## SITE HAZARD ASSESSMENT <u>WORKSHEET 1</u> Summary Score Sheet

#### SITE INFORMATION:

**Site Name: Pettit Oil (640, 700, or 720 Myrtle St)** Address: 700 Myrtle Street, Hoquiam

Ecology Facility Site ID No.: 87399456 Township/Range/Section: 17 N/ 09 W/ 07 W.M. Latitude: 46.97199 Longitude: -123.85229

Site scored/ranked for the <u>August 2014</u> update Today's date: July 30, 2014 **SITE DESCRIPTION:** 

The subject site consists of three localized tax parcels designated as "Retail Trade – Automotive, Marine Craft, Aircraft, & Accessories – Gas Stations" in an area of Hoquiam zoned for commercial, residential, and industrial use. The associated parcels are listed below:

052209300100

052209300101

052209301300

The site is rectangular in shape, occupies approximately 1.7 acres, and lies 13 feet above mean sea level. Myrtle Street and a railroad provide the eastern and southern boundaries for the site, respectively. The commercial fueling bulk plant house at the site was constructed in the 1920s. The facility consists of a storehouse, office, loading racks, above ground storage tanks (ASTs), underground storage tanks (USTs), a drum storage area, a filling area, and a gasoline station with dispensers.

In March 1993 the Washington State Department of Ecology (Ecology) was notified of a 100 gallon gasoline release at the site. No documentation of remedial activities was received for this release. Four storage tanks were listed at the site at this time. The tanks included a 2,000 gallon solvent tank, a 6,000 gallon hydraulic oil tank, a 20,000 gallon gasoline/diesel/fuel oil tank, and a "-000" gallon diesel tank, the volume of this tank was not legible.

Pacific Crest Environmental completed due diligence activities at the site in October 1997 and May 1998. Seventeen exploratory soil borings were completed to depths of 1.5 ft – 4 ft below ground surface (bgs). The soil borings ended at the soil-groundwater interface. Seventeen soil samples and 9 groundwater samples were collected at the site for benzene, toluene, ethyl benzene, and xylene (BTEX), total petroleum hydrocarbon, gasoline, diesel, heavy oil, and methyl tertiary-butyl ether (MTBE) analysis. The soil sample results returned with gasoline, diesel, benzene, ethyl benzene, and xylene above their respective MTCA Method A Cleanup Levels in soil. The groundwater sample results returned with gasoline, diesel, heavy oil, and benzene above their respective MTCA Method A Cleanup Levels in groundwater. The highest soil results were from samples collected in the area west of the former gasoline station and the area south of the former AST farm. The highest groundwater results were from samples collected west of the drum storage area.

In September 1998 GeoEngineers installed four monitoring wells at the site. The monitoring wells were completed to depths between 2.5 ft and 10 ft bgs. Soil samples from the monitoring well borings showed benzene contamination above 0.03 mg/kg, the MTCA Method A Cleanup Level for benzene in soil.

GeoEngineers completed a Site Characterization Activities Report in November 1998. The report documented the completion of four soil borings, converted to groundwater monitoring wells at the site. Soil and groundwater samples were collected from the borings. The soil and groundwater samples were analyzed for gasoline, diesel, heavy oil, MTBE, and BTEX. Soil sample results showed benzene contamination, while groundwater sample results showed substances of concern below their respective MTCA Method A Cleanup Levels.

Two additional groundwater monitoring wells, well numbers five and six, were installed in April 2001. Soil and groundwater samples were collected from the monitoring well borings. The sample results showed BTEX, gasoline, diesel, and heavy oil contamination above their respective MTCA Method A Cleanup Levels.

In June 2001 GeoEngineers completed a Delineation Assessment in order to further investigation subsurface conditions. Two additional monitoring wells were installed. One monitoring well was installed at an off-site location southwest of the bulk plan. The other monitoring well was installed at an on-site location east of the oil-water separator. Five soil samples and two groundwater samples were collected for BTEX, gasoline, diesel, heavy oil, and MTBE analysis. The sample results showed that groundwater contamination had migrated off-site to the southeast.

GeoEngineers completed a Delineation Assessment Report in February 2003. The report assessed a drainage ditch beyond the southern boundary of the site to determine if contamination was migrating off-site. The assessment confirmed that surface contamination from the ASTs was migrating off-site.

