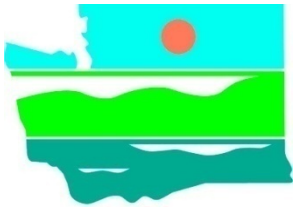
FINAL INTERIM REMEDIAL ACTION WORK PLAN

Former Texaco Service Station No. 21-1556
101 Mulford Road
Toledo, Washington

August 18, 2010

Prepared for:



Washington State Department of Ecology
P.O. Box 47775
Olympia, Washington 98504-7775

Prepared by:
Science Applications International Corporation
18912 North Creek Parkway, Suite 101
Bothell, WA 98011

On Behalf of:
Chevron Environmental Management Company
6111 Bollinger Canyon Road
San Ramon, CA 94583

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Peter Catterall
Project Manager

Gabriel Cisneros, PG #2357
Project Geologist

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ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

APNs	Assessor's Parcel Numbers
bgs	Below ground surface
BTEX	Benzene, toluene, ethyl benzene, and total xylenes
CAP	Cleanup Action Plan
COC	Contaminants of Concern
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
Chevron	Chevron Environmental Management Company
Clearcreek	Clearcreek Contractors
CUL	Cleanup level
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
EPH	Extractable petroleum hydrocarbons
mg/kg	Milligrams per kilograms
Olson Bros	Olson Brothers Garage Inc.
ORC	Oxygen Release Compound
PAHs	Polycyclic aromatic hydrocarbons
PLPs	Potentially Liable Persons
QAP	Quality assurance project plan
RI/FS	Remedial Investigation/Feasibility Study
SAIC	Science Applications International Corporation
SAP	Sampling and analysis plan
SECOR	SECOR International Inc.
SEPA	State Environmental Policy Act
TEE	Terrestrial ecological evaluation
Texaco	Texaco Oil Company
TPH-D	Diesel-range hydrocarbons
TPH-G	Gasoline-range hydrocarbons
TPH-O	Heavy Oil-range hydrocarbons
Tri-Tex	Tri-Tex Oil Company
ug/L	Micrograms per liter
USGS	United States Geologic Survey
UST	Underground Storage Tank
VOCs	Volatile organic compounds
VPH	Volatile petroleum hydrocarbons
WAC	Washington Administrative Code

FINAL INTERIM ACTION WORK PLAN

1.0 INTRODUCTION

This interim action work plan has been prepared pursuant to Section IV(C) of Agreed Order No. DE 08 TCPSR-5236 between Washington State Department of Ecology (Ecology) and Chevron Environmental Management Company (Chevron). This plan was prepared on behalf of Chevron by Science Applications International Corporation (SAIC) in accordance with Washington Administrative Code (WAC) 173-340-430(7). This plan describes the scope of work to be conducted at Chevron facility No. 21-1556, a Former Texaco Service Station located in Toledo, Washington (the Site).

Under WAC 173-340-430, this interim action work plan is distinguishable from a cleanup action in that an interim action only partially addresses the cleanup of the Site. In addition, this interim action meets the criteria identified in WAC 173-340-430, subsections 1(a), 2(a), and 3(b).

2.0 SITE BACKGROUND

The following sections summarize current and historic Site use and ownership information, which have been compiled from previous investigation reports produced for the Site. Also included in this section is a chronologic summary of past environmental related activities conducted at the Site.

2.1 SITE DESCRIPTION

Former Chevron facility No. 21-1556 is located within T11N, R2W, Section 23 of the Willamette Meridian and on the east side of Interstate 5 at the Vader-Ryderwood exit (Exit No. 59) in Lewis County, Washington. A site location map is presented as Figure 1. The Site is defined under Section III (A) of the Agreed Order by the extent of contamination caused by the release of hazardous substances at the Site. Ecology refers to the Site as Cowlitz BP and it is comprised of three land parcels, which are separated by Mulford Road. The two parcels on the north side of Mulford Road are designated as the 'active station', which is currently an operating gasoline service station (Cowlitz Shell; Figure 2). The parcel on the south side of Mulford Road comprises the 'inactive station', which was a former Texaco gasoline service station, but is currently a vacant lot. Both the active and inactive stations are located on property owned by Mr. Charles Vineyard and comprise the Cowlitz BP Site.

The active station and adjacent restaurant are located on Lewis County Assessor's Parcel Numbers (APNs) 012429003001 and 012429004000. The inactive station is located on Lot 1 of Vineyard Short Plat SP09-00002 which was formerly part of APN 01249002001. The parcels were originally on the tax lot which was purchased by Mr. Frank Vineyard in 1947. In 1955, the property was divided into separate lots and leased. In 2009, APN 012429002001 was divided into Lot 1 (2.176 acres) and Lot 2 (23.215 acres). Lot 1 includes the inactive station. Both service station locations have confirmed historical subsurface petroleum contamination and were combined into the Cowlitz BP Site in part due to their common property ownership.

2.2 SITE HISTORY

In early 1947, Mr. Frank Vineyard (former property owner, deceased) purchased a tax lot that included both the active station and inactive station parcels. These parcels were utilized for

farming operations until 1955, when the parcels were subdivided into separate lots and leased. The subsequent parcel uses from 1955 to present are described in the following sections.

2.2.1 'Active Station'

The active station parcel is located at 101 Mulford Road in Toledo, Washington. This portion of the Site was leased to Texaco Oil Company (Texaco) in 1955. Texaco constructed a service station building and installed four underground storage tanks (USTs) and associated piping. In 1980, Texaco passed lease and ownership interests to Olson Brothers Garage Inc. (Olson Bros), which were then passed to West Coast Oil Company in 1985. In 1986, Robert and Sherry Smith purchased the service station from West Coast Oil Company. The Smiths operated the facility until 2004, when Tri-Tex Oil Company (Tri-Tex) purchased the facility. Tri-Tex currently operates the Cowlitz Shell gasoline service station on the active station parcel.

The following is a historical sequence of activities pertaining to the active station parcel:

- 1956 – Four USTs were originally installed on the active station parcel by Texaco: one 550-gallon, one 2,000-gallon, one 4,000-gallon and one 6,000-gallon UST.
- 1971 – One additional 6,000-gallon UST was installed at the active station.
- 1976 - A leak in the UST system was reported by the Texaco retailer. In 1977, the reported leak was found in the piping under the pump island. It was estimated that this leak released approximately 2,300 gallons of gasoline.
- 1977 – One 2,000-gallon UST was removed and replaced with a 6,000-gallon fiberglass UST.
- 1978 – A second release was reported by the Texaco retailer. This second release was determined to be located in the piping under the pump island, which was later repaired. This leak resulted in an undetermined volume of product loss.
- 1984 – During a tank test and replacement of the piping associated with the 4,000-gallon UST, it was reported to Ecology that there had been a suspected release from this UST.
- 1990 – Three 6,000-gallon and one 4,000-gallon USTs and associated piping were removed from the 'active station' parcel. Approximately 1,000 cubic yards of petroleum-impacted soils were subsequently removed and treated onsite by aeration. However, based on soil analytical results from samples collected from the excavation sidewalls, it appears that impacted soil was left in place in the vicinity of the former USTs. Three new fiberglass USTs were installed in the former UST excavation (SECOR, 1995).
- 1991 – In February 1991, four groundwater monitoring wells were installed on the active station parcel (B-1 through B-4). In April 1991, Ecology issued an Enforcement Order (No. DE91-S123) to Mr. Frank Vineyard. The Enforcement Order required Mr. Vineyard to conduct a Remedial Investigation/Feasibility Study (RI/FS).
- 1993 – The RI/FS was completed and submitted to Ecology as directed in the Enforcement Order.
- 1994 – A site Cleanup Action Plan (CAP) was proposed and underwent public comment. However, the CAP was not implemented due to concerns by Ecology that the remedy

proposed in the CAP might not be appropriate. Additionally, based upon requests from Mr. Vineyard, Texaco and the Smiths were added to the Enforcement Order as Potentially Liable Person(s) (PLPs), and the Enforcement Order was redrafted as Agreed Order Nos. DE94-S361, -S362 and -S368.

