

SITE HAZARD ASSESSMENT  
WORKSHEET 1  
Summary Score Sheet

**SITE INFORMATION:**

**Unocal Bulk Plant 0046**

217 E. Stueben Street  
Bingen, Klickitat County, WA 98605

Section/Township/Range: T3N/R11E/Sec 35

Latitude: 45° 43' 11"

Longitude: 121° 27' 35"

Ecology Facility Site ID No.: ~~0050704~~

*Site scored/ranked for the February 20, 2008 update*  
January 18, 2008

**SITE DESCRIPTION/BACKGROUND**

The Unocal Bulk Plant (hereinafter referred to as site) is located slightly to the east of downtown Bingen, WA, Klickitat County (Township 03N/Range 11E/Section 35), at 217 E. Stueben Street (south side of that street), occupying the area between Cherry Street (to the east) and Maple Street (west). A railway line runs along the southern border of the site.

The bulk plant was constructed in 1924, and land use prior to that is unknown. In 1990, the facilities at the site included five 20,000 gallon vertical steel above-grade storage tanks (ASTs), a loading rack and unloading platform, associated piping, pumps and reservoirs, a septic tank, an oil storage warehouse, a garage, an office building, and two detention ponds. In addition, an underground storage tank (UST) and fuel dispenser service pump operated by the bulk plant was located at the east end of the property.

**SITE INVESTIGATIONS**

A 5,000 gallon diesel UST was removed from the site in May 1989 and soil sampling of the sidewalls and floor of the 9 – 10 deep excavation (the excavated soil was left stockpiled on the site north of the excavation) showed remaining concentrations of TPH-diesel (analyzed using EPA Method 418.1) of 7920 – 9200 mg/kg (ppm), significantly in excess of the Model Toxics Cleanup Act (MTCA) Method A Cleanup level for diesel in soil of 2000 ppm. This was samples from the area of the south wall of the excavation and adjacent to the oil storage building (warehouse). It appeared that petroleum contamination likely may also extend beneath this building.

GeoEngineers conducted an environmental site characterization of the site in May 1990. Eight borings were drilled between 8 and 25 feet deep throughout the site, along with a shallow hand-dug test pit in the detention pond in the southeast corner of the site. Monitoring wells were installed in four of the

boring for collection of ground water samples, which was encountered between 6 – 14 feet below ground surface.

Only very low concentrations of gasoline components benzene (all results were reported as non-detect, or ND), ethylbenzene, toluene, and xylenes (BETX) were reported for all soil and ground water samples. Total petroleum hydrocarbons (TPH) as measured by EPA Method 418.1 was found as high as 1.6 mg/l in MW-1, located near the truck loading rack and 0.8 mg/l in MW-4, located in the vicinity of the high concentrations of diesel measured in May 1989. This is in excess of the current MTCA Method A Cleanup level for TPH in groundwater, whether it is of diesel or gasoline origin.

GeoEngineers completed a followup subsurface soil investigation in July 1994, and found significantly high enough concentrations of TPH-diesel and TPH-heavy to estimate that a total of approximately 465 cubic yards of petroleum-contaminated soil (PCS) were present at various locations on the site.

GeoEngineers conducted remedial excavation activities at the site between September 19 – October 19, 1995, and removed a total of 932 cubic yards of PCS from a various area throughout the site for transport to the Roosevelt Landfill in Roosevelt, Washington. Confirmation sampling documented PCS (from TPH-diesel and TPH-heavy oil) still remaining on the site, in concentrations as high as 6,000 ppm in the south wall of the former pumps excavation (further removal was not possible without going offsite to the abandoned BNRD spur), and 12,000 ppm in the south wall of the large excavation made on the eastern portion of the site near the former warehouse. PCS contamination in the former area is a subsurface zone of soil approximately two feet thick, and in the latter, PCS was detected from at a depth of two feet.

**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):**

Due to the significant contamination remaining on-site documented to being primarily subsurface (two feet depth downward), the surface water would not be applicable for WARM scoring for this site. Thus, only the air and groundwater routes will be scored.

**ROUTE SCORES:**

Surface Water/Human Health: NS  
Air/Human Health: 21.1  
Groundwater/Human Health: 39.3

Surface Water/Environmental.: NS  
Air/Environmental: NS

**OVERALL RANK: 3**

WORKSHEET 2  
Route Documentation

1. **SURFACE WATER ROUTE – Not Scored**

- a. List those substances to be considered for scoring: Source:
- b. Explain basis for choice of substance(s) to be used in scoring.
- c. List those management units to be considered for scoring: Source:
- d. Explain basis for choice of unit to be used in scoring:

2. **AIR ROUTE**

- a. List those substances to be considered for scoring: Source: 1-4  
TPH-diesel, heavy oil
- b. Explain basis for choice of substance(s) to be used in scoring:  
These substances were detected in on-site soil samples at concentrations exceeding MTCA Method A cleanup levels.
- c. List those management units to be considered for scoring: Source: 1-5  
Subsurface soils.
- d. Explain basis for choice of unit to be used in scoring:  
The contaminating substance were detected in on-site soil samples in concentrations exceeding MTCA Method A cleanup levels.