In December 2003 GeoEngineers completed an additional Delineation Assessment Report. The report detailed the completion of two additional groundwater monitoring wells at the site. Soil samples collected from the well borings were analyzed for volatile organic compounds, gasoline, diesel, and total metals. The soil sample results returned below the MTCA Method A Cleanup Levels for all substances of concern. No groundwater samples were collected at this time.

A Supplemental Soil Investigation Report was completed by Delta Environmental Consultants Inc. in September 2005. A total of 23 shallow soil borings were completed at the site to further define the shallow soil contamination. The borings were completed to depths between 2 ft and 5 ft bgs. Sixteen soil samples were collected from the 23 soil borings for gasoline, diesel, heavy oil, BTEX, MTBE, and naphthalene analysis. The soil sample results showed gasoline, diesel, heavy oil, benzene, toluene, xylene, and naphthalene above their respective MTCA Method A Cleanup Levels.

Delta Environmental Consultants Inc conducted an Additional Soil Investigation Report in August 2007 to delineate previously identified impacted areas at the site. A total of 33 soil borings of varying depths were completed in four main areas of concern. The four areas of concern are: near the ASTs, west and south of the warehouse, south of the loading rack, and west and east of the cardlock. Twenty

of the soil borings were from previously identified locations of soil contamination; 13 samples were completed from new locations in order to further delineate the extent of the soil contamination. The soil sample results showed the most impacted soils were from the AST area. Soil contamination was also identified in the area southeast of the truck unloaders, west of the western outfall, and south of the loading rack. The impacted areas were estimated to contain approximately 745 tons of contaminated soil extending 2.5 ft to 5 ft bgs.

In March 2008 Delta Consultants Inc completed a Soil Excavation Report documenting soil excavation conducted in advance of anticipated facility upgrades to the ASTs and pumps. Approximately 197 cubic yards of surface soil was removed from the AST area and the pump area. Excavation was limited by shallow groundwater and existing structures. Soil samples confirmed remaining soil contamination at the excavation's boundaries.

Routine quarterly groundwater monitoring was conducted from June 2000 through December 2009. Additional groundwater monitoring was conducted in March and June 2010, December 2011, February and August 2012, and February and August 2013. Groundwater sample results showed persistent elevated levels of gasoline, diesel, heavy oil, and benzene above their respective MTCA Method A Cleanup Levels.





SPECIAL CONSIDERATIONS (include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):

The scope of this Site Hazard Assessment did not include a hydrogeologic survey of the subject site and surrounding area. The groundwater contamination documented or inferred at the subject site is therefore considered to have the potential to impact any well located within the prescribed 2-mile radius and all such wells were used in the scoring process.

An additional and unrelated release of diesel occurred at the site in March 2012. The release occurred as a result of human error. A tank valve was left open, the valve drained into the containment which overflowed into the oil-water separator, which flowed into a storm water ditch on the south site of the property. A total estimated volume of 100 gallons of diesel was released to the storm water ditch. A total of 6,043 gallons of diesel and impacted water was removed from the storm drain with a vactor truck. A surface water sample was collected from the "discharge of the under flow weir." The surface water sample returned with diesel, heavy oil, BTEX, and naphthalene below their respective MTCA Method A Cleanup Levels. This incident was granted the status of "No Further Action," and was not used in scoring this site.

#### **ROUTE SCORES:**

Surface Water/Human Health: 25.9 => 4 Air/Human Health: 48.5 => 5 Groundwater/Human Health: 54.4 => 5 Surface Water/Environmental.: 58.7 => 5 Air/Environmental: 14.6 => 3

OVERALL RANK: <u>1</u>

#### WORKSHEET 2 **Route Documentation**

#### 1. SURFACE WATER ROUTE

a. List those substances to be <u>considered</u> for scoring:

TPH as gasoline (from benzene), TPH as diesel (from naphthalene), benzene, ethyl benzene, xylene, and naphthalene were confirmed in surface and subsurface soils at the site.

b. Explain basis for choice of substance(s) to be used in scoring.

