SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 6422

Chevron 211551

Facility/Site ID: 63938375

7132 Delridge Way SW

Seattle, King County, WA 98106

Section:	25	Latitude:	47.53829
Township:	24N	Longitude:	-122.36063
Range:	3E	Tax/Parcel ID:	7985400520

Site scored/ranked for the Hazardous Sites List Publication: February 2018

SITE DESCRIPTION:

The Chevron 211551 site (Site) is a current and former service station located in Seattle, King County, Washington. The 0.58-acre property is located approximately 6,000 feet from the Lower Duwamish Waterway and approximately 250 feet from Longfellow Creek, and zoned for commercial (City of Seattle C1-40) use.

Surrounding properties include a public storage facility to the west (across Delridge Way), a City of Seattle stormwater overflow storage tank to the south (across SW Orchard Street), and an AM/PM mini-mart and gas station to the southwest. Land immediately adjacent to the north and east is undeveloped, but residences and an elementary school are located nearby to the north, northeast, and east. Prior development of the area has included service stations on each corner of the intersection of Delridge Way SW and SW Orchard Street.

The Site is currently operated as a Shell service station with mini-mart and restaurant by Chung Hyon Ok.

The Site is operated as an active gasoline service station with multiple fueling islands and a convenience store with a teriyaki restaurant. The Site is located at the northeast corner of the intersection of Delridge Way SW and SW Orchard Street.

SITE BACKGROUND:

A summary of prior operations/tenants at the subject property is presented below.

From	To	Operator/Tenant	Activity
1940	1995	Service Station	Automotive service station under various brands including Philips, Shell, and Texaco.
1995	1998	Vacant	Property redevelopment
1998	2017	Service Station	Service station and convenience store, Chevron and Shell branded.

SITE CONTAMINATION:

In 1990 the Chevron 211551 site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites List (CSCSL).

The release reported in 1990 was associated with three 8,000-gallon gasoline underground storage tanks (UST) system located in the northern portion of the Site. This included the USTs and related piping and product dispensers.

Initial Site characterization activities performed in 1990 and 1991 included installation of 26 soil borings and collection and laboratory analysis of soil and groundwater samples, with 14 of the locations completed as monitoring wells (MW-1 to MW-14) . These wells and boring locations were located on the property and in the Delridge Way right-of-way (ROW) west of the property. In addition, subsurface soil vapor samples were collected at eight locations along a storm drain utility corridor, and stormwater samples were collected at four

manhole locations. The soil vapor and stormwater samples were collected from the western margin of the property, the Orchard Street ROW south of the property, and the Delridge Way ROW west of the property.

Soil samples collected from the 1990/1991 borings contained concentrations of gasoline-range hydrocarbons [up to 690 milligrams per kilogram (mg/kg)], benzene (up to 9.7 mg/kg), toluene (up to 39 mg/kg), ethylbenzene (up to 24 mg/kg), and total xylenes (up to 45 mg/kg) above Ecology's current MTCA Method A soil cleanup levels.

Gasoline-range hydrocarbons and BTEX were also detected in groundwater samples collected from 9 of the 14 wells during the initial assessment in the early 1990s at concentrations above MTCA Method A CULs. Concentrations of gasoline-range hydrocarbons [up to 75,000 micrograms per liter (ug/l)], benzene (up to 19,000 ug/l), toluene, ethylbenzene, and/or xylenes were present in samples collected from wells MW-1, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10, and MW-11 at concentrations above Ecology's current MTCA Method A groundwater cleanup levels. Free-phase hydrocarbon product (up to 0.54 foot in MW-11) was observed in wells MW-4, MW-7, MW-8, and MW-11. (Note: The groundwater results discussed above are for samples collected prior to the remedial activities discussed below, and are not representative of current Site conditions. More recent groundwater results are discussed below.)

