EXHIBIT C

SOIL MANAGEMENT PLAN
CITY OF CHELAN COLUMBIA TO SANDERS WATER AND SEWER MAIN REPLACEMENT PROJECT
Chelan, Washington

February 28, 2022

Prepared for:
The City of Chelan
135 E. Johnson Avenue
Chelan, Washington 98816

Prepared by:
Leidos, Inc.
11824 North Creek Parkway N, Suite 101
Bothell, Washington 98011

On Behalf of:
Resource Environmental, LLC
925 Salida Del Sol Drive
Paso Robles, California 93446

leidos

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Russell S. Shropshire, PE
Principal Engineer

leidos

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SOIL MANAGEMENT PLAN
CITY OF CHELAN COLUMBIA TO SANDERS
WATER AND SEWER MAIN REPLACEMENT PROJECT

1. INTRODUCTION AND OBJECTIVES

Leidos, Inc. (Leidos), on behalf of Resource Environmental, LLC (RELLC), has prepared this Soil Management Plan (SMP) for work to be conducted in association with the City of Chelan's Columbia to Sanders Water and Sewer Main Replacement project (the Project).

Specifically, this SMP applies to work that will be conducted for the Project on, or in the vicinity of, areas of the "Chelan Chevron Site", which is an on-going environmental investigation project to address petroleum impacts to soil and groundwater present in an area along and adjacent to E. Woodin Avenue in Chelan (Figure 1). Work associated with the Chelan Chevron Site is being performed by RELLC for Chevron Environmental Management Company (CEMC), under direction from the Washington State Department of Ecology (Ecology), Toxics Cleanup Program.

The purpose of this SMP is to establish procedures to be utilized by RELLC, the City of Chelan (the City), and the City's selected contractor (Contractor) to identify and properly manage any petroleum contaminated soil (PCS), originating from the Chelan Chevron Site, that potentially may be encountered during excavation, or other subsurface work, performed for the Project. The objective of this document is to facilitate completion of the Project in a manner that:

- Minimizes potential human and ecological health risks that may result from exposure to PCS originating from the Chelan Chevron Site;
- Complies with applicable Federal and State laws related to handling and management of PCS;
- Minimizes potential delays for the Project, which may result from an unplanned discovery of PCS; and
- Facilitates timely reimbursement of incremental costs incurred by the City associated with proper management of PCS originating from the Chelan Chevron Site.

This SMP is considered an "evergreen" document that may be revised based on changes in the Project scope or conditions encountered in the field, subject to mutual agreement between RELLC and the Public Works Director for the City of Chelan.

2. PROJECT DESCRIPTION AND BACKGROUND

The Project will consist of replacement of subgrade water supply and sanitary sewer lines, as well as installation of new storm-water catchment and conveyance infrastructure along a two-block section (100 block and 200 block) of the alley north of E. Woodin Avenue, between Columbia and Sanders Streets (Figure 2). Replacement of the existing sanitary-sewer piping is expected to require excavation to maximum depths of approximately 12 feet below ground surface (bgs).

Portions of the Project area overlie, or are located in close proximity to, areas of the Chelan Chevron Site where petroleum contamination that exceeds regulatory cleanup levels established by Ecology is suspected or potentially present in shallow soils that may be excavated for the

Project. Additional details regarding the nature and extent of known and potential contamination in the Project area is provided in Section 3.

3. NATURE AND EXTENT OF PCS CONTAMINATION IN THE PROJECT AREA

3.1 CHELAN CHEVRON SITE

A series of environmental investigations were initiated at the Chelan Chevron service station, located at 232 E. Woodin Avenue, following the discovery of a leak from the gasoline underground storage tank (UST) system in 1987. After initial investigation efforts and cleanup activities that focused on the Chevron service station property through the remainder of the 1980s and 1990s, additional investigations were performed to evaluate the extent of potential petroleum impacts to nearby properties.

These investigations have determined that the surrounding downtown area has been impacted by previous uncontrolled releases of petroleum products (gasoline, diesel fuel and/or #2 heating oil) from at least four unrelated sources in the area along and adjacent to E. Woodin Avenue, between Sanders Street and Columbia Street. These sources include:

1. The Chevron service station located at 232 E. Woodin Ave;
2. A former Unocal service station that previously operated at 221 E. Woodin Ave;
3. A former Standard Oil service station that previously operated at 141 E. Woodin Ave; and
4. One or more undetermined sources of diesel fuel or heating oil in the vicinity of the property at 136 E. Johnson Ave.

Within the Chelan Chevron Site area, petroleum impacts are present in soil and groundwater at concentrations exceeding regulatory cleanup levels established by Ecology. Petroleum impacted soil has been encountered at depths ranging from 10 to 75 feet below the ground surface within this area.

In the vicinity of the Project area, results of Supplemental Remedial Investigation Phase 5 soil sampling conducted in November 2020 on the properties at 221 E. Woodin Ave, 136 E. Johnson Ave, and adjacent to 141 E. Woodin Ave, provide the most comprehensive data set regarding petroleum-hydrocarbon impacts to shallow soil (from ground surface to approximately 20 feet bgs), the results of which are summarized in Table 1 and presented on Figure 3 (Leidos, 2021a). As these results indicate, shallow soils from the ground surface to approximately 10-15 feet bgs were generally found to contain low levels of petroleum-range hydrocarbons that were less than Method A cleanup levels specified in Ecology's Model Toxics Control Act (Ecology, 2013). These soils generally consisted of an upper layer of silty soil extending to depths of 5 to 6 feet bgs, which were underlain by a coarser interval of sand and silt with gravel. Beneath these upper intervals, beginning at depths of 10 to 15 feet bgs, soils were found to consist of a less permeable, clay-rich silt interval extending to the drilled depths of 25 to 30 feet bgs. Results of the November 2020 event, as well as previous shallow soil sampling events, have identified the presence of heavily impacted PCS beginning at, and immediately below, this upper contact of the clay-rich silt interval. Weathered separate-phase hydrocarbon product is also known to be present in monitoring wells located along E. Woodin Avenue, and in the monitoring well (MW-27) that is located on the property at 136 E. Johnson Avenue.

3.1.1 Petroleum Contaminants of Concern

The following contaminants of concern (COCs) have been confirmed to be variously present in soil at the Chelan Chevron Site, at concentrations that exceed MTCA Method A cleanup levels for unrestricted land use:

- Gasoline-range organics (GRO)
- Diesel-range organics (DRO)
- Benzene, toluene, ethylbenzene, and xylenes (BTEX)
- Naphthalenes (naphthalene, 1-methyl-naphthalene, and 2-methyl-naphthalene)
- Ethylene dibromide (EDB)
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs)

3.2 OTHER POTENTIAL PCS SOURCES IN THE PROJECT AREA

Historical property use in the Project area, dating back to the early 1900s, includes at least seven locations that were used as service stations, as well as other petroleum USTs that were used for equipment fueling or heating oil storage.

Heating oil was formerly used throughout the Chelan area, and inactive heating oil tanks (both aboveground storage tanks [ASTs] and USTs) are known to be present at properties near the Project area. Heating oil impacts to soil may exist due to surface spills or subsurface releases from these formerly active tanks.

Additionally, Ecology's Cleanup Site database indicates that the following petroleum cleanup sites are located in close proximity to the Site:

- Chelan Sewer Pump Station No. 1 (100 W. Woodin Avenue)
- Chelan Self Serve Texaco (101 E. Woodin Avenue)

4. DOCUMENT SCOPE

The intent of this document is to establish guidance and procedures for the Project to address the possibility of encountering PCS that is attributable to the Chelan Chevron Site. To facilitate this objective, RELLC has conservatively identified an area of interest (RELLC AOI) where it is estimated that PCS resulting from the Chelan Chevron Site may be encountered (Figure 2). Therefore, the procedures and guidelines established by this SMP, and RELLC's involvement with the Project, apply only for work conducted in the RELLC AOI.

However, RELLC will re-assess the boundaries of the RELLC AOI if PCS is encountered outside of this area that appears to be associated with the Chelan Chevron Site.