TPH as gasoline and xylene will be used due to their confirmed presence at the site. No additional substances of concern will be used due to the two above mentioned substances having the highest values for toxicity and solubility.

c. List those management units to be considered for scoring: Source: 1.2.3

Tanks, spills, discharges, and contaminated soil

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

Tanks, spills, discharges, and contaminated soil will be the management unit used for scoring due to contaminated surface and subsurface soils and groundwater, verified through sampling and analysis

#### 2. AIR ROUTE

a. List those substances to be considered for scoring:

TPH as gasoline (from benzene), TPH as diesel (from naphthalene), benzene, ethyl benzene, xylene, and naphthalene.

b. Explain basis for choice of substance(s) to be used in scoring:

TPH as gasoline and xylene will be used doe to their confirmed presence at the site. No additional substances of concern will be used due to the two above mentioned substances having the highest values for toxicity and solubility.

c. List those management units to be considered for scoring: Source: 1,2,3

Tanks, spills, discharges, and contaminated soil

d. Explain basis for choice of unit to be <u>used</u> in scoring:

Tanks, spills, discharges, and contaminated soil will be the management unit used for scoring due to contaminated surface and subsurface soils and groundwater, verified through sampling and analysis

#### 3. GROUNDWATER ROUTE

a. List those substances to be considered for scoring:

Source: 1.2.3

Source: 1.2.3

Source: 1,2,3

TPH as gasoline (from benzene), TPH as diesel (from naphthalene), benzene, ethyl benzene, xylene, and naphthalene

b. Explain basis for choice of substance(s) to be <u>used</u> in scoring:

TPH as gasoline and xylene will be used doe to their confirmed presence at the site. No additional substances of concern will be used due to the two above mentioned substances having the highest values for toxicity and solubility

c. List those management units to be <u>considered</u> for scoring: Source: 1,2,3

Tanks, spills, discharges, and contaminated soil

d. Explain basis for choice of unit to be <u>used</u> in scoring:

Tanks, spills, discharges, and contaminated soil will be the management unit used for scoring due to contaminated surface and subsurface soils and groundwater, verified through sampling and analysis

# WORKSHEET 4

### Surface Water Route

#### **1.0 SUBSTANCE CHARACTERISTICS**

1.1	1.1 Human Toxicity									
		Drinking		Acute		Chronic		Carcino	Carcinogenicity	
	Substance	vater Standard (μg/L)	Value	Toxicity (mg/ kg-bw)	Value	Toxicity (mg/kg/day)	Value	WOE	PF*	Value
1	TPH as Gasoline (from benzene)	5	8	3306	3	ND	ND	А	0.02 9	5
2	Xylene	10,000	2	50	10	2	1	ND	ND	ND
3										
4										
5										
6										

\* Potency Factor

Source: 1,2,3 Highest Value: 10 (Max = 10)Plus 2 Bonus Points? 2 Final Toxicity Value: 12 (Max = 12)

1.2	Environmental Toxicity () Freshwater		()	X) Marine	
	Substance			Acute Water Quality Criteria	Non-Human Mammalian Acute Toxicity

		(µg/L)	Value	(mg/kg)	Value
1	TPH as Gasoline (from benzene)	5100	2	3306	3
2	Xylene		ND	05	10
3					
4					
5					
6					

Source: 2,3

Highest Value: 10 (Max = 10)

1.3	Substance Quantity	
Explain docume	<b>Basis:</b> The substance quantity was based on the total volume of all the ASTs ented to have been at the site. A value of 120,000 gallons was used for scoring.	Source: 1,2 Value: 6 (Max = 10)

# 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment</b> <b>Explain basis:</b> Spill, discharge, or contaminated oil at the surface with no run-on/runoff control or unknown controls	1,2	<b><u>10</u></b> (Max = 10)
2.2	Surface Soil Permeability: Udorthents	2,8	(Max = 7)
2.3	Total Annual Precipitation: 60.1-70 inches	2,4	<u>5</u> (Max = 5)
2.4	Max 2yr/24hr Precipitation: 3.48 inches	2,15	<u><b>3</b></u> (Max = 5)
2.5	Flood Plain: This site lies within the 500 year flood plain	2,14	<b><u>1</u></b> (Max = 2)
2.6	<b>Terrain Slope:</b> Approximately 8 ft elevation change over a distance of 520 ft to Fry Creek. The calculated slope is 1.5%	2,7,16	$\frac{1}{(Max = 5)}$

