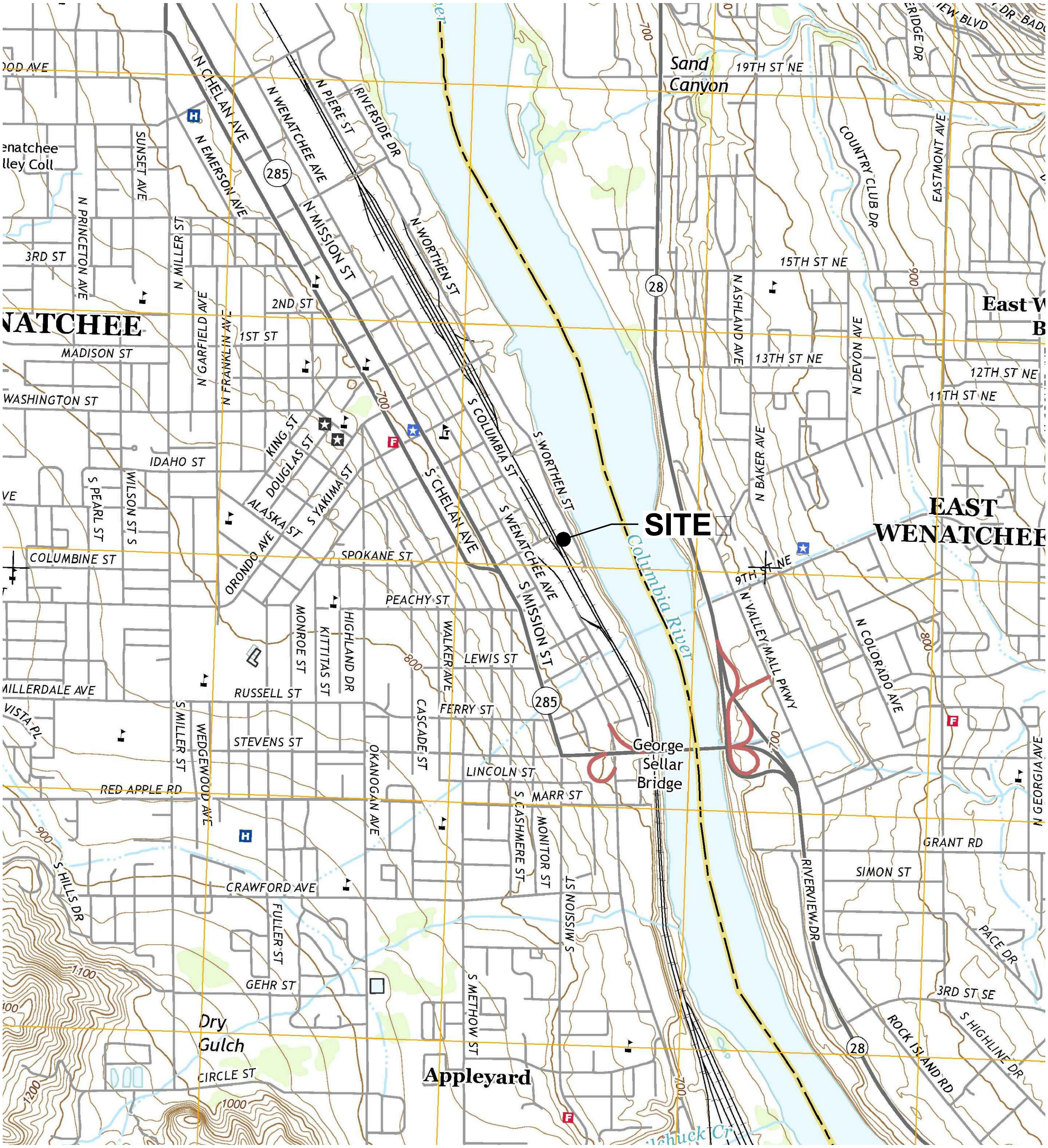
FIGURES



NOTE(S):

USGS, WENATCHEE QUADRANGLE
WASHINGTON
7.5 MINUTE SERIES (TOPOGRAPHIC)

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1" = 2000'

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DATE: 10-10-19
DWN: JJT
CHK: RH
APPROVED: RH
PRJ. MGR: CH
PROJECT NO: 2017-074

FIGURE 1
SITE LOCATION MAP

COLEMAN OIL COMPANY
3 CHEHALIS ST.
WENATCHEE, WA.

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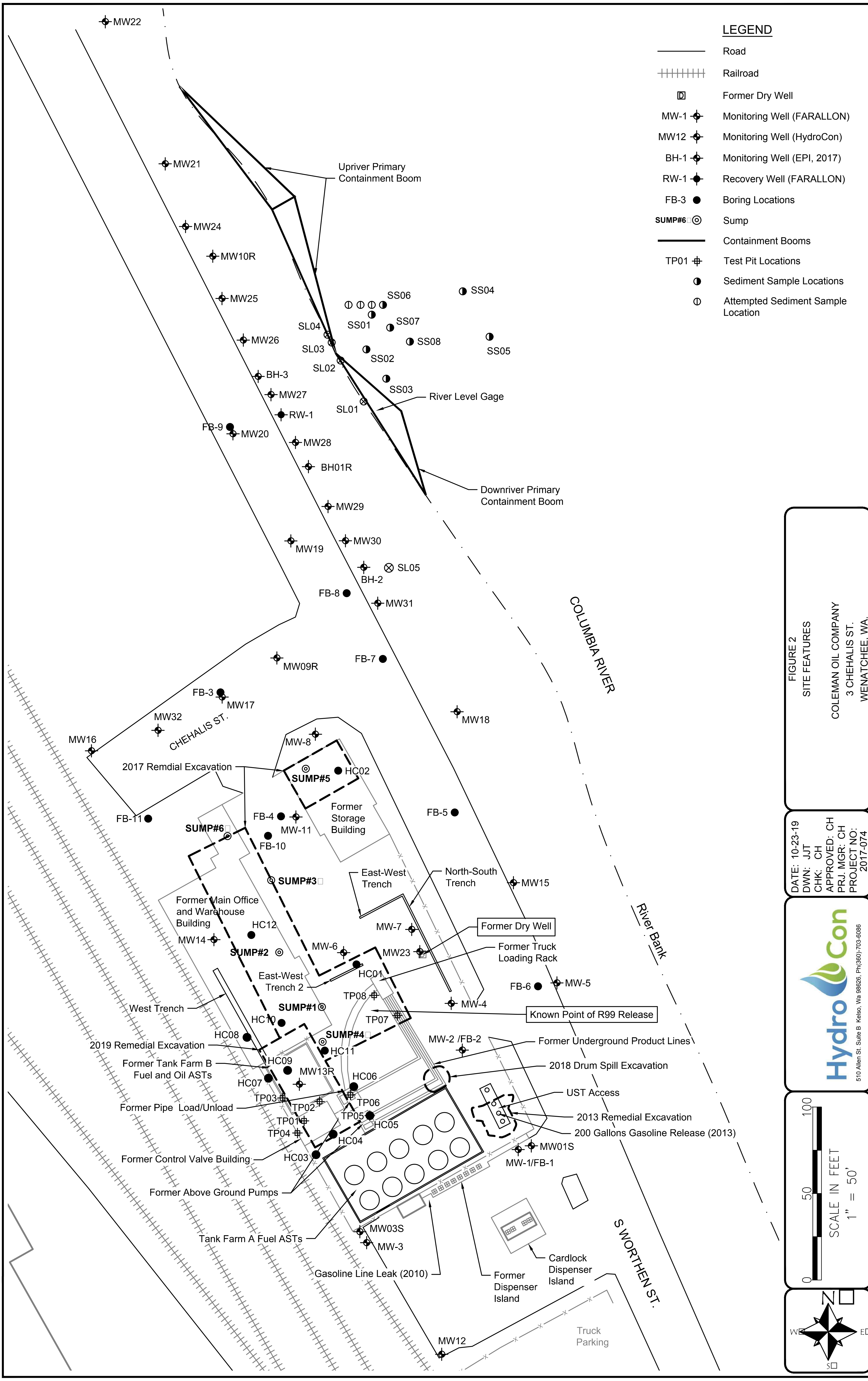

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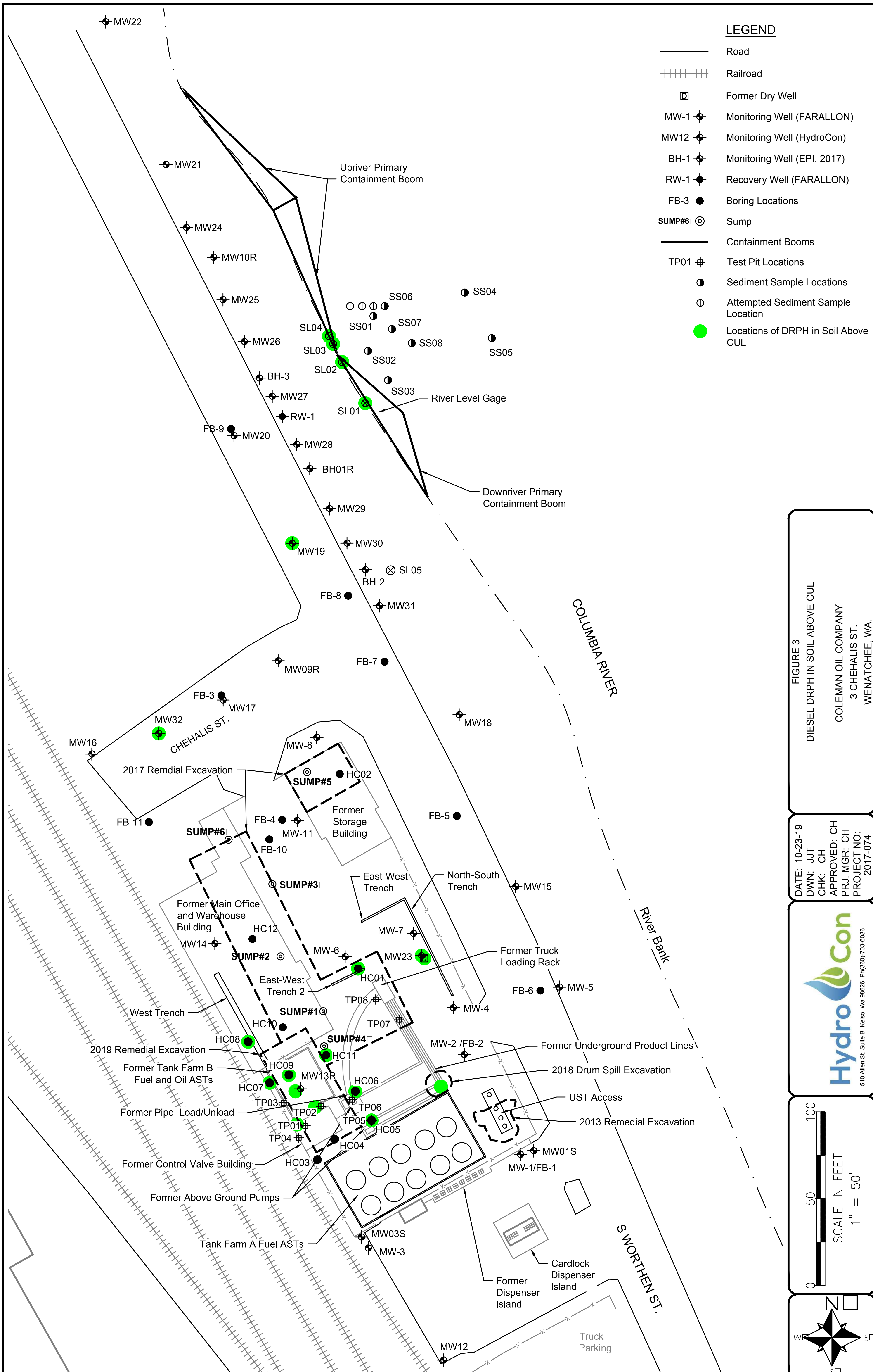