- 1995 – A Supplemental Remedial Investigation report was prepared by SECOR International Inc. (SECOR, 1995).
- 1996 – SECOR performed a vapor extraction test on monitoring well B-4. The results of the vapor extraction test indicated that additional vapor wells/sparge points should be installed to facilitate an optimal remedial system design (SECOR, 1996). Additionally, 'intrinsic bioremediation sampling' was performed on selected groundwater monitoring wells during the 1996 groundwater monitoring and sampling program. The results of the 'intrinsic bioremediation sampling' indicated that the groundwater plume was naturally attenuating (SECOR, 1997).
- 1998 – One 5,000-gallon diesel UST was removed from the eastern side of the active station parcel. Soil samples collected and analyzed during this UST removal confirmed the presence of diesel-range hydrocarbons (TPH-D) in the north sidewalls of the excavation. Soil samples from the remaining sidewalls did not contain petroleum hydrocarbon constituents above the laboratory reporting limits (SECOR, 1998).
- 1999 – A revised CAP was submitted in August 1999 (SECOR, 1999). The revised CAP proposed enhanced in-situ biodegradation of soil and groundwater using an oxygen release compound (ORC).
- 2001 – Ecology issued a new Agreed Order Nos. DE00 TCPSR-297, -298, and -299. This Agreed Order was revised to include provisions for implementation of an enhanced in-situ biodegradation strategy by ORC for soil and groundwater cleanup proposed in the 1999 CAP.
- 2004 – Additional investigation was performed by SAIC in the vicinity of well MW-110 southeast of the active station.
- 2004 – A letter dated May 27, 2004 which documented the review of the implemented CAP actions (enhanced in-situ biodegradation by ORC) was submitted to Ecology. Based upon this review, it was determined that the proposed remedial strategy was ineffective and should not be continued, and that alternative strategies should be investigated. On December 20, 2004, a second letter was issued, suggesting that the most effective remedial option may be excavation followed by natural attenuation monitoring.
- 2006 – Per Ecology's request, a draft CAP was submitted for review. Ecology responded to this CAP with a letter dated November 2, 2006.

2.2.2 'Inactive Station'

The inactive station parcel is located at 102 Mulford Road, in Toledo Washington. This portion of the Site was originally leased to General Petroleum Corporation. In 1978, a new lease was assigned to Olson Bros. Olson Bros operated a Mobil service station and a small restaurant on the property until 1984. Sometime around 1994, the inactive station was utilized as a sales lot for pre-fabricated homes, but the property is currently vacant.

The following is a historical sequence of activities pertaining to the inactive station parcel:

- 1991 – In April 1991, Ecology issued an Enforcement Order (No. DE91-S123) to Mr. Frank Vineyard. The Enforcement Order required Mr. Vineyard to conduct an RI/FS. Additionally, the Enforcement Order also required the removal of the USTs from the inactive station parcel.
- 1992 – Two 6,000-gallon and one 300-gallon USTs were removed from the inactive station parcel per Enforcement Order No. DE91-S123 (SECOR 1995).
- 1993 – The RI/FS was completed and submitted to Ecology as directed in the Enforcement Order.
- 1994 – A site CAP was proposed and underwent public comment. However, the CAP was not implemented due to concerns by Ecology that the remedy proposed in the CAP might not be appropriate. Additionally, based upon requests from Mr. Vineyard, Texaco and the Smiths were added to the Enforcement Order as PLPs, and the Enforcement Order was redrafted as Agreed Order Nos. DE94-S361, -S362 and -S368.
- 1995 – A Supplemental Remedial Investigation was prepared by SECOR (SECOR, 1995).
- 1999 – A revised CAP was submitted in August 1999 which proposed enhanced in-situ biodegradation of soil and groundwater using ORC (SECOR, 1999).
- 2001 – Ecology issued new Agreed Order Nos. DE00 TCPSR-297, -298, and -299. This Agreed Order was revised to include provisions for implementation of the strategy of enhanced in-situ biodegradation by ORC for soil and groundwater cleanup proposed in the 1999 CAP.
- 2004 – Additional investigation was performed by SAIC in the vicinity of well MW-101 near the former UST basin on the inactive parcel. One soil boring (SB-1) was completed in this portion of the site to confirm the presence of TPH impacts in this area of the site.
- 2006 – Per Ecology's request, a draft CAP was submitted for review. Ecology responded to this CAP with a letter dated November 2, 2006.

3.0 SITE ASSESSMENT AND REMEDIATION HISTORY

Numerous investigations have been conducted on both the active and inactive stations since 1991. A groundwater monitoring program has been ongoing at the Site since 1991, and site assessment and remedial investigations have identified two separate petroleum impacted areas:

- The active station area currently operating as a Shell Service Station north of Mulford road as described in Section 2.1.
- The inactive station area located on the former station property south of Mulford Road as described in Section 2.1.

3.1 ACTIVE STATION

As discussed in Section 2.2.1, four USTs were removed from the active station parcel (Figure 2) in 1990, and approximately 1,000 cubic yards of soil were removed and treated onsite by

aeration. Following the UST removal activities, soil containing petroleum hydrocarbon impacts was identified in the excavation sidewalls (SECOR, 1999). To further investigate the nature and extent of the hydrocarbon impacts observed at the Site, four monitoring wells (B-1 through B-4) were installed. Soil analytical results collected during the installation of the monitoring wells indicated that gasoline-range hydrocarbon (TPH-G) concentrations were not present in exceedance of the Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs). However, TPH-G, benzene, toluene, ethylbenzene, and total xylenes (BTEX) have been detected in groundwater at concentrations above their respective MTCA Method A CULs in monitoring wells B-3 and B-4.

Additional soil borings B-201 through B-205 were advanced in 1992 (Figure 2). Soil samples collected from these borings were also below the MTCA Method A CULs for TPH-G and BTEX. The 1995 installation of monitoring wells MW-110, MW-111, and MW-114 provided for additional delineation of the groundwater plume. Groundwater analytical results were in exceedance of MTCA Method A CULs in monitoring wells MW-110 and MW-111, but initial concentrations in monitoring well MW-114 were below MTCA Method A CULs.

In 1998, one 5,000-gallon diesel UST was removed from the active station parcel. Soil samples collected from the northwest sidewall and below the fuel pipe line confirmed the presence of TPH-D. The northwest sidewall sample, collected at 6.8 feet below ground surface (bgs), indicated TPH-D impacted soil at a concentration of 1,890 milligrams per kilograms (mg/kg). The soil sample collected beneath the fuel line contained TPH-D at a concentration of 142 mg/kg. Soil samples from the remaining sidewalls and bottoms contained TPH-D concentrations below the laboratory reporting limits (Figure 3).