# **3.0 TARGETS**

		Source	Value
21	Distance to Surface Water: Fry Creek lies approximately 520 feet east of	27	10
3.1	the subject site	2,7	(Max = 10)
	Population Served within 2 miles (see WARM Scoring Manual		_
3.2	<b>Regarding Direction</b> ): Approximately 27 residents served by surface water	2,7,9,10	$\frac{5}{(May - 75)}$
	within two miles of the subject site		(Ividx = 73)

3.3	Area Irrigated by surface water within 2 miles : $(0.75)*\sqrt{\# \text{ acres}} =$ Approximately 11 acres irrigated by surface water within two miles of the subject site	2,7,9,10	<b><u>2</u></b> (Max = 30)
3.4	<b>Distance to Nearest Fishery Resource:</b> The nearest fishery resource is Grays Harbor, which supports many species of salmon and trout. Grays Harbor lies approximately 2,100 ft southwest of the subject site	2,7,17	<b>9</b> (Max = 12)
3.5	<b>Distance to, and Name(s) of, Nearest Sensitive Environment(s):</b> The nearest fishery resource is Grays Harbor, which supports many species of salmon and trout. Grays Harbor lies approximately 2,100 ft southwest of the subject site	2,7,17	<b>9</b> (Max = 12)

## 4.0 RELEASE

Explain Basis: Documented release to surface and subsurface soils make the substances	Source: 1,2
of concern available to the surface water route. Documentation of a confirmed release	Value: 0
to surface water was not provided.	(Max = 5)

## WORKSHEET 5 Air Route

## **1.0** SUBSTANCE CHARACTERISTICS

## **1.1.** Introduction (WARM Scoring Manual) – Please review before scoring

1.	2 Human Toxicity									
		Air	N/ I	Acute	X7.1	Chronic	Carcinogenicity		genicity	
	Substance	$(\mu g/m^3)$	Value	$(mg/m^3)$	Value	Toxicity (mg/kg/day)	Value	WOE	PF*	value
1	TPH as Gasoline (from benzene)	0.12	10	31,947	3		ND	А	0.02 9	5
2	Xylene	1,448.6	1	21,714	3	0.085	1			ND
3										
4										
5										

\* Potency Factor

Source: 1,2,3 Highest Value: 10 (Max = 10)

Plus 2 Bonus Points? 0 Final Toxicity Value: 10

1.	<b>1.3</b> Mobility (Use numbers to refer to above listed substances)							
	1.3.1 Gaseous Mobility1.3.2 Particulate Mobility							
	Vapor Pressure(s) (mmHg)	Soil Type		Erodibility	Climatic Factor			
1	9.70E + 01 = 4	Udorthents	22		<1			
2	1.00E + 01 = 3	Udorthents	22		<1			
3								
Source: 2,3				S	ource: 1,2,8			
	<b>Value: 4</b> (Max = 4)				<b>Value: 0</b> (Max = 4)			

 1.4
 Highest Human Health Toxicity/ Mobility Matrix Value (from Table A-7)

 (Use highest of:
 )

 Final Matrix Value: 20

(Max = 24)

1.5	Environmental Toxicity/Mobility –					
	Substance	Non-human Mammalian Inhalation Toxicity (mg/m <sup>3</sup> )	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	TPH as Gasoline (from Benzene)	31,947	3	9.70E+01	4	6
2	Xylene	21,714	3	1.00E+01	3	5

Highest Environmental Toxicity/Mobility Matrix Value (Table A-7) = **Final Matrix Value: 6** (Max = 24)

1.6 Substance Quantity	
<b>Explain Basis:</b> The substance quantity was based on the total volume of all the USTs documented to have been at the site. A value of 148,000 gallons was used	e ASTs and for scoring. Source: 1,2 Value: 7 (Max = 10)

# 2.0 MIGRATION POTENTIAL

Source Value

2.1	Containment: Discharges/spills directly onto ground surface	1,2	<b>10</b> (Max = 10)
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# **3.0** TARGETS

		Source	Value
31	Nearest Population: The nearest residence lies approximately 220 feet north	27	10
3.1	of the subject site	2,7	(Max = 10)
	Distance to [and name(s) of] nearest sensitive environment(s):		2
3.2	The nearest sensitive environment is a wetland that lies approximately 3,800	2,13	(Max - 7)
	ft west of the subject site		(IVIAX = 7)
3.3	Population within 0.5 miles: Approximately 2004 residents within a half	27	45
	miles of the subject site	2,7	(Max = 75)

# 4.0 RELEASE

Explain Basis for scoring a release to air:	Source: 1,2
Documented release to surface and subsurface soils make the substances of concern	Value: 0
available to the air route. Documentation of a confirmed release to air was not	(Max = 5)
provided.	