5. PROJECT PLANNING

5.1 HEALTH AND SAFETY PLANNING

Certain Federal and State occupational health and safety laws and regulations that have been established for work at hazardous materials sites may be applicable for the Project if PCS is encountered. RELLC and its representatives working in the field will operate in accordance with their own site-specific health and safety plan (HASP), which will be developed for their specific

scope of work for the Project. The City and their Contractor shall be responsible for management of workplace safety, including but not limited to the potential to encounter PCS, for their respective employees.

5.2 PCS DISPOSAL PLANNING

If PCS is excavated for the Project that requires offsite disposal, the City will select and contract with an appropriately permitted disposal facility to receive the PCS. In preparation for this potential outcome, it would be prudent to select a disposal facility and establish a pre-approved waste disposal profile with the facility prior to the start of the project. RELLC and its representatives can and will assist with this process by providing data from previous soil sampling conducted at the Chelan Chevron Site.

Based on the Project location, Waste Management's Greater Wenatchee Regional Landfill is believed to be the closest facility that is permitted to accept PCS waste.

6. SOIL MANAGEMENT PROCEDURES

This section describes the procedures that will be utilized to identify and manage PCS in the RELLC AOI portion of the Project. As determined necessary by RELLC, its representative(s) will monitor work performed by the Contractor within the RELLC AOI in order to determine if PCS is encountered. If PCS is encountered, RELLC's representative(s) will provide direction to the Contractor on soil segregation and will assist the Contractor in classifying all soils excavated from the RELLC AOI for appropriate reuse or disposal. RELLC's representatives are not expected to be onsite during Project activities taking place outside the RELLC AOI.

It is anticipated that RELLC's monitoring of this work will not interfere with, or otherwise impact, the means, methods, or rate of the work being performed by the Contractor, except in the event of a discovery of potential PCS.

6.1 SOIL FIELD SCREENING METHODS

When monitoring work performed by the Contractor in the RELLC AOI, RELLC's representative(s) will utilize the following methods to regularly field screen excavated soils for indications of potential petroleum contamination.

- Visual Inspection – Soil will be inspected for staining or other visual indicators of petroleum impact such as visible LNAPL blebs. Soil type will be classified in accordance with the Unified Soil Classification System and observations regarding odor, if present, will be recorded.
- Headspace Vapor Screening – A photo-ionization detector (PID) will be used to provide semi-quantitative analysis of volatile organic compounds (VOCs) present in the soil. PID readings may be collected from various locations, as conditions allow, including: the air space in the general work zone; the air head-space above soil stockpiles or the excavator bucket; or from sealable plastic bags containing a grab sample of soil.
- Water Sheen Testing – Sheen testing will be conducted by placing soil in a pan of water and observing the water surface for signs of oily sheen. Sheens will be classified as follows:

- **Slight Sheen**: Light, colorless, dull sheen. The spread is irregular and dissipates rapidly.
- **Moderate Sheen**: Light to heavy sheen, may show color/iridescence. The spread is irregular to flowing. Few remaining areas of no sheen are evident on the water surface.
- **Heavy Sheen**: Heavy sheen with color/iridescence. The spread is rapid and the entire water surface may be covered with sheen.

6.2 SOIL REUSE/DISPOSAL CATEGORIES

For the Project, soils excavated from the RELLC AOI will be classified into the following categories, which have been developed based on Ecology guidelines for reuse of petroleum-contaminated soil (Ecology, 2016).

6.2.1 Category 1/2 Soils

Per Ecology guidelines, Category 1 soils are "clean" soils with no detectable/quantifiable levels of petroleum hydrocarbons or constituents and which are not suspected of being contaminated with any other hazardous substances. These soils can be reused anywhere that their use is allowed under other regulations.

Category 2 soils are those soils with residual levels of petroleum hydrocarbons that could have adverse impacts on the environment in some circumstances; however, acceptable uses of Category 2 soils include as backfill above the water table in commercial or industrial areas. Historical groundwater monitoring records for the Chelan Chevron Site indicate that groundwater is typically encountered at depths of 20 feet or more bgs (Leidos, 2021b); therefore, use of Category 2 soil for backfill is considered appropriate for the Project.

Classification of soil as Category 1/2 soils will be based on the following field screening criteria:

- No to minor staining or other visual indications of hydrocarbon impact;
- No to weak hydrocarbon odor;
- No to slight sheen; and
- PID readings for bagged grab samples less than 100 ppm higher than background readings[1].

For the Project, all Category 1/2 soils will be approved for reuse as backfill above the water table in the Project area. However, if excess Category 1/2 soils are generated that cannot be used for the Project, further evaluation will be necessary to determine an appropriate reuse or disposal option (see Section 6.5 for additional details).

6.2.2 Category 3/4 Soils

Category 3 and Category 4 soils contain higher concentrations of petroleum hydrocarbons, which further restricts their ability for reuse. For the Project, all Category 3 and Category 4 soils will be disposed of offsite at a facility permitted to accept PCS waste.

[1] PID reading ranges used for soil segregation criteria are subject to revision, if necessary, based on laboratory results of subsequent soil stockpile confirmation sampling.

Classification of soil as Category 3/4 soils will be based on the following field screening criteria:

- Moderate to heavy staining or other visual indications of hydrocarbon impact;
- Moderate to strong hydrocarbon odor;
- Moderate to heavy sheen; and
- PID readings for bagged grab samples greater than 100 ppm higher than background readings.

For the Project, all Category 3/4 soils will be disposed of offsite at a facility permitted to accept PCS waste.

6.3 SOIL SEGREGATION AND HANDLING METHODS

Following field screening and classification of excavated soils as described above, RELLC's representatives will work cooperatively with the City and their Contractor to determine the most efficient and cost-effective method to segregate and handle all Category 3/4 soils or excess Category 1/2 soils. One or more of the following methods are expected to be utilized, based on the given field conditions at the time.

6.3.1 Stockpiling (Category 3/4 and Excess Category 1/2 Soils)

Stockpiling of Category 3/4 soils or excess Category 1/2 soils is expected to be the initial and primary soil segregation and handling method. Under this method, Category 3/4 soils or excess Category 1/2 soils would be stockpiled onsite, or at another location selected by the City if onsite stockpiling is not practical due to space constraints. Category 3/4 soils and excess Category 1/2 soils would be managed in separate stockpiles to prevent comingling.

Stockpiling will be required for any Category 3/4 soils excavated prior to the City selecting, and receiving an approved waste disposal profile from, an appropriately permitted disposal facility to receive PCS waste. This method is also expected to be the most efficient and cost-effective for management of relatively small amounts of PCS. Stockpiling will also be required to facilitate laboratory analysis of any Category 1/2 soils proposed for offsite reuse, or for other circumstances that may require laboratory analysis of excavated soils prior to their reuse or disposal.

Alternatives to stockpiling, such as use of roll-off boxes or similar soil storage methods may also be utilized if mutually agreed upon by RELLC and the City as efficient and cost-effective methods for temporary soil segregation and storage.

6.3.2 Direct-Loading (Category 3/4 Soils Only)

Direct-loading is an alternative segregation and handling method that may be utilized for Category 3/4 soils when Project conditions allow and warrant its use. Under this method, soils identified as Category 3/4 by field screening results would be direct-loaded into trucks for transportation to the selected offsite disposal facility. This method is expected to be used when larger amounts of Category 3/4 soils are encountered that would not be efficiently managed by stockpiling due to space limitations, or the need for excessive double-handling of soils if an offsite stockpile location is selected.

Direct-loading of Category 3/4 soils will not be possible prior to the City receiving an approved waste disposal profile from an appropriately permitted disposal facility to receive PCS waste.

This method will also require additional coordination by the Contractor to ensure alignment of trucking resources with expected Category 3/4 soil production for each day.

6.4 SOIL STOCKPILE MANAGEMENT AND SAMPLING

The following stockpile management and sampling procedures will apply for all Category 3/4 soils and excess Category 1/2 soils excavated from the RELLC AOI.

6.4.1 Soil Stockpile Management

The Contractor will be responsible for management of all soil stockpiles, with support by RELLC's representative(s) to confirm their final reuse/disposal category, when applicable.

In addition to any erosion controls required by the City's Plans and Specifications for the Project, the Contractor shall implement the following added stockpile control measures.