The soil vapor and stormwater samples collected during the 1990/1991 assessment were analyzed for BTEX constituents, which were detected above laboratory reporting limits in two soil vapor and two stormwater samples. Benzene [up to 1,300 part per million (ppm)], toluene (up to 450 ppm), ethylbenzene (up to 38 ppm), and total xylenes (up to 260 ppm) were detected in soil vapor samples SG-7 and SG-8, which were located along the western property margin in the area of greatest soil and groundwater impacts. These soil vapor samples were collected prior to conducting remedial action at the site; these samples may not represent current conditions due to the age of the data and more recent remedial activities. Stormwater samples collected from locations MH-3 and MH-4 also contained concentrations of benzene (up to 26 ug/l), toluene (up to 90 ug/l), ethylbenzene (up to 6 ug/l), and total xylenes (up to 52 ug/l). Sample MH-3 was collected from a manhole located near the northwestern corner of the property, adjacent to soil vapor sample SG-8. Sample MH-4 was collected from a manhole located south of the property near the southeastern corner of the intersection of SW Orchard Street and Delridge Way. (Note: The Site appears unlikely to have been the source of BTEX detected at MH-4 because it is reportedly located upgradient from the Property. As previously discussed, several other service stations are/were located south of the Site).

REMEDIATION ACTIVITIES:

In October 1992, two in-situ remediation systems were installed at the Site including a soil vapor extraction (SVE) and a groundwater pump-and-treat system. The SVE system was operated until November 1994, and the groundwater treatment system operated until December 1995. According to Site reports, the SVE system reportedly removed approximately 1,819 pounds of TPH, and the groundwater treatment system processed approximately 484,520 gallons of groundwater. Free-phase product was reportedly not encountered in Site monitoring wells after start-up of the groundwater remediation system.

In 1995, the existing service station facilities were removed, including the three 8,000-gallon gasoline USTs in the northern portion of the Site and one 500-gallon UST that was discovered in the southern portion of the Site. Five dispenser islands (two active and three previously abandoned) were also removed at the time. A total of approximately 3,226 tons of petroleum-impacted soil was removed from the Site, and approximately 18,790 gallons of groundwater were treated onsite (using the existing groundwater treatment system). Final confirmation soil samples collected from the excavation limits indicated that residual petroleum-impacted soil (gasoline-range hydrocarbons and benzene) was left in place within the excavation boundaries, including in the northern portion of the Site and to the west of the excavation area (along the western property margin and extending into the eastern portion of the Delridge Way ROW).

Approximately 312 tons of additional petroleum-impacted soil was excavated from the former UST area in the northern portion of the Site during redevelopment activities in 1997. Petroleum hydrocarbon odors were reportedly observed in the excavated soil stockpile and western excavation margin. Gasoline-range hydrocarbons and benzene were reportedly detected at concentrations above MTCA Method A soil cleanup levels in soil samples collected from the excavated soil stockpile, and gasoline-range hydrocarbons were also reportedly detected above the cleanup level in a sample collected from the western excavation sidewall;

however, analytical reports and data tables were not available for review.

No additional information regarding other remedial actions at the site was available for review in Ecology's files, but groundwater monitoring was performed on an annual to quarterly basis through 2013. Groundwater monitoring performed between 1999 (following completion of remedial activities) and 2009 was generally continued until each well had four consecutive quarters of clean groundwater results; however, some wells (e.g. MW-1, MW-5 and MW-6, and MW-11) were abandoned or sampling was discontinued before this happened, so it is unclear whether impacted groundwater still exists in these areas. COCs detected above MTCA Method A CULs in these wells included diesel-, gasoline-, and oil-range hydrocarbons, BTEX constituents, and/or total lead. Well MW-1 was destroyed in 1997, and wells MW-2, MW-11, and MW-12 were reportedly paved over in 1999 or 2000. Wells MW-5 and MW-6, located in the Delridge Way ROW, were abandoned in 2006. Wells MW-15 and MW-16 were installed in the Delridge Way ROW in 2010.

The most recent available groundwater monitoring data for the Site is from April 2013. Monitoring events performed between December 2010 and April 2013 included only MW-3 (through September 2011 only), MW-15 (through September 2011 only), and MW-16. Analyses performed between 2010 and 2013 included diesel- and oil-range hydrocarbons for all events, and gasoline-range hydrocarbons, BTEX, and total lead for MW-15 and MW-16 from December 2010 to September 2011. Petroleum hydrocarbons, BTEX, and total lead were not detected at concentrations above MTCA Method A groundwater cleanup levels during this time period, with the exception of oil-range hydrocarbons, which were detected in the sample collected from MW-16 in September 2011 (1,200 ug/l).

CURRENT SITE CONDITIONS:

Soil with detected gasoline-range hydrocarbons and benzene concentrations above MTCA Method A soil cleanup levels was not removed from the area to the west of the 1995 excavation in the northern portion of the Site. In addition, multiple confirmation soil samples collected from the 1995 excavation areas contained benzene at concentrations above the MTCA Method A soil cleanup level.