In 2004, seven soil borings (SB-2 through SB-8) were advanced in the southern part of the active station, in the vicinity of MW-111 (Figure 2). The highest detections of petroleum constituents (i.e., TPH-G, benzene, and total xylenes) with concentrations above MTCA Method A CULs were encountered between depths of 7.5 to 12 feet bgs. Soil contamination was not encountered in boring SB-2, located southeast of Mulford Road. Groundwater analytical data for monitoring wells MW-112 and MW-113 indicate that although the contaminant plume may extend into Mulford Road, it does not appear to cross Mulford Road (SAIC, 2004).

TPH-G, benzene, ethylbenzene, and total xylenes have been identified as contaminants of concern (COCs) in soils at the active station (SECOR, 1999). Soils with concentrations exceeding the MTCA Method A CULs for TPH-G and benzene at the active station have been identified south of the USTs, adjacent to Mulford Road. The contamination in this area is most likely attributed to leaking USTs which were removed in 1990.

TPH-G, TPH-D, and BTEX have been identified as COCs in groundwater (SECOR, 1999). The dissolved groundwater contaminant plume generally corresponds with the extent of contaminated soil and extends roughly over the southern portion of the active station.

3.2 INACTIVE STATION

In 1991, Ecology required the removal of the USTs on the inactive station parcel (Figure 2). The removal of these USTs was conducted in 1992; two gasoline USTs and one used oil UST were removed. Approximately 300 cubic yards of petroleum-impacted soils were removed from the

tank pit excavation and stockpiled onsite. Sidewall samples collected from the UST excavation confirmed that concentrations exceeding the respective MTCA Method A CULs for TPH-G and DRO were left in place on all four sides of the tank pit excavation (SECOR, 1995).

To further investigate the release from the active station and inactive station parcels, monitoring wells MW-101 through MW-109 (Figure 2) were installed on the inactive station parcel. Soil samples collected during the installation of these wells did not contain petroleum hydrocarbon constituents at concentrations above laboratory detection limits; however, groundwater analytical results confirmed the presence of a dissolved phase hydrocarbon plume with concentrations of TPH-G, TPH-D, benzene, ethylbenzene, and total xylenes exceeding their respective MTCA Method A CULs in monitoring wells MW-101, MW-102, and MW-109 (SECOR, 1995).

In 1995, seven additional groundwater monitoring wells were installed (MW-112, MW-113, and MW-115 through MW-119; Figure 2). Reportedly, the presence of numerous cobbles prevented the collection of soil samples for laboratory analysis during this phase of field work (SECOR 1995). Results of this investigation indicated that groundwater impacts were primarily limited to the soils immediately adjacent to the UST basins at both the active and inactive station parcels.

In addition to the confirmation soil borings advanced in 2004 on the active station parcel, one soil boring was advanced on the inactive station parcel in the vicinity of MW-101 (SB-1). Benzene and TPH-G were detected in the soil sample collected at 10 feet bgs from this boring (SB-1) at concentrations exceeding their respective MTCA Method A CULs (SAIC, 2004; Figure 3).

TPH-G, TPH-D, TPH-O BTEX and lead were identified as COCs in soils at the inactive station. The area of soil impacts is located on the western edge of the property in the vicinity of the former UST pit. As with the active station, it is highly likely that impacts in this area are due to leaking USTs in the former UST pit. Soil impacts originating from the vicinity of the former gasoline UST pit extend to the southeast in the direction of groundwater flow.

TPH-G, TPH-D, heavy oil-range hydrocarbons (TPH-O), BTEX and lead have been identified as COCs in groundwater at the inactive station. Concentrations of petroleum constituents in groundwater south of Mulford Road have declined dramatically in the past decade. Since April 2004, none of the monitoring wells south of Mulford Road have contained dissolved phase hydrocarbons at concentrations exceeding their respective MTCA Method A CULs.

Benzene concentrations have never exceeded MTCA Method A CULs for any monitoring well on the inactive station. TPH-G concentrations in MW-101 have also exhibited a downward trend, albeit with wide variations between sampling events. Prior to 2000, TPH-G concentrations in MW-101 typically exceeded 10,000 micrograms per liter (µg/L). By 2000, TPH-G concentrations had declined to concentrations typically between 1,000 µg/L and 10,000 µg/L. Since 2004, TPH-G concentrations detected in monitoring well MW-101 have been below the Method A CUL of 800 µg/L (Gettler-Ryan 2009).

Based on the current contaminant distributions, the historically contaminated groundwater in the vicinity of monitoring well MW-101 appears to have been related to a limited volume of residual saturated-zone soil contamination associated with the former UST excavation.

4.0 GEOLOGY AND HYDROGEOLOGY

Geologic interpretations of soils in the vicinity of the project site developed by the United States Geological Survey (USGS) indicate that quaternary alluvial deposits of silt, sand, and gravel associated with the Cowlitz River are characteristic of the area. The alluvial deposits are bounded by outwash deposits of sand and gravel interbedded with silt and clay associated with the Frasier glaciation of the Cascade Mountains. Shallow groundwater within these deposits generally discharges to the Cowlitz River.

Site investigation activities have provided data consistent with the USGS interpretation of the regional geology. Generally, the soil at the Site exhibits the characteristics of gravelly alluvial material with cobbles and interbedded layers of sand and silt. Data collected during drilling activities indicate that the site is underlain by sandy cobbles and gravel and gravelly sand with varying percentages of silt. The upper stratum varies in thickness from approximately 10 feet to at least 18.5 feet. Beneath the sand and gravels is a silt/clay layer of undetermined thickness.

Depth to water measurements collected at the Site indicate that an unconfined aquifer is present at approximately 7 to 8 feet bgs, with a 2-foot seasonal fluctuation across the site. Based on field measurements, groundwater has a high yield and flows in a southeast direction toward the Cowlitz River. A river terrace 15 feet lower than the site elevation is located approximately 500 feet southeast of the site. Shallow groundwater has been observed discharging through springs and seeps along the bank above this terrace.

5.0 CONTAMINANTS OF CONCERN

Contaminants of concern for the site were previously identified in the CAP submitted by SECOR (SECOR 1999). TPH-O and cPAHs have been since been included in this list of COCs per Table 830-1, WAC 173-340-900. The current list of COCs by media for this site include:

COCs	Soil	Groundwater
TPH-G	X	X
TPH-D	X	X
TPH-O	X	X
Benzene	X	X
Toluene	X	X
Ethylbenzene	X	X

Total Xylenes	X	X
Lead	X	X
cPAHs	X	X

6.0 EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

MTCA [WAC 173-340-200] defines an exposure pathway as: "the path a hazardous substance takes or could take from a source to an exposed organism. An exposure pathway describes the mechanism by which an individual or population is exposed or has the potential to be exposed to hazardous substances at or originating from a site."

The COCs and impacted media identified for this site include TPH-G, TPH-D, TPH-O, and BTEX in soil and groundwater. Under WAC 173-340-430 (2)(a), an interim action may achieve cleanup standards for a portion of the site. Therefore, this interim action work plan only addresses the potential exposure pathways associated with soil within the proposed excavation areas, located in the vicinity of the former UST basins at the active and inactive station parcels.