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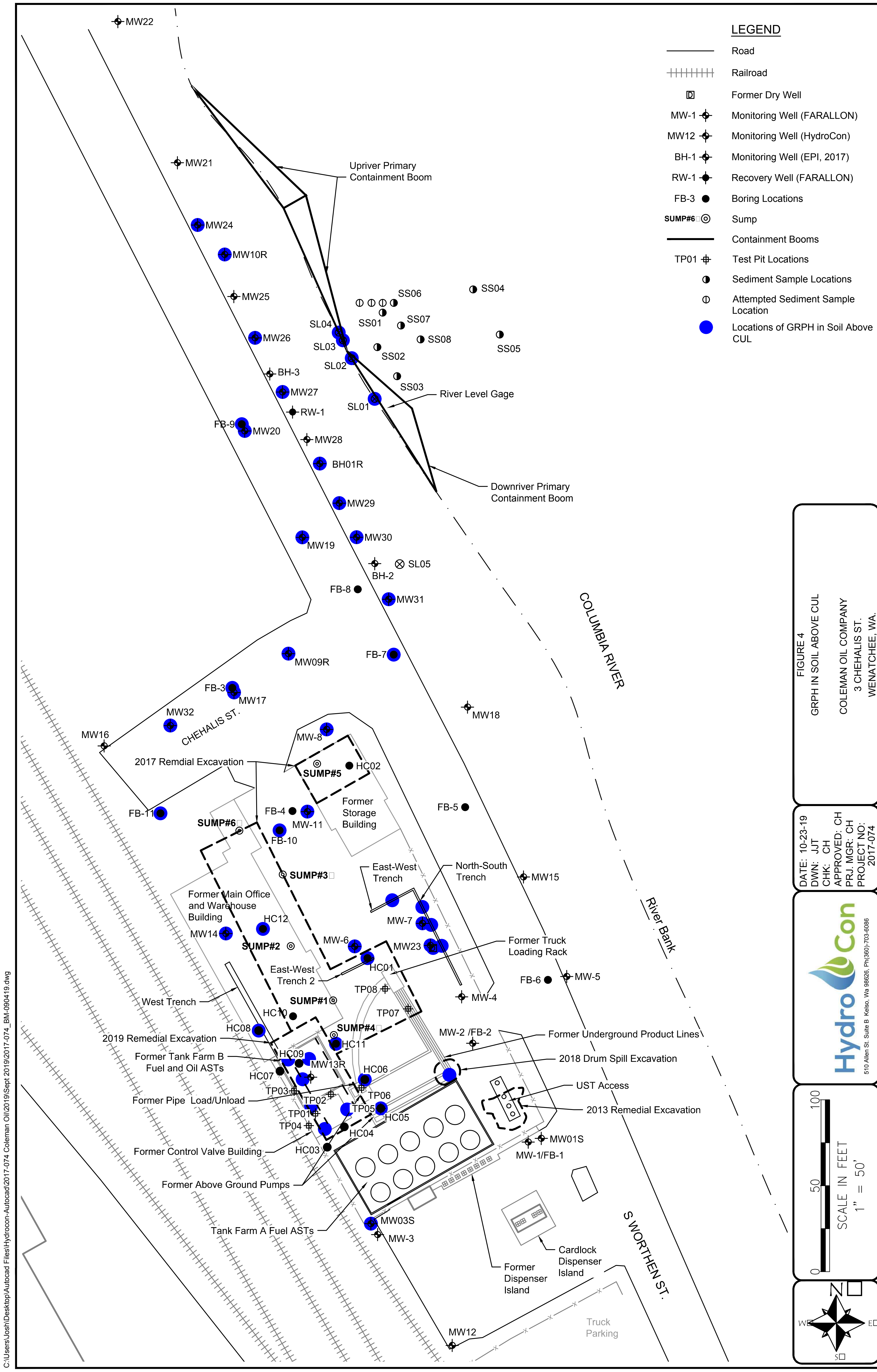
LEGEND
Road
Railroad
Former Dry Well
MW-1 Monitoring Well (FARALLON)
MW12 Monitoring Well (HydroCon)
BH-1 Monitoring Well (EPI, 2017)
RW-1 Recovery Well (FARALLON)
FB-3 Boring Locations
SUMP#6 Sump
Containment Booms
TP01 Test Pit Locations
Sediment Sample Locations
Attempted Sediment Sample Location
Locations of GRPH in Soil Above CUL
MW22
MW21
MW24
MW10R
MW25
MW26
BH-3
MW27
RW-1
FB-9
MW20
MW28
BH01R
MW29
MW19
MW30
BH-2
SL05
FB-8
MW31
MW09R
FB-7
FB-3
MW17
MW32
CHEHALIS ST.
MW16
MW18
MW-8
2017 Remdial Excavation
SUMP#5
HC02
Former Storage Building
FB-11
FB-4
MW-11
FB-10
FB-5
SUMP#6
SUMP#3
East-West Trench
North-South Trench
MW15
Former Main Office and Warehouse Building
HC12
MW-7
MW14
SUMP#2
MW-6
MW23
Former Truck Loading Rack
HC01
East-West Trench 2
FB-6
MW-5
TP08
MW-4
West Trench
SUMP#1
HC10
TP07
HC08
SUMP#4
MW-2 /FB-2
Former Underground Product Lines
2019 Remedial Excavation
HC11
HC09
MW13R
2018 Drum Spill Excavation
Former Tank Farm B Fuel and Oil ASTs
HC07
HC06
UST Access
Former Pipe Load/Unload
TP03
TP02
TP06
2013 Remedial Excavation
TP01
TP05
HC05
TP04
HC04
MW01S
MW-1/FB-1
Former Control Valve Building
HC03
Former Above Ground Pumps
MW03S
Tank Farm A Fuel ASTs
MW-3
Cardlock Dispenser Island
Former Dispenser Island
S WORTHEN ST.
MW12
Truck Parking
Upriver Primary Containment Boom
SS06
SS04
SS01
SS07
SL04
SS08
SS05
SL03
SS02
SL02
SS03
River Level Gage
SL01
Downriver Primary Containment Boom
COLUMBIA RIVER
River Bank
FIGURE 4
GRPH IN SOIL ABOVE CUL
COLEMAN OIL COMPANY
3 CHEHALIS ST.
WENATCHEE, WA.
DATE: 10-23-19
DWN: JJT
CHK: CH
APPROVED: CH
PRJ. MGR: CH
PROJECT NO: 2017-074
HydroCon
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SCALE IN FEET
1" = 50'
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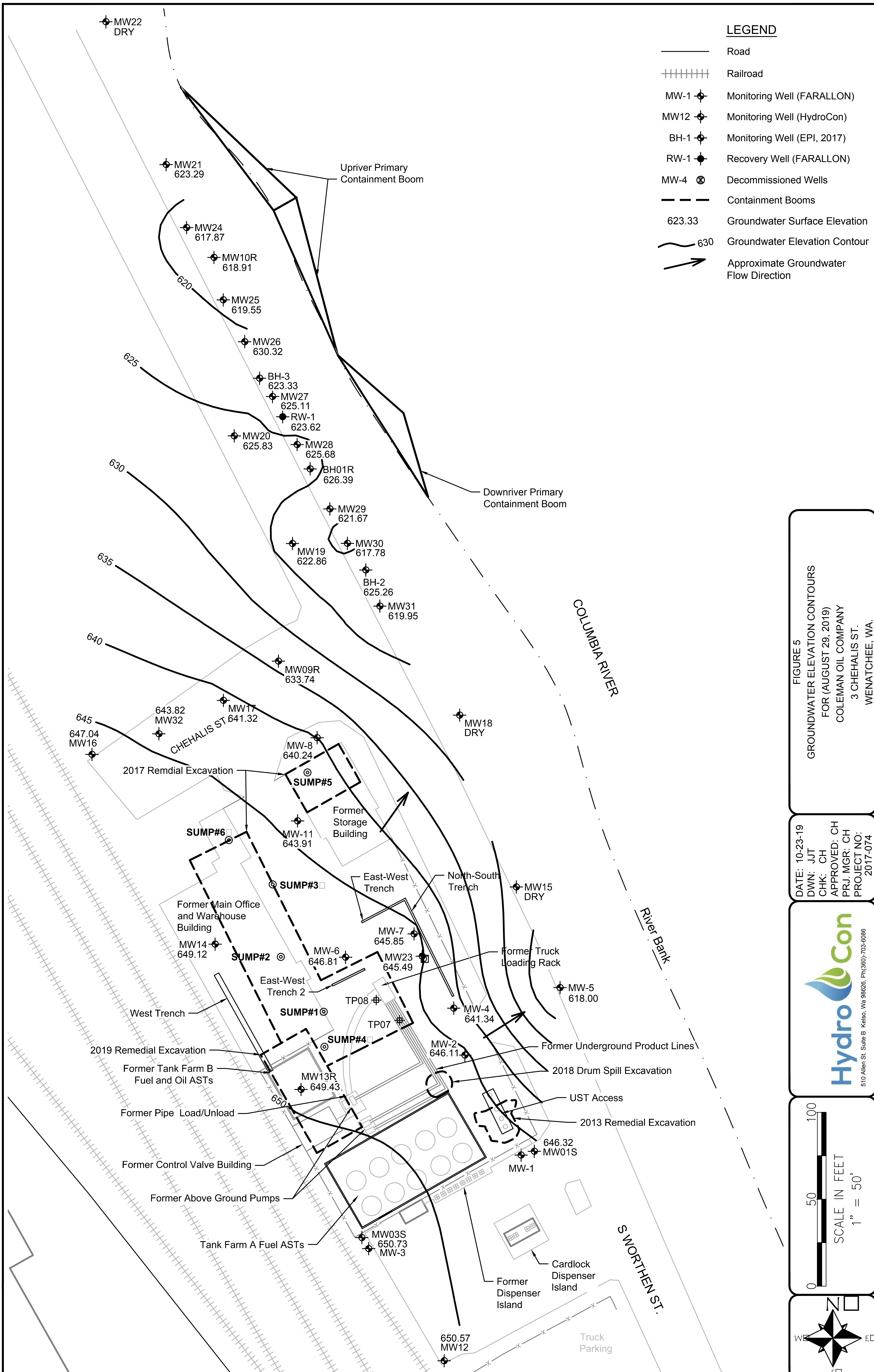

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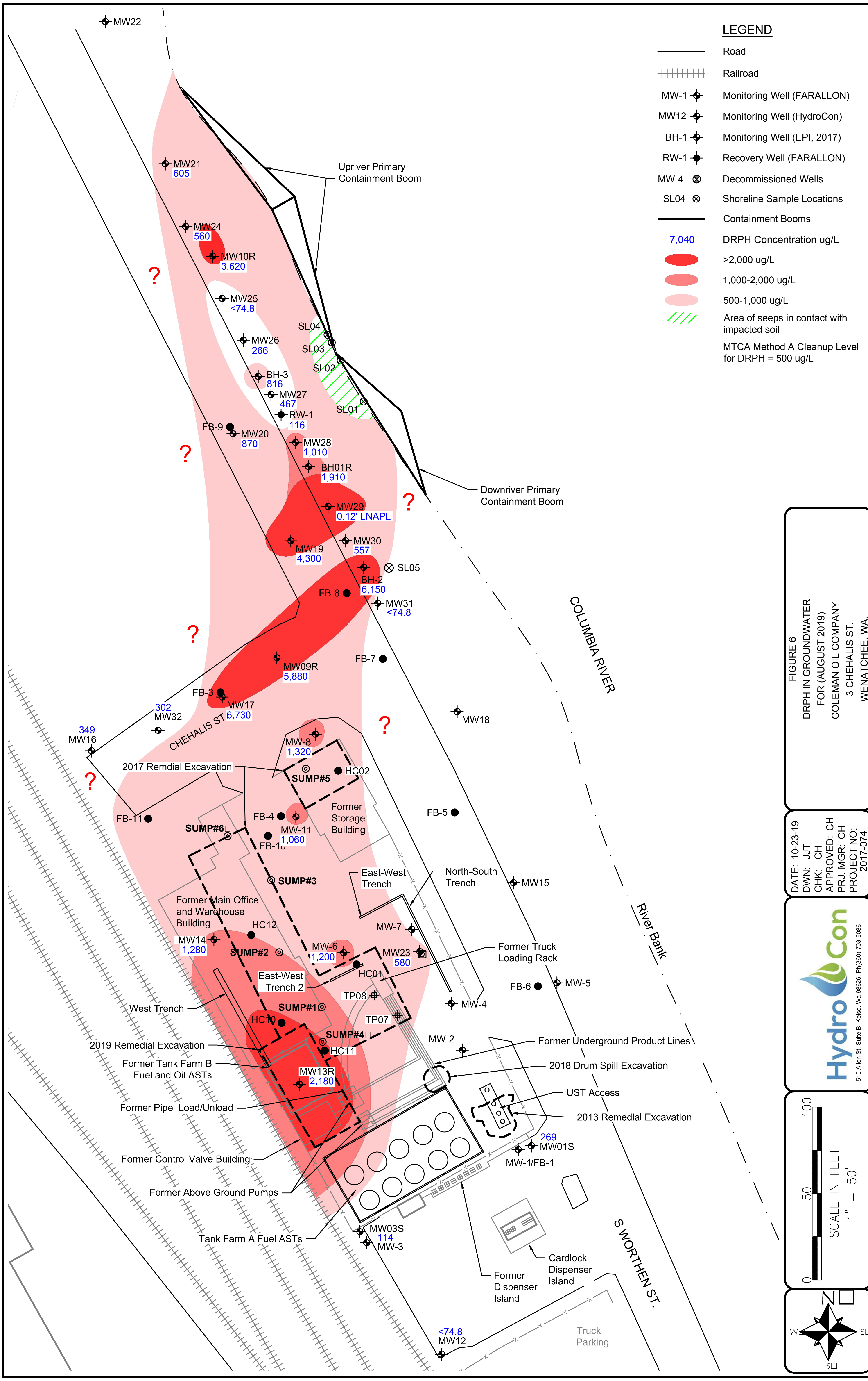

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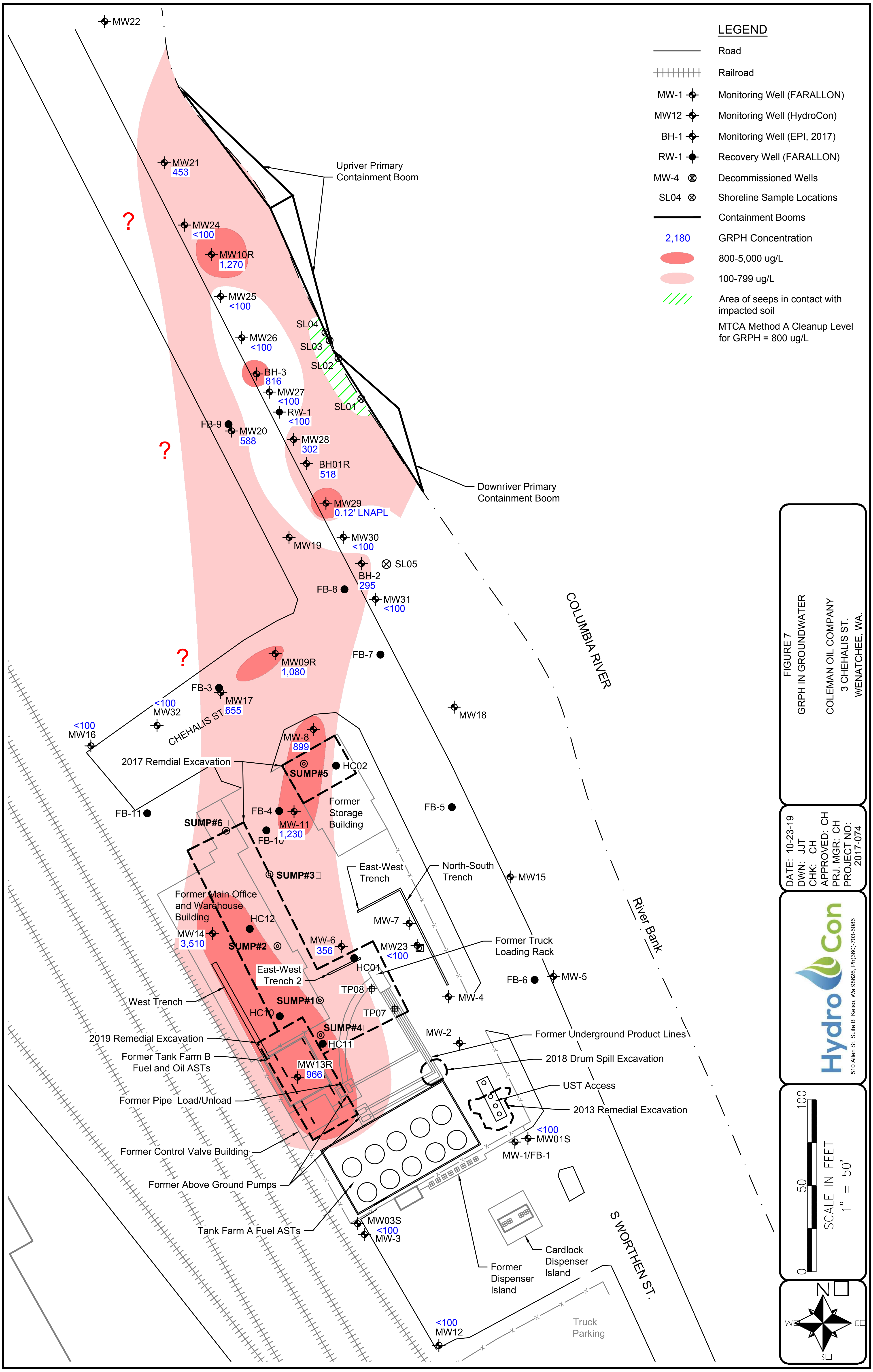

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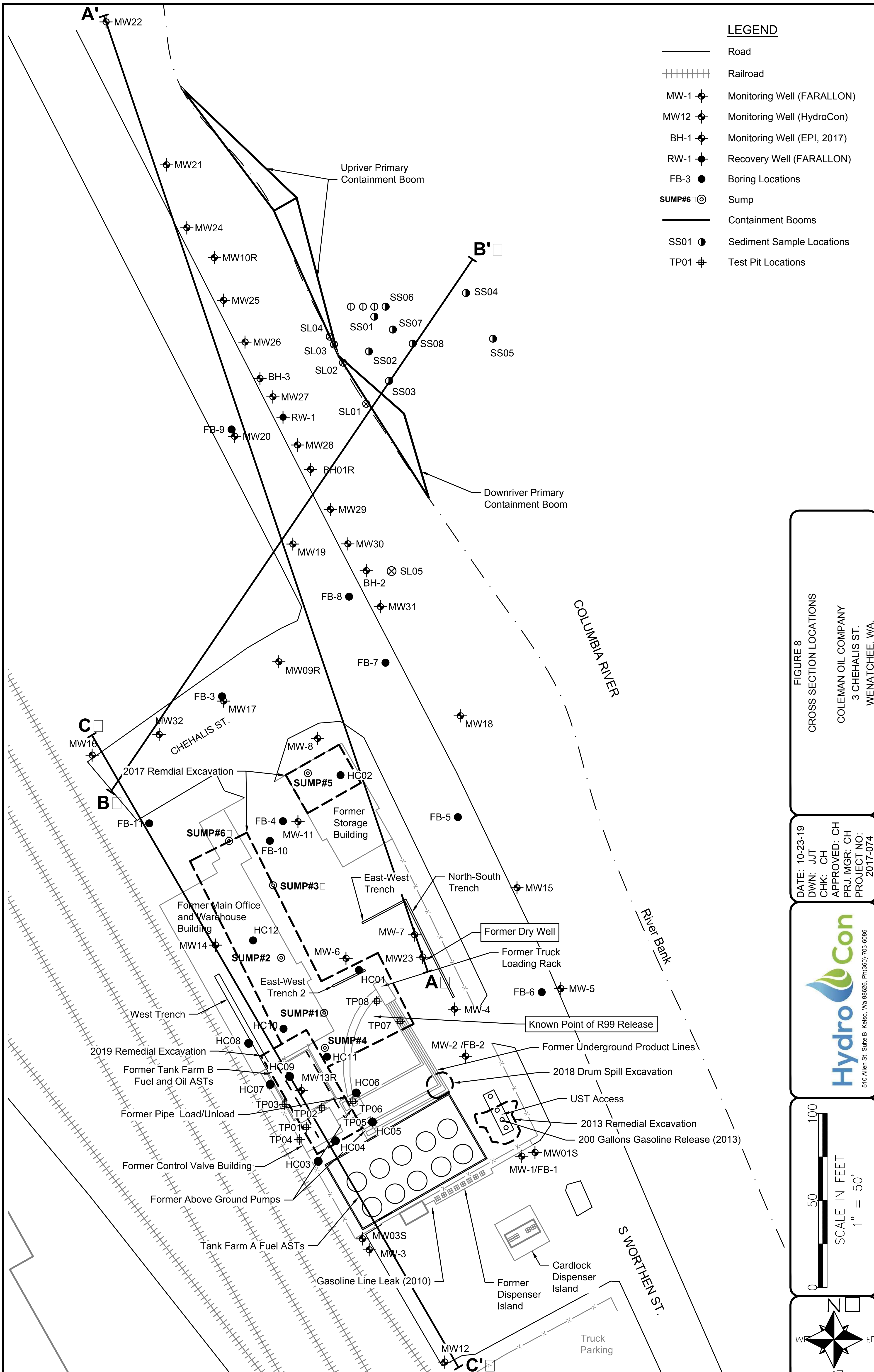