Impacted groundwater is also likely present at the Site. Although groundwater samples collected between 2010 and 2013 generally showed COC concentrations below cleanup levels, sampling was performed at only a few locations and for a limited range of analyses, and consequently is not necessarily representative of existing Site-wide conditions. Historical groundwater results (i.e., late 1990s and 2000s) included diesel- and oil-range hydrocarbons, BTEX constituents, and total lead at concentrations above MTCA Method A groundwater cleanup levels.

The approximate depth to groundwater is 5 feet below ground surface, with groundwater flowing to the northwest. Subsurface soils are clay with gravel and cobbles with imported fill in former excavation areas (based on Site reports).

SPECIAL CONSIDERATIONS:

Checked boxes indicate routes applicable for Washington Ranking Method (WARM) scoring

☐ **Surface Water**

Release occurred to the subsurface and is not expected to impact surface water.

☑ **Air**

Confirmed releases of volatile compounds to soil and groundwater.

☑ **Groundwater**

Confirmed releases of COCs to soil and groundwater at concentrations above MTCA Method A cleanup levels.

Recent (i.e., since approximately 2010) groundwater monitoring has included only a limited number of wells and analyses. Based on historical soil and groundwater data, groundwater monitoring at all Site wells for all potential COCs is needed to verify current conditions.

SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

ROUTE SCORES:

Surface Water/ Human Health:		Surface Water/ Environment:	
Air/ Human Health:	46.2	Air/ Environment:	1.6
Groundwater/ Human Health:	37.7		

Overall Rank: 2

REFERENCES:

1 Cambria. 2006. Well Decommissioning Report, Chevron Station No. 21-1551, 7132 Delridge Way South, Seattle, Washington. Prepared for Washington State Department of Ecology. Dated 27 October 2006

2 Conestoga-Rovers & Associate 2008. Response to Opinion Letter and Site Assessment Work Plan, Former Texaco Service Station #21-1551, 7132 Delridge Way Southwest, Seattle, Washington. Prepared for Washington State Department of Ecology. Dated 5 September 2008.

3 Conestoga-Rovers & Associates. 2010. Site Investigation Work Plan, Former Texaco Service Station 21-1551, 7132 Delridge Way Southwest, Seattle, Washington. Prepared for Washington State Department of Ecology. Dated 20 August 2010.

4 Conestoga-Rovers & Associates. 2013. Second Quarter 2013, Groundwater Monitoring and Sampling Report, Chevron Facility 211551, Former Texaco Service Station 63-232-0369, 7132 Delridge Way Southwest, Seattle, Washington. Prepared for Washington State Department of Ecology. Dated 21 August 2013.

5 Emcon. 1996. Annual Groundwater Sampling and Remediation Status Report, Former Shell Station, 7132 Delridge Way Southwest, Seattle, Washington. Prepared for Shell Oil Products Company. Dated 25 June 1996.

6 Environmental Science & Engineering, Inc. 1991. Results of a Site Relinquishment and Acquisition Assessment for Shell Service Station #39, 7132 Delridge Way SE, Seattle, Washington. Prepared for Shell Oil Company. Dated 25 March 1991.

7 Environmental Science & Engineering, Inc. 1992. Supplemental Site Characterization Report and Recommended Remedial Action for a Shell Service Station Located at 7132 Delridge Way SW in Seattle, Washington. Prepared for Shell Oil Company. Dated 22 June 1992.

8 Environmental Science & Engineering, Inc. 1995a. Service Station Demolitions / Underground Storage Tank Decommissioning and Soil Remediation Program at 7132 Delridge Way SW, Seattle, Washington. Prepared for Shell Oil Company. Dated 22 May 1995.

9 Environmental Science & Engineering, Inc. 1995b. Results of Groundwater Monitoring and Status of the Soil and Groundwater Remediation Systems at Former Shell Service Station, 7132 Delridge Way SW, Seattle, Washington. Prepared for Shell Oil Products Company. Dated 20 December 1995.

10 Noll Environmental, Inc. 1997. Results of Phase I Environmental Assessment, Former Texaco Station #63-232-0369, 7132 Delridge Way SW, Seattle, Washington. Prepared for Texaco Refining & Marketing, Inc. Dated 8 May 1997.