- All stockpiled soils will be placed on top of plastic sheeting of at least 10-mil thickness, with adjacent sheeting sections overlapping a minimum of 3 feet.
- All soil stockpiles will be covered with plastic sheeting of at least 6-mil thickness when not in use, and the cover will be anchored to prevent it from being disturbed by wind.

6.4.2 Soil Stockpile Sampling

When analytical analysis of stockpiled soil is required, RELLC will utilize the following guidance to determine the number of samples required to adequately characterize the stockpiled soil:

Cubic Yards of Soil	Number of Samples for Chemical Analysis
0 to 100	3
101 to 500	5
501 to 1000	7
1001 to 2000	10
>2000	10 + 1 for each additional 500 cubic yards
Source: Table 6.9 of Ecology Toxics Cleanup Program Publication No. 10-09-057, "Guidance for Remediation of Petroleum Contaminated Sites", June 2016.	

RELLC, the City, and their Contractor will work collaboratively to determine an appropriate schedule for RELLC's representative(s) to conduct sampling for each stockpile, when necessary. Sampling should be conducted only after a stockpile has been completed, and no additional soil shall be added to a stockpile after it has been sampled.

Soil stockpile samples will be analyzed by the laboratory methods specified in Section 6.4.3. RELLC will work with the City and their Contractor to determine and request appropriate turn-around times for laboratory results and will request expedited turn-around times when necessary. However, due to the Project location (which will necessitate shipping or courier services for

laboratory samples) it is expected that at least 48 to 72 hours will be needed after sampling to receive laboratory results. Alternatively, use of an on-site mobile laboratory may be considered for situations that require faster turn-around times of analytical results for a large sample group.

Upon receipt of stockpile sampling results, RELLC will provide the results to the City and their Contractor. The City or their Contractor will be responsible to coordinate loading, transport, and offsite reuse or disposal of any stockpiles that have been confirmed by laboratory analytical results.

6.4.3 Laboratory Analysis of Soil Samples for Reuse/Disposal Classification

Laboratory analysis of soil samples collected to confirm soil reuse or disposal classifications will be performed for RELLC by a Washington State accredited analytical laboratory. Unless otherwise required by the City's selected disposal facility, soil samples collected in the RELLC AOI will be analyzed for the following indicator compounds that have been identified for the Chelan Chevron Site:

- GRO by Ecology NWTPH-Gx;
- DRO and heavy-oil-range organics (HRO) by Ecology NWTPH-Dx; and
- BTEX by USEPA method 8260.

Duplicate soil samples will be collected at a rate of one per each 20 soil samples and submitted for the above-referenced analyses to ensure quality assurance and quality control (QA/QC) measures. Additional QA/QC samples will include one trip blank to accompany each sample cooler shipment. Trip blank samples will be submitted for the following analyses:

- GRO by Ecology NWTPH-Gx; and
- BTEX by USEPA method 8260.

6.5 SOIL PRE-CHARACTERIZATION SAMPLING

When Project and/or field conditions warrant, RELLC may also elect to collect samples for pre-characterization of soils to facilitate a better understanding of the extent of petroleum impacted soil that may be encountered for the Project. RELLC representative(s) will work collaboratively with the Contractor to develop a plan to collect soil samples along the trench alignment prior to excavation in that area. The location and method of sample collection will be determined based on conditions in the field. Likely sample collection methods include collection of samples from Contractor excavation equipment, use of a stainless-steel hand auger, or if conditions allow, using a limited-access direct-push drill rig.

6.6 SOIL REUSE AND DISPOSAL

The Contractor will be responsible for management of reuse and disposal, as described below, for any soils excavated for the Project in the RELLC AOI, following RELLC confirmation of the appropriate soil reuse and disposal category.

6.6.1 On-Site Soil Reuse

Soils identified as Category 1/2 soils by field screening results will be considered approved for reuse as backfill in the Project area if the soil also meets the City's backfill requirements.

6.6.2 Off-Site Soil Reuse or Disposal of Excess Category 1/2 Soils

When applicable, excess soil from the Project that has been classified as Category 1/2 soils by field screening results will require further evaluation by RELLC, and possibly laboratory analytical results, to determine an appropriate reuse or disposal option.

The City shall work with RELLC to determine an appropriate location or facility for off-site reuse or disposal of any excess Category 1/2 soils.

6.6.3 Off-Site Soil Disposal of Category 3/4 Soils

Category 3/4 soils will be disposed at the City's selected disposal facility. The City shall be responsible for any required manifesting for transportation or disposal of PCS and will be the designated Generator of Waste, if such documentation is required.

7. REFERENCES

Ecology (2013). "Model Toxics Control Act Statute and Regulation." Toxics Cleanup Program Publication No. 94-06, November.

Ecology (2016). "Guidance for Remediation of Petroleum Contaminated Sites." Toxics Cleanup Program Publication No. 10-09-057, June.

Leidos (2021a). "Agency Review Draft - Supplemental Remedial Investigation Report – Phase 5, Chelan Chevron." April 27.

Leidos (2021b). "2020 Groundwater Monitoring Summary Report, Chelan Chevron Site." August 27.

LIMITATIONS

This technical document was prepared on behalf of RELLC and is intended for its sole use and for use by the local, state, or federal regulatory agency that the technical document was sent to by Leidos. Any other person or entity obtaining, using, or relying on this technical document hereby acknowledges that they do so at their own risk, and Leidos shall have no responsibility or liability for the consequences thereof.

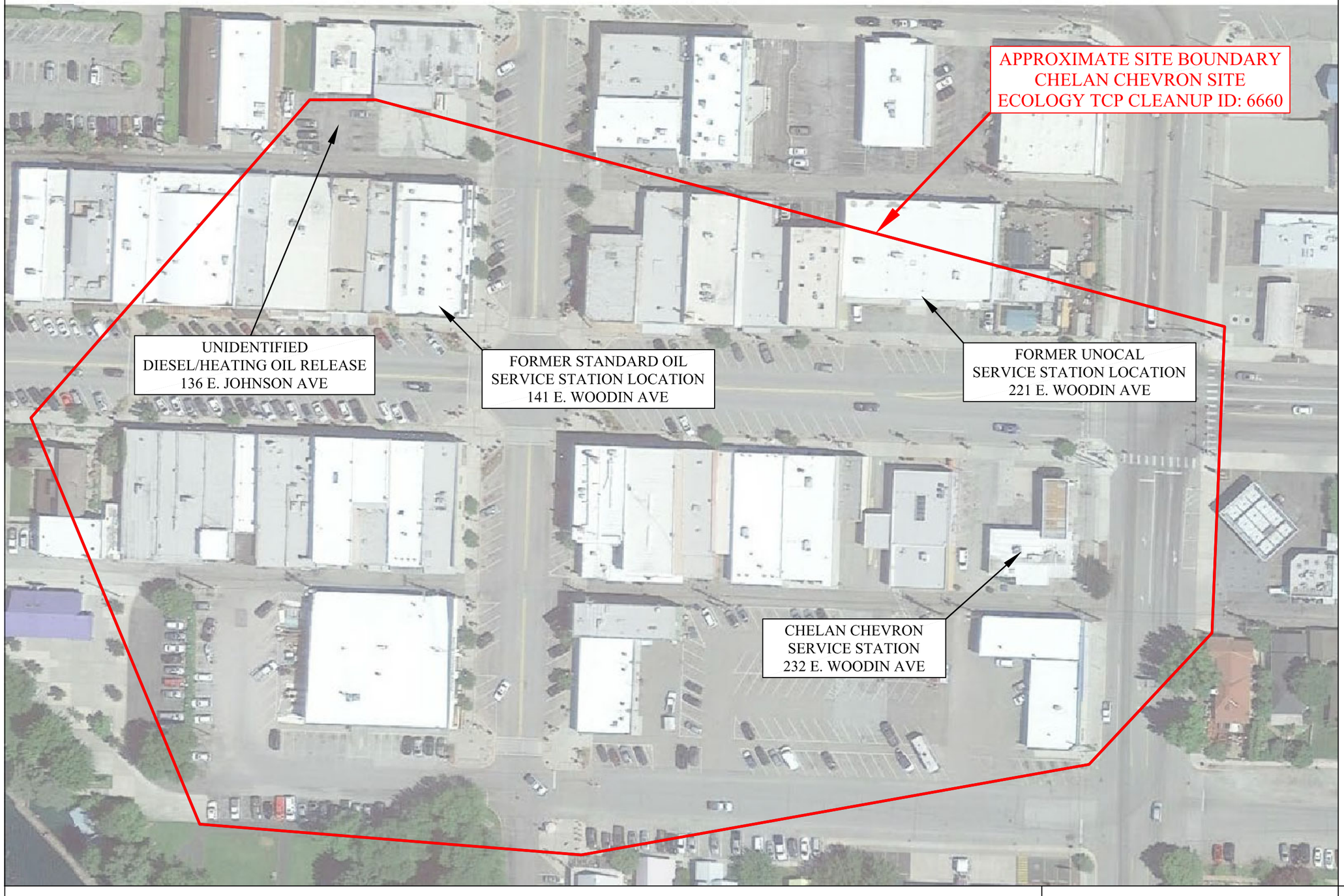
Site history and background information provided in this technical document are based on sources that may include interviews with environmental regulatory agencies and property management personnel and a review of acquired environmental regulatory agency documents and property information obtained from RELLC and others. Leidos has not made, nor has it been asked to make, any independent investigation concerning the accuracy, reliability, or completeness of such information beyond that described in this technical document.

