SITE HAZARD ASSESSMENT

WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Site Name: Lamb Grays Harbor Co
Address: Blaine Street and Firman Street, Hoquiam
Ecology Facility Site ID No.: 97672932
Section/Township/Range: 10/17N/10W
Latitude: 46.97929 Longitude: -122.90367

Site scored/ranked for the February 2014 update
Today's date: 08/19/2013

SITE DESCRIPTION:

The subject site consists of five localized tax parcels designated as "Industrial Land" and "Misc. Manufacturing," in an area of Hoquiam zoned for mixed industrial, commercial, and residential uses. Some of the parcels are separated, north from south, by a railroad transportation line. The associated parcels are listed below:

052001200000	052000100001	052000100002
517101011001	056401000600	

The site is irregular in shape, occupies approximately 84 acres, and rests at approximately 14 feet above mean sea level. Firman Avenue borders the property to the north and Adams Street provides the eastern boundary. Approximately 470 feet south, beyond the southernmost property boundary, lies Grays Harbor.

Currently the site houses several buildings, which are no longer in use, and a packaging system manufacturer. The majority of this site's acres are unpaved; however, the majority of the soil in the vicinity of the buildings is paved. The Lamb facility, which ceased operations in December of 2001, had been a machinery manufacturing facility for pulp and paper equipment since the early 1900s.

In April of 1986, the Washington State Department of Ecology (Ecology) received documentation regarding the removal of three underground storage tanks (USTs), of varying volume and documented to have contained fuel oil, diesel, and leaded gasoline. Documentation was also received regarding an above ground storage tank (AST) reportedly containing between 1,000-4,999 gallons of diesel fuel. No environmental assessment was completed for these tank removals.

In April of 1990, Ecology received a notice of permanent closure for a 5,000 gallon UST, documented to have contained Bunker C oil, and a 2,000 gallon UST, documented to have contained gasoline. An additional AST was documented at the site; its contents and size, however, were not noted.

In May of 1990, Ecology received a notice of permanent closure for a 500 gallon UST documented to have contained diesel fuel. This UST was noted to have been closed in place with cement slurry. No environmental assessment was conducted.

In December of 2000, a Phase I Environmental Site Assessment was completed by Clayton Group Services Inc. The Site Assessment was completed in order to assess the property and provide a professional opinion regarding the recognized environmental conditions, evidence of releases, and threats of potential releases.

In March of 2005, Ecology received a complaint through the Environmental Report Tracking System, regarding the release of paint thinners and lubricants to the surrounding soil. The reporting party stated the practice of releasing these compounds to the soil had been occurring for years.

In April of 2005, Ecology requested access to the property, and a site visit was conducted by Ecology in May of 2005. The complaint focused around the paint and welding shops, located south of the rail road. No containment was noted for storage drums, the drums were documented to contain holes and cracks. Widespread oil staining was documented at the site. Three soil samples were collected from the soil in the vicinity of the painting and welding shops, and two samples were compiled from the collecting pits in the main machine shop on the property. The soil samples returned below the MTCA Method A Cleanup Level for petroleum, however, the samples taken from the collecting pits contained significant amounts, including free product, of petroleum.

In September of 2005, Ecology added the subject site to the Confirmed or Suspected Contaminated Sites List (CSCSL), as a state cleanup site awaiting a Site Hazard Assessment.

In November of 2005, Ecology received an Environmental Clean-Up Report completed by Evergreen Environmental Inc. The report documented the collection of miscellaneous loose containers of hazardous materials and the clean-up process for the four sump pumps located on the property.

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.

ROUTE SCORES:

Surface Water/Human Health: **27.0**
Surface Water/Environmental.: **70.2**
Air/Human Health: **65.0**
Air/Environmental: **38.3**
Groundwater/Human Health: **34.1**

OVERALL RANK: 1

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**

   a. List those substances to be considered for scoring: Source: 1,2,3,11

   TPH as Diesel (from Naphthalene), TPH as Gasoline (from Benzene), Toluene, Ethyl benzene, Xylene, n-Hexane, Dibromoethane, 1-2, Dichloroethane, 1-2, Methyl tertiary-butyl ether (MTBE), Lead, cPAHs (as benzo(a)pyrene)

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

   TPH as gasoline and lead will be used due to the fact that leaded gasoline was documented to be on the site and available to the groundwater route. Xylene will be used as it is a common compound found in gasoline and is presumed to be present with gasoline contamination, unless proven otherwise.