11 King County GIS Center iMAP application, Property Information, Groundwater Program, and Sensitive Areas mapsets. Accessed June 2017. http://www.kingcounty.gov/operations/GIS/Maps/iMAP.aspx

12 Missouri Census Data Center, Circular Area Profiles - 2010 census data around a point location. http://mcdc.missouri.edu/websas/caps10c.html. Accessed June 2017.

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13 National Climatic Data Center 2011 Local Climatological Data for Seattle, Seattle Tacoma Airport. http://www1.ncdc.noaa.gov/pub/orders/IPS-90B1F39F-6CFA-4A6B-AA82-5ED1FF897CCC.pdf

14 WARM Scoring Manual

15 WARM Toxicological Database

16 Washington Department of Transportation 24-hour Isopluvial Maps, January 2006 update. http://www.wsdot.wa.gov/publications/fulltext/Hydraulics/Wa24hrIspoluvials.pdf

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 6422 Chevron 211551

Facility/Site ID: 63938375

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

NA

Explain the basis for choice of substances to be used in scoring:

NA

List those management units to be considered for scoring:

NA

Explain basis for choice of unit to be used in scoring:

NA

2. AIR ROUTE

List those substances to be considered for scoring:

Gasoline, benzene, toluene, ethylbenzene, xylenes

Explain the basis for choice of substances to be used in scoring:

Volatile compounds detected in soil and groundwater above MTCA cleanup levels.

List those management units to be considered for scoring:

Soil and groundwater

Explain basis for choice of unit to be used in scoring:

Prior detection in site soil and groundwater

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

Gasoline, diesel/oil, BTEX constituents, lead

Explain the basis for choice of substances to be used in scoring:

Detected in soil and/or groundwater above MTCA cleanup levels.

List those management units to be considered for scoring:

Groundwater

Explain basis for choice of unit to be used in scoring:

Prior detection in site soil and groundwater

Worksheet 5

Air Route

CSID: 6422 **Site Name:** Chevron 211551

1.0 Substance Characteristics

1.1 Introduction (WARM Scoring Manual) - Please Review before scoring

1.2 Human Toxicity

Substance	Ambient Air Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Gasoline (benzene)	10	3	8	5
Toluene	1	X	3	X
Ethylbenzene	10	X	3	X
Xylenes	X	3	5	X

Highest Value 10

Bonus Points? 2

Toxicity Value 12

1.3 Mobility

Gaseous Mobility	Max Value:	4
Particulate Mobility	Soil Type:	
	Erodibility:	
	Climatic Factor:	

Mobility Value 4

1.4 Final Human Health Toxicity/Mobility Matrix Value **HH Final Matrix Value** 24

1.5 Environmental Toxicity/Mobility

Substance	Non-human Mammalian Inhalation Toxicity (mg/m3)	Acute Value	Mobility Value	Table A-7 Matrix Value
Gasoline (benzene)	31947	3	4	6
Toluene	X	X	4	X
Ethylbenzene	X	X	3	X
Xylenes	21714	3	3	5

Env. Final Matrix Value 6

1.6 Substance Quantity

Amount: >2,700 - 13,500 square feet

Basis: Estimated aerial extent

Substance Quantity Value 5

Worksheet 5

Air Route

CSID: 6422 **Site Name:** Chevron 211551

2.0 Migration Potential

2.1 Containment Containment Value: 5

Explain Basis: Release to subsurface with no operational vapor collection system

3.0 Targets

3.1 Nearest Population Population Distance Value: 10

Residence <200 feet to the northwest

3.2 Distance to and name of nearest sensitive environments Sensitive Environment Value: 7

250 feet to a freshwater forested/shrub wetland, western pond turtle priority area

3.3 Population within 0.5 miles Population Value: 73

5259 population

4.0 Release Release to Air Value: 0

Explain basis for scoring a release to air:

No confirmed release to air

Pathway Scoring - Air Route, Human Health Pathway

$AIR_H = (SUB_{AH}*60/329)*[REL_A+(TAR_{AH}*35/85)]/24$

Where:

SUB_{AH} =(Human toxicity + 5) * (Containment + 1) + Substance Qty	SUB_{AH}	179
REL_A = Release to Air	REL_A	0
TAR_{AH} = Nearest Population + Population within 1/2 mile	TAR_{AH}	82.5
	AIR_H	46.2