6.1 ACTIVE STATION

On the active station parcel, soil contamination is present southeast of the UST basin and service station building and in the vicinity of the former diesel UST, located east of the active station building (Figure 3). The surface adjacent to the current UST basin is paved, while the surface of the former diesel UST area is composed of fill material and exposed soil. Therefore, only the area around the former diesel UST provides a reasonable potential pathway for dermal contact and inhalation and/or ingestion of soil particulates and risk to terrestrial ecological receptors. This interim action work plan addresses this pathway and the soil impacts in the vicinity of the former diesel UST.

6.2 INACTIVE STATION

On the inactive station parcel, soil contamination is present in the vicinity of the former UST basin (Figure 3). The site surface in this area is composed of fill material and exposed soil. These conditions create a reasonable potential pathway for dermal contact and inhalation and/or ingestion of soil particulates and risk to terrestrial ecological receptors. This interim action work plan addresses this pathway and the soil impacts in the vicinity of the former UST..

6.3 TERRESTRIAL ECOLOGICAL EVALUATION

In addition to an evaluation of potential human health risks, MTCA requires that a terrestrial ecological evaluation (TEE) be completed following the release of hazardous substances to soil in order to determine the potential impacts to terrestrial organisms at a Site [WAC 173-340-7490] unless certain exclusion criteria are met. A simplified TEE was conducted, as set forth in WAC 173-340-7492, and it was determined that the Site poses a threat of significant adverse effects to terrestrial ecological receptors. Therefore, cleanup levels based on the protection of

ecological receptors as listed in MTCA Table 749-2 will be applied (WAC 173-340-7492(1)(d) for soil between ground surface and 6 feet bgs.

7.0 CLEANUP STANDARDS

Under WAC 173-340-200, a cleanup level is defined as: "the concentration of a hazardous substance in soil, water, air, or sediment that is determined to be protective of human health and the environment under specified exposure conditions." Cleanup standards must be established for the two potential exposure pathways that were identified in Sections 6.1 and 6.2. Although, COCs are present in groundwater at the site, dissolved phase hydrocarbons are not present in the groundwater monitoring wells downgradient from these two impacted areas. Therefore, the following section only discusses the cleanup levels for soil that will be met during the interim action.

7.1 SOIL CLEANUP LEVELS

MTCA provides three approaches for establishing soil cleanup levels: Method A, Method B, and Method C. Because this site does not meet the industrial site definition in MTCA, Method C CULs are not appropriate. Both Method A and Method B CULs can be applied to any site as they both represent unrestricted land use standards. This interim remedial action work plan will use Method A to establish CULs at the Site because only a limited number of hazardous substances are present and the Site is undergoing a routine cleanup action as defined in WAC 173-340-704(1)(a). However, because the site fails to qualify for a TEE exclusion, a downward adjustment to the unrestricted use CULs must be applied to soils less than 6 feet bgs. Therefore, the following table summarizes the CULs that will be used as the reasonable maximum exposure (RME) for both the active and inactive station parcels.

	Soil Cleanup Levels Established for the Interim Action (mg/kg)									
Parcel	Depth bgs (ft)	TPH-G	TPH-D	TPH-O	B	T	E	X	Lead	Benzo(a) pyrene (cPAHs)
Active Station Diesel UST	0 to 6	30	460	2,000	0.03	7	6	9	250	0.1
	6 to 15	30	2,000	2,000	0.03	7	6	9	250	0.1
Inactive Station Gasoline USTs	0 to 6	30	460	2,000	0.03	7	6	9	250	0.1
	6 to 15	30	2,000	2,000	0.03	7	6	9	250	0.1

These cleanup levels are derived from:

- MTCA Table 749-2, priority contaminants of ecological concern for sites that qualify for simplified terrestrial ecological evaluation procedure; and
- MTCA Table 740-1, Method A Soil CULS for unrestricted land uses.

Under WAC 173-340-7492(2)(c), MTCA states that no hazardous substance listed in Table 749-2 is, or will be, present in the soil within six feet of the ground surface at concentrations higher than the values provided in Table 749-2. The CULs for the COCs in soil between the ground surface and 6 feet bgs were selected using the most stringent criteria in either MTCA Table 740-1 or Table 749-2. For soils greater than 6 feet bgs, MTCA Method A CULs as listed in MTCA Table 740-1 will be used.

8.0 NATURE AND EXTENT OF CONTAMINATION

As discussed in Section 5.0, TPH-G, TPH-D, TPH-O, BTEX, total lead, and carcinogenic polycyclic aromatic Hydrocarbons (cPAHs) have been identified as the COCs for the Site. Although ethylbenzene and total xylenes have been detected in soil at concentrations exceeding their respective MTCA Method A CULs, they have never been detected in soil samples at concentrations exceeding their respective CULs except for when/where either TPH-G or benzene were also present at concentrations above their respective CULs. Therefore, TPH-G, TPH-D, TPH-O and benzene have been selected as indicator contaminants for the Site. The term indicator contaminants, is used to identify contaminants that have consistently been encountered whenever other constituents are present. The use TPH-G, -D -O and benzene as indicator contaminants is explicitly for field screening due to the delay in obtaining confirmation data for total lead and cPAHs from the off-site laboratory. It would be infeasible to allow the proposed excavations to remain open while awaiting laboratory analytical data for these additional constituents.

8.1 SOIL

Benzene and TPH-G are the most widespread contaminants at the Site, occurring in concentrations exceeding Method A cleanup levels for soil. TPH-D is also present in soils on both parcels between ground surface and 6 feet bgs at concentrations exceeding the ecological protection standard listed in Table 749-2 (Figure 3). Areas containing impacts exceeding the CULs previously identified in Section 7.1 are present in the following areas of the Site:

- Southeast of the current UST basin and service station building at the active station;
- In the vicinity of the former diesel UST, east of the active station building; and
- South of the former gasoline UST at the inactive station.

8.2 GROUNDWATER

In general, the extent of groundwater contamination lies within the zone of soil contamination. The most significant groundwater contaminants relative to Method A CULs are TPH-G, TPH-D, and benzene. During the first quarter 2010 groundwater monitoring event, three wells (B-3, B-4, and MW-111) contained concentrations of these constituents above MTCA Method A CULs. Monitoring wells B-3, B-4, and MW-111 are located on the active station property, to the south

and southeast of the UST basin. Between September 2007 and May 2009, analytical results from monitoring well MW-114 indicated elevated TPH-O detections at concentrations exceeding MTCA Method A CULs. However, prior to September 2007 and after May 2009, analytical results for well MW-114 were below laboratory detections limits; therefore, detection of TPH-O in this well are likely anomalous.

9.0 DESCRIPTION OF INTERIM ACTION

The goal of this interim action work plan is to remove all readily accessible soil on the Site containing COCs at concentrations exceeding the remediation levels for soil identified in Section 7.1. This will be accomplished by excavating impacted soil posing a direct contact/incidental ingestion risk to humans and terrestrial ecological receptors. Two areas will be excavated on the Site in order to reduce the threat to human health and the environment by eliminating the two current pathways for exposure addressed in Sections 6.1 and 6.2. These proposed excavation areas are outline in Figure 3 as Excavation 1 and Excavation 2. Excavated soil will be properly disposed of offsite, performance monitoring samples will be collected and analyzed, and clean backfill will be imported and compacted. This interim action is scheduled to occur in mid-October 2010 during low groundwater conditions.