Recognizing reasonable limits of time and cost, this technical document cannot wholly eliminate uncertainty regarding the vertical and lateral extent of impacted environmental media.

Opinions and recommendations presented in this technical document apply only to site conditions and features as they existed at the time of Leidos site visits or site work and cannot be applied to conditions and features of which Leidos is unaware and has not had the opportunity to evaluate.

All sources of information on which Leidos has relied in making its conclusions (including direct field observations) are identified by reference in this technical document or in appendices attached to this technical document. Any information not listed by reference or in appendices has not been evaluated or relied on by Leidos in the context of this technical document. The conclusions, therefore, represent our professional opinion based on the identified sources of information.

Figures



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NOTES
Base Map Source: Google Earth
Imagery Date: 7/1/2017

0 80' 160'

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Soil Management Plan
City of Chelan Columbia to Sanders
Water and Sewer Main Replacement Project
Chelan, Washington

FIGURE 1
Approximate Site Boundaries and Known Petroleum Source Areas - Chelan Chevron Site

FILE NAME:	DATE:
Chelan SMP Figures.dwg	1/15/2022

100 BLOCK

200 BLOCK

LEGEND

- APPROXIMATE PROJECT AREA FOR CITY OF CHELAN COLUMBIA TO SANDERS WATER AND SEWER MAIN REPLACEMENT PROJECT
- RELLC AREA OF INTEREST (AOI) - ESTIMATED PORTION OF CITY PROJECT AREA WHERE PETROLEUM IMPACTED SOILS RELATED TO THE CHELAN CHEVRON SITE MAY POTENTIALLY BE ENCOUNTERED

N

0 80' 160'

NOTES
Base Map Source: Google Earth
Imagery Date: 7/1/2017

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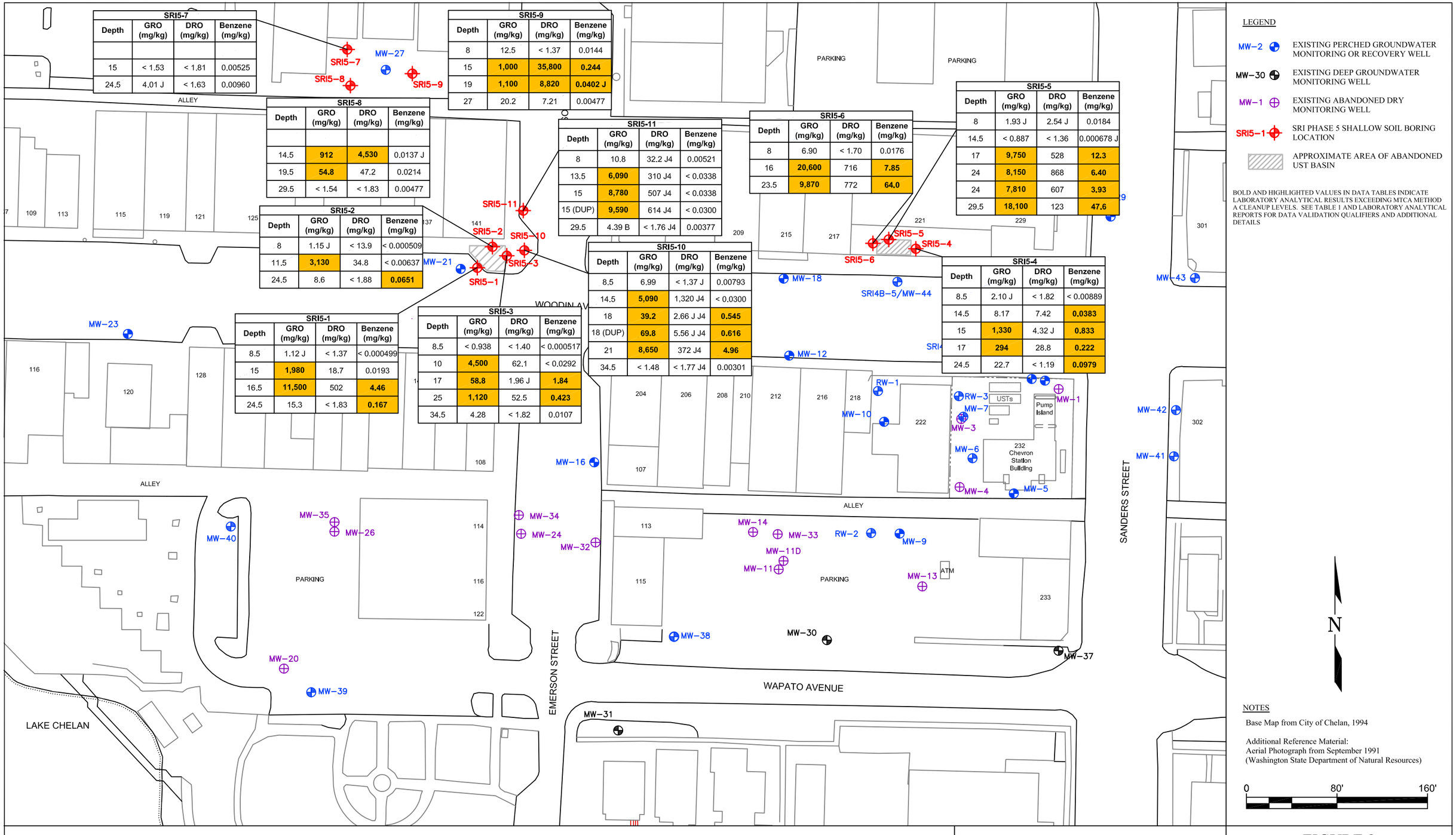
Soil Management Plan
City of Chelan Columbia to Sanders
Water and Sewer Main Replacement Project
Chelan, Washington

FIGURE 2
City Project Area
and RELLC Area of Interest

FILE NAME: Chelan SMP Figures.dwg
DATE: 1/15/2022



LEGEND

- MW-2 — EXISTING PERCHED GROUNDWATER MONITORING OR RECOVERY WELL
- MW-30 — EXISTING DEEP GROUNDWATER MONITORING WELL
- MW-1 — EXISTING ABANDONED DRY MONITORING WELL
- SRI5-1 — SRI PHASE 5 SHALLOW SOIL BORING LOCATION
- APPROXIMATE AREA OF ABANDONED UST BASIN

BOLD AND HIGHLIGHTED VALUES IN DATA TABLES INDICATE LABORATORY ANALYTICAL RESULTS EXCEEDING MTCA METHOD A CLEANUP LEVELS. SEE TABLE 1 AND LABORATORY ANALYTICAL REPORTS FOR DATA VALIDATION QUALIFIERS AND ADDITIONAL DETAILS

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NOTES

Base Map from City of Chelan, 1994

Additional Reference Material:
Aerial Photograph from September 1991
(Washington State Department of Natural Resources)

0 80' 160'

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Soil Management Plan
City of Chelan Columbia to Sanders
Water and Sewer Main Replacement Project
Chelan, Washington