Pathway Scoring - Air Route, Environmental Pathway

$AIR_E = (SUB_{AE}*60/329)*[REL_A+(TAR_{AE}*35/85)]/24$

Where:

SUB_{AE} =(Environmental Toxicity Value +5)*(Containment +1) +Substance Qty	SUB_{AE}	71
REL_A = Release to Air	REL_A	0
TAR_{AE} = Nearest Sensitive Environment	TAR_{AE}	7.0
	AIR_E	1.6

Worksheet 6

Groundwater Route

CSID: 6422 **Site Name:** Chevron 211551

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Gasoline (benzene)	8	3	3	5
Diesel	X	5	1	X
Toluene	4	3	1	X
Ethylbenzene	4	3	1	X
Xylenes	2	10	1	X
Lead	6	10	X	X

Highest Value 10

Bonus Points? 2

Toxicity Value 12

1.2 Mobility

Cations/Anions Max Value:

Solubility Max Value: 3 Mobility Value 3

1.3 Substance Quantity

Amount: >100-1,000 cubic yards

Basis: Estimated extent of remaining impacted soil

Substance Quantity Value 3

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Contaminated soil

2.2 Net Precipitation 10-20 inches Net Precipitation Value 2

2.3 Subsurface Hydraulic Conductivity Conductivity Value 2

Silt, sand, and clay

2.4 Vertical Depth to Groundwater 5 feet

Confirmed release: Yes Depth to Aquifer Value 8

3.0 Targets

3.1 Groundwater Usage Aquifer Use Value 3

Irrigation of food crops only

3.2 Distance to Nearest Drinking Water Well >10000 feet

Well Distance Value 0

3.3 Population Served within 2 Miles Population Served Value 0

0 people

Worksheet 6

Groundwater Route

CSID: 6422 **Site Name:** Chevron 211551

3.4 Area Irrigated by GW Wells within 2 miles Area Irrigated Value 1

3 acres

4.0 Release Release to Groundwater Value 5

Explain basis for scoring a release to groundwater:

Confirmed release to groundwater

Pathway Scoring - Groundwater Route, Human Health Pathway

$GW_H = (SUB_{GH}*40/208)*[(MIG_G*25/17)+REL_G+(TAR_{GH}*30/165)]/24$

Where:

SUB_{GH} =(Human toxicity + mobility + 3) * (Containment + 1) + Substance Qty	SUB_{GH}	201
MIG_G=Depth to Aquifer+Net Precip + Hydraulic Conductivity	MIG_G	12
REL_G = Release to Groundwater	REL_G	5
TAR_{GH} = Aquifer Use + Well Distance + Population Served + Area Irrigated	TAR_{GH}	4.3
	GW_H	37.7

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Chevron 211551 **CSID:** 6422

Site Address: 7132 Delridge Way SW, Seattle, WA 98106 **FSID:** 63938375

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	ns	0
Air	46.2	5
Groundwater	37.7	3

H=	5
M=	3
L=	0

$$\frac{H^2 + 2M + L}{8} = \frac{25 + 6 + 0}{8}$$

Human Health Priority Bin Score: **4**

rounded up to next whole number

ENVIRONMENT ROUTE SCORES

Enter Environment Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	ns	0
Air	1.6	3

H=	3
L=	0

$$\frac{H^2 + 2L}{7} = \frac{9 + 0}{7}$$

Environment Priority Bin Score: **2**

rounded up to next whole number

Comments/Notes:

FINAL MATRIX RANKING **2**

FOR REFERENCE:

