SITE HAZARD ASSESSMENT

WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Mason County Salvage Yard
1840 W. Cloquallum Road
Shelton, Mason County, WA 98584

Section/Township/Range: Sec 36/T20N/R04E
Latitude: 47° 10' 42.8" Longitude: 123° 7' 8.4"

Ecology Facility Site ID No.: **7638537**

Site scored/ranked for the August 2008 update
April 7, 2008

Site Description (Include management areas, substances of concern, and quantities):

Property Description

The subject site is located at 1840 W. Cloquallum Road, Shelton, Washington 98584. The site is owned and operated by Lawrence King, Jr. The two and half acre facility is located in a somewhat rural area. Private homes surround the salvage yard. Lake Isabella is located in the near vicinity. The yard is located on a slope that drains downward to a roadside ditch; this ditch most likely discharges to the lake. The facility has a large covered shop. When wrecked vehicles are brought in, they are immediately placed in the unpaved yard with all fluids in place. The ground is moderately stained with oil in this area. Fluids, including fuels, are drained into 55-gallon drums prior to crushing. The facility operates five days a week and normally employs three full-time people.

Geology

The subsurface soils consist of sandy, rocky, clay type material to a depth of about eight (8) feet. The yard is located on a slope that drains downward to a roadside ditch; this ditch has the potential of discharges to Lake Isabella. Groundwater is suspected to be approximately fifty feet below ground surface (bgs). The direction of flow is undetermined.

History

The current owner, Lawrence G. King Jr., purchased the property on March 19, 2007. According to the previous owner, Lawrence G. and Vickie King, the property has been used for vehicle wrecking since the mid 1990's. It has been reported that the site had been a wrecking yard approximately 40 years. The Washington Department of Ecology (Ecology), Southwest Regional Office (SWRO) received a complaint (ERTS #529875) on October 29, 2002, regarding potential contamination at the referenced site through spilling hydraulic fluid, gasoline, and oil onto the ground.

Initial Investigation

On December 19, 2002, Ecology met with Larry King, owner of the property and explained the reason for my visit. Mr. King accompanied us during the visit. At that time, my field observations indicated very little petroleum-impacted soil. However, the petroleum odors were strong. Mr. King will allow Ecology staff to return after a good rain storm to conduct an initial investigation. Before leaving the site, it was pointed out to Mr. King an area in the driveway that indicated petroleum-impacted soil. Mr. King said they would remove the dirt and place the soil in a five gallon buckets for future disposal. Visual observations confirmed the lack of BMP's and water run-off.

On February 3, 2003, Ecology revisited the site. During the inspection, the smell of gasoline and visual observation of dark surface staining, and I detected strong petroleum product odors inside the entry gateway on the east side of the property. Photographs were taken and three soil samples were collected. The depth of the petroleum in the soil was approximately three to seven inches deep, about 12" wide and approximately four feet long.

Table 1. Soil Sampling Results

Sample ID	Analyte	Concentration	MTCA Method A Soil Cleanup Level
1. #03068000	NWTPH-Dx (Lube Oil)	76,500 mg/Kg dw	2000 mg/kg
2. #03068001	NWTPH-Dx (Lube Oil)	6,100 mg/Kg dw	2000 mg/kg

See attached map for sample locations. All samples were stored on ice immediately and forwarded to Manchester Laboratory for NWTPH-Dx analysis. Laboratory results indicate the two soil samples above current MTCA Method A Soil Cleanup Levels for Unrestricted Land Use in samples 1 and 2 (Table 1.) On July 28, 2004, an Early Notice Letter was sent to the site owner notifying him the

site was being added to Ecology's Confirmed and Suspected Contaminated Sites List, with a status of awaiting assessment.

Site Hazard Assessment (SHA)

On April 25, 2007, Ecology sent a letter notifying the owner, Larry G. King, Sr. that an SHA would be conducted on the site regarding the site's current condition. On May 17, 2007, I met with Mr. King and was given permission to access the property. Historic land-use activities at the Mason County Salvage Yard site included salvage of automobiles, batteries, transformers, and tires.

Soil, lube oil, potential polychlorinated biphenyls (PCBs) and lead exceeded state standards for direct human contact. The site is zoned industrial, is accessible to the interstate highway system and is surrounded by a partial fence. Groundwater in Mason County is shallow and very vulnerable to contamination, because it is sandy and lacks natural protection. Petroleum products, such as gasoline, diesel, and fuel oil are the most commonly spilled substances. Other include paints, solvents and fluids of various kinds, including transmission fluids, hydraulic fluid, and transformer fluid. During my inspection of the yard, numerous small and large stains of oil were observed throughout the yard. Crushing of vehicles still occurs outside in an uncovered and unpaved area. Lake Isabell is located in the near vicinity. Part of the site is covered by the building and paved surface driveway. I collected four soil samples from the wrecking yard at a depth ranging from 2'–3'. The sample results are tabulated below. All units are in mg/Kg.