FIGURE 3

SRI Phase 5 - Selected Shallow Soil Boring Sampling Results

FILE NAME: Chelan SMP Figures.dwg

DATE: 1/15/2022

Tables

Table 1
Summary of SRI Phase 5 Soil Sampling Results
Chelan Chevron Site
Chelan, Washington

Laboratory Analyte			GRO	DRO	HRO	Benzene	Toluene	Ethylbenzene	Xylenes (total)	MTBE	EDB	EDC	1-Methyl-naphthalene	2-Methyl-naphthalene	Naphthalene	PCE	Lead	PCBs	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno (1,2,3-cd) pyrene
			Results Reported in mg/kg dry weight																						
MTCA Method A Cleanup Level			30	2,000	2,000	0.03	7	6	9	0.1	0.005	---	5 (Total Sum of All Naphthalenes)			0.05	250	1	0.1 (Total Sum of All Carcinogenic PAHs)						
Sample Identification	Sample Depth	Date																							
SRI5-1																									
SRI5-1-S-8.5-201105	8.5	11/5/2020	1.12 J	< 1.37	< 3.44	< 0.000499	< 0.00139	< 0.000787	< 0.000940	< 0.000374	< 0.000692	0.000959 J	---	---	---	---	2.30	---	---	---	---	---	---	---	---
SRI5-1-S-15-201110	15	11/10/2020	**1,980**	18.7	< 4.38	0.0193	2.78	4.12	**26.2**	< 0.00483	**< 0.00893**	< 0.00895	---	---	---	---	26.9	---	---	---	---	---	---	---	---
SRI5-1-S-16.5-201110	16.5	11/10/2020	**11,500**	502	< 4.22	**4.26**	**67.7**	**38.3**	**203**	0.0314 J	< 0.00413	< 0.00415	**2.83**	**5.54**	**10.2**	**< 0.0571**	4.79	< 0.0150	< 0.00219	< 0.00227	< 0.00194	< 0.00273	< 0.00294	< 0.00218	< 0.00229
SRI5-1-S-24.5-201110	24.5	11/10/2020	15.3	< 1.83	< 4.59	**0.167**	0.423	0.0898	0.294	< 0.000641	< 0.00118	< 0.00119	---	---	---	---	4.99	---	---	---	---	---	---	---	---
SRI5-2																									
SRI5-2-S-8-201105	8	11/5/2020	1.15 J	< 13.9	< 34.7	< 0.000509	< 0.00142	< 0.000803	0.00109 J	< 0.000381	< 0.000706	0.000707	---	---	---	---	4.03	---	---	---	---	---	---	---	---
SRI5-2-S-11.5-201110	11.5	11/10/2020	**3,130**	34.8	< 4.39	< 0.00637	0.438	2.37	**10.5**	< 0.00477	**< 0.00882**	< 0.00884	0.0919	0.190	0.161	< 0.0122	15.9	< 0.0156	< 0.00228	< 0.00236	< 0.00202	< 0.00284	< 0.00306	< 0.00227	< 0.00239
SRI5-2-S-24.5-201110	24.5	11/10/2020	8.6	< 1.88	< 4.71	**0.0651**	0.157	0.170	0.208	< 0.000668	< 0.00124	< 0.00124	---	---	---	---	5.82	---	---	---	---	---	---	---	---
SRI5-3																									
SRI5-3-S-8.5-201105	8.5	11/5/2020	< 0.938	< 1.40	< 3.50	< 0.000517	< 0.00144	< 0.000815	0.00122 J	< 0.000387	< 0.000717	0.000718	---	---	---	---	1.82	---	---	---	---	---	---	---	---
SRI5-3-S-10-201110	10	11/10/2020	**4,500**	62.1	< 4.17	< 0.0292	0.433	3.71	**11.3**	< 0.0219	**< 0.0405**	< 0.0407	0.115	0.242	0.203	**< 0.0560**	17.8	< 0.0148	< 0.00217	< 0.00224	< 0.00191	< 0.00269	< 0.00290	< 0.00215	< 0.00227
SRI5-3-S-17-201110	17	11/10/2020	**58.8**	1.96 J	< 4.76	**1.84**	2.52	0.441	2.10	< 0.000679	< 0.00126	< 0.00126	---	---	---	---	6.28	---	---	---	---	---	---	---	---
SRI5-3-S-25-201110	25	11/10/2020	**1,120**	52.5	14.6	**0.423**	5.35	4.70	**25.6**	0.00245	**< 0.00982**	< 0.000983	---	---	---	---	7.0	---	---	---	---	---	---	---	---
SRI5-3-S-34.5-201110	34.5	11/10/2020	4.28	< 1.82	< 4.55	0.0107	0.0248	0.00859	0.0421	< 0.000643	< 0.00119	< 0.00119	---	---	---	---	5.68	---	---	---	---	---	---	---	---
SRI5-4																									
SRI5-4-S-8.5-201107	8.5	11/7/2020	2.10 J	< 1.82	< 4.56	0.00889	0.0111	< 0.00141	< 0.00168	< 0.000671	< 0.00124	0.00148 J	---	---	---	---	2.63	---	---	---	---	---	---	---	---
SRI5-4-S-14.5-201108	14.5	11/8/2020	8.17	7.42	< 3.45	**0.0383**	0.132	0.0142	0.0469	< 0.000377	< 0.000698	< 0.000700	---	---	---	---	4.00	---	---	---	---	---	---	---	---
SRI5-4-S-15-201108	15	11/8/2020	**1,330**	4.32 J	< 4.06	**0.833**	**18.0**	**11.6**	**61.4**	< 0.0214	**< 0.0396**	< 0.0397	---	---	---	---	28.3	---	---	---	---	---	---	---	---
SRI5-4-S-17-201108	17	11/8/2020	**294**	28.8	< 4.19	**0.222**	2.78	1.57	7.33	< 0.0218	**< 0.0403**	< 0.0404	---	---	---	---	5.24	---	---	---	---	---	---	---	---
SRI5-4-S-24.5-201108	24.5	11/8/2020	22.7	< 1.19	< 4.48	**0.0979**	0.369	0.0592	0.234	< 0.000622	< 0.00115	< 0.00115	---	---	---	---	4.58	---	---	---	---	---	---	---	---
SRI5-5																									
SRI5-5-S-8-201107	8	11/7/2020	1.93 J	2.54 J	< 4.27	0.0184	0.00266	< 0.00121	0.00280 J	< 0.000643	< 0.00119	< 0.00119	---	---	---	---	2.32	---	---	---	---	---	---	---	---
SRI5-5-S-14.5-201107	14.5	11/8/2020	< 0.887	< 1.36	< 3.40	0.000678 J	0.00339 J	0.00153 J	0.00681	< 0.000366	< 0.000678	< 0.000679	---	---	---	---	2.07	---	---	---	---	---	---	---	---
SRI5-5-S-17-201108	17	11/8/2020	**9,750**	528	< 20.0	**12.3**	**195**	**122**	**682**	< 0.0204	**< 0.0378**	< 0.0379	**2.81**	**14.3**	**21.6**	**< 0.0522**	35.1	< 0.0142	0.00287 J	< 0.00216	< 0.00184	< 0.00259	0.00281 J	< 0.00207	< 0.00218
SRI5-5-S-24-201108	24	11/8/2020	**8,150**	868	< 21.5	**6.40**	**170**	**104**	**632**	< 0.0233	**< 0.0431**	< 0.0432	**11.5**	**24.3**	**38.3**	**< 0.0595**	18.8	< 0.0153	0.00340 J	< 0.00232	< 0.00199	< 0.00279	0.00408 J	< 0.00223	< 0.00235