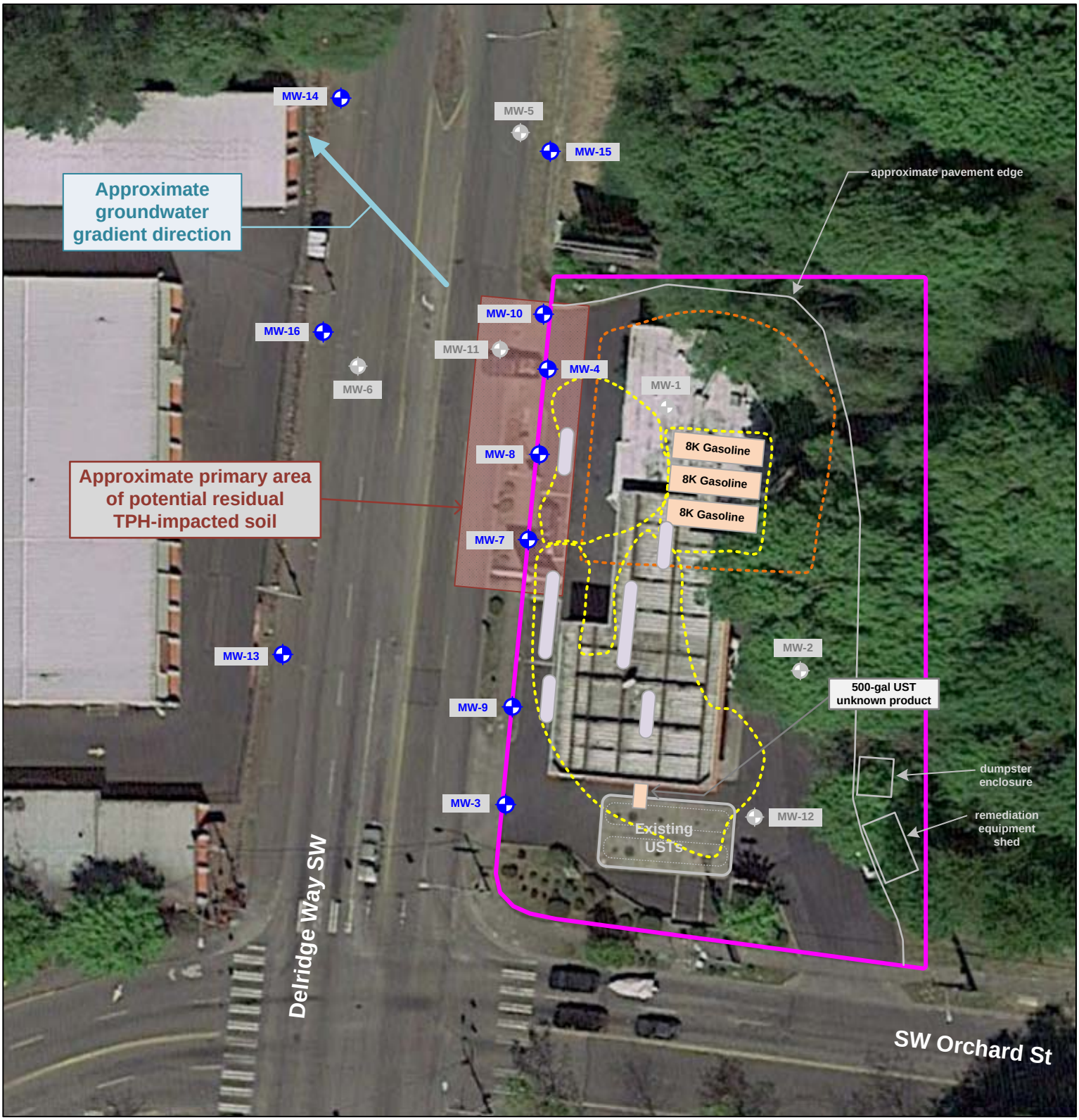
Final WARM Bin Ranking Matrix

Human Health Priority	Environment Priority 5	4	3	2	1	N/A
5	1	1	1	1	1	1
4	1	2	2	2	3	2
3	1	2	3	4	4	3
2	2	3	4	4	5	3
1	2	3	4	5	5	5
N/A	3	4	5	5	5	NFA

Quintile Values for Route Scores - August 2017 Values

Quintile	Human Health: Surface Water	Air	Ground Water	Environment: Surface Water	Air
5	>= 29.8	>= 39.1	>= 50.3	>= 49.7	>= 27.8
4	>= 21.4	>= 25.0	>= 40.3	>= 32.1	>= 15.3
3	>= 15.5	>= 15.8	>= 33.1	>= 24.2	>= 1.6
2	>= 8.0	>= 8.4	>= 24.0	>= 11.6	>= 1.3
1	<= 7.9	<= 8.3	<= 23.9	<= 11.5	<= 1.2

Quintile value associated with each route score entered above



Legend:

- Property Location
- Former UST Location
- Former Dispenser Island Location
- Existing Monitoring Well Location
- Former Monitoring Well Location
- 1995 Excavation Areas
- 1997 Excavation Area

N

DEPARTMENT OF ECOLOGY
State of Washington

Chevron 211551
7132 Delridge Way SW
Seattle, WA

Site Overview Map

CSID 6422
CSID6422.vsd