May 17, 2007

Sample ID **Analyte and Concentration**

Sample (depth)	HCID	VOA	Volatile Organic Analysis	NWTPH-Dx
07214000	ND-soil			
07214001	ND-soil			
07214002	Lube oil-Groundwater	1300 mg/Kg dw	Acetone 193 ug/Kg dw, Methylene Chloride 2.5 ug/Kg dw, 2-Butanone 58 ug/Kg dw	1300 mg/Kg dw
07214003	ND-soil			

MTCA Method A Soil Cleanup Level for Unrestricted Land Use is 2000 mg/kg

Upon request from the Manchester Laboratory, Ecology revisited the site and collected additional four soil samples (6-7" deep) from the wrecking yard on June 14, 2007.

June 14, 2007

Sample ID Analyte and Concentration

Sample (Depth)	**Hydrocarbon Identification**	**NWTPH-Dx Analysis**	**Semivolatiles**
07254010	Lube Oil	2700 mg/Kg	Retene 21ug/Kg dw
07254011	Lube Oil	2000 mg/Kg	Phenol 61 ug/Kg dw; Retene 146 ug/Kg dw; 1,2 Diphenylhydrazine 21 ug/Kg dw Butyl benzyl phthalate, bis(2-ethylhexeyl) phthalates
07254012	Lube Oil	890 mg/mg/Kg	
07254013	Lube Oil	8100 mg/Kg	

Conclusions and Recommendations

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):**
When scoring "migration potential" for the groundwater route, the scorer viewed well logs from wells within close proximity to the referenced site.

Route Scores:

Surface Water/Human Health: **23.9**
Air/Human Health: **12.5**
Groundwater/Human Health: **32.5**
Surface Water/Environmental.: **31.4**
Air/Environmental: **NS**

OVERALL RANK: 3

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**

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

   Lead, bis(2-ethylhexeyl) phthalates, butyl benzyl phthalate, and total petroleum hydrocarbons-heavy oil (TPH-heavy oil)

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

   These substances were detected on-site in surface samples in significant concentrations, and are potentially available to the route of concern.

   c. List those management units to be considered for scoring: Source 2-4

   Surface soils.

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

   The contaminating substances were detected on-site in surface soils in significant concentrations.

2. **AIR ROUTE**

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

   Lead, bis(2-ethylhexeyl) phthalates, butyl benzyl phthalate, and total petroleum hydrocarbons-heavy oil (TPH-heavy oil)

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

   These substances were detected on-site in surface samples in significant concentrations, and are potentially available to the route of concern.

   c. List those management units to be considered for scoring: Source: 2-4

   Surface soils.

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

   The contaminating substances were detected on-site in surface soil samples in significant concentrations.

3. **GROUNDWATER ROUTE**

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

Lead, bis(2-ethylhexeyl) phthalates, butyl benzyl phthalate, and total petroleum hydrocarbons-heavy oil (TPH-heavy oil)

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

These substances were detected on-site in surface soil samples in significant concentrations, and are potentially available to the route of concern.

c. List those management units to be considered for scoring: Source: 2-4

Surface and subsurface soils and groundwater.

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

The contaminating substances were detected on-site in surface soil samples in significant concentrations.

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	15	6	ND	-	<0.001 (NOAEL)	10	ND	ND	-
2	Bis (2-ethylhexyl) phthalate	ND	-	30,600 (rat)	1	0.02	1	A=.8	.014 = 5	4
3	Butyl benzyl phthalate	4	8	2330 (rat)	3	0.2	1	ND	ND	1
4	TPH-Other (Heavy oil)	ND	-	ND	-	0.040 (RfD)	1	ND	ND	-

* *Potency Factor*

Source: 2,3,5

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 (µg/L)	Value	Non-Human Mammalian Acute Toxicity (mg/kg)	Value
1	Lead	82	6	-	-
2	Bis(2-ethylhexyl) phthalate	2944	2	-	-
3	Butyl benzyl phthalate	2944	2	-	-
4	TPH-Other	ND	-	ND	-

Source: 2,3,5

Highest Value: 6
(Max = 10)

1.3 Substance Quantity

Explain Basis: Unknown, use default value = 1

Source: 2,4,6

Value: 1
(Max = 10)