DUP-1-S-201108	24	11/8/2020	**7,810**	607	< 21.6	**3.93**	**50.4**	**44.7**	**280**	< 0.0236	**< 0.0437**	< 0.0439	**3.10**	**18.9**	**30.0**	**< 0.0604**	16.0	< 0.0154	0.00304 J	< 0.00233	< 0.00199	< 0.00280	0.00352 J	< 0.00224	< 0.00236
SRI5-5-S-29.5-201108	29.5	11/8/2020	**18,100**	123	< 4.48	**47.6**	**345**	**121**	**616**	< 0.0249	**< 0.0460**	< 0.0462	---	---	---	---	18.4	---	---	---	---	---	---	---	---
SRI5-6																									
SRI5-6-S-8-201107	8	11/7/2020	6.90	< 1.70	< 4.25	0.0176	0.0188	< 0.00135	< 0.00144	< 0.000574	< 0.00106	< 0.00106	---	---	---	---	2.31	---	---	---	---	---	---	---	---
SRI5-6-S-16-201108	16	11/8/2020	**20,600**	716	< 21.3	**7.85**	**102**	**90.7**	**672**	< 0.0230	**< 0.0426**	< 0.0428	**17.0**	**36.1**	**32.0**	**< 0.0589**	33.7	< 0.0151	0.00501 J	< 0.00229	< 0.00196	< 0.00275	0.00588 J	< 0.00220	< 0.00232
SRI5-6-S-23.5-201108	23.5	11/8/2020	**9,870**	772	< 22.9	**64.0**	**202**	**109**	**320**	< 0.0257	**1.79**	< 0.0478	---	---	---	---	20.4	---	---	---	---	---	---	---	---
SRI5-7																									
SRI5-7-S-15-201111	15	11/11/2020	< 1.53	< 1.81	< 4.52	0.00525	0.0197	0.00239 J	0.00883 BJ	< 0.000633	< 0.00117	< 0.00117	---	---	---	---	5.66	---	---	---	---	---	---	---	---
SRI5-7-S-24.5-201111	24.5	11/11/2020	4.01 J	< 1.63	< 4.08	0.00960	0.0412	0.00386	0.0135	< 0.000569	< 0.00105	< 0.00106	---	---	---	---	3.40	---	---	---	---	---	---	---	---
SRI5-8																									
SRI5-8-S-14.5-201111	14.5	11/11/2020	**912**	**4,530**	152 J	0.0137 J	0.0647	1.25	3.28	< 0.00505	**< 0.00934**	< 0.00936	**94.1**	**44.7**	**8.61**	< 0.0129	6.07	< 0.0160	0.0387	**< 0.121**	**< 0.104**	**< 0.146**	**0.123**	**< 0.116**	**< 0.123**
SRI5-8-S-19.5-201111	19.5	11/11/2020	**54.8**	47.2	< 4.59	0.0214	0.0579 J	0.0574	0.101 B	< 0.00520	**< 0.00962**	< 0.00964	---	---	---	---	4.87	---	---	---	---	---	---	---	---
SRI5-8-S-29.5-201111	29.5	11/11/2020	< 1.54	< 1.83	< 4.57	0.00477	0.0261	0.00312 J	0.0107 BJ	< 0.000635	< 0.00118	< 0.00118	---	---	---	---	5.35	---	---	---	---	---	---	---	---
SRI5-9																									
SRI5-9-S-8-201110	8	11/10/2020	12.5	< 1.37	< 3.43	0.0144	0.0453	0.00372	0.0145	< 0.000370	< 0.000686	< 0.000687	---	---	---	---	1.46	---	---	---	---	---	---	---	---
SRI5-9-S-15-201111	15	11/11/2020	**1,000**	**35,800**	< 924	**0.244**	1.24	2.61	**11.8**	< 0.0131	**< 0.0242**	< 0.0242	**38.7**	**42.9**	**7.80**	< 0.0334	6.99	< 0.0164	**0.0368**	< 0.00248	< 0.00212	< 0.00298	**0.0662**	< 0.00239	< 0.00251
SRI5-9-S-19-201111	19	11/11/2020	**1,110**	**8,820**	291 J	**0.0402 J**	0.228 J	1.27	**5.33**	< 0.0215	**< 0.0399**	< 0.0400	---	---	---	---	3.11	---	---	---	---	---	---	---	---
SRI5-9-S-27-201111	27	11/11/2020	20.2	7.21	< 4.39	0.00421	0.0140	0.00652	0.0245	< 0.000604	< 0.00112	< 0.00112	---	---	---	---	5.94	---	---	---	---	---	---	---	---
SRI5-10																									
SRI5-10-S-8-201112	8	11/12/2020	6.99	< 1.37 J4	< 3.43	0.00793	0.0252	0.00202 J	0.00738 B	< 0.000371	< 0.000687	< 0.000688	---	---	---	---	2.18	---	---	---	---	---	---	---	---
SRI5-10-S-14.5-201112	14.5	11/12/2020	**5,090**	1,320 J4	< 4.51	**< 0.0330**	5.76	**27.2**	**116**	< 0.0247	**< 0.0458**	< 0.0459	**7.20**	**14.9**	**15.9**	**< 0.0633**	19.8	< 0.0160	< 0.00234	< 0.00243	< 0.00207	< 0.00291	< 0.00314	< 0.00233	< 0.00245
SRI5-10-S-18-201112	18	11/12/2020	**39.2**	2.66 J J4	< 4.51	**0.545**	1.02	0.450	1.65	< 0.0125	**< 0.0233**	< 0.0233	---	---	---	---	5.14	---	---	---	---	---	---	---	---
DUP-2-201112	18	11/12/2020	**69.8**	5.56 J J4	< 4.60	**0.616**	1.11	0.450	1.71	< 0.000653	< 0.00121	< 0.01121	---	---	---	---	6.15	---	---	---	---	---	---	---	---
SRI5-10-S-21-201112	21	11/12/2020	**8,650**	372 J4	7.74 J	**4.96**	**57.7**	**36.0**	**202**	< 0.0214	**< 0.0397**	< 0.0398	---	---	---	---	5.11	---	---	---	---	---	---	---	---
SRI5-10-S-34.5-201112	34.5	11/12/2020	< 1.48	< 1.77 J4	< 4.43	0.00301	0.0106	0.00355 J	0.0161	< 0.000613	< 0.00113	< 0.00114	---	---	---	---	5.95	---	---	---	---	---	---	---	---
SRI5-11																									
SRI5-11-S-8-201112	8	11/12/2020	10.8	32.2 J4	25.4	0.00521	0.0194	0.00268	0.00744	< 0.000369	< 0.000684	< 0.000685	---	---	---	---	1.54	---	---	---	---	---	---	---	---
SRI5-11-S-13.5-201112	13.5	11/12/2020	**6,090**	310 J4	8.27 J	**< 0.0338**	0.937	**12.0**	**41.0**	< 0.0253	**< 0.0468**	< 0.0469	---	---	---	---	9.86	---	---	---	---	---	---	---	---
SRI5-11-S-15-201112	15	11/12/2020	**8,780**	507 J4	7.71 J	**< 0.0308**	**26.0**	**52.9**	**213**	< 0.0231	**< 0.0427**	< 0.0428	**4.27**	**6.68**	**10.9**	**< 0.0590**	4.55	< 0.0153	< 0.00225	< 0.00232	< 0.00199	< 0.00279	< 0.00301	< 0.00223	< 0.00235
DUP-3-201112	15	11/12/2020	**9,590**	614 J4	5.67 J	< 0.0300	**17.2**	**36.5**	**151**	< 0.0225	**< 0.0416**	< 0.0418	**3.56**	**5.88**	**9.20**	**< 0.0575**	4.98	< 0.0151	< 0.00222	< 0.00229	< 0.00196	< 0.00276	< 0.00297	< 0.00220	< 0.00232
SRI5-11-S-29.5-201112	29.5	11/12/2020	4.39 B	< 1.76 J4	6.31 J	0.00377	0.0216	0.00841	0.0451	< 0.000605	< 0.00112	< 0.00112	---	---	---	---	5.63	---	---	---	---	---	---	---	---