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

   Spills, discharges and contaminated soil

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

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

2. **AIR ROUTE**

   a. List those substances to be considered for scoring: Source: 1,2,3,11

   TPH as Diesel (from Naphthalene), TPH as Gasoline (from Benzene), Toluene, Ethyl benzene, Xylene, n-Hexane, Dibromoethane, 1-2, Dichloroethane, 1-2, Methyl tertiary-butyl ether (MTBE), Lead, cPAHs (as benzo(a)pyrene)

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

   TPH as gasoline and lead will be used due to the fact that leaded gasoline was documented to be on the site and available to the groundwater route. Xylene will be used as it is a common compound found in gasoline and is presumed to be present with gasoline contamination, unless proven otherwise.

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

   Spills, discharges and contaminated soil

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

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

3. **GROUNDWATER ROUTE**

   a. List those substances to be considered for scoring: Source: 1,2,3,11

TPH as Diesel (from Naphthalene), TPH as Gasoline (from Benzene), Toluene, Ethyl benzene, Xylene, n-Hexane, Dibromoethane, 1-2, Dichloroethane, 1-2, Methyl tertiary-butyl ether (MTBE), Lead, cPAHs (as benzo(a)pyrene)

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

TPH as gasoline and lead will be used due to the fact that leaded gasoline was documented to be on the site and available to the groundwater route. Xylene will be used as it is a common compound found in gasoline and is presumed to be present with gasoline contamination, unless proven otherwise.

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

Spills, discharges and contaminated soil

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

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

WORKSHEET 4
Surface Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity WOE	Carcinogenicity PF*	Value
1	Lead	5	8	8	--	ND	--	ND	--	--
2	TPH as Gasoline (from Benzene)	5	8	3306	3	--	ND	A	0.029	5
3	Xylene	10,000	2	50	10	2	1	--	--	ND
4										
5										
6										

* *Potency Factor*

Source: 1,2,3,11

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12
(Max = 12)

1.2 Environmental Toxicity (X) Freshwater ( ) Marine

Substance	Acute Water Quality Criteria	Non-Human Mammalian Acute Toxicity

		(µg/L)	Value	(mg/kg)	Value
1	Lead	82	6	--	ND
2	TPH as Gasoline	5300	2	3306	3
3	Xylene	--	ND	50	10
4					
5					
6					

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

1.3 Substance Quantity	
Explain Basis: Estimated quantity is based upon the total volume for the above and underground storage tanks documented to have been on the property, approximately 12,500 gallons.	Source: 1,2 **Value: 5** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment, Explain basis:** Based upon the documented soil staining throughout the property; spill, discharge, or contaminated soil at the surface with unknown run-on/run-off controls	1,2	**10** (Max = 10)
2.2	**Surface Soil Permeability:** Manmade fill	2,8	**1** (Max = 7)
2.3	**Total Annual Precipitation:** 70.1-80 inches	2,4	**5** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** 3.46 inches	2,15	**3** (Max = 5)
2.5	**Flood Plain:** Site is within the 100 year flood plain	2,7,14	**2** (Max = 2)
2.6	**Terrain Slope:** Approximately 3.33% slope, 15.67 foot elevation change over a 470 foot area	2,7,16	**2** (Max = 5)

3.0 TARGETS

		Source	Value
3.1	**Distance to Surface Water:** Grays Harbor is approximately 470 feet south of the subject site	2,7	**10** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** Approximately 6 residents served by surface water	2,5,6	**2** (Max = 75)

3.3	**Area Irrigated by surface water within 2 miles : (0.75)*√# acres =** No documented irrigation within 2 miles	2,7, 9,10	**0** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** Grays Harbor is approximately 470 feet south of the subject site	2,7,13	**12** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** Grays Harbor is approximately 470 feet south of the subject site	2,7,13	**12** (Max = 12)

4.0 RELEASE

Explain Basis: The release was documented to surface soil which makes the substances of concern available to the surface water route, however, no release to surface water was documented	Source: 1,2 **Value: 0** (Max = 5)