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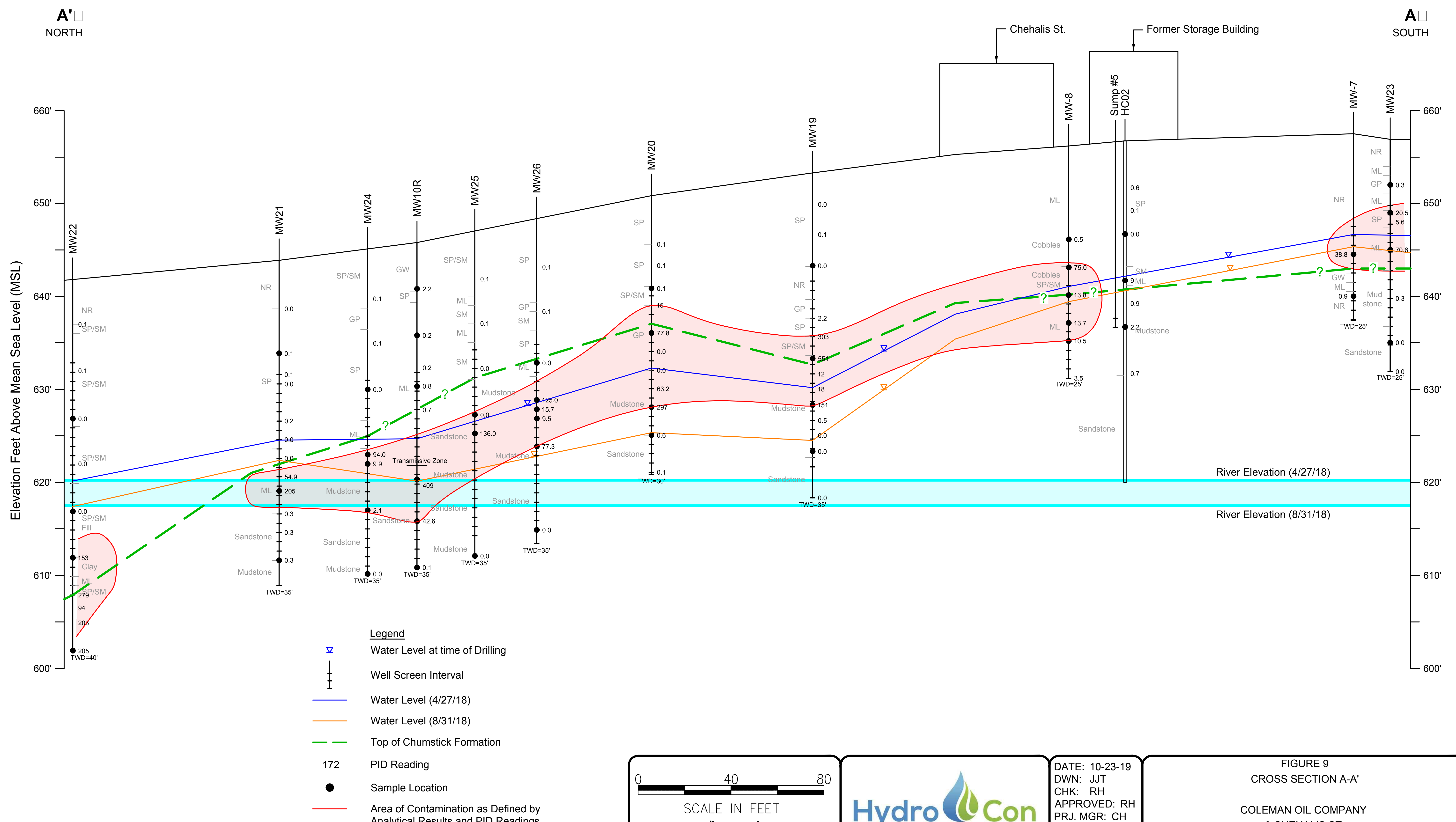

0 40 80
SCALE IN FEET
1" = 40'

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FIGURE 9
CROSS SECTION A-A'

COLEMAN OIL COMPANY
3 CHEHALIS ST.
WENATCHEE, WA.

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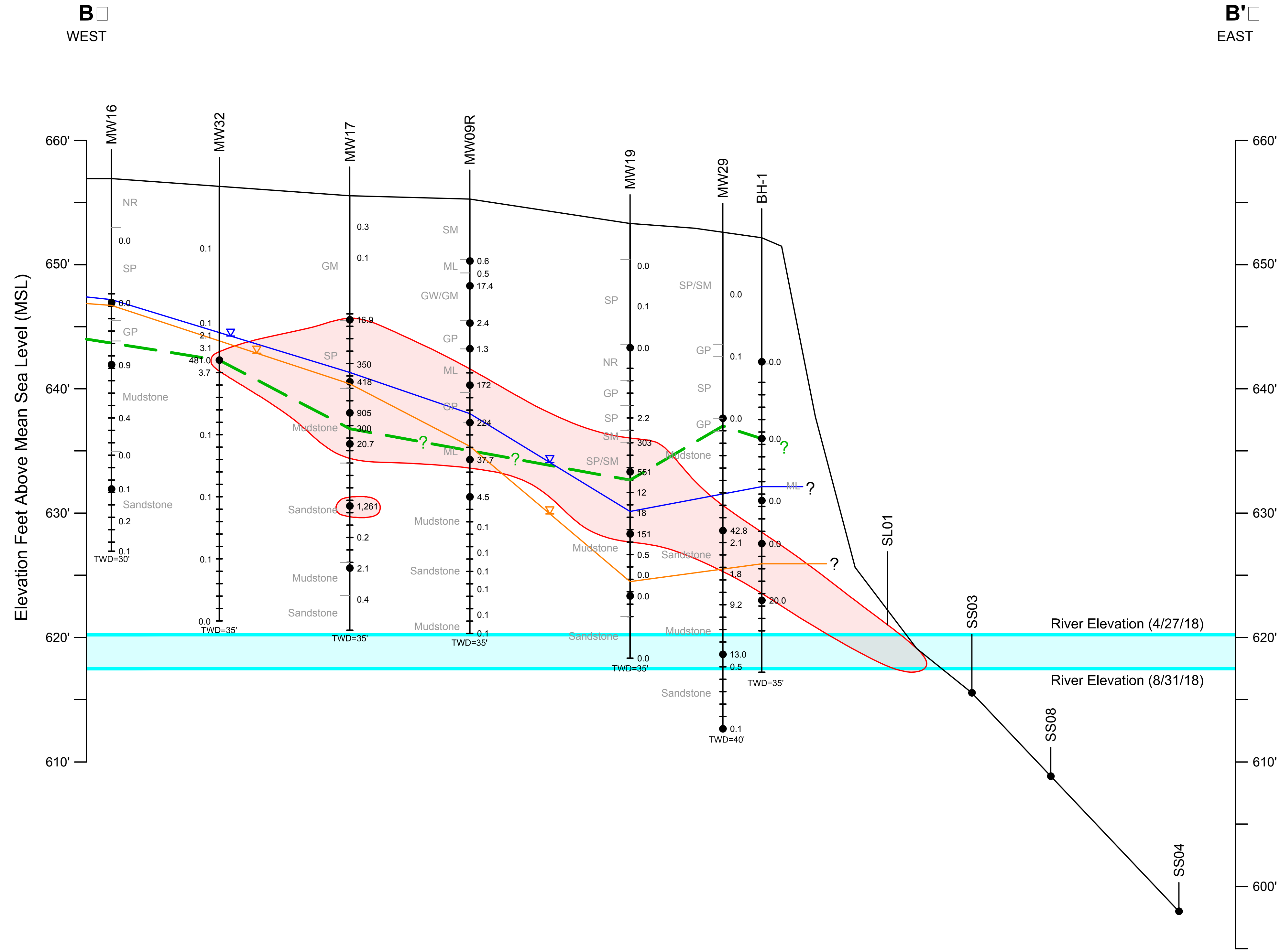

Legend

- Water Level at time of Drilling
- Well Screen Interval
- Water Level (4/27/18)
- Water Level (8/31/18)
- Top of Chumstick Formation
- 300 PID Reading
- Sample Location
- Area of Contamination as Defined by Analytical Results and PID Readings

0 40 80
SCALE IN FEET
1" = 40'

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PRJ. MGR: CH
PROJECT NO: 2017-074

FIGURE 10
CROSS SECTION B-B'

COLEMAN OIL COMPANY
3 CHEHALIS ST.
WENATCHEE, WA.

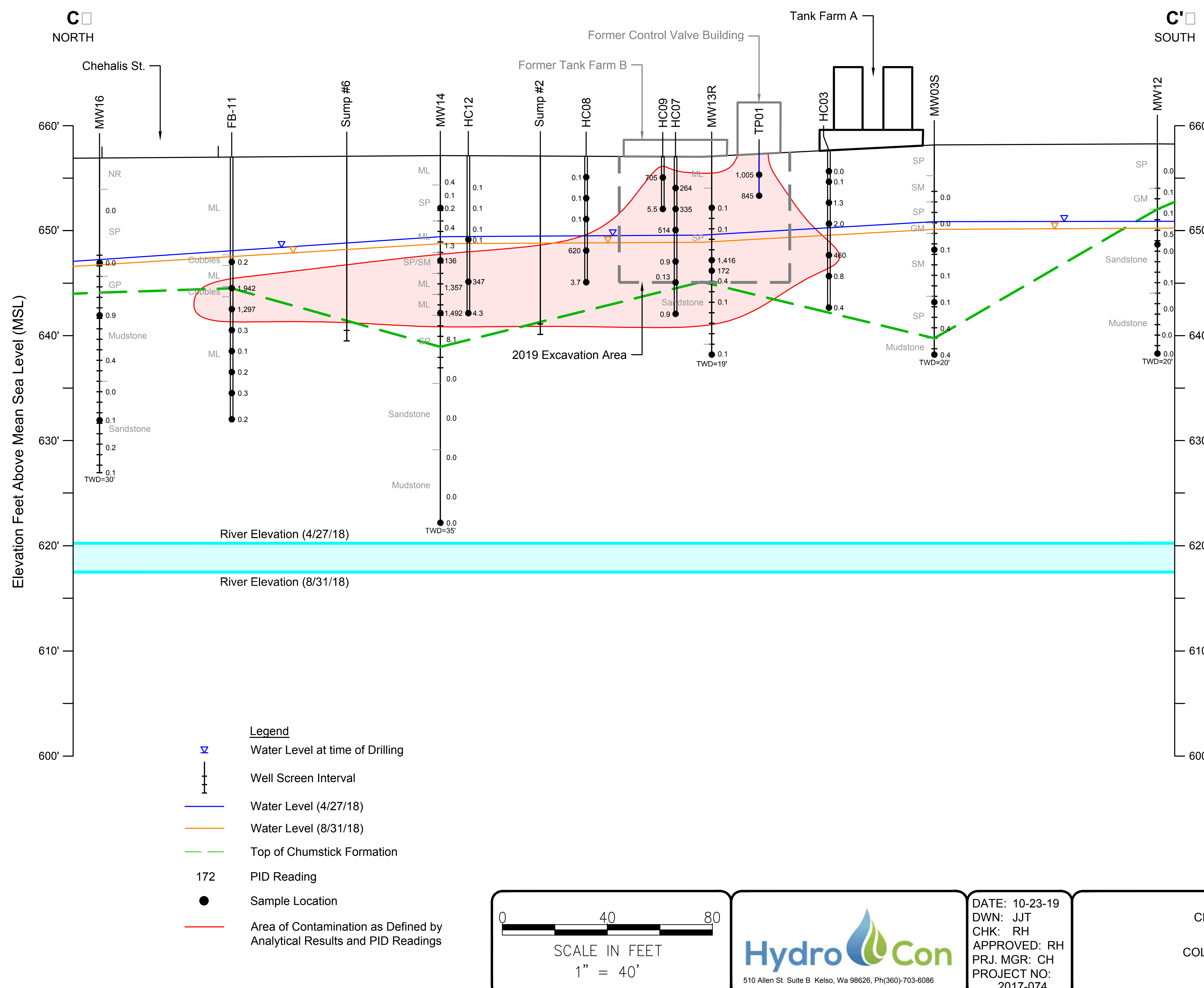

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FIGURE 11
CROSS SECTION C-C'

COLEMAN OIL COMPANY
3 CHEHALIS ST.
WENATCHEE, WA.

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FIGURE 12
CURRENT EXTENT OF CONTAMINATION
ABOVE CLEANUP LEVELS
COLEMAN OIL COMPANY
3 CHEHALIS ST.
WENATCHEE, WA.

DATE: 10-23-19
DWN: JJT
CHK: NV
APPROVED: NV
PRJ. MGR: CH
PROJECT NO:
2017-074

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SCALE IN FEET
1" = 50'

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TABLES

Table 1

Soil Analytical Results - Fuels and BTEX
Coleman Oil
Wenatchee, Washington

			Fuels			BTEX			
			GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Total Xylenes
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WA MTCA Method A Cleanup Level for Soil			**30/100**	**2,000**	**2,000**	**0.3**	**7**	**6**	**9**
Benzene (Non Detect)			**100**						
Benzene (Detect)			**30**						
Field ID	**Sample Depth**	**Date**							
Dry Well and Conrete Box Excavation									
CMTB-3.0	3	4/3/2017	**370**	**150**	< 7.5	< 0.020	< 0.075	< 0.075	< 0.150
DRY WELL-B-5.0	5	4/3/2017	**2,400**	**2,000**	--	--	--	--	--
DRY WELL-E-4.0	4	4/3/2017	**2,000**	**540**	--	--	--	--	--
DRY WELL-N-4.0	4	4/3/2017	**4,400**	**1,800**	--	--	--	--	--
DRY WELL-S-4.0	4	4/3/2017	**580**	**< 55**	--	--	--	--	--
DRY WELL-W-4.0	4	4/3/2017	**1,800**	**300**	--	--	--	--	--
Fuel Line Excavation									
FUEL LINE-EX-B-6.0	6	4/3/2017	**14,000**	**< 3,300**	--	--	--	--	--
FUEL LINE-EX-E-2.0	2	4/3/2017	**58,000**	**< 6,000**	--	--	--	--	--
FUEL LINE-EX-E-3.0	3	4/3/2017	**3,400**	< 230	--	--	--	--	--
FUEL LINE-EX-N-3.0	3	4/3/2017	**3,400**	< 280	--	--	--	--	--
North-South Trench Excavation									
NS-TRENCH-1-5.0	5	4/4/2017	< 28	< 56	--	--	--	--	--
NS-TRENCH-2-10.0	10	4/4/2017	**49**	< 55	--	--	--	--	--
NS-TRENCH-3-10.0	10	4/4/2017	< 28	< 55	--	--	--	--	--
NS-TRENCH-4-5.0	5	4/4/2017	< 28	**61**	--	--	--	--	--
NS-TRENCH-5-10.0	10	4/4/2017	< 28	< 56	--	--	--	--	--
NS-TRENCH-6-10.0	10	4/4/2017	< 28	< 55	--	--	--	--	--
NS-TRENCH-7-10.0	10	4/4/2017	**6,400**	< 550	--	--	--	--	--
NS-TRENCH-8-5.0	5	4/4/2017	**94** N	**600**	--	--	--	--	--
NS-TRENCH-9-10.0	10	4/4/2017	**5,600**	< 600	--	--	--	--	--
NS-TRENCH-9-10.0-1	10	4/4/2017	**6,400**	< 570	--	--	--	--	--
East-West Trench Excavation									
EW-TRENCH-1-5.0	5	4/4/2017	< 27	< 54	--	--	--	--	--
EW-TRENCH-10.0	10	4/4/2017	< 28	< 56	--	--	--	--	--
EW-TRENCH-3-5.0	5	4/5/2017	< 28	< 57	--	--	--	--	--
EW-TRENCH-4-10.0	10	4/5/2017	**7,700**	< 550	--	--	--	--	--
EW-TRENCH2-5-5.0	5	4/5/2017	< 28	< 55	--	--	--	--	--
EW-TRENCH2-6-9.0	9	4/5/2017	< 28	< 55	--	--	--	--	--
EW-TRENCH2-7-5.0	5	4/5/2017	< 27	< 54	--	--	--	--	--
EW-TRENCH2-8-6.0	6	4/5/2017	< 27	< 55	--	--	--	--	--
Filling Station Excavation									
FS-EX-1-6.0	6	4/6/2017	**8,700**	< 550	**540** F	**0.089**	**0.74**	**2.4**	**7.1**
FS-EX-2-4.0	4	4/6/2017	**42,000**	**2,200** N1	--	--	--	--	--
FS-EX-2-4.0-1	4	4/6/2017	**45,000**	**2,500** N1	--	--	--	--	--
FS-EX-3-2.0	2	4/6/2017	**69,000**	**5,600** N1	--	--	--	--	--
FS-EX-4-8.0	8	4/6/2017	**12,000**	< 660	**1,300** F	**0.050**	**0.071**	**3.9**	**12.7**
FS-EX-5-11.0	11	4/6/2017	**24,000**	< 730	--	--	--	--	--