Table 1
Summary of SRI Phase 5 Soil Sampling Results
Chelan Chevron Site
Chelan, Washington

Symbols and Abbreviations:

87 - Bold and highlighted entries indicate results exceeding MTCA Method A cleanup levels

< 0.074 - Bold text indicates that detection limit was greater than MTCA Method A cleanup level due to necessary sample dilution by the laboratory

GRO = Gasoline-range organics
DRO = Diesel-range organics
HRO = Heavy-range organics
MTBE = Methyl tert-butyl ether
EDB = Ethylene dibromide (1,2-Dibromoethane)
EDC = Ethylene dichloride (1,2-Dichloroethane)
PCE = Tetrachloroethane
PCBs = Polychlorinated Biphenyls
PAHs = Polycyclic aromatic hydrocarbons
--- = Not Analyzed

Laboratory Assigned Data Qualifiers:

B = The same analyte is found in the associated blank.
J = The identification of the analyte is acceptable; the reported value is an estimate.
J4 = The associated batch QC was outside the established quality control range for accuracy.
V = The sample concentration is too high to evaluate accurate spike recoveries.

Appendix A:

12.0 Re-use of Petroleum-Contaminated Soils

Ecology recognizes that cleanup of petroleum-contaminated sites is expensive. Landfilling contaminated soils and associated transportation costs greatly increase cleanup costs and contribute to greenhouse gas production. Heavily contaminated soils must be properly treated or disposed of at a facility permitted to accept these soils to ensure that human health and the environment remain protected. However, for moderately or lightly contaminated soils, or soils with most of the contamination removed by treatment, a number of alternatives exist.

Under Washington State's solid waste and hazardous waste laws, one of the highest priorities for managing waste is to recycle or reuse waste materials. MTCA also states that remedial actions should provide for permanent solutions to the maximum extent practical. Consistent with these statutory priorities, Ecology offers guidelines for best management practices in this section to facilitate the productive reuse of petroleum-contaminated soils generated by petroleum-contaminated site cleanups. Soils managed consistently with these guidelines will most likely be protective of human health and the environment based on Ecology's past experience. Soils with contaminants other than petroleum-related are not addressed by these guidelines and these guidelines should not be used for these soils.

Petroleum-contaminated soils are considered solid waste and, as such, are regulated by local health departments/districts. Some local health departments/districts may require a permit for reuse of these soils or have more restrictive reuse regulations. Use of petroleum-contaminated soils in public rights of way or easements is typically controlled by the local public works department or the Washington State Department of Transportation (for State highways). Use of these soils may also be subject to local land-use laws and shoreline regulations. The appropriate agencies should be consulted before reusing the soil in accordance with these guidelines.

Petroleum-contaminated soils generated by the cleanup of regulated UST facilities are exempt from most of the dangerous waste management requirements under WAC 173-303-071(3)(t). But other types of petroleum-contaminated soil are not exempt. While the values in Table 12.1 are generally well below concentrations that are likely to trigger regulation of the soil as a hazardous waste, even a soil that has low contaminant levels may still be a regulated hazardous waste if the soil was classified as a hazardous waste prior to treatment or contains a listed waste. Consult with Ecology's Hazardous Waste & Toxics Reduction Program in these cases. For more information see http://www.ecy.wa.gov/programs/hwtr/index.html.

The general guidance in this section should not be construed as an endorsement of the reuse of any particular soils or a guarantee that any particular soils can be safely reused. All reuse decisions need to be made in the context of the individual site in compliance with all applicable laws. This section does not override state or local regulatory requirements. Furthermore, reuse of petroleum-contaminated soils consistent with this section does not relieve any party of any resulting liability, including but not limited to MTCA liability, common law liability for nuisance conditions or a reduction in property value caused by aesthetic issues like odors, should a subsequent problem arise.

Persons may propose another site-specific basis for the reuse of petroleum-contaminated soil. This will require detailed site-specific characterization of the soil composition and variability (including testing for equivalent carbon fractions) and bioassays. A risk assessment evaluating all potential exposure pathways would also need to be conducted. This information will need to be submitted to Ecology's Waste 2 Resources Program and the local Health Department/District.

12.1 Factors Considered in the Development of Soil Re-use Categories

Table 12.1 provides recommended categories for reuse of petroleum contaminated soils. These values are based on evaluation of multiple potential exposure pathways and other considerations. Several values in Table 12.1 are more stringent than the Method A MTCA soil cleanup levels. There are several reasons for this:

- The solid waste handling standards, Chapter 173-350 WAC, apply to soils containing "harmful substances" removed during a cleanup. As noted below, petroleum-contaminated soils can cause harm in ways not considered under the MTCA Method A cleanup levels.
- For a variety of reasons, the Method A table values do not consider all potential exposure pathways and assume exposure conditions that may not be protective at all sites. For example, under Method A the soil is assumed to not impact surface water and terrestrial ecological risk is addressed separately. Under MTCA, Ecology has the authority to require more stringent cleanup levels than the Method A values on a site-specific basis. It is not practical to apply that level of site-specific judgment to reuse.
- Cleanup sites are typically cleaned to concentrations below the Method A cleanup levels to ensure the cleanup levels are met. However, the reuse categories set maximum not-to-exceed concentrations. Thus, for a given concentration, a soil reused under these guidelines is likely to have a higher TPH concentration than soil remaining after cleanup.
- At cleanup sites, it is possible to find out if the site was once contaminated through a site assessment or review of historical uses and cleanup records. However, because soil meeting these reuse categories can be reused on uncontaminated properties, property owners and workers will most likely not have similar information available and thus are unlikely to take any precautions regarding exposure.
- There is no state-wide permitting process controlling where soils meeting the reuse categories are used or requiring institutional controls to limit exposures.
- More data is available now than was available when the Method A soil cleanup levels were developed. This data indicates there is considerable product variability which has been taken into account in developing these reuse categories.
- PCB-contaminated soils are not recommended for any reuse because of the persistence, toxicity and bioaccumulation potential of these compounds. This is consistent with Ecology's approach to regulation of these chemical mixtures under other authorities.

12.2 How to Determine Compliance with Soil Re-use Categories

Soils proposed for reuse should be tested for the parameters specified in Table 12.1, consistent with Table 7.2 for the product being cleaned up. The frequency of testing should be consistent with Table 6.9 for stockpiled soil, with the volume consisting of the amount of soil planned for reuse in any given reuse project, or a suitable alternative sampling plan submitted to the local regulatory agency for approval. To conform with these reuse categories, no sample should exceed the recommended values. If one or more samples exceed the recommended values, Ecology recommends that portion of the soil represented by that test result be separated from the other soil and appropriately disposed of. Soil samples bracketing the area should be taken to confirm whether the remainder of the soil qualifies for the selected category.

12.3 Soil Re-use Categories

Table 12.1 identifies four categories for re-use of petroleum contaminated soil. Table 12.2 describes uses and limitations for the four categories of soil. The footnotes to Table 12.1 are considered part of this Table and must be considered when reusing soils as specified in these tables.

While it is expected most petroleum contaminated soils will have been subjected to treatment prior to reuse, this is not a prerequisite for use of these guidelines. It may be possible, for example, through careful field screening using the methods described in Section 5 and segregation during excavation, to separate soils on the outer fringe of contamination or above the release that are only slighted contaminated. These soils may meet a particular soil reuse category without treatment.

Table 12.1 Guidelines for Reuse of Petroleum-Contaminated Soil

Parameter	Analytical Method	Soil Category (8)(9)(10)			
		1 No detectable Petroleum Components (mg/kg)	2 Commercial Fill Above Water Table (mg/kg)	3 Paving Base Material & Road Construction (mg/kg)	4 Landfill Daily Cover or Asphalt Manufacturing (mg/kg)
Total Petroleum Hydrocarbons (1)(2) See Table 7.1 for petroleum products that fall within these categories.					
Gasoline Range Organics	NWTPH-Gx	<5	5 - 30	>30 - 100	>100
Diesel Range Organics	NWTPH-Dx	<25	25 - 200	>200 - 500	>500
Heavy Fuels and Oils*	NWTPH-Dx	<100	100 - 200	>200 – 500	>500
Mineral Oil	NWTPH-Dx	<100	100 - 200	>200 – 500	>500
Volatile Petroleum Components					
Benzene	SW8260B	<0.005	0.005 - 0.03	0.03 or less	See Table 12.2
Ethylbenzene	SW8260B	<0.005	0.005 - 6	6 or less	>6
Toluene	SW8260B	<0.005	0.005 - 7	7 or less	>7
Xylenes (3)	SW8260B	<0.015	0.015 - 9	9 or less	>9
Fuel Additives & Blending Components					
(MTBE) Methyl Tert-Butyl Ether	SW8260B	<0.005	0.005 - 0.1	0.1 or less	>0.1
Lead	SW6010A	<17	17 - 50	>50 - 220	See Table 12.2
Other Petroleum Components					
Polychlorinated (4) Biphenyls (PCBs)	SW8082	<0.04	<0.04	<0.04	See Table 12.2
Naphthalenes (5)	SW8260B	<0.05	0.05 - 5	5 or less	>5
cPAHs (6)	SW8270C	<0.05	0.05 - 0.1	>0.1 - 2	>2
Other Petroleum Characteristics (Applies to soils contaminated with any petroleum product.)					
Odors	Smell	No detectable odor			
Staining	Visual	No unusual color or staining			
Sheen Test	See Footnote # 7	No visible sheen			

IMPORTANT: See Table 12.2 and the footnotes to this Table on the following pages!
Test soil for the parameters specified in Table 7.2.
****Does NOT include waste oil contaminated soils, which should be disposed of in a landfill.***
"<" means less than; ">" means greater than

Table 12.1 Guidelines for reuse of petroleum-contaminated soil.