9.1 OBJECTIVES

The Agreed Order specifies a process and schedule for the selection and implementation of an interim action at the site. As required, the interim action meets the criteria set forth in subsections (1), (2), and (3) of WAC 173-340-430 by having the following characteristics:

- The interim action is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance at the Site.
- The interim action is expected to achieve soil cleanup standards for a portion of the site.
- The interim action will not foreclose reasonable alternatives for the final cleanup action.

In addition to meeting the above criteria, the interim action proposed is considered a permanent solution with a short restoration time frame, and is easily implemented. Therefore, the remainder of this document will focus on the details of the interim action components being proposed in the two areas outlined in Figure 3.

9.2 SCOPE OF WORK

The interim action will involve a number of activities, which are described in the following subsections.

9.2.1 Obtain Permits and Notifications

SAIC will apply for the required permits and make the necessary notifications to the relevant jurisdictions to conduct the interim action. These include:

- Fill/Grading Permit – Lewis County; and
- Notice of Intent for Well Decommissioning – Washington State Department of Ecology.

A State Environmental Policy Act (SEPA) Checklist will also be required; however, the SEPA Checklist will be submitted by Ecology as the lead agency for this work.

9.2.2 Address Utilities

A minimum of 48 hours prior to beginning excavation, SAIC will notify the Utilities Underground Location Center ("one-call") to locate and mark underground utilities. SAIC will also arrange for a private locating service (Geomarkout Locating Company) to locate and mark any underground utilities that may not have been marked by the one-call service. In addition, any overhead utilities (e.g., power and telephone) will be assessed to determine if they will interfere with the excavation activities. If so, the relevant utility companies will be notified and the line(s) de-energized or guarded.

9.2.3 Decommission Monitoring Wells MW-101 and MW-110

The lateral extents of Excavation 2, located within the inactive station parcel, may extend beyond the current location of monitoring well MW-101. Therefore, a Washington-state licensed driller will be contracted to decommission monitoring well MW-101 by filling the casing with bentonite pellets from the bottom of the well to the land surface in accordance with the requirements of the Washington Minimum Standards for Construction and Maintenance of Wells [WAC 173-160-460]. In addition, if excavation activities extend laterally to and beyond any additional monitoring wells (e.g. monitoring well MW-110 for Excavation 1) then those monitoring wells will be similarly decommissioned by a licensed driller. Any monitoring wells that are decommissioned due to excavation activities will be replaced with new monitoring wells following the completion of the interim action.

9.2.4 Excavated Contaminated Soils

Access control. The work area, including the excavations and load-out areas, will be fenced with temporary chain-link fencing.

Excavation. Contaminated soil beneath the areas outlined in Figure 3 will be excavated and transported offsite for disposal. Based on soil analytical results from previous investigations, the lateral extents of potentially contaminated soil to be removed from excavation 1, which is located adjacent to the active station parcel, are estimated to be approximately 25 by 40 feet. The lateral extents of excavation 2, which is located at the inactive station parcel, are estimated to extend to a radius of approximately 27 feet.

Soil excavation will proceed outward at an approximately 1:1 slope. Both excavations will begin at locations of known impacts and proceed vertically until field observations (odor, sheen, staining, and PID headspace readings) indicate the vertical extent of soil contamination has been surpassed, groundwater is encountered, or until the standard point of compliance of 15 feet bgs is reached, whichever is achieved first. The groundwater table is present within a sandy gravel layer and has a very high recharge rate so it may not be feasible to dewater the excavation and excavate below the water table. The interim action is scheduled to be performed during a period when seasonal low groundwater elevations are present in order to maximize excavation depth. However, if gross contamination (staining, moderate- to heavy-sheen, or free product) is observed in the vicinity of the water table, a best level of effort will be made to excavate below the water table to remove this contamination.

The excavations will begin at locations of known impacts and extend laterally until field observations indicate the lateral extent of soil contamination has been reached. Performance monitoring samples will be collected from the bottom and sidewalls of the excavations for chemical analysis as described below in Section 10.0.

Soil Disposal. It is estimated that a total of approximately 1,800 cubic yards of petroleum-contaminated soil will require removal and disposal. Soil containing obvious signs of petroleum impacts using field screening techniques (odor, sheen, staining, and PID headspace readings) will be loaded directly into trucks and transported offsite for disposal. All contaminated soil will be transported to the Waste Management Inc. landfill in Hillsboro, Oregon.

Stock Piling. Soil with no signs of petroleum impacts observed using field screening techniques will be temporarily stockpiled to be reused as backfill pending laboratory analytical confirmations. Due to the high groundwater table at the Site, some impacted soil that is removed may be saturated. Impacted soil that is saturated will be temporarily stockpiled in a separate location on visqueen and sloped toward a temporary visqueen-lined sump placed adjacent to the saturated soil stockpile area so that accumulated water can be collected for disposal. The saturated soil will be allowed time to drain into the temporary sump before being loaded into trucks and transported offsite.

Environmental controls. Stockpiled soil will be placed within a temporary bermed area lined with visqueen and will be covered with visqueen at the end of each day to prevent erosion and runoff. In addition, catch basins in the vicinity of the excavation work area will be lined with a filter fabric to prevent the introduction of fine soils and debris into surface water. Straw bales may be used to prevent any offsite transport of contaminated runoff. Dust will be addressed with water spray, if necessary.

Confirmation sampling. Once field observations indicate that an excavation is complete, a number of soil samples will be collected from the base and sidewalls and analyzed by a mobile onsite laboratory in order to document that all contaminated material has been removed. Samples will be collected from the excavation bottom and sidewalls, and from the clean soil stockpile. The performance monitoring program is described more fully in Section 10.0. If confirmation sampling indicates that remediation levels have not been met at the base and sidewalls of the excavation, additional soil will be removed vertically until prevented by high groundwater recharge or until the point of compliance is reached and laterally and additional confirmation samples will be collected.

Backfilling. After the excavation has been completed and the results of performance monitoring samples have been adequately documented, the excavation will be backfilled. Quarry rock, or equivalent, will be placed in the base of the excavation, followed by compactable backfill material, including suitable non-contaminated soil stockpiled from the excavation. Backfill will be used to bring the excavation to grade and compacted.

If confirmation samples indicate that soil impacts exceeding the established CULs are still present at or below groundwater, then calcium oxy-hydroxide, an oxygen release compound (ORC), will be disseminated throughout the base of the excavations by track hoe to enhance the treatment of groundwater at the Site.

9.3 HEALTH AND SAFETY

The interim action will be conducted in accordance with approved site-specific health and safety plan (HASP), sampling and analysis plan (SAP), and quality assurance project plan (QAP). These documents are being submitted under separate covers and are incorporated herein by reference.

10.0 PERFORMANCE MONITORING

10.1 APPROACH

Performance monitoring will be conducted to confirm that the interim action has achieved remediation levels. Remediation levels for this interim action will be considered met if excavation sidewalls and bottom soils at 6 feet bgs meet the TEE CULs stated in MTCA Table 749-2. If remediation levels are not met at a depth of less than 6 feet bgs, the excavation will extend vertically until excavation sidewalls and bottom soils meet MTCA Method A CULs for the indicator contaminants identified in Section 8.0. CULs for soil shallower than 6 feet bgs are 30 mg/kg for TPH-G, 460 mg/kg for TPH-D, 2,000 mg/kg for TPH-O and 0.03 mg/kg for benzene. CULs for soil below 6 feet are 30 mg/kg for TPH-G, 2000 mg/kg for TPH-D and TPH-O, and 0.03 mg/kg for benzene. As previously stated, the use TPH-G, -D -O and benzene as indicator contaminants is explicitly for field screening due to the delay in obtaining confirmation data for total lead and cPAHs from the off-site laboratory.