Table 1

Soil Analytical Results - Fuels and BTEX
Coleman Oil
Wenatchee, Washington

			Fuels			BTEX			
			GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Total Xylenes
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WA MTCA Method A Cleanup Level for Soil			**30/100**	**2,000**	**2,000**	**0.3**	**7**	**6**	**9**
Benzene (Non Detect)			**100**						
Benzene (Detect)			**30**						
Field ID	**Sample Depth**	**Date**							
Temporary Soil Borings - Uplands Area									
HC03-07	7	1/8/2019	<5.02	<25.0	<50.0	<0.0100	<0.0502	<0.0251	<0.0754
HC03-10	10	1/8/2019	**3,550**	**3,240**	<216	<0.179	<0.895	<0.447	<1.34
HC03-15	15	1/8/2019	<5.08	<25.0	<50.0	<0.0102	<0.0508	<0.0254	<0.0762
HC04-07	7	1/8/2019	**152**	**631**	**4,640**	<0.0105	<0.0527	<0.0264	**1.40**
HCO4-09	9	1/8/2019	**1,070**	**6,400**	<869	<0.203	<1.01	<0.507	**10.2**
HC04-12	12	1/8/2019	<4.98	<25.0	<50.0	<0.00996	<0.0498	<0.0249	<0.0747
HC05-10	10	1/8/2019	<5.63	**130**	**62.9**	<0.0113	<0.0563	<0.0281	<0.0844
HC05-12	12	1/8/2019	**101**	**2,210**	**316**	<0.0107	<0.0537	<0.0269	<0.0806
HC05-15	15	1/8/2019	**55.4**	<25.0	<50.0	<0.0109	<0.0547	<0.0274	<0.0821
HC06-09	9	1/8/2019	**17.6**	**1,750**	<50.0	<0.00987	<0.0494	<0.0247	<0.0740
HC06-12	12	1/8/2019	**1,900**	**5,560**	<416	<0.0414	<0.207	**0.968**	**53.6**
HC06-15	15	1/8/2019	<5.28	<25.0	<50.0	<0.0106	<0.0528	<0.0264	<0.0792
HC07-03	3	1/9/2018	**712**	**1,780**	<50.0	**0.0913**	<0.207	**0.373**	**2.17**
HC07-05	5	1/9/2018	**1,270**	**2,740**	<50.0	**0.159**	<0.185	**0.367**	**3.53**
HC07-15	15	1/9/2018	<4.92	<25.0	<50.0	<0.00983	<0.0492	<0.0246	<0.0737
HC08-04	4	1/9/2019	<4.43	<25.0	<50.0	<0.00887	<0.0443	<0.0222	<0.0665
HC08-09	9	1/9/2019	**1,260**	**9,150**	<230	<0.112	<0.562	<0.281	<0.843
HC08-12	12	1/9/2019	<5.35	<25.0	<50.0	<0.0107	<0.0535	<0.0267	<0.0802
HC09-02	2	1/9/2019	**12,200**	**3,320**	**515**	**2.35**	**9.46**	**41.4**	**307**
HC10-05	5	1/9/2019	<4.92	<25.0	<50.0	<0.00984	<0.0492	<0.0246	<0.0738
HC10-12	12	1/9/2019	**17.6**	**84.5**	<50.0	<0.0117	<0.0584	<0.0292	<0.0876
HC10-15	15	1/9/2019	<6.88	<25.0	**51.7**	<0.0138	<0.0688	<0.0344	<0.103
HC11-06	6	1/9/2019	<4.94	**45.0**	**1,110**	<0.00987	<0.0494	<0.0247	<0.0741
HC11-11	11	1/9/2019	**1,520**	**6,760**	**1,740**	**1.12**	<0.214	**0.567**	**34.2**
HC11-15	15	1/9/2019	<4.95	<25.0	<50.0	<0.00990	<0.0495	<0.0248	<0.0743
HC12-08	8	1/9/2019	**627**	<25.0	<50.0	<0.0231	<0.115	<0.0577	<0.173
HC12-12	12	1/9/2019	**1,190**	**3,790**	<439	<0.0113	<0.0567	0.0458	2.80
HC12-15	15	1/9/2019	<5.16	<25.0	<50.0	<0.0103	<0.0516	<0.0258	<0.0774
Uplands Test Pits									
TP01-02	2	1/7/2019	**4,970**	**3,510**	**1,850**	**0.328**	**0.408**	**40.5**	**343**
TP02-02	2	1/7/2019	<6.06	<99.8	**1,250**	<0.0121	<0.0606	<0.0303	<0.0910
TP03-04	4	1/7/2019	<6.23	**119**	<50.0	<0.0125	<0.0636	<0.0311	<0.0934
TP04-02	2	1/7/2019	**47.6**	<560	**4,270**	<0.0138	<0.0690	**0.263**	**1.66**
TP05-02	2	1/7/2019	<5.93	**270**	<50.0	<0.0119	<0.0596	<0.0297	<0.0890
TP06-02	2	1/7/2019	<6.43	**580**	**61.1**	<0.0129	**0.0643**	<0.0321	<0.0964
TP07-6	6	6/20/2019	<4.95	<25.0	<50.0	<0.00989	<0.0495	<0.0247	<0.0742
TP08-6	6	6/20/2019	<4.46	<25.0	<50.0	<0.00892	<0.0446	<0.0223	<0.0669
Uplands Remedial Excavation									
NE-CORNER01-08	8	5/23/2019	**12.0**	**120**	**346**	<0.00985	<0.0493	<0.0246	<0.0739
NSW01-08	8	5/23/2019	<5.44	<25.0	<50.0	<0.0109	<0.0544	<0.0272	<0.0816
NW CORNER01-08	8	5/23/2019	**127**	**282** F-19	**197** F-16	<0.00998	**0.102**	**0.177**	**2.44**
SE CORNER01-08	8	5/22/2019	<5.65	<25.0	<50.0	<0.0113	<0.0567	<0.0283	<0.0850
SSW01-08	8	5/22/2019	<5.40	<25.0	**803**	<0.0108	<0.0540	<0.0270	<0.0810
SW CORNER01-08	8	5/22/2019	**29.0**	<1,720	**12,900**	<0.0111	<0.0557	**0.0455**	**0.587**
ESW01-08	8	5/22/2019	<5.77	<25.0	<50.0	<0.0115	<0.0577	<0.0289	<0.0866
ESW02-08	8	5/23/2019	<5.26	<25.0	<50.0	<0.015	<0.0526	<0.0263	<0.0789
ESW03-08	8	5/23/2019	**5.96**	**171**	**693**	<0.0108	<0.0541	<0.0271	<0.0812
WSW01-08	8	5/22/2019	**3,010**	**1,330** F-19	**443** F-16	0.0390	**0.123**	**9.80**	**93.1**
WSW02-08	8	5/23/2019	**1,450**	**2,850** F-15	**466** F-16	**0.0704**	**0.955**	**8.30**	**52.3**
WSW03-08	8	5/23/2019	**769**	**3,210**	<210	<0.0792	<0.396	<0.198	1.14
B01-12	12	5/22/2019	**1,730**	**8,220**	<869	**0.236**	**0.0782**	**0.118**	**12.1**
B02-12	12	5/23/2019	**848**	**5,650**	<436	**1.01**	**0.179**	**1.04**	**11.6**
B03-13	13	5/23/2019	**2,780**	**10,100**	<837	**3.16**	<0.945	**1.46**	**34.6**
Drum Spill Excavation									
EX01-WSW-06	6	10/26/2018	<5.38	<25.0	<50.0	<0.0108	<0.0538	<0.0269	<0.0807
EX-01-SSW-06	6	10/26/2018	<5.57	**27**	<50.0	<0.0110	<0.0551	<0.0275	<0.0826
EX01-ESW-06	6	10/26/2018	<4.92	<25.0	<50.0	<0.00985	<0.0492	<0.0246	<0.0739
EX01-B-08	8	10/26/2018	**789** F-09	**8,570** S-05	<399	<0.110	<0.551	<0.276	<0.827

Table 1

Soil Analytical Results - Fuels and BTEX
Coleman Oil
Wenatchee, Washington

			Fuels			BTEX			
			GRPH mg/kg	DRPH mg/kg	ORPH mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg
WA MTCA Method A Cleanup Level for Soil			**30/100**	**2,000**	**2,000**	**0.3**	**7**	**6**	**9**
Benzene (Non Detect)			**100**						
Benzene (Detect)			**30**						
Field ID	**Sample Depth**	**Date**							
Temporary Soil Borings - Site Investigation									
FB-3-9.0-040617	9	4/6/2017	< 27	< 55	< 5.4	< 0.020	< 0.054	< 0.054	< 0.108
FB-3-12.5-040617	12.5	4/6/2017	**4,000**	< 110	**420** F	< 0.020	< 0.049	**0.68**	**0.59**
FB-3-13.5-040617	13.5	4/6/2017	**14,000**	< 610	**940** F	**0.046**	< 0.042	**2.5**	**4.03**
FB-3-15.0-040617	15	4/6/2017	**2,300**	**150** N1	**380** F	**0.028**	< 0.044	**1.2**	**0.98**
FB-5-13.5-040617	13.5	4/6/2017	< 26	< 51	< 4.2	< 0.020	< 0.042	< 0.042	< 0.084
FB-5-15.0-040617	15	4/6/2017	< 26	< 52	< 4.4	< 0.020	< 0.044	< 0.044	< 0.088
FB-5-17.0-040617	17	4/6/2017	< 27	< 53	< 4.8	< 0.020	< 0.048	< 0.048	< 0.096
FB-6-12.0-040617	12	4/6/2017	< 120	**1,100**	< 4.7	< 0.020	< 0.047	< 0.047	< 0.094
FB-7-13.0-040617	13	4/6/2017	< 27	< 53	< 4.9	< 0.020	< 0.049	< 0.049	< 0.098
FB-7-23.0-040617	23	4/6/2017	**40** N	440	< 4.7	< 0.020	< 0.047	< 0.047	< 0.094
FB-8-14.0-040717	14	4/7/2017	< 27	< 55	< 5.0	< 0.020	< 0.050	< 0.050	< 0.100
FB-9-6.9-040717	6.9	4/7/2017	**1,100**	350	< 4.7	< 0.020	< 0.047	< 0.047	< 0.094
FB-9-10.0-040717	10	4/7/2017	**60**	< 53	< 5.0	< 0.020	< 0.050	< 0.050	< 0.100
FB-9-14.0-040717	14	4/7/2017	**440**	**180**	**330** F	< 0.020	< 0.050	**0.63**	**0.48**
FB-10-12.8-040717	12.8	4/7/2017	**4,300**	< 610	**880** F	< 0.020	< 0.044	**0.59**	**0.99**
FB-10-14.0-040717	14	4/7/2017	**5,900**	**1,800** N1	**860** F	**0.080**	< 0.055	**0.52**	**2.1**
FB-10-17.1-040717	17.1	4/7/2017	**1,300**	**270**	**910** F	**0.086**	< 0.25	**0.58**	**3.0**
FB-10-17.3-040717	17.3	4/7/2017	**8,200**	< 580	**530** F	**0.13**	< 0.27	**1.3**	**2.2**
FB-11-12.6	12.6	4/13/2017	< 27	< 54	< 5.5	**0.020**	< 0.055	< 0.055	< 0.110
FB-11-23.4	23.4	4/13/2017	**140**	**390**	< 5.9	< 0.020	< 0.059	< 0.059	< 0.118
HC01-4.5	4.5	3/28/2018	<5.7	<25	<50	<0.0114	<0.0570	<0.0285	<0.0855
HC01-10	10	3/28/2018	**671**	**4,680**	<433	<0.104	<0.518	<0.259	<0.0855
HC01-15	15	3/28/2018	<4.25	<25	<50	<0.0114	<0.0570	<0.0285	<0.776
HC01-22	22	3/28/2018	**7.99**	**104**	**80.3**	<0.00850	<0.0425	<0.0212	<0.0637
HC01-34	34	3/28/2018	<5.53	**38.6**	<50	<0.0111	<0.0553	<0.0277	<0.0830
HC02-10	10	3/28/2018	<7.66	<25	<50	<0.0153	<0.0766	<0.0383	<0.115
HC02-15	15	3/28/2018	**37.7**	<25	<50	<0.0103	<0.0513	<0.0257	<0.0770
HC02-22	22	3/28/2018	**9.26**	**26.6**	<50	<0.00984	<0.0492	<0.0246	<0.0738
Monitoring Wells									
MW1S-10	10	4/3/2018	<5.26	<25	<50	<0.0132	<0.0658	<0.0329	<0.0987
MW1S-20	20	4/3/2018	<4.88	<25	<50	**0.318**	<0.0488	<0.0244	<0.0731
MW3S-15	15	4/3/2018	**83.8**	<25	<50	<0.00910	<0.0455	<0.0227	<0.0682
MW3S-20	20	4/3/2018	<4.88	<25	<50	<0.0132	<0.0658	<0.0329	<0.0987
MW-6-10.3	10	4/12/2017	**10,000**	< 570	**280** F	**0.068**	< 0.065	**2.2**	**0.96**
MW-6-12.8	13	4/12/2017	**3,900**	< 310	**1,400** F	**0.066**	< 0.29	**0.34**	**0.76**
MW-7-13.0	13	4/11/2017	**160**	< 56	< 5.8	< 0.020	< 0.058	< 0.058	< 0.116
MW-7-17.3	17	4/11/2017	< 29	< 58	< 6.1	< 0.020	< 0.061	< 0.061	< 0.122
MW-8-12.8	13	4/11/2017	**1,400**	< 55	< 6.0	< 0.020	< 0.060	< 0.060	< 0.120
MW-8-15.0	15	4/11/2017	**100**	< 51	< 4.3	< 0.020	< 0.043	< 0.043	< 0.086
MW-8-17.5	18	4/11/2017	**230**	< 56	< 5.5	< 0.020	< 0.055	< 0.055	< 0.110
MW-9-12.8	13	4/12/2017	< 28	< 55	< 6.2	< 0.020	< 0.062	< 0.062	< 0.124
MW-9-15.6	16	4/12/2017	**15,000**	< 580	**1,800** F	< 0.062	< 0.31	**0.64**	**2.7**
MW-9-24.5	25	4/13/2017	**280**	**330**	**31** F	< 0.020	< 0.076	< 0.076	**0.094**
MW09R-35	35	8/16/2018	**12.8**	**176**	**117**	< 0.0132	< 0.0661	**0.102**	**0.495**
MW-10-15.7	16	4/14/2017	< 30	< 59	< 6.1	< 0.020	< 0.061	< 0.061	< 0.122
MW-10-25.1	25	4/14/2017	**1,300**	< 55	**1,300** F	**0.13**	< 0.46	**4.5**	**5.14**
MW10R-35	35	8/16/2018	< 4.76	**50.6**	< 50.0	< 0.00953	< 0.0476	< 0.0238	< 0.0714
MW-11-5.8	6	4/14/2017	< 28	< 55	< 5.0	< 0.020	< 0.050	< 0.050	< 0.100
MW11-13.2	13	4/14/2017	**600**	< 59	**570** F	< 0.024	< 0.12	**1.0**	**0.97**
MW11-17.8	18	4/14/2017	**58**	< 56	**12**	< 0.020	< 0.060	< 0.060	< 0.120
MW12-10	10	4/2/2018	<5.10	<25	<50	<0.0102	<0.0510	<0.0255	<0.0766
MW12-20	20	4/2/2018	<4.79	**42.5**	**66.7**	<0.00958	<0.0479	<0.0239	<0.0718
MW13-05	5	3/29/2018	**580**	**1,700**	**5,310**	**0.701**	**25.5**	**6.27**	**29.3**
MW13-10	10	3/29/2018	**3,360**	**2,290**	<50	**1.51**	<1.07	<0.533	**5.2**
MW13-12	12	3/29/2018	**12.1**	<25	<50	<0.0102	<0.0512	<0.0256	0.0774
MW13-21	21	3/29/2018	**22.5**	**90.9**	**209**	<0.00998	<0.0499	<0.0250	<0.0749
MW13-35	35	3/29/2018	<5.16	<25	<50	<0.0103	<0.0516	<0.0258	<0.0773
MW13-45	45	3/30/2018	<7.12	<25	<50	<0.0142	<0.0712	<0.0356	<0.107
MW14-05	5	3/30/2018	<4.74	<25	<50	<0.00948	<0.0474	<0.0237	<0.0711
MW14-10	10	3/30/2018	**171**	**50.2**	<50	<0.00971	<0.0486	<0.0243	<0.0729
MW14-15	15	3/30/2018	**465**	**447**	<50	<0.0142	<0.0712	<0.0356	<0.107
MW14-25	25	4/2/2018	<3.97	<25	<50	<0.0794	<0.0397	<0.0198	<0.0595
MW15-10	10	4/12/2018	<5.17	<25	**75.8**	<0.0103	<0.0517	<0.0258	<0.0775
MW15-20	20	4/12/2018	<5.74	<25	<50	<0.0115	<0.0574	<0.0287	<0.0862
MW15-30	30	4/12/2018	<5.73	<25	<50	<0.0115	<0.0573	<0.0286	<0.0859
MW16-10	10	4/5/2018	<4.78	<25	<50	<0.00955	<0.0478	<0.0239	<0.0717
MW16-14	14	4/5/2018	<5.09	<25	<50	<0.0102	<0.0509	<0.0255	<0.0764
MW16-25	25	4/6/2018	<2.38	<25	<50	<0.00476	<0.0238	<0.0119	<0.0357