Table 12.2 Description and Recommended Best Management Practices for Soil Categories in Table 12.1 (continued next page)

Category	Acceptable Uses	Limitations
Category 1 Soils: Soils with no detectable/ quantifiable levels of petroleum hydrocarbons or constituents using the analytical methods listed in Table 7.3 and are not suspected of being contaminated with any other hazardous substances.	• Can be used anywhere the use is allowed under other regulations. • Any use allowed for Category 2, 3 & 4 soils.	• These soils should be odor-free.
Category 2 Soils: Soils with residual levels of petroleum hydrocarbons that could have adverse impacts on the environment in some circumstances.	• Any use allowed for Category 3 & 4 soils. • Backfill at cleanup sites above the water table. • Fill in commercial or industrial areas above the water table. • Road and bridge embankment construction in areas above the water table.	• These soils may have a slight petroleum odor, depending on the sensitivity of the individual. This should be considered when reusing these soils. • Should be placed above the highest anticipated high water table. If seasonal groundwater elevation information is not available, place at least 10 feet above the current water table. • Should not be placed within 100 feet of any private drinking water well or within the 10 year wellhead protection area of a public water supply well. • Should not be placed in or directly adjacent to wetlands or surface water where contact with water is possible. • Should not be placed under a surface water infiltration facility or septic drain field. • Any other limitations in state or local regulations.
Category 3 Soils: Soils with moderate levels of residual petroleum contamination that could have adverse impacts on the environment unless re-used in carefully controlled situations.	• Any use allowed for Category 4 soils. • Use as pavement base material under public and private paved streets and roads. • Use as pavement base material under commercial and industrial parking lots.	• Should be placed above the highest anticipated high water table. If seasonal ground water elevation information is not available, place at least 10 feet above the water table. • Should be a maximum of 2 feet thick to minimize potential for leaching or vapor impacts. • Should not be placed within 100 feet of any private drinking water well or within the 10 year wellhead protection area of a public water supply well. • Should not be placed in or directly adjacent to wetlands or surface water. • Should not be placed under a surface water infiltration facility or septic drain field. • When exposed, runoff from area in use should be contained or treated to prevent entrance to storm drains, surface water or wetlands. • Any other limitations in state or local regulations.

Table 12.2 Description and recommended best management practices for soil categories in Table 12.1 (continued next page).

Table 12.2 (continued) Description and Recommended Best Management Practices for Soil Categories in Table 12.1

Category	Acceptable Uses	Limitations
Category 4 Soils: Soils with high levels of petroleum contamination that should not be re-used except in very limited circumstances.	• Use in the manufacture of asphalt. • Use as daily cover in a lined municipal solid waste or limited purpose landfill provided this is allowed under the landfill operating permit.	**Landfill Limitations:** The soil should be tested for and pass the following tests: ➢ Free liquids test. Soils that contain free liquids cannot be landfilled without treatment. ➢ TCLP for lead and benzene. Unless exempt under WAC 173-303-071(3)(t), soils that fail a TCLP for lead or benzene must be disposed of as hazardous waste. ➢ Flammability test. Soils that fail this test must be disposed of as hazardous waste. ➢ Bioassay test under WAC 173-303-100(5). Soils that fail this test must be disposed of as hazardous waste. ➢ PCBs. Soils with a total PCB content of 2 ppm or more must be disposed of as hazardous waste. Soil used for daily cover should be stockpiled within the landfill lined fill area. Soil containing more than 10,000 mg/kg TPH should be buried immediately with other wastes or daily covered to limit potential worker exposure. Any additional limitations specified in the landfill permit or in other state or local regulations. **Asphalt Manufacturing Limitations:** Soil storage areas should be contained in a bermed area to minimize contact with surface water runoff from adjacent areas. Runoff from storage areas should be considered contaminated until tested to prove otherwise. Soil storage areas should also be lined and covered with a roof or secured tarp to minimize contact with precipitation and potential groundwater contamination. Leachate from storage areas should be considered contaminated until tested to prove otherwise. The soil should be tested for and pass the following tests: ➢ TCLP for lead and benzene. Unless exempt under WAC 173-303-071(3)(t), soils that fail a TCLP for lead or benzene must be disposed of as hazardous waste. ➢ Flammability test. Soils that fail this test must be disposed of as hazardous waste. ➢ Bioassay test under WAC 173-303-100(5). Soils that fail this test must be disposed of as hazardous waste. ➢ No detectable levels of PCBs in soil (<0.04 mg/kg). Precautions should be taken to minimize worker exposure to soil storage piles and any dust or vapors from these piles prior to feeding into the asphalt batch plant.

IMPORTANT: See the following page for additional information!

Notes to Table 12.1:

Contaminated soils can be treated to achieve these concentrations but dilution with clean soil to achieve these concentrations is a violation of Washington State solid and hazardous waste laws.

(1) See Table 7.1 for a description of what products fall within these general categories. If the product released is unknown, use the limitations for gasoline range organics. If the soil is contaminated from releases from more than one product, use the limitations for both products. For example, if the release is a mixture of gasoline and diesel, the soil should be tested for components of both gas and diesel and the limitations for both fuels and their components used.

(2) The concentrations for diesel, heavy oil and mineral oil are not additive. Use the TPH product category most closely representing the TPH mixture and apply the limitations for that product to the mixture. ***The reuse of waste oil contaminated soil is not allowed due to the wide variety of contaminants likely to be present.***

(3) Value is total of m, o, & p xylenes.

(4) Value is the total of all PCBs. Only heavy oil and mineral oil contaminated soils need to be tested for PCBs. Soil contaminated with a spill from a regulated PCB containing device must be disposed of in a TSCA permitted landfill, regardless of the PCB concentration. Other PCB contaminated soils may be disposed of in a municipal solid waste landfill permitted to receive such materials, provided the concentration does not exceed 2 ppm PCBs (WAC 173-303-9904).

(5) Value is total of naphthalene, 1-methyl naphthalene and 2-methyl naphthalene. Only diesel and heavy oil contaminated soils need to be tested for naphthalenes.

(6) The value is the benzo(a)pyrene equivalent concentration of the following seven cPAHs. See Appendix C for how to calculate a toxic equivalent concentration. The seven cPAHs are as follows: benz(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzo(a)pyrene; chrysene; dibenz(a,h)anthracene; and, indeno(1,2,3-cd)pyrene. Only diesel and heavy oil contaminated soils need to be tested for cPAHs. Soils contaminated with more than 1% polycyclic aromatic hydrocarbons, as that term is defined in WAC 173-303-040 (which is more expansive than the above list), must be disposed of as hazardous waste.

(7) No visible sheen observed on water when approximately one tablespoon of soil placed in approximately ½ liter of water held in a shallow pan (like a gold pan or similar container).

(8) A soil in a lower category can be used for uses specified in any higher category. This means that:

- A category 1 soil can be used for any use specified in categories 1, 2, 3 and 4.
- A category 2 soil can be used for any use specified in categories 2, 3 and 4.
- A categories 3 soil can be used for any use specified in categories 3 and 4.

(9) ***If an environmental site assessment or soil or groundwater analyses indicate contaminants other than common petroleum constituents and naturally occurring levels of metals are likely to be present in the soil of interest at the site (for example, solvents or pesticides), do not reuse the soil.*** The soil should instead be treated using appropriate technology to address all contaminants or landfilled at a solid waste or hazardous waste facility permitted to receive these materials.

(10) Soils in categories 2, 3 and 4 should be stockpiled consistent with the soil storage recommendations in Subsection 11.3 of this guidance.