Additional samples will be collected from the clean soil stockpile to confirm that stockpiled material is suitable for backfill. However, these samples will not be used as confirmation samples to determine whether the interim action has achieved remediation levels.

10.2 SAMPLE COLLECTION

Once field observations indicate that contaminated soil has been removed from the base of each excavation, at least five discrete, evenly spaced soil samples will be collected from the bottom of each excavation. These soil samples will be collected at locations where field observations indicate that contamination is most likely to be present. Samples will be obtained from the excavator bucket using care to collect material from the middle of the bucket to avoid cross-contamination.

Once field observations indicate that contaminated soil is no longer present along each sidewall, a minimum of four samples will be collected between the ground surface and 6 feet bgs, one from each sidewall. If the excavation extends vertically past 6 feet bgs, a minimum of eight samples will be collected along the sidewalls: one sample from each sidewall between the ground surface and 6 feet bgs, and one sample from each sidewall between 6 feet and 15 feet bgs near the base of the final excavation depth. These samples will be collected to confirm that the CULs have been met and will be collected at locations where field observations indicate that contamination is most likely to be present.

Stockpiled soil will be sampled and analyzed to determine its ultimate disposition consistent with WDOEs “Guidance for Remediation of Releases from Underground Storage Tanks”. A minimum of 3 samples will be collected from each stockpile up to 100 cubic yards in volume, and 5 samples will be collected for stockpiles between 100 to 500 cubic yards in volume. Although it is estimated that approximately 1,800 cubic yards of soil will be excavated, no more

than 500 cubic yards of clean soil is expected to be stockpiled. Stockpile samples will be analyzed for the same constituents as the excavation samples. Stockpiles confirmed to be free of petroleum impacts in exceedance of the site-specific CULs may be used as backfill, while stockpiles with detections exceeding MTCA Method B CULs will be transported offsite for disposal.

Soil samples will be collected in glass jars. Sample locations will be noted in the field logbook and on the site map. All samples will be properly labeled and hand-carried to the mobile analytical laboratory using appropriate chain-of-custody procedures.

Additional sampling information is provided in the SAP and QAP.

10.3 ANALYTICAL METHODS

TPH-G, TPH-D, TPH-O, and BTEX are identified as indicator contaminants in Sections 8.0 and 10.1. These compounds will be analyzed by an Ecology-approved mobile onsite laboratory in order to determine the maximum lateral and vertical extent of the excavations. The onsite laboratory will analyze soil samples for the following:

- TPH-G by Ecology Method NWTPH-Gx;
- TPH-D by Ecology Method NWTPH-Dx extended with silica gel cleanup; and
- TPH-O by Ecology Method NWTPH-Dx extended with silica gel cleanup; and
- BTEX compounds by EPA Method 8021.

In addition to the above analysis, confirmation soil samples collected from the sidewalls and bottoms of the excavations will be shipped to Lancaster Laboratories in Lancaster, PA for the following additional analysis:

- cPAHs by EPA Method 8270C SIM; and
- Total Lead by EPA Method 6020.

The quality assurance/quality control procedures for sample analyses are specified within the SAP and QAP. These procedures are incorporated by reference into this interim action plan.

11.0 REPORTING

Following the interim action, SAIC will prepare an Interim Action Report documenting the field activities and analytical results.

12.0 SCHEDULE

As stated in Section 9.0, the interim remedial action work proposed is expected to be implemented beginning in mid-October when groundwater is lowest. The interim remedial action field activities are expected to require 5-7 days to complete. Most sample analysis is expected to be performed by a mobile onsite lab on a nearly real-time basis; however analysis of total lead, and cPAHs will require an off-site laboratory which will result in a 7-10 day delay in receipt of analytical data.

A report documenting the interim remedial action results will be provided to Ecology within 60 days of the completion of the field activities.

13.0 REFERENCES

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SAIC. 2004. Identification of Possible Remedial Actions and Summary of Recent Soil Sampling, Former Cowlitz BP/Texaco Station #211556 in Toledo, Washington. Memorandum. Prepared for Washington State Department of Ecology. December 20, 2004.

SECOR International Incorporated. 1995. Supplemental Investigation Report, Cowlitz BP Site. Prepared for Texaco Environmental Services. October 23, 1995.

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SECOR International Incorporated. 1998. Cowlitz BP Site Diesel UST Removal-Excavation Soil Sampling. Prepared for Texaco Environmental Services. March 5, 1998.

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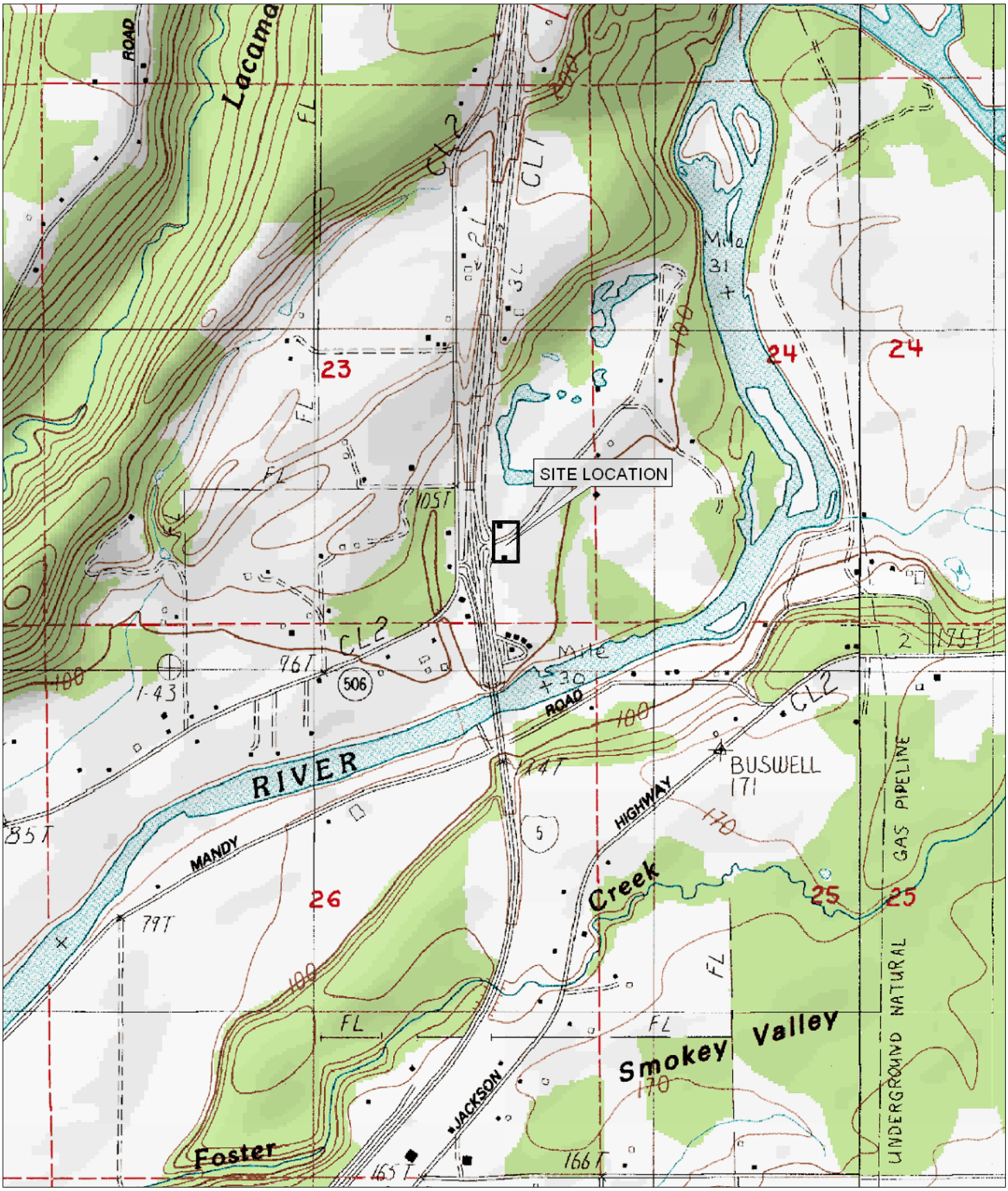
WAC 173-340. Model Toxics Control Act Cleanup Regulation. Washington Administrative Code. November 2007.