Table 1

Soil Analytical Results - Fuels and BTEX
Coleman Oil
Wenatchee, Washington

Field ID	Sample Depth	Date	GRPH mg/kg	DRPH mg/kg	ORPH mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg
			Fuels			BTEX			
WA MTCA Method A Cleanup Level for Soil			**30/100**	**2,000**	**2,000**	**0.3**	**7**	**6**	**9**
Benzene (Non Detect)			**100**						
Benzene (Detect)			**30**						
Monitoring Wells (continued)									
MW17-10	10	4/4/2018	<4.71	<25	<50	<0.00943	<0.0471	<0.0236	<0.0707
MW17-17	17	4/4/2018	**1,900**	1,650	**740**	<0.0360	<0.180	<0.0900	<0.270
MW17-25	25	4/4/2018	**83.6**	<25	<50	**0.0109**	<0.0508	**0.0631**	**0.0799**
MW17-30	30	4/4/2018	<4.86	<25	<50	<0.00973	<0.0486	<0.0243	<0.0730
MW18-10	10	4/11/2018	<6.01	<25	**102**	<0.0120	<0.0601	<0.0301	<0.0902
MW18-15	15	4/11/2018	<5.45	<25	<50	<0.0109	<0.0545	<0.0273	<0.0818
MW18-25	25	4/11/2018	<4.66	<25	<50	<0.00932	<0.0466	<0.0233	<0.0699
MW19-10	10	4/5/2018	<5.34	<25	<50	<0.0107	<0.0534	<0.0267	<0.0801
MW19-18	18	4/5/2018	**386**	**2,010**	<50	<0.0104	<0.0518	<0.0259	<0.0776
MW19-30	30	4/5/2018	<5.48	**167**	**284**	<0.0110	<0.0548	<0.0274	<0.0822
MW20-10	10	4/10/2018	<5.02	<25	<50	<0.0100	<0.0502	<0.0251	<0.0753
MW20-15	15	4/10/2018	**60.3**	**72.9**	<50	<0.0102	<0.0508	<0.0254	<0.0762
MW20-23.5	33	4/10/2018	<6.84	<25	<50	<0.0137	<0.0684	<0.0342	<0.103
MW20-26	26	4/10/2018	<5.05	<25	<50	<0.0101	<0.0505	<0.0253	<0.0758
MW21-10	10	4/9/2018	<5.32	<25	<50	<0.0106	<0.0532	<0.0266	<0.0797
MW21-25	25	4/9/2018	**9.65**	**47.2**	<50	<0.0114	<0.0570	<0.0285	<0.0854
MW21-32	32	4/9/2018	<5.69	<25	<50	<0.0114	<0.0569	<0.0285	<0.0854
MW22-15	15	4/13/2018	<5.15	<25	<50	<0.0103	<0.0515	<0.0258	<0.0773
MW22-25	25	4/13/2018	<13.4	<25.9	<51.8	<0.0268	<0.134	<0.0670	<0.201
MW22-30	30	4/13/2018	**4,180**	**45,700**	<8,160 ec	**10.7**	<5.87	**23.1**	**43.8**
MW22-40	40	4/13/2018	**248**	**52.5**	<50	**0.0854**	**0.085**	**0.156**	**0.696**
MW23-05	5	3/29/2018	<4.63	**29.7**	**65.2**	<0.00926	<0.0463	<0.0231	<0.0694
MW23-08	8	3/29/2018	**116**	**586**	**112**	<0.0101	<0.0504	<0.0252	<0.0756
MW23-12	12	3/29/2018	**127**	**63.3**	<50	<0.0115	<0.0577	<0.0289	<0.0866
MW23-22	22	3/29/2018	<6.69	<25	<50	<0.0134	<0.0669	<0.0335	<0.100
MW24-15	15	8/6/2018	<5.29	< 25.0	< 50.0	<0.0106	<0.0529	<0.0265	<0.0794
MW24-22	22	8/6/2018	**109**	< 25.0	< 50.0	<0.0112	<0.0559	<0.0279	**0.110**
MW24-28	28	8/6/2018	**179**	< 25.0	< 50.0	<0.0131	<0.0653	<0.0326	<0.0979
MW24-35	35	8/6/2018	**19.5**	**73**	<50.0	<0.0114	<0.0572	<0.0286	**0.117**
MW25-19	19	8/7/2018	<6.67	< 25.0	< 50.0	<0.0133	<0.0667	<0.0334	<0.100
MW25-22	22	8/7/2018	**6.7**	**92.7**	<50.0	<0.0112	<0.0562	<0.0281	<0.0843
MW25-35	35	8/7/2018	**7.98**	**239**	**323**	<0.0131	<0.0653	<0.0326	<0.0979
MW26-15	15	8/8/2018	<6.18	<25.0	<50.0	<0.0124	<0.0618	<0.0309	<0.0928
MW26-19	19	8/8/2018	**7.69**	**34.1**	< 50.0	<0.0113	<0.0563	<0.0282	<0.0845
MW26-29	29	8/8/2018	**33.4**	**94.8**	< 50.0	<0.0125	<0.0627	<0.0314	<0.0941
MW26-33	33	8/8/2018	<7.39	**228**	**288**	<0.0148	<0.0739	<0.0369	<0.111
MW27-15	15	8/9/2018	<6.83	< 25.0	< 50.0	<0.0137	<0.0683	<0.0341	**0.102**
MW27-19	19	8/9/2018	**126**	**263**	<50.0	<0.0123	<0.0616	0.0992	**0.631**
MW27-39	39	8/9/2018	<6.18	**69.4**	**65.9**	<0.0124	<0.0618	<0.0309	<0.0926
MW28-19	19	8/10/2018	<5.88	< 25.0	< 50.0	<0.0118	<0.0588	<0.0294	0.169
MW28-25	25	8/10/2018	<7.04	< 25.0	< 50.0	<0.0141	<0.0704	**0.0528**	**0.317**
MW28-39	39	8/10/2018	**28.2**	**27.8**	<50.0	<0.0105	<0.0523	**0.0638**	**0.233**
MW29-15	15	8/13/2018	< 5.66	< 25.0	< 50.0	< 0.0113	< 0.0566	< 0.0283	< 0.0849
MW29-24	24	8/13/2018	**33.6**	**81.2**	< 50.0	< 0.0149	< 0.0745	< 0.0373	< 0.112
MW29-34	34	8/13/2018	<5.24	< 25.0	< 50.0	< 0.0105	< 0.0524	< 0.0262	< 0.0786
MW29-40	40	8/13/2018	< 5.15	< 25.0	< 50.0	< 0.0103	< 0.0515	< 0.0258	< 0.0773
MW30-15	15	8/14/2018	< 5.86	< 25.0	< 50.0	< 0.0117	< 0.0586	< 0.0293	< 0.0879
MW30-20	20	8/14/2018	**132**	**424**	< 50.0	< 0.0123	< 0.0617	< 0.0308	< 0.0925
MW30-28	28	8/14/2018	**618**	**1,900**	< 50.0	< 0.0113	< 0.0563	**0.0473**	**0.123**
MW30-32	32	8/14/2018	**96.2**	407	< 50.0	< 0.0112	< 0.0558	< 0.0279	< 0.0837
MW30-40	40	8/14/2018	< 6.80	**266**	**250**	< 0.0136	< 0.0680	< 0.0340	**0.109**
MW31-19	19	8/15/2018	< 5.21	< 25.0	< 50.0	< 0.0104	< 0.0521	< 0.0261	< 0.0782
MW31-28	28	8/15/2018	**125**	**564**	< 50.0	< 0.00904	< 0.0452	< 0.0226	< 0.0678
MW31-38	38	8/15/2018	< 5.23	< 25.0	< 50.0	< 0.0105	< 0.0523	< 0.0262	< 0.0785
MW32-10	10	8/17/2018	< 5.09	< 25.0	< 50.0	< 0.0102	< 0.0509	< 0.0255	< 0.0764
MW32-14	14	8/17/2018	**1,930**	**3,400**	< 438	< 0.00950	< 0.0475	< 0.0238	< 0.0713
MW32-28	28	8/17/2018	< 5.38	< 25.0	< 50.0	< 0.0108	< 0.0538	< 0.0269	< 0.0808
RW-1-17.5	18	4/10/2017	< 32	< 63	< 6.9	< 0.020	< 0.069	< 0.069	< 0.138
BH-1R-32	32	1/10/2019	<5.77	**73.5**	**125**	<0.0115	<0.0577	<0.0288	<0.0865
BH-1R-37	37	1/10/2019	**108**	**400**	<50.0	<0.0101	<0.0507	<0.0253	<0.0760

Table 1

Soil Analytical Results - Fuels and BTEX
Coleman Oil
Wenatchee, Washington

			Fuels			BTEX			
			GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Total Xylenes
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WA MTCA Method A Cleanup Level for Soil			**30/100**	**2,000**	**2,000**	**0.3**	**7**	**6**	**9**
Benzene (Non Detect)			**100**						
Benzene (Detect)			**30**						
Field ID	**Sample Depth**	**Date**							
Shoreline Seep Samples									
SL01-0.5	1	4/12/2018	**1,140**	**39,400**	<2,350 ec	<0.246	<1.23	<0.614	<1.84
SL02-0.5	1	4/12/2018	**629**	**30,400**	<2,570 ec	<0.0528	<0.264	<0.132	<0.396
SL03-0.5	1	4/12/2018	**2,580**	**21,400**	<2,240 ec	<0.203	<1.02	<0.508	**1.6**
SL04-0.5	1	4/12/2018	**968**	**18,100**	<2,310 ec	<0.209	<1.05	<0.523	<1.57
SL05-0.5	1	4/12/2018	<5.15	**527**	<442	<0.0103	<0.0515	<0.0258	<0.0773

Notes

Red denotes concentration in excess of MTCA Method Cleanup Level for Soil.
Blue denotes concentration above the laboratory method reporting limit (MRL) but below the MTCA Method Cleanup Level for Soil.
Fill shading denotes soil has been removed by excavation
GRPH (gasoline range petroleum hydrocarbons) analyzed by Method NWTPH-Gx.
DRPH (diesel range petroleum hydrocarbons) analyzed by Method NWTPH-Dx.
ORPH (oil range petroleum hydrocarbons) analyzed by Method NWTPH-Dx.
Volatiles analyzed by EPA Method 8260C.
MTCA Method A Cleanup Levels, WAC 173-340-720 through 173-340-760, revised Nov., 2007
< = less than method reporting limit shown
--- = not analyzed
F-15 Results for diesel are due to overlap from the reported oil result.
F-16 Results for oil are due to overlap from the reported diesel result.
F-19 Results are estimated due to the presence of multiple fuel products.
F = hydrocarbons indicative of heavier fuels are present in sample and impacting the gasoline result
N = hydrocarbons in the oil-range are impacting the diesel result
N1 = hydrocarbons in the diesel-range are impacting the oil result

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
MW-1	4/17/2017	20-35	658.01	9.47	- - -	- - -	648.54
	4/20/2017			9.63	- - -	- - -	648.38
	4/27/2017			10.14	- - -	- - -	647.87
	5/1/2017			10.31	- - -	- - -	647.70
	6/8/2017			11.20	- - -	- - -	646.81
	7/3/2017			NM	- - -	- - -	- - -
	9/28/2017			12.36	- - -	- - -	645.65
	8/27/2018			12.17	- - -	- - -	645.84
	8/31/2018			12.20	- - -	- - -	645.81
	11/26/2018			11.36	- - -	- - -	646.65
	11/30/2018			11.38	- - -	- - -	646.63
	3/29/2019			9.68	- - -	- - -	648.33
	8/29/2019			11.69	- - -	- - -	646.32
MW01S	4/25/2018	5.37 - 20.37	657.54	10.49	- - -	- - -	647.05
	4/27/2018			10.62	- - -	- - -	646.92
	8/27/2018			12.30	- - -	- - -	645.24
	8/31/2018			12.33	- - -	- - -	645.21
	11/26/2018			11.54	- - -	- - -	646.00
	11/30/2018			11.51	- - -	- - -	646.03
	3/29/2019			9.88	- - -	- - -	647.66
	8/29/2019			11.81	- - -	- - -	645.73
MW-2	4/17/2017	25-40	657.76	9.58	- - -	- - -	648.18
	4/20/2017			9.61	- - -	- - -	648.15
	4/27/2017			10.19	- - -	- - -	647.57
	5/1/2017			10.36	- - -	- - -	647.40
	6/8/2017			11.33	- - -	- - -	646.43
	7/3/2017			11.96	- - -	- - -	645.80
	9/28/2017			12.65	- - -	- - -	645.11
	4/25/2018			10.50	- - -	- - -	647.26
	4/27/2018			10.54	- - -	- - -	647.22
	8/27/2018			12.20	- - -	- - -	645.56
	8/31/2018			12.22	- - -	- - -	645.54
	11/26/2018			11.43	- - -	- - -	646.33
	11/30/2018			11.46	- - -	- - -	646.30
	3/29/2019			9.61	- - -	- - -	648.15
	8/29/2019			11.65	- - -	- - -	646.11
MW-3	4/17/2017	25-35	658.26	7.12	- - -	- - -	651.14
	4/20/2017			7.15	- - -	- - -	651.11
	4/27/2017			11.44	- - -	- - -	646.82
	5/1/2017			7.90	- - -	- - -	650.36
	6/8/2017			7.33	- - -	- - -	650.93
	7/3/2017			7.46	- - -	- - -	650.80
	9/28/2017			7.74	- - -	- - -	650.52
	8/27/2018			7.75	- - -	- - -	650.51
	8/31/2018			7.80	- - -	- - -	650.46
	11/26/2018			7.78	- - -	- - -	650.48
	11/30/2018			7.89	- - -	- - -	650.37
	3/29/2019			6.42	- - -	- - -	651.84
	8/29/2019			7.53	- - -	- - -	650.73

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
MW03S	4/25/2018	4.43 - 19.43	658.17	7.25	- - -	- - -	650.92
	4/27/2018			7.24	- - -	- - -	650.93
	8/27/2018			8.04	- - -	- - -	650.13
	8/31/2018			8.05	- - -	- - -	650.12
	11/26/2018			7.48	- - -	- - -	650.33
	11/30/2018			7.93	- - -	- - -	650.33
	3/29/2019			7.22	- - -	- - -	650.24
	8/29/2019			7.72	- - -	- - -	650.45
MW-4	4/17/2017	27-37	657.48	15.29	- - -	- - -	642.19
	4/20/2017			15.40	- - -	- - -	642.08
	4/27/2017			15.74	- - -	- - -	641.74
	5/1/2017			15.71	- - -	- - -	641.77
	6/8/2017			16.23	- - -	- - -	641.25
	7/3/2017			16.93	- - -	- - -	640.55
	9/28/2017			18.18	- - -	- - -	639.30
	4/25/2018			16.22	- - -	- - -	641.26
	4/27/2018			17.59	- - -	- - -	639.89
	8/27/2018			17.25	- - -	- - -	640.23
	8/31/2018			17.28	- - -	- - -	640.20
	11/26/2018			16.54	- - -	- - -	640.94
	11/30/2018			16.55	- - -	- - -	640.93
	3/29/2019			14.66	- - -	- - -	642.82
	8/29/2019			16.14	- - -	- - -	641.34
MW-5	4/17/2017	30-45	656.00	33.98	- - -	- - -	622.02
	4/20/2017			35.67	- - -	- - -	620.33
	4/27/2017			34.98	- - -	- - -	621.02
	5/1/2017			35.92	- - -	- - -	620.08
	6/8/2017			32.06	- - -	- - -	623.94
	7/3/2017			36.75	- - -	- - -	619.25
	9/28/2017			38.67	- - -	- - -	617.33
	4/25/2018			NM	- - -	- - -	- - -
	4/27/2018			35.58	- - -	- - -	620.42
	8/27/2018			38.21	- - -	- - -	617.79
	8/31/2018			38.30	- - -	- - -	617.70
	11/26/2018			38.34	- - -	- - -	617.66
	11/30/2018			38.44	- - -	- - -	617.56
	3/29/2019			37.58	- - -	- - -	618.42
	8/29/2019			38.00	- - -	- - -	618.00
MW-6	4/17/2017	8-18	657.70	9.57	- - -	- - -	648.13
	4/20/2017			9.40	- - -	- - -	648.30
	4/27/2017			9.89	- - -	- - -	647.81
	5/1/2017			9.95	- - -	- - -	647.75
	6/8/2017			10.60	10.55	0.05	647.14
	7/3/2017			11.10	- - -	- - -	646.60
	9/28/2017			11.51	- - -	- - -	646.19
	4/25/2018			10.20	- - -	- - -	647.50
	4/27/2018			10.21	- - -	- - -	647.49
	8/27/2018			11.28	- - -	- - -	646.42
	8/31/2018			11.29	- - -	- - -	646.41
	11/26/2018			10.82	- - -	trace	646.88
	11/30/2018			10.84	- - -	- - -	646.86
	3/29/2019			9.50	- - -	trace	648.20
	8/29/2019			10.89	- - -	- - -	646.81