2.0 Migration Potential

		Source	Value
2.1	**Containment:** Maximum value of 10 points scored. **Explain basis::** Contaminated surface soil, no run-on/runoff control system or cover	2,4,6	**10** (Max = 10)
2.2	**Surface Soil Permeability:** Clayey sands	2-4	**3** (Max = 7)
2.3	**Total Annual Precipitation:** 21.9"	7	**2** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** 3.0" – 4.0"	6	**3** (Max = 5)
2.5	**Flood Plain:** Not in flood plain	2,4,6	**0** (Max = 2)
2.6	**Terrain Slope:** 2%	2,6,10	**1** (Max = 5)

3.0 Targets

		Source	Value
3.1	**Distance to Surface Water:** <1000 feet	2,6,10	**10** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** $\sqrt{(6 \times 3)} = 4.2 = 4$	8	**4** (Max = 75)
3.3	**Area Irrigated by surface water within 2 miles : (0.75)*$\sqrt{}$ # acres =** $0.75 * \sqrt{125} = 8.38 = 8$	8	**8** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** 3500 feet	2,4,10	**6** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** fishery resource/wetlands 3500 feet	2,4,10	**6** (Max = 12)

4.0 Release

Explain Basis: None documented	Source: 1-3 **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 WOE	Carcinogenicity PF*	Value
1	Lead		10	ND	-	ND	-	ND	ND	-

** Potency Factor*

Source: 2-3,5

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? No

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		Clayey sands	>30 – 80 (best fit range)	<1
2				

Source: 5

Value: 3
(Max = 4)

Source: 2,4,6

Value: 1
(Max = 4)

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

Final Matrix Value: 5
(Max = 24)

1.5 Environmental Toxicity/Mobility –

	Substance	Non-human Mammalian Inhalation Acute Toxicity (mg/m^3)	Value	Mobility (mmHg)	Value	Matrix Value
1	No Data					
2						

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

1.6 Substance Quantity	
Explain Basis: Unknown, use default value = 1	Source: 2,4,6 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** Spill to ground surface, no cover, no vapor collection system	1-3	**10** (Max = 10)

3.0 TARGETS

		Source	Value
3.1	**Nearest Population:** < 1000'	2-4,10	**10** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s):** NA	2-4,10	**NA** (Max = 7)
3.3	**Population within 0.5 miles:** $\sqrt{661}$ = 25.7 = 26	11	**26** (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air:	
None documented.	Source: 1-4 **Value: 0** (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	15	6	ND	-	<0.001 (NOAEL)	10	ND	ND	-
2	Bis (2-ethylhexyl) phthalate	ND	-	30,600 (rat)	1	0.02	1	A=.8	.014 = 5	4
3	Butyl benzyl phthalate	4	8	2330 (rat)	3	0.2	1	ND	ND	1
4	TPH-Other (Heavy oil)	ND	-	ND	-	0.040 (RfD)	1	ND	ND	-

* *Potency Factor*

Source: 2,3,5

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? 2

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= Lead = 0.1 – 1.0 = 2	1=
2=	2= 4.0E-01 = 0
3=	3 = 2.7E+00 = 0
4=	4= <10 = 0

Source: 2,3,5,6

Value: 2
(Max = 3)

1.3 Substance Quantity:

Explain basis: Unknown for this route, use default = 1

Source: 2-4,6

Value: 1
(Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** Spill, discharge to ground surface, no cover or liner	1-4	**10** (Max = 10)
2.2	**Net precipitation:** 14.4" – 3.3" = 11.1"	7	**2** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Clayey sands	2,3	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** 50 - 100 feet	8,9	**4** (Max = 8)

2.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Public supply, unthreatened alts. avail.	8,9	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** 600 – 1300 feet	8,9	**4** (Max = 5)
3.3	**Population served within 2 miles:** $\sqrt{(195 + 390)} = 24.1$	8,9,	**24** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** **(0.75)*√355 acres** = 14.1	8,9	**14** (Max = 50)

3.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: No analytical data.	2,3	**0** (Max = 5)

SOURCES USED IN SCORING

1. Annual inspection (fire) of "1905 Marine View Drive", Lt. Brian Trunk, Tacoma Fire Department, June 21, 2002.
2. Initial Investigation Reports/Photographic Documentation/Sample Results, Sharon Bell and Andy Comstock, Tacoma-Pierce County Health Department, June 21 and 25, 2002.
3. Site Inspection/Sample Results, Lisa Pearson, Washington Department of Ecology, May 18, 2004.
4. SHA Site Drive-by Inspections, July 10, 2007, and November 30, 2007.
5. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
6. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
7. Washington Climate – Net Rainfall Table
8. Washington State Department of Ecology, Water Rights Application System (WRATS) printout for two-mile radius of site.
9. Washington Department of Health, Sentry Internet Database printout for public water supplies.
10. U.S.G.S. Topo map for site area.
11. Personal memo, Population Data for half-mile radius, Sharon Bell, Tacoma-Pierce County, Health Department, December 6, 2007.