# WORKSHEET 6 Groundwater Route

## **1.0 SUBSTANCE CHARACTERISTICS**

1.1	1.1 Human Toxicity									
Substance		Drinking	nking ater ndard g/L)	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		
		vvater Standard (µg/L)						WOE	PF*	Value
1	TPH as Gasoline (from benzene)	5	8	3306	3	ND	ND	А	0.02 9	5
2	Xylene	10,000	2	50	10	2	1	ND	ND	ND
3										
4										
5										
6										

\* Potency Factor

Source: 1,2,3 Highest Value: 10 (Max = 10) Plus 2 Bonus Points? 2 Final Toxicity Value: 12 (Max = 12)

Mobility (use numbers to refer to above listed substances)				
Cations/Anions [Coefficient of Aqueous Migration (K)]	OR Solubility (mg/L)			
1=	1 = 1.80E + 03 = 3			
2=	<b>2</b> = 2.00E+02 = 2			
3=	3 =			
4=	4=			
5=	5=			
6=	6=			

Source: 2,3 Value: 3 (Max = 3)

## **1.3** Substance Quantity:

<b>Explain basis:</b> The substance quantity was based on the total volume of all the ASTs and USTs documented to have been at the site. A value of 148,000 gallons was used for scoring.	Source: 1,2 Value: 7 (Max=10)
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## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment (explain basis):</b> Spills, discharges, and contaminated soils are scored with a value of 10	1,2	<u><b>10</b></u> (Max = 10)
2.2	Net precipitation: 60.1-70 inches	2,4	$\frac{5}{(Max = 5)}$
2.3	Subsurface hydraulic conductivity: Udorthents	2,8	$\frac{4}{(Max = 4)}$
2.4	<b>Vertical depth to groundwater:</b> Gasoline and benzene were confirmed in groundwater at the site through sample analysis	1,2	(Max = 8)

## 2.0 TARGETS

		Source	Value
3.1	<b>Groundwater usage:</b> Private supply, but no alternate unthreatened sources available	2,5,6	<b><u>5</u></b> (Max = 10)
3.2	<b>Distance to nearest drinking water well:</b> The nearest well is located approximately 290 feet SW of the subject site	2,5,7,12	(Max = 5)
3.3	<b>Population served within 2 miles:</b> Approximately 18 residents served by groundwater within two miles of the subject site	2,5,6	<b><u>4</u></b> (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: (0.75)* $$ Approximately 12 acres irrigated by groundwater within two miles of the subject site	2,9,10	<b><u>3</u></b> (Max = 50)

# 3.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Gasoline and benzene	1.2	5
were confirmed in groundwater at the site through sample analysis	1,2	(Max = 5)

### SOURCES USED IN SCORING

- 1. Washington State Department of Ecology Site Hazard Assessment File/TCP file
- 2. Washington State Department of Ecology, WARM Scoring Manual, April 1992
- 3. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
- 4. U.S. Department of Interior Geological Survey Topographical Map
- 5. Washington State Department of Health, Public Water System Database
- 6. Washington State Department of Ecology, Water Resources Explorer
- 7. Grays Harbor County GIS map
- 8. Washington State Department of Agriculture, soil maps
- 9. Washington State Department of Ecology Water Rights Tracking System
- 10. GeoCommunicator, Land Survey Information System
- 11. Model Toxics Control Act, Statue and Regulation, November 2007
- 12. Washington State Department of Ecology Well Log Viewer
- 13. Washington State Department of Ecology, Washington State Costal Atlas Map
- 14. Washington State Department of Ecology, Costal Atlas, Flood Hazard Maps
- 15. NOAA Atlas 2 Precipitation Frequency Estimates
- 16. Daft Logic, Google Maps Find Altitude
- 17. U.S. Fish & Wildlife Service, Critical Habitat Portal