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
MW-7	4/17/2017	10-20	657.52	9.64	- - -	- - -	647.88
	4/20/2017			9.71	- - -	- - -	647.81
	4/27/2017			10.26	- - -	- - -	647.26
	5/1/2017			10.35	- - -	- - -	647.17
	6/8/2017			11.44	- - -	- - -	646.08
	7/3/2017			11.91	- - -	- - -	645.61
	9/28/2017			12.46	- - -	- - -	645.06
	4/25/2018			10.61	- - -	- - -	646.91
	4/27/2018			10.63	- - -	- - -	646.89
	8/27/2018			11.96	- - -	- - -	645.56
	8/31/2018			12.18	- - -	- - -	645.34
	11/26/2018			11.50	- - -	- - -	646.02
	11/30/2018			11.53	- - -	- - -	645.99
	3/29/2019			9.72	- - -	- - -	647.80
	8/29/2019			11.67	- - -	- - -	645.85
MW-8	4/13/2017	15-25	656.20	16.71	14.50	2.21	641.21
	4/17/2017			13.47	- - -	- - -	642.73
	4/20/2017			13.96	13.95	0.01	642.25
	4/27/2017			17.25	14.91	2.34	640.78
	5/1/2017			17.47	14.94	2.53	640.70
	6/8/2017			18.02	- - -	- - -	638.18
	7/3/2017			17.97	17.91	0.07	638.28
	9/28/2017			18.10	- - -	- - -	638.10
	4/25/2018			15.14	- - -	- - -	641.06
	4/27/2018			15.12	- - -	- - -	641.08
	8/27/2018			16.71	- - -	- - -	639.49
	8/31/2018			16.77	- - -	- - -	639.43
	11/26/2018			16.04	- - -	- - -	640.16
	11/30/2018			16.07	- - -	- - -	640.13
	3/29/2019			13.37	- - -	- - -	642.83
	8/29/2019			15.96	- - -	- - -	640.24
MW-9	4/17/2017	14-24	655.29	13.56	- - -	- - -	641.73
	4/20/2017			14.31	- - -	- - -	640.98
	4/27/2017			17.45	16.75	0.70	638.39
	5/1/2017			18.60	17.33	1.27	637.68
	6/8/2017			22.14	- - -	- - -	633.15
	7/3/2017			22.16	- - -	- - -	633.13
	9/28/2017			22.69	- - -	- - -	632.60
	4/25/2018			17.22	- - -	- - -	638.07
	4/27/2018			17.22	- - -	- - -	638.07
MW09R	8/27/2018	8.59-33.59	653.55	19.90	- - -	- - -	635.39
	8/31/2018			19.91	- - -	- - -	635.38
	11/26/2018			28.28	- - -	- - -	625.27
	11/30/2018			19.94	- - -	- - -	633.61
	3/29/2019			12.82	- - -	- - -	640.73
	8/29/2019			19.81	- - -	- - -	633.74
MW-10	4/17/2017	14-30	645.80	16.72	- - -	- - -	629.08
	4/20/2017			17.31	- - -	- - -	628.49
	4/27/2017			18.11	- - -	- - -	627.69
	5/1/2017			18.99	- - -	- - -	626.81
	6/8/2017			19.88	- - -	- - -	625.92
	7/3/2017			25.06	23.62	1.44	621.86
	9/28/2017			25.70	- - -	- - -	620.10
	4/25/2018			21.18	- - -	- - -	624.62
	4/27/2018			20.96	- - -	- - -	624.84

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
MW10R	8/27/2018	14.66-34.64	644.30	24.64	- - -	- - -	619.66
	8/31/2018			25.71	- - -	- - -	618.59
	11/26/2018			27.51	- - -	- - -	616.79
	11/30/2018			26.19	25.95	0.24	618.30
	3/29/2019			18.54	- - -	- - -	625.76
	8/29/2019			NM	- - -	- - -	
MW-11	4/17/2017	12-22	658.00	13.45	- - -	- - -	644.55
	4/20/2017			13.45	- - -	- - -	644.55
	4/27/2017			13.76	- - -	- - -	644.24
	5/1/2017			13.77	- - -	- - -	644.23
	6/8/2017			14.32	14.05	0.27	643.89
	7/3/2017			14.30	- - -	- - -	643.70
	9/28/2017			14.65	- - -	- - -	643.35
	4/25/2018			13.82	- - -	- - -	644.18
	4/27/2018			13.82	- - -	- - -	644.18
	8/27/2018			14.20	- - -	- - -	643.80
	8/31/2018			14.21	- - -	- - -	643.79
	11/26/2018			14.11	- - -	- - -	643.89
	11/30/2018			14.11	- - -	- - -	643.89
	3/29/2019			13.41	- - -	- - -	644.59
	8/29/2019			14.09	- - -	- - -	643.91
MW12	4/25/2018	4.63 - 19.63	658.27	7.37	- - -	- - -	650.90
	4/27/2018			7.31	- - -	- - -	650.96
	8/27/2018			8.01	- - -	- - -	650.26
	8/31/2018			8.04	- - -	- - -	650.23
	11/26/2018			7.88	- - -	- - -	650.39
	11/30/2018			7.93	- - -	- - -	650.34
	3/29/2019			7.13	- - -	- - -	651.14
	8/29/2019			7.70	- - -	- - -	650.57
MW13	4/25/2018	4.91 - 19.91	657.04	7.39	- - -	- - -	649.65
	4/27/2018			7.36	- - -	- - -	649.68
	8/27/2018			8.05	- - -	- - -	648.99
	8/31/2018			8.15	- - -	- - -	648.89
	11/26/2018			8.22	- - -	- - -	648.82
	11/30/2018			8.17	- - -	- - -	648.87
	3/29/2019			7.21	- - -	- - -	649.83
	8/29/2019			7.61	- - -	- - -	649.43
MW14	4/25/2018	5.23 - 20.23	657.15	7.81	- - -	- - -	649.34
	4/27/2018			7.75	- - -	- - -	649.40
	8/27/2018			8.35	- - -	- - -	648.80
	8/31/2018			8.40	- - -	- - -	648.75
	11/26/2018			8.45	- - -	- - -	648.70
	11/30/2018			8.51	- - -	- - -	648.64
	3/29/2019			7.70	- - -	- - -	649.45
	8/29/2019			8.03	- - -	- - -	649.12
MW15	4/25/2018	10.33 - 35.33	654.99	NM	- - -	- - -	- - -
	4/27/2018			34.80	- - -	- - -	620.19
	8/27/2018			34.76	- - -	- - -	620.23
	8/31/2018			34.82	- - -	- - -	620.17
	11/26/2018			dry	- - -	- - -	- - -
	11/30/2018			dry	- - -	- - -	- - -
	3/29/2019			dry	- - -	- - -	- - -
	8/29/2019			dry	- - -	- - -	- - -

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
MW16	4/25/2018	9.28 - 29.28	656.93	9.72	- - -	- - -	647.21
	4/27/2018			9.70	- - -	- - -	647.23
	8/27/2018			10.05	- - -	- - -	646.88
	8/31/2018			10.18	- - -	- - -	646.75
	11/26/2018			10.07	- - -	- - -	646.86
	11/30/2018			9.73	- - -	- - -	647.20
	3/29/2019			9.44	- - -	- - -	647.49
	8/29/2019			9.89	- - -	- - -	647.04
MW17	4/25/2018	9.52 - 29.52	655.55	14.25	- - -	- - -	641.30
	4/27/2018			14.22	- - -	- - -	641.33
	8/27/2018			15.07	- - -	- - -	640.48
	8/31/2018			15.14	- - -	- - -	640.41
	11/26/2018			14.78	- - -	- - -	640.77
	11/30/2018			14.66	- - -	- - -	640.89
	3/29/2019			13.38	- - -	- - -	642.17
	8/29/2019			14.23	- - -	- - -	641.32
MW18	4/25/2018	15.86 - 35.86	654.51	NM	- - -	- - -	- - -
	4/27/2018			34.69	- - -	- - -	619.82
	8/27/2018			dry	- - -	- - -	- - -
	8/31/2018			dry	- - -	- - -	- - -
	11/26/2018			dry	- - -	- - -	- - -
	11/30/2018			dry	- - -	- - -	- - -
	3/29/2019			dry	- - -	- - -	- - -
	8/29/2019			dry	- - -	- - -	- - -
MW19	4/25/2018	11.66 - 31.66	653.31	23.05	- - -	- - -	630.26
	4/27/2018			23.15	- - -	- - -	630.16
	8/27/2018			28.63	- - -	- - -	624.68
	8/31/2018			28.83	- - -	- - -	624.48
	11/26/2018			dry	- - -	- - -	- - -
	11/30/2018			27.72	- - -	- - -	625.59
	3/29/2019			21.30	- - -	- - -	632.01
	8/29/2019			30.45	- - -	- - -	622.86
MW20	4/25/2018	9.79 - 29.79	650.85	18.55	- - -	- - -	632.30
	4/27/2018			18.64	- - -	- - -	632.21
	8/27/2018			24.97	- - -	- - -	625.88
	8/31/2018			25.24	- - -	- - -	625.61
	11/26/2018			25.20	- - -	- - -	625.65
	11/30/2019			24.95	- - -	- - -	625.90
	3/29/2019			13.32	- - -	- - -	637.53
	8/29/2019			25.02	- - -	- - -	625.83
MW21	4/25/2018	12.30 - 32.30	643.88	19.40	- - -	- - -	624.48
	4/27/2018			19.31	- - -	- - -	624.57
	8/27/2018			20.88	- - -	- - -	623.00
	8/31/2018			21.36	- - -	- - -	622.52
	11/26/2018			20.42	- - -	- - -	623.46
	11/30/2018			20.71	- - -	- - -	623.17
	3/29/2019			19.67	- - -	- - -	624.21
	8/29/2019			20.59	- - -	- - -	623.29

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
MW22	4/25/2018	9.19 - 34.19	641.85	21.80	- - -	- - -	620.05
	4/27/2018			21.80	- - -	- - -	620.05
	8/27/2018			23.72	- - -	- - -	618.13
	8/31/2018			24.46	- - -	- - -	617.39
	11/26/2018			23.49	- - -	- - -	618.36
	11/30/2018			24.74	- - -	- - -	617.11
	3/29/2019			24.90	- - -	- - -	616.95
	8/29/2019			NM	- - -	- - -	
MW23	4/25/2018	7.13 - 22.13	656.91	10.28	- - -	- - -	646.63
	4/27/2018			10.30	- - -	- - -	646.61
	8/27/2018			12.16	- - -	- - -	644.75
	8/31/2018			11.99	- - -	- - -	644.92
	11/26/2018			11.27	- - -	- - -	645.64
	11/30/2019			11.30	- - -	- - -	645.61
	3/29/2019			9.36	- - -	- - -	647.55
	8/29/2019			11.42	- - -	- - -	645.49
MW24	8/27/2018	14.17 - 34.17	644.38	26.03	- - -	- - -	618.35
	8/31/2018			26.77	- - -	- - -	617.61
	11/26/2018			27.11	- - -	- - -	617.27
	11/30/2018			27.05	- - -	- - -	617.33
	3/29/2019			24.75	- - -	- - -	619.63
	8/29/2019			26.51	- - -	- - -	617.87
MW25	8/27/2018	12.81 - 32.81	645.57	26.01	- - -	- - -	619.56
	8/31/2018			26.49	- - -	- - -	619.08
	11/26/2018			24.96	- - -	- - -	620.61
	11/30/2018			25.19	- - -	- - -	620.38
	3/29/2019			13.45	- - -	- - -	632.12
	8/29/2019			26.02	- - -	- - -	619.55
MW26	8/27/2018	13.54 - 33.54	646.65	25.23	- - -	- - -	621.42
	8/31/2018			25.76	- - -	- - -	620.89
	11/26/2018			25.45	- - -	- - -	621.20
	11/30/2018			25.83	- - -	- - -	620.82
	3/29/2019			16.35	- - -	- - -	630.30
	8/29/2019			26.33	- - -	- - -	620.32
MW27	8/27/2018	13.56 - 38.56	649.00	24.87	- - -	- - -	624.13
	8/31/2018			25.06	- - -	- - -	623.94
	11/26/2018			24.92	- - -	- - -	624.08
	11/30/2018			23.90	- - -	- - -	625.10
	3/29/2019			20.04	- - -	- - -	628.96
	8/29/2019			23.89	- - -	- - -	625.11
MW28	8/27/2018	13.62 - 38.62	650.64	26.04	- - -	- - -	624.60
	8/31/2018			26.25	- - -	- - -	624.39
	11/26/2018			33.05	- - -	- - -	617.59
	11/30/2018			25.00	- - -	- - -	625.64
	3/29/2019			20.50	- - -	- - -	630.14
	8/29/2019			24.96	- - -	- - -	625.68
MW29	8/27/2018	14.05 - 39.05	652.34	34.43	- - -	- - -	617.91
	8/31/2018			34.84	- - -	- - -	617.50
	11/26/2018			34.92	- - -	- - -	617.42
	11/30/2018			34.25	- - -	- - -	618.09
	3/29/2019			20.80	- - -	- - -	631.54
	8/29/2019			30.67	30.67	<0.01	621.67

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
MW30	8/27/2018	14.67 - 39.67	652.83	34.73	- - -	- - -	618.10
	8/31/2018			35.01	- - -	- - -	617.82
	11/26/2018			34.91	- - -	- - -	617.92
	11/30/2018			34.84	- - -	- - -	617.99
	3/29/2019			35.28	- - -	- - -	617.55
	8/29/2019			35.05	- - -	- - -	617.78
MW31	8/27/2018	14.11 - 39.11	653.97	34.55	- - -	- - -	619.42
	8/31/2018			35.16	- - -	- - -	618.81
	11/26/2018			35.04	- - -	- - -	618.93
	11/30/2019			34.96	- - -	- - -	619.01
	3/29/2019			32.45	- - -	- - -	621.52
	8/29/2019			34.02	- - -	- - -	619.95
MW32	8/27/2018	8.95 - 33.95	655.83	12.41	- - -	- - -	643.42
	8/31/2018			12.43	- - -	- - -	643.40
	11/26/2018			12.28	- - -	- - -	643.55
	11/30/2019			12.25	- - -	- - -	643.58
	3/29/2019			11.13	- - -	- - -	644.70
	8/29/2019			12.01	- - -	- - -	643.82
BH-1	4/17/2017	20-30	652.17	19.71	- - -	- - -	632.46
	4/20/2017			20.13	- - -	- - -	632.04
	4/27/2017			22.88	- - -	- - -	629.29
	5/1/2017			23.16	- - -	- - -	629.01
	6/8/2017			25.64	- - -	- - -	626.53
	7/3/2017			28.46	27.91	0.55	624.14
	9/28/2017			28.73	- - -	- - -	623.44
	4/25/2018			23.03	- - -	- - -	629.14
	4/27/2018			20.03	- - -	- - -	632.14
	8/27/2018			26.21	- - -	- - -	625.96
	8/31/2018			26.27	- - -	- - -	625.90
	11/26/2018			NM	- - -	- - -	- - -
	11/30/2018			NM	- - -	- - -	- - -
BH01R	3/29/2019	14.52-39.52	651.03	20.30	- - -	- - -	630.73
	8/29/2019			24.64	- - -	- - -	626.39
BH-2	4/17/2017	20-35	653.77	26.16	- - -	- - -	627.61
	4/20/2017			26.30	- - -	- - -	627.47
	4/27/2017			26.56	26.48	0.08	627.27
	5/1/2017			26.68	26.58	0.10	627.17
	6/8/2017			26.73	- - -	- - -	627.04
	7/3/2017			28.86	- - -	- - -	624.91
	9/28/2017			31.25	- - -	- - -	622.52
	4/25/2018			27.68	- - -	- - -	626.09
	4/28/2017			27.53	- - -	- - -	626.24
	8/27/2018			28.50	- - -	- - -	625.27
	8/31/2018			28.91	- - -	- - -	624.86
	11/26/2018			28.66	- - -	trace	625.11
	11/30/2018			28.63	- - -	trace	625.14
	3/29/2019			27.75	- - -	- - -	626.02
	8/29/2019			28.51	- - -	- - -	625.26