WORKSHEET 5
Air Route

1.0 SUBSTANCE CHARACTERISTICS

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

1.2 Human Toxicity

	Substance	Air Standard ($\mu g/m^3$)	Value	Acute Toxicity (mg/m^3)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	TPH as Gasoline	1448.6	10	31,947	3	--	ND	A	0.029	5
2	Xylene	0.12	1	21,714	3	0.085	1	--	--	ND
3										
4										
5										

* *Potency Factor*

Source: 1,2,3,11
Highest Value: 10
(Max = 10)
Plus 2 Bonus Points?
Final Toxicity Value: 10
(Max = 12)

1.3 Mobility (Use numbers to refer to above listed substances)				
	1.3.1 Gaseous Mobility	1.3.2 Particulate Mobility		
	Vapor Pressure(s) (mmHg)	Soil Type	Erodibility	Climatic Factor
1	5.6E-03 = 4	Manmade fill	220	<1
2	7.0E-03 = 3	Manmade fill	220	<1
3				

Source: 2,3
Value: 4
(Max = 4)

Source: 2,3
Value: 2
(Max = 4)

1.4 Highest Human Health Toxicity/ Mobility Matrix Value (from Table A-7)
(Use highest of: 4)

Final Matrix Value: 20
(Max = 24)

1.5 Environmental Toxicity/Mobility –						
	Substance	**Non-human Mammalian Inhalation Toxicity (mg/m^3)**	**Acute Value**	**Mobility (mmHg)**	**Value**	**Matrix Value**
2	TPH as Gasoline	31,947	3	5.6E-03	4	6
6	Xylene	21,714	3	7.0E-03	3	5

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

1.6 Substance Quantity	
Explain Basis: Estimated quantity is based upon the total volume for the above and underground storage tanks documented to have been on the property, approximately 12,500 gallons.	Source: 1,2 **Value: 5** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment: :** Based upon the documented soil staining throughout the property; no cover or discharge/spills directly onto ground surface with no vapor collection system	1,2	**10** (Max = 10)

3.0 TARGETS

		Source	Value
3.1	**Nearest Population:** Nearest residence is approximately 60 feet from the subject site	2,7	**10** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s):** Property lays within a shrub/scrub wetland	2,13	**7** (Max = 7)
3.3	**Population within 0.5 miles:** Approximately 2,740 residents within 2 miles	2,7	**52** (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air: Petroleum odors documented during a site inspection.	Source: 1,2 **Value: 5** (Max = 5)

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Lead	5	8	8	--	ND	--	ND	--	--
2	TPH as Gasoline (from Benzene)	5	8	3306	3	--	ND	A	0.029	5
3	Xylene	10,000	2	50	10	2	1	--	--	ND
4										
5										
6										

* *Potency Factor*

Source: 1,2,3,11

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? 8

Final Toxicity Value: 12
(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)

Cations/Anions [Coefficient of Aqueous Migration (K)]	OR Solubility (mg/L)
1=	1= --
2=	2= 1.8E+03 = 3
3=	3 = 2.0E+02 = 2
4=	4=
5=	5=
6=	6=

Source: 2,3

Value: 3
(Max = 3)

1.3 Substance Quantity:

Explain basis: Estimated quantity is based upon the total volume for the above and underground storage tanks documented to have been on the property, approximately 12,500 gallons.	Source: 1,2 **Value: 5** (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** For all spills, discharges, and contaminated soil, a value of 10 is assigned	1,2	**10** (Max = 10)
2.2	**Net precipitation:** 70.1-80 inches	2,4	**5** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Manmade fill	2,8	**4** (Max = 4)
2.4	**Vertical depth to groundwater:** Documented at 91 feet	1,2,12	**4** (Max = 8)

2.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Private supply with alternate sources available	2,5,6	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** Nearest well is located approximately 1,300 feet northwest of the subject site	2,5,7	**3** (Max = 5)
3.3	**Population served within 2 miles:** Approximately 21 residents served by groundwater	2,5,6	**3** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** **(0.75)*√**No documented irrigation within 2 miles	2,7,9,10	**0** (Max = 50)

3.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: The release was documented to soil which makes the substances of concern available to the groundwater route, however, no release to groundwater was documented	1,2	**0** (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. Google Maps Find Altitude