Figures



1 mile:4 inches

Reference: Topographic Map from
Delorme® 3-D Topo Quads - 2002
from USGS Topographic Map Winlock WA - 1990

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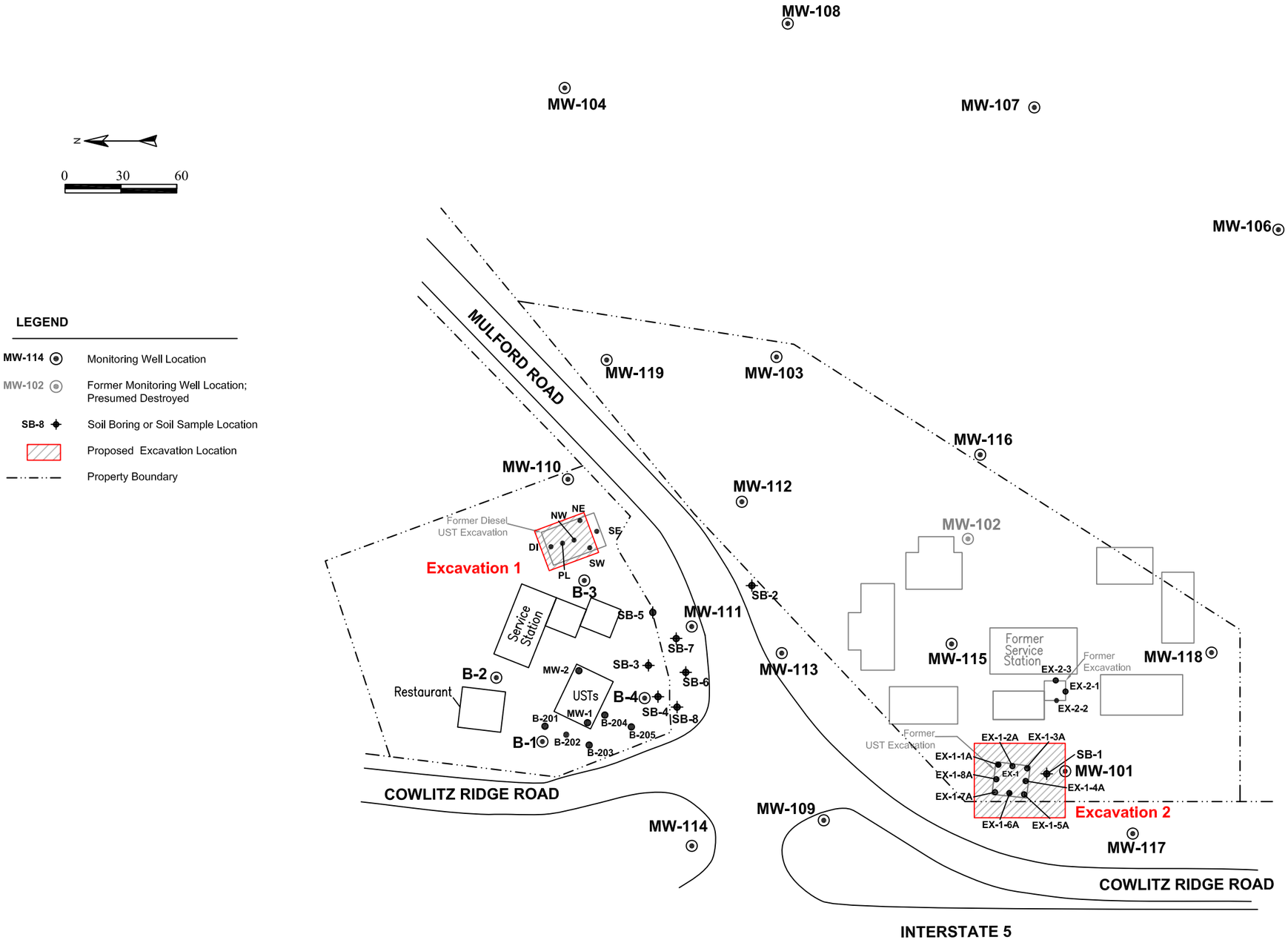
	SITE LOCATION MAP	FIGURE 1
	Former Texaco Station 211556 101 Mulford Road Toledo, Washington	
211556_figure1.dwg	Date: 09-16-08 Drawn By: AJW	



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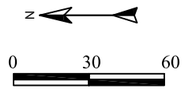
Former Texaco Station 211556
101 Mulford Road
Toledo, Washington

FIGURE 2
Site Map with Proposed Excavation Locations

DATE: 03/22/2010 | DRAWING: 211556_Toledo.dwg



LEGEND

MW-114 ⊙	Monitoring Well Location
SB-8 ✦	Soil Boring or Soil Sample Location
▨	Proposed Excavation Location
— · — · —	Property Boundary
57	Diesel-Range Hydrocarbon Concentration in Milligrams per Kilogram (mg/kg)
130	Gasoline-Range Hydrocarbon Concentration in Milligrams per Kilogram (mg/kg)
ND ND	Diesel- or Gasoline-Range Hydrocarbon Concentration Below Method Detection Limits or Hydrocarbons Not Detected in HCID Analysis