Table 2
Depth to Water/Groundwater Elevation
Coleman Oil
Wenatchee, Washington

Well Identification	Date	Monitoring Well Screened Interval (feet bgs)	Elevation Top of Casing [1] (feet)	Depth to Water (feet below top of casing)	Depth to NAPL (feet below top of casing)	LNAPL Thickness (feet)	Groundwater Elevation (feet)
BH-3	4/17/2017	15-30	648.76	17.47	- - -	- - -	631.29
	4/20/2017			17.88	- - -	- - -	630.88
	4/27/2017			18.70	- - -	- - -	630.06
	5/1/2017			19.06	- - -	- - -	629.70
	6/8/2017			21.19	- - -	- - -	627.57
	7/3/2017			21.70	- - -	- - -	627.06
	9/28/2017			23.04	- - -	- - -	625.72
	4/25/2018			20.06	- - -	- - -	628.70
	4/27/2018			22.36	- - -	- - -	626.40
	8/27/2018			22.20	- - -	- - -	626.56
	8/31/2018			23.68	- - -	- - -	625.08
	11/26/2018			24.05	- - -	- - -	624.71
	11/30/2018			25.29	- - -	- - -	623.47
	3/29/2019			18.05	- - -	- - -	630.71
	8/29/2019			25.43	- - -	- - -	623.33
RW-1	4/17/2017	15-30	650.42	16.15	- - -	- - -	634.27
	4/20/2017			16.34	- - -	- - -	634.08
	4/27/2017			17.35	- - -	- - -	633.07
	5/1/2017			18.55	- - -	- - -	631.87
	6/8/2017			22.67	- - -	- - -	627.75
	7/3/2017			24.19	- - -	- - -	626.23
	9/28/2017			26.74	- - -	- - -	623.68
	4/25/2018			21.19	- - -	- - -	629.23
	4/27/2018			21.21	- - -	- - -	629.21
	8/27/2018			25.09	- - -	- - -	625.33
	8/31/2018			25.69	- - -	- - -	624.73
	11/26/2018			28.81	- - -	- - -	621.61
	11/30/2018			25.63	- - -	- - -	624.79
	3/29/2019			21.12	- - -	- - -	629.30
	8/29/2019			26.80	- - -	- - -	623.62

NOTES:

- - - denotes no LNAPL present

[1]Elevation in feet above mean sea level. Elevations based on NAVD88 vertical datum. Well survey conducted by Munson Engineers, Inc. of Wenatchee, Washington in July 2010 and April 2017.

Groundwater elevations in wells with LNAPL corrected for water-level elevation using typical specific gravity of R99 LNAPL of 0.78.

bgs = below ground surface
LNAPL = light nonaqueous-phase liquid
NAPL = nonaqueous-phase liquid

Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

Field ID	Date	Fuels: GRPH	Fuels: DRPH	Fuels: ORPH	Volatiles: Benzene	Volatiles: Toluene	Volatiles: Ethylbenzene	Volatiles: Xylene, Total	Volatiles: Naphthalene	Volatiles: MTBE	Volatiles: EDB	Volatiles: EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		**800/1000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**160**	**20**	**0.01**	**5**
Benzene (Non Detect)		**1,000**										
Benzene (Detect)		**800**										
FB-9	4/7/2017	**1,200** F	**2,900**	**1,200**	**2.4**	< 1.0	**3.7**	**1.7**	--	--	--	--
FB-10	4/7/2017	**2,000** F	**57,000**	**< 4,100** ec	**71**	**13**	**7.1**	**64**	--	--	--	--
BH-1	4/21/2017	**820** F	**1,900**	**970** N1	**15**	**2.8**	**8.3**	**18.5**	--	--	--	--
BH-1	4/26/2018	**2,140**	**1,390**	<377	**0.671**	<1.00	**5.55**	12.5	--	--	--	--
BH-1	8/30/2018	**591**	**243**	<148	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-1	12/1/2018	**1,420**	**5,120** F13	<151	<0.200	<1.00	0.608	<1.50	--	--	--	--
BH01R	3/27/2019	**1,130**	**13,600** F-13	<151	**4.33**	<1.00	**1.15**	**1.78**	--	--	--	--
BH01R	8/27/2019	**518**	**1,910** F-13	<150	**0.240**	<1.00	<0.500	<1.50	--	--	--	--
BH-2	4/10/2017	**1,900** F	**100,000**	**10,000**	< 4.0	< 4.0	**13**	**39**	--	--	--	--
BH-2	4/21/2017	**1,500** F	**2,600**	**630** N1	**4.2**	**3.3**	**12**	**39**	--	--	--	--
BH-2	4/24/2018	**854**	**9,360**	<377	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-2	8/28/2018	**639**	**3,300**	<148	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-2	11/30/2018	**509**	**7,040**	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-2	3/27/2019	**354**	**5,310** F-13, F-15	**475** F-03, F-16	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-2	8/27/2019	**295**	**6,150** F-13	<150	<0.200	<1.00	<0.500	<1.50				
BH-3	4/21/2017	**1,800** F	**2,400**	**660**	**1.8**	<1.0	**5.4**	**8.2**	--	--	--	--
BH-3	9/29/2017	**150** O	**1,200**	**550** N1	<1.0	<1.0	<1.0	<2.0	--	--	--	--
BH-3	4/26/2018	**172**	**1,130**	<377	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-3	8/30/2018	**250**	**276**	<148	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-3	11/29/2018	<100	**502**	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-3	3/28/2019	**319**	**1,850** F-13	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
BH-3	8/28/2019	**121**	**816** F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--

Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

		Fuels			Volatiles							
		GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		**800/1000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**160**	**20**	**0.01**	**5**
Benzene (Non Detect)		**1,000**										
Benzene (Detect)		**800**										
Field ID	**Date**											
RW-1	4/21/2017	<100	**840**	**540** N1	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	9/29/2017	<100	**360**	**440**	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	4/26/2018	<100	<189	<377	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/30/2018	<100	**327**	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/30/2018	<100	**152**	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	<100	<74.8 F-13	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/28/2019	<100	116 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-1	3/23/2017	---	**520**	**480**	---	---	---	---	--	--	--	--
	4/21/2017	210 F	**730**	**510**	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	9/29/2017	**200**	**410**	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	8/28/2018	**449**	**219**	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/27/2018	**152**	**159**	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/25/2019	**172**	126 F-11,F-20	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW01S	4/24/2018	**188**	<187	<374	**0.42**	<1.00	**5.8**	**9.48**	--	--	--	--
	8/28/2018	**268**	**294**	<151	**1.49**	<1.00	**1.26**	<1.50	--	--	--	--
	11/27/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/25/2019	**133**	116 F-11, F-20	<151	<0.200	<1.00	**4.18**	**8.97**	--	--	--	--
	8/26/2019	<100	269 F-11, F-20	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-2	3/23/2017	---	<260	<410	---	---	---	---	--	--	--	--
	4/20/2017	<100	<260	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	4/25/2018	<100	<187	<374	<0.200	<1.00	<0.500	<1.50	--	--	--	--

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Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

		Fuels			Volatiles							
		GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		800/1000	500	500	5	1,000	700	1,000	160	20	0.01	5
Benzene (Non Detect)		1,000										
Benzene (Detect)		800										
Field ID	**Date**											
MW-3	4/20/2017	<100	<260	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	9/28/2017	<100	<260	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
MW03S	4/25/2018	<100	<187	<374	<0.200	<1.00	<0.500	<1.50	<2.00	<1.00	<0.500 ec	<0.400
	8/29/2018	<100	139	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/27/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/25/2019	<100	<76.2	<152	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/26/2019	<100	114 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-4	3/23/2017	---	<260	<410	---	---	---	---	--	--	--	--
	4/20/2017	<100	<260	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	9/28/2017	<100	<260	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	4/25/2018	<100	<187	<374	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-5	3/23/2017	---	<260	<410	---	---	---	---	--	--	--	--
	4/20/2017	<100	<260	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	9/28/2017	<100	<260	<410	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	4/25/2018	<100	<189	<377	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/28/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-6	4/20/2017	880 F	1,800	480 N1	5.0	<4.0	6.2	37	--	--	--	--
	9/28/2017	530 O	760	430 N1	<1.0	<1.0	<1.0	4.3	--	--	--	--
	4/25/2018	643	1,620	<374	0.56	<1.00	<0.500	2.19	--	--	--	--
	8/29/2018	376	668	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/27/2018	499	634	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/25/2019	398	1,010 F-13,F-20	<152	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/26/2019	356	1,200 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--

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Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

		Fuels			Volatiles							
		GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		800/1000	500	500	5	1,000	700	1,000	160	20	0.01	5
Benzene (Non Detect)		1,000										
Benzene (Detect)		800										
Field ID	**Date**											
MW-7	4/20/2017	1,100 F	1,300	420 N1	3.2	< 1.0	15	11.4	--	--	--	--
	9/28/2017	<100	520	<470 U1	<1.0	<1.0	<1.0	<2.0	--	--	--	--
	4/25/2018	<100	435	<374	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/29/2018	<100	448	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/28/2018	<100	283	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-8	9/29/2017	1,300 O	2,100	690 N1	<1.0	<1.0	4.1	27.2	--	--	--	--
	4/26/2018	720	1,300	<374	0.641	<1.00	<0.500	4.67	--	--	--	--
	8/29/2018	774	907	<151	<0.200	<1.00	<0.500	3.42	--	--	--	--
	11/28/2018	921	505	<151	0.214	<1.00	1.06	6.23	--	--	--	--
	3/26/2019	768	2,220 F-13,F-20	<152	22.2	<1.00	<0.500	2.70	--	--	--	--
	8/26/2019	899	1,320 F-13,F-20	<151	0.853	<1.00	0.504	2.17	--	--	--	--
MW-9	9/29/2017	500 O	1,200	670 N1	<1.0	<1.0	<1.0	1.5	--	--	--	--
	4/26/2018	2,810	2,620	<374	2.73	<1.00	9.95	20.4	--	--	--	--
MW-9R	8/29/2018	234	654	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/28/2018	1,300	1,850	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/26/2019	1,000	5,690 F-13,F-20	<151	5.64	<1.00	0.545	<1.50	--	--	--	--
	8/27/2019	1,080	5,880 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-10	4/21/2017	1,900 F	3,800	730	3.4	< 1.0	11	12.5	--	--	--	--
	9/29/2017	1,900 O	16,000	1,300 N1	<1.0	<1.0	13	26.7	--	--	--	--
	4/26/2018	2,290	1,500	<377	0.219	<1.00	3.52	5.95	--	--	--	--
MW-10R	8/30/2018	1,080	838	< 150	< 0.200	< 1.00	1.22	2.42	--	--	--	--
	11/29/2018	2,160	1,370	<755 ec	<0.200	<1.00	3.90	5.98	--	--	--	--
	3/28/2019	1,020	2,960 F-13	<151	0.401	<1.00	0.837	<1.50	--	--	--	--
	8/27/2019	1,270	3,620 F-13	<1,510 ec	<0.200	<1.00	1.44	3.06	--	--	--	--

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Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

Field ID	Date	GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		Fuels			Volatiles							
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		800/1000	500	500	5	1,000	700	1,000	160	20	0.01	5
Benzene (Non Detect)		1,000										
Benzene (Detect)		800										
MW-11	4/21/2017	1,400 F	1,700	1,000 N1	28	4.1	8.2	26.1	--	--	--	--
MW-11	9/29/2017	1,000 O	3,100	720 N1	<1.0	<1.0	1.9	12.5	--	--	--	--
MW-11	4/26/2018	1,240	1,140	<374	<0.200	<1.00	0.56	2.27	--	--	--	--
MW-11	8/29/2018	944	251	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-11	11/27/2018	1,350	503	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW-11	3/26/2019	1,540	1,230 F-13,F-20	<150	11.6	<1.00	<0.500	2.34	--	--	--	--
MW-11	8/26/2019	1,230	1,060 F-13, F-20	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW12	4/25/2018	<100	<189	<377	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW12	8/28/2018	<100	<74.8	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW12	11/27/2018	<100	92.8	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW12	3/25/2019	<100	<76.2	<152	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW12	8/26/2019	<100	<74.8	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW13	4/25/2018	40,900	1,790	<377	1,500	4,710	627	3,780	--	--	--	--
MW13	8/29/2018	39,300	2,500	<150	1,780	3,010	796	4,850	167	<50.0 ec	<25.0 ec	<25.0 ec
MW13	11/27/2018	22,400	3,250	<151	1,380	271	458	3,170	--	--	--	--
MW13	3/25/2019	28,500	4,650 F-11,F-20	<151	701	761	804	4,980	--	--	--	--
MW13R	8/26/2019	966	2,180 F-11,F-20	<151	96.4	<1.00	8.52	28.5	--	--	--	--
MW14	8/29/2018	4,040	487	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW14	4/25/2018	4,620	900	<374	13.1	<1.00	16.1	<1.50	3.21	<1.00	<0.500 ec	<0.400
MW14	11/27/2018	5,170	933	<151	15.2	<1.00	1.70	<1.50	--	--	--	--
MW14	3/25/2019	2,650	1,070 F-11,F-20	<151	17.8	<1.00	2.04	<1.50	--	--	--	--
MW14	8/26/2019	3,510	1,280 F-11,F-20	<151	44.2	<10.0	5.95	<15	--	--	--	--

Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

		Fuels			Volatiles							
		GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		800/1000	500	500	5	1,000	700	1,000	160	20	0.01	5
Benzene (Non Detect)		1,000										
Benzene (Detect)		800										
Field ID	**Date**											
MW15	4/25/2018 iw	--	--	--	--	--	--	--	--	--	--	--
	8/29/20018 iw	--	--	--	--	--	--	--	--	--	--	--
	11/27/2018 iw	--	--	--	--	--	--	--	--	--	--	--
	3/26/2019 iw	--	--	--	--	--	--	--	--	--	--	--
	8/26/2019 iw	--	--	--	--	--	--	--	--	--	--	--
MW16	4/26/2018	<100	330	<374	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/29/2018	<100	298	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/28/2018	<100	337	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/26/2019	<100	183 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/26/2019	<100	349 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW17	4/26/2018	2,800	1,630	<377	1.23	<1.00	1.62	7.66	4.72	<1.00	<0.500 ec	<0.400
	8/29/2018	1,270	986	<150	0.450	<1.00	<0.500	<1.50	5.61	<1.00	<0.500 ec	<0.500
	11/28/2018	1,390	1,580	<151	0.305	<1.00	<0.500	<1.50	--	--	--	--
	3/26/2019	1,180	2,520 F-13,F-20	<151	2.91	<1.00	0.692	1.50	--	--	--	--
	8/26/2019	655	6,730 F-13	<150	2.72	<1.00	<0.500	<1.50	--	--	--	--
MW18	4/26/2018 iw	--	--	--	--	--	--	--	--	--	--	--
	8/2920018 iw	--	--	--	--	--	--	--	--	--	--	--
	11/27/2018 iw	--	--	--	--	--	--	--	--	--	--	--
	3/26/2019 iw	--	--	--	--	--	--	--	--	--	--	--
	8/26/2019 iw	--	--	--	--	--	--	--	--	--	--	--
MW19	4/26/2018	280	979	<377	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2018	<100	406	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/30/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	447	4,300 F-13	<151	0.673	<1.00	<0.500	<1.50	--	--	--	--
	8/26/2019	--	--	--	--	--	--	--	--	--	--	--

Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

		Fuels			Volatiles							
		GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		800/1000	500	500	5	1,000	700	1,000	160	20	0.01	5
Benzene (Non Detect)		1,000										
Benzene (Detect)		800										
Field ID	**Date**											
MW20	4/26/2018	1,270	1,320	<377	<0.200	<1.00	1.56	5.44	--	--	--	--
	8/30/2018	320	346	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/29/2018	674	1,280	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	1,220	2,190 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/28/2019	588	870 F-11,F-20	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW21	4/26/2018	991	965	<374	<0.200	<1.00	0.835	1.82	--	--	--	--
	8/30/2018	<100	234	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/27/2018	789	992	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	799	1,400 F-13	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2019	453	605 F-11,F-20	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW22	4/26/2018	6,960	4,690	<377	118	28.8	102	196	--	--	--	--
	8/30/2018	2,040	1,150	<748 ec	30.4	5.34	30.5	55.9	--	--	--	--
MW23	4/25/2018	<100	419	<381	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/29/2018	<100	266	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/27/2018	<100	380	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/25/2019	<100	339 F-11	<152	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/26/2019	<100	580 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW24	8/30/2018	<100	220	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/29/2018	154	914	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	<100	696 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2019	<100	560 F-11, F-20	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW25	8/30/2018	<100	<74.8	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/27/2018	<100	121	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	<100	302 F-11	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2019	<100	262 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--

Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

		Fuels			Volatiles							
		GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		800/1000	500	500	5	1,000	700	1,000	160	20	0.01	5
Benzene (Non Detect)		1,000										
Benzene (Detect)		800										
Field ID	**Date**											
MW26	8/30/2018	<100	128	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/29/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	<100	591 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2019	<100	266 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW27	8/30/2018	<100	118	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/29/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/28/2019	<100	185 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/28/2019	<100	467 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW28	8/30/2018	<100	105	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	12/1/2018	385	486	<158	0.208	<1.00	<0.500	<1.50	--	--	--	--
	3/27/2019	303	1,370 F-13	<151	1.30	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2019	302	1,010 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW29	8/28/2018	<100	459	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/29/2018	<100	238	809	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/27/2019	237	2,930 F-13,F-15	928 F-16	1.64	<1.00	<0.500	<1.50	--	--	--	--
	8/26/2019	--	--	--	--	--	--	--	--	--	--	--
MW30	8/28/2018	<100	193	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	11/29/2018	<100	304	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/27/2019	<100	612 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2019	<100	557 F-13	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--

Table 3
Groundwater Analytical Results - Fuels and VOCs
Coleman Oil Site
Wenatchee, Washington

		Fuels			Volatiles							
		GRPH	DRPH	ORPH	Benzene	Toluene	Ethylbenzene	Xylene, Total	Naphthalene	MTBE	EDB	EDC
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup for Groundwater		800/1000	500	500	5	1,000	700	1,000	160	20	0.01	5
Benzene (Non Detect)		1,000										
Benzene (Detect)		800										
Field ID	**Date**											
MW31	8/28/2018	<100	<74.1	<148	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	12/1/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/27/2019	<100	<74.8	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/27/2019	<100	<74.8	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
MW32	8/29/2018	139	161	<148	<0.200	<1.00	<0.500	<1.50	<2.00	<1.00	<0.500 ec	<0.500
	11/28/2018	<100	<75.5	<151	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	3/26/2019	<100	296 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--
	8/26/2019	<100	302 F-11	<150	<0.200	<1.00	<0.500	<1.50	--	--	--	--

Notes:

Red denotes concentration in excess of MTCA Method Cleanup Level for Groundwater.
Blue denotes concentration in excess of laboratory method reporting limit (MRL) but below the MTCA Method Cleanup Level for Groundwater.
MTCA Method A Cleanup Levels, WAC 173-340-720 through 173-340-760, revised Nov., 2007
GRPH (gasoline range petroleum hydrocarbons) analyzed by Method NWTPH-Gx.
DRPH (diesel range petroleum hydrocarbons) and ORPH (oil range petroleum hydrocarbons) analyzed by Method NWTPH-Dx.
VOCs = volatile organic compounds
VOCs analyzed by EPA Method 8260C
Total Lead by EPA Method 6020
< = less than method reporting limit shown
--- = not analyzed. MW15 and MW18 not sampled due to lack of water in the well.
ec = Method reporting limit exceeds Clean Up Level shown.
F and O = hydrocarbons indicative of heavier fuels are present in sample and impacting the gasoline result (Farallon 2017b)
N1 = hydrocarbons in the diesel-range are impacting the oil result (Farallon 2017b)
U1 = the practical quantitation limit is elevated due to interferences present in the sample (Farallon 2017b)
F-03 = The result for this hydrocarbon range is elevated due to the presence of individual analyte peaks in the quantitation range that are not representative of the fuel pattern reported.
F-11 = The hydrocarbon pattern indicates possible weathered diesel, or a contribution from a related component.
F-13 = The chromatographic pattern does not resemble the fuel standard used for quantitation.
F-15 = Results for diesel are estimated due to overlap from the reported oil result.
F-16 = Results for oil are estimated due to overlap from the reported diesel result.
F-20 = Result for Diesel is estimated due to overlap from Gasoline Range Organics or other VOCs.
S-02 = Surrogate recovery cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
S-06 = Surrogate recovery is outside of established control limits.

Table 4
Historical Groundwater Analytical Results - PAHs
Coleman Oil Site
Wenatchee, Washington

Field ID	Date	Acenaphthene	Acenaphthylene	Anthracene	Benz [a] anthracene	Benzo [a] pyrene	Benzo [b] fluoranthene	Benzo [k] fluoranthene	Benzo (g,h,i) perylene	Chrysene	Dibenz [a,h] anthracene
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup Level for Groundwater						0.1					
MW21	4/26/2018	0.193	<0.0935	0.145	<0.0935	<0.0935	<0.0935	<0.0935	<0.0935	<0.0935	<0.0935
MW22	4/26/2018	113	<12.3	8.48	0.284	<0.0943	<0.0943	<0.0943	<0.0943	0.243	<0.0943
	8/30/2018	43.4	4.21	3.32	0.156	<0.0374	<0.0374	<0.0374	<0.0374	0.156	<0.0374
MW32	8/29/2018	<0.0370	<0.0370	<0.0370	<0.0370	<0.0370	<0.0370	<0.0370	<0.0370	<0.0370	<0.0370

Field ID	Date	Dibenzofuran	Fluoranthene	Fluorene	Indeno [1,2,3-cd] pyrene	1- Methyl-naphthalene	2-Methyl- naphthalene	Naphthalene	Phenanthrene	Pyrene	TEQ
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WA MTCA Method A Cleanup Level for Groundwater								160			0.1
MW21	4/26/2018	0.103	<0.0935	0.144	<0.0935	1.48	0.494	1.16	<0.0935	<0.0935	0.0706
MW22	4/26/2018	8.55	3.2	36.7	<0.0943	298	210	**692**	36.6	4.30	0.0968
	8/30/2018	3.34	1.49	14.0	<0.0374	94.2	92.2	**189**	13.7	2.43	0.0433
MW32	8/29/2018	<0.0370	<0.0370	0.0382	<0.0370	<0.0741	<0.0741	<0.0833	<0.0370	<0.0370	0.0279

Notes:
Red denotes concentration in excess of MTCA Method Cleanup Level for groundwater.
MTCA Method A Cleanup Levels, WAC 173-340-720 through 173-340-760, revised Nov., 2007
< = less than method reporting limit shown
ug/L = micrograms per liter (parts per billion)
PAHs by EPA Method 8270D SIM
TEQ = Toxic Equivalent Concentration per Ecology Focus Sheet. One-half the detection limit used for non-detected concentrations.

Table 5
Groundwater Analytical Results - Geochemical Indicators
Coleman Oil Site
Wenatchee, Washington

		Field Parameters			Laboratory Analytical					Field Test
		Dissolved Oxygen	Redox Potential	pH	Nitrate	Sulfate	Alkalinity	Manganese	Methane	Ferrous Iron
		mg/L	mV	Unitless	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L
Field ID	Date									
BH01R	8/27/2019	0.30	-83.3	6.16	<0.05	0.50	435	9,780	2,100	5.5
BH-2	8/27/2019	0.37	-80.3	6.10	<0.05	1.41	431	4,410	2,200	4.0
BH-3	8/28/2019	0.29	-79.9	6.16	<0.05	6.78	619	1,570	1,500	6.5
RW-1	8/28/2019	0.92	-17	7.10	<0.05	18.3	487	52.8	340	0.0
MW01S	8/26/2019	0.18	117	6.07	0.75	78.4	185	589	21	0.0
MW03S	8/26/2019	0.18	17	6.44	<0.05	25.4	230	482	29	0.0
MW-6	8/26/2019	0.63	-196	6.42	<0.05	8.79	241	714	3,100	0.0
MW-8	8/26/2019	0.65	-87	6.75	<0.05	<0.1	375	3,370 J	8,100	4.5
MW-9R	8/27/2019	0.71	-21	6.70	<0.05	4.97	148	5,800	540	3.0
MW-10R	8/27/2019	0.71	0	6.80	<0.05	0.39	490	4,410 J	1,600	1.5
MW-11	8/26/2019	0.72	-92	6.78	<0.05	<0.1	334	2,030	6,300	6.5
MW12	8/26/2019	0.18	31.7	6.37	<0.05	39.5	175	130	7.3	0.0
MW13R	8/26/2019	0.54	-91	7.09	<0.05	50.6	333	2,160	200	0.0
MW14	8/26/2019	0.63	-90	6.83	<0.05	<0.1	414	1,890	1,400	0.0
MW15	8/26/2019	--	--	--	--	--	--	--	--	--
MW16	8/26/2019	1.69	85	6.55	2.0	22.2	306	91	<1	0.0
MW17	8/26/2019	0.18	-103.5	6.02	<0.05	0.32	418	3,450	4,100	3.5
MW18	8/26/2019	--	--	--	--	--	--	--	--	--
MW19	8/26/2019	--	--	--	--	--	--	--	--	--
MW20	8/28/2019	0.22	-37	5.97	<0.05	0.18	462	6,980	99	5.0
MW21	8/27/2019	1.03	-8	6.64	<0.05	22.8	468	3,450	1,700	2.0
MW23	8/26/2019	0.69	-117	6.29	<0.05	43.1	284	1,590	140	0.5
MW24	8/27/2019	1.01	-22	6.81	<0.05	15.2	450	1,330	640	3.0
MW25	8/27/2019	0.70	12	7.43	<0.05	20.5	396	330	3.1	0.0
MW26	8/27/2019	0.79	17	7.13	<0.05	14.0	487	810	20	2.0
MW27	8/28/2019	0.93	-36	6.90	<0.05	9.60	504	3,920	500	2.5
MW28	8/27/2019	0.22	-61.6	6.16	<0.05	2.39	472	10,700 J	2,100	4.5
MW29	8/27/2019p	--	--	--	--	--	--	--	--	--
MW30	8/27/2019	0.37	-149.4	6.28	<0.05	2.32	592	1,460	790	3.5
MW31	8/27/2019	0.39	-108.4	6.40	<0.25	63.8	578	413	230	2.5
MW32	8/26/2019	2.77	128.4	6.07	0.35	22.7	279	274	38	0.1

Notes:

Field parameters measured during sample collection using a YSI multi-parameter meter.
Nitrate analyzed by EPA Method 300.0.
Sulfate analyzed by EPA Method 300.0.
Manganese analyzed by EPA Method 200.8.
Alkalinity analyzed by Method SM3220-B.
Ferrous Iron by Hach test kit.
< = less than method reporting limit shown
--- = not analyzed. MW15, MW18, and MW19 not sampled due to lack of water in the well.
p = Product recorded in well. No sample collected.
J = estimated value - Matrix spike and or duplicate analysis was performed on this sample. % recovery or RPD for this analyte is outside laboratory control limits.

Table 6
Sediment Sample Results - Fuels and BTEX
Coleman Oil Site
Wenatchee, Washington

			Fuels			BTEX			
			GRPH mg/kg	DRPH mg/kg	ORPH mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg
SCUM II Sediment Management SCO Standards (SMS) for Freshwater Sediments[1]				**340**	**3,600**				
Field ID	**Sample Depth (feet)**	**Date**							
SEDIMENT SAMPLES									
SS01-13.97cm	0.46	4/23/2018	<25.2	**842**	**392**	<0.0503	**0.395**	<0.126	<0.378
SS01-0.5	0.5	3/26/2019	--	<262	**1,730**	--	--	--	--
SS01-1.5	1.5	3/26/2019	--	**39.8**	**168**	--	--	--	--
SS01-2	2	3/26/2019	--	<26.3	**83.7**	--	--	--	--
SS02-11.75cm	0.38	4/23/2018	<13.7	**473**	**175**	<0.0274	**0.182**	<0.0684	<0.205
SS02-0.5	0.5	3/26/2019	--	<33.1	**66.3**	--	--	--	--
SS02-1.5	1.5	3/26/2019	--	<25.8	<51.6	--	--	--	--
SS02-2	2	3/26/2019	--	<31	**76.5**	--	--	--	--
SS03-13.97cm	0.46	4/23/2018	<16.2	**207**	**147**	<0.325	<0.0162	<0.0811	<0.243
SS04-11.82 cm	0.39	4/23/2018	<16.6	<45.1	**90.6**	<0.0333	<0.166	<0.0832	<0.0250
SS05-13.97	0.46	4/23/2018	<13.8	<38.1	**87.2**	<0.0276	<0.138	<0.0690	<0.207
SS06-0.5	0.5	3/26/2019	--	<32.2	**87.5**	--	--	--	--
SS06-1.5	1.5	3/26/2019	--	<32.6	**68.3**	--	--	--	--
SS07-0.5	0.5	3/26/2019	--	<30.8	**95.6**	--	--	--	--
SS07-1.5	1.5	3/26/2019	--	<31.9	**151**	--	--	--	--
SS08-0.5	0.5	3/26/2019	--	<41.5	**84.7**	--	--	--	--
SS02-1.5	1.5	3/26/2009	--	<30.8	<61.5	--	--	--	--
SEDIMENT SAMPLES WITH ACID/SILICA GEL CLEANUP									
SS01-13.97cm	0.46	4/23/2018	--	**947**	<105	--	--	--	--
SS01-0.5	0.5	3/26/2019	--	<26.2	**1,510**	--	--	--	--
SS01-1.5	1.5	3/26/2019	--	**35.4**	**169**	--	--	--	--
SS01-2	2	3/26/2019	--	<26.3	**87.3**	--	--	--	--
SS02-11.75cm	0.38	4/23/2018	--	**526**	<73.4	--	--	--	--
SS02-0.5	0.5	3/26/2019	--	<33.1	**66.8**	--	--	--	--
SS02-2	2	3/26/2019	--	<31	**79.3**	--	--	--	--
SS03-13.97cm	0.46	4/23/2018	--	**238**	<78.4	--	--	--	--
SS04-11.82 cm	0.39	4/23/2018	--	<45.1	<90.3	--	--	--	--
SS05-13.97	0.46	4/23/2018	--	<38.1	<76.1	--	--	--	--
SS06-0.5	0.5	3/26/2019	--	<32.2	**91.2**	--	--	--	--
SS06-1.5	1.5	3/26/2019	--	<32.6	**87.5**	--	--	--	--
SS07-0.5	0.5	3/26/2019	--	<30.8	**95.9**	--	--	--	--
SS07-1.5	1.5	3/26/2019	--	<31.9	**134**	--	--	--	--
SS08-0.5	0.5	3/26/2019	--	<41.5	**148**	--	--	--	--

Notes

Red denotes concentration in excess of Sediment Management Standard (SMS) for Freshwater Sediment.
Blue denotes concentration that exceeds the MRL but is below the SMS
GRPH (gasoline range petroleum hydrocarbons) analyzed by Method NWTPH-Gx.
DRPH (diesel range petroleum hydrocarbons) and ORPH (oil range petroleum hydrocarbons) analyzed by Method NWTPH-Dx.
BTEX analyzed by EPA Method 8260C.
[1]SCUMII 173-204 WAC - Sediment Management Standards for Freshwater Sediments
SCO = Sediment Cleanup Objective
< = less than method reporting limit shown
--- = not analyzed

Hydro Con

Table 7
Remedial Alternative Screening
Coleman Oil Site
Wenatchee, Washington

	Protectiveness	Permanence	Long-term Effectiveness	Implementability	implementation Risk	Reasonableness of Cost	Total Points
Alternative 1: No Action (No further Action)	1	1	1	5	5	5	18
Alternative 2: Excavation and Disposal	5	5	5	1	1	1	18
Alternative 3: Groundwater Pump and Treat	4	4	5	5	5	5	28
Alternative 4: Biodegradable Solvent	3	3	3	3	3	3	18
Alternative 5: In Situ Chemical Oxidation	3	3	3	3	3	3	18
Alternative 6: Monitored Natural Attenuation	2	4	4	5	5	5	25
Alternative 7: Barrier Wall	4	4	3	1	2	2	16
Alternative 8: Soil Vapor Extraction	5	5	5	5	4	5	29