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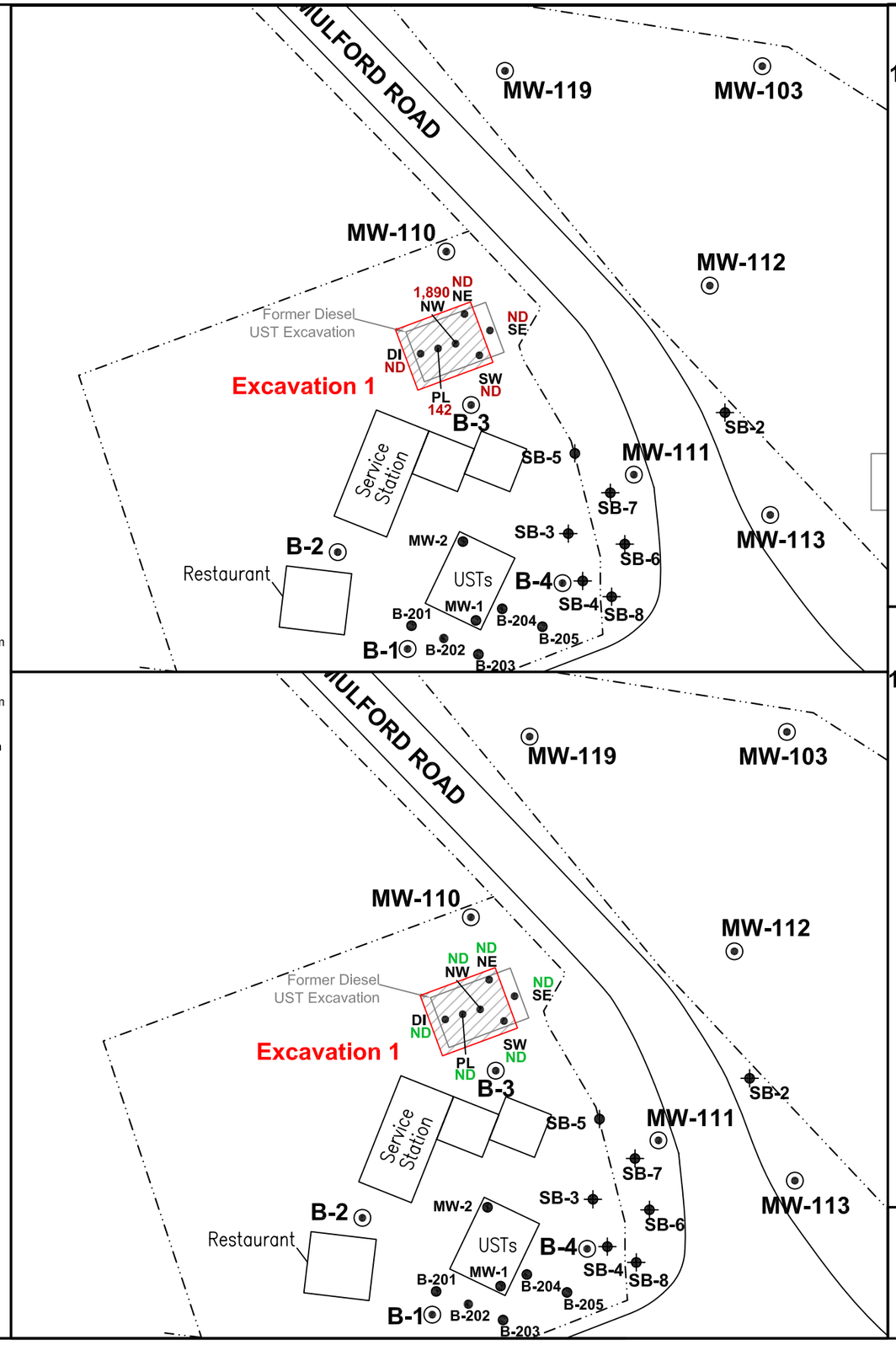

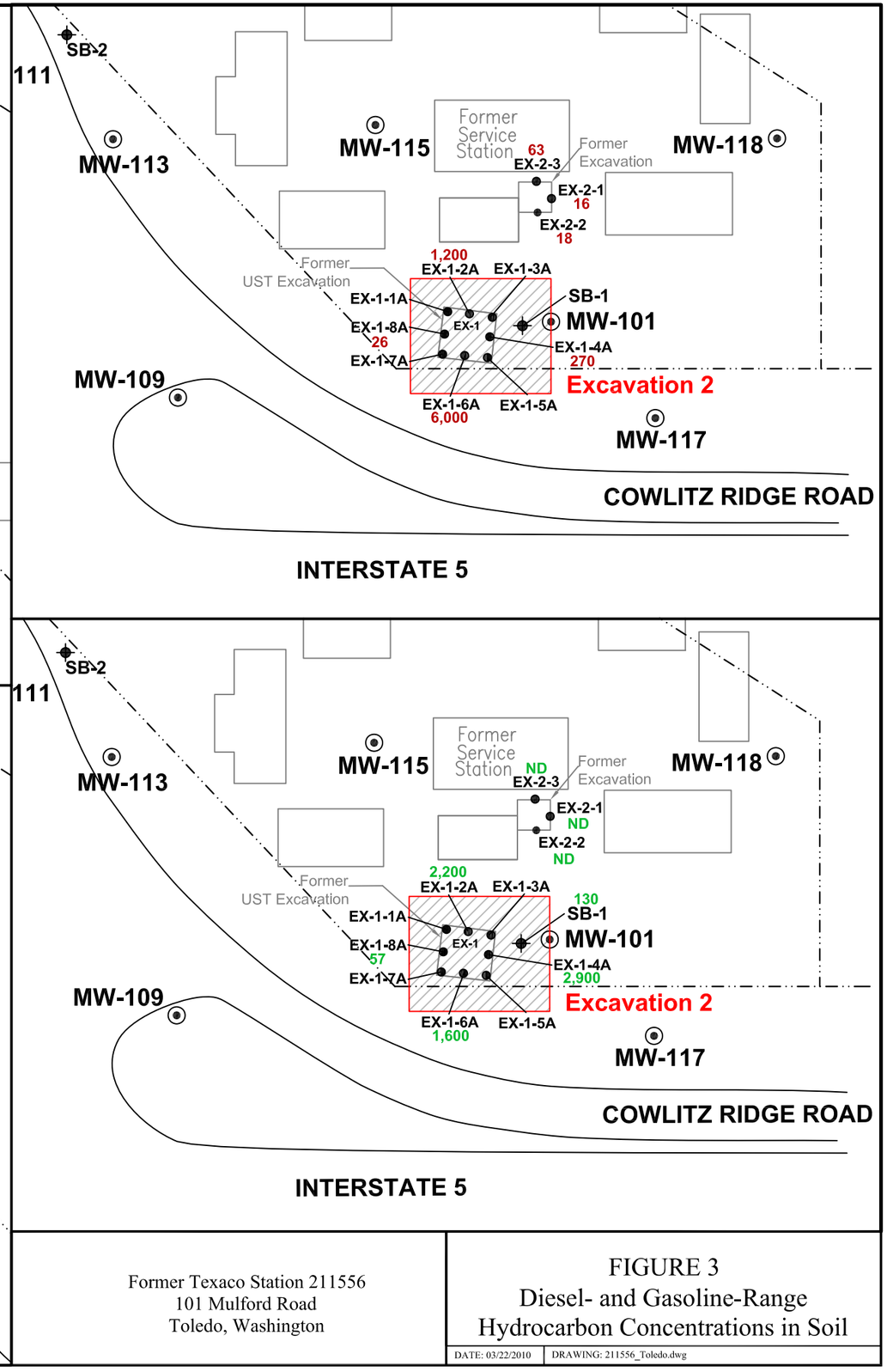

Former Texaco Station 211556
101 Mulford Road
Toledo, Washington

FIGURE 3
Diesel- and Gasoline-Range Hydrocarbon Concentrations in Soil

DATE: 03/22/2010 | DRAWING: 211556_Toledo.dwg