3. **GROUNDWATER ROUTE**

- a. List those substances to be considered for scoring: Source: 1-3  
TPH-diesel
- b. Explain basis for choice of substance(s) to be used in scoring:  
These substances were detected in on-site soil samples at concentrations exceeding MTCA Method A cleanup levels.
- c. List those management units to be considered for scoring: Source: 1-3  
Subsurface soils and groundwater.
- d. Explain basis for choice of unit to be used in scoring:  
The contaminating substance were detected in on-site soil samples in concentrations exceeding MTCA Method A cleanup levels.

**WORKSHEET 5**

Air Route

**1.0 SUBSTANCE CHARACTERISTICS**

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

<b>1.2 Human Toxicity</b>										
	Substance	Air Standard (µg/m <sup>3</sup> )	Value	Acute Toxicity (mg/ m <sup>3</sup> )	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	TPH-diesel	166.5	4	ND	-	ND	-	ND	ND	-
2	TPH-heavy oil	ND	-	ND	-	ND	-	ND	ND	-

\* Potency Factor

Source: 1-3,6

**Highest Value: 4**

(Max = 10)

**Plus 2 Bonus Points? No**

**Final Toxicity Value: 4**

(Max = 12)

<b>1.3 Mobility (Use numbers to refer to above listed substances)</b>				
<b>1.3.1 Gaseous Mobility</b>		<b>1.3.2 Particulate Mobility</b>		
Vapor Pressure(s) (mmHg)		Soil Type	Erodibility	Climatic Factor
1	8.2E-02 = 3			
2	ND			

Source: 6

**Value: 3**

(Max = 4)

Source: \_\_\_\_\_

**Value: \_\_\_\_\_**

(Max = 4)

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

**Final Matrix Value: 6**

(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	No data					
2	No data					

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

1.6 Substance Quantity	
Explain Basis: Unknown, use default value = 1	Source: <u>3</u> Value: <u>1</u> (Max = 10)

## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment:</b> Surface spill, cover 2' thick, no vapor collection system.	3,5	<u>10</u> (Max = 10)

## 3.0 TARGETS

		Source	Value
3.1	<b>Nearest Population:</b> < 1000 feet	3,5	<u>10</u> (Max = 10)
3.2	<b>Distance to [and name(s) of] nearest sensitive environment(s):</b> Not applicable	3,5	<u>NA</u> (Max = 7)
3.3	<b>Population within 0.5 miles:</b> $\sqrt{665} = 25.78$ (est. from drinking water users in Bingen)	9,10	<u>26</u> (Max = 75)

## 4.0 RELEASE

Explain Basis for scoring a release to air: No analytical evidence.	Source: <u>1-3</u> Value: <u>0</u> (Max = 5)
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WORKSHEET 6  
Groundwater Route<sup>1</sup>

**1.0 SUBSTANCE CHARACTERISTICS**

<b>1.2 Human Toxicity</b>										
Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value	
							WOE	PF*		
1 TPH-diesel	160	4	490 (rat)	5	0.004 (RfD)	3	ND	ND	-	
2 TPH-heavy oil	Nd	-	ND	-	2.0	1	ND	ND	-	

\* Potency Factor

Source: 1-3,6

**Highest Value: 5**  
(Max = 10)

**Plus 2 Bonus Points? No**

**Final Toxicity Value: 5**  
(Max = 12)

<b>1.2 Mobility (use numbers to refer to above listed substances)</b>	
Cations/Anions	OR Solubility (mg/L)
1=	1= $3.0 \times 10^1 = 1$
2=	2= 0

Source: 1-3,6

**Value: 1**  
(Max = 3)

<b>1.3 Substance Quantity:</b>	
Explain basis: Unknown, use default = 1	Source: <u>1-3,7</u> <b>Value: 1</b> (Max=10)

**2.0 MIGRATION POTENTIAL**

		Source	Value
2.1	<b>Containment (explain basis):</b> Contaminated subsurface soil, no impermeable cover	5,7	<u>10</u> (Max = 10)
2.2	<b>Net precipitation:</b> 13.1" – 3.4" = 9.7"	8	<u>1</u> (Max = 5)
2.3	<b>Subsurface hydraulic conductivity:</b> Gravels with large cobbles/silt	3	<u>3</u> (Max = 4)
2.4	<b>Vertical depth to groundwater:</b> <25'; observed release = 0'	1-3	<u>8</u> (Max = 8)

**3.0 TARGETS**

		Source	Value
3.1	<b>Groundwater usage:</b> Public supply, unthreatened alts. avail.	9,10	<u>4</u> (Max = 10)
3.2	<b>Distance to nearest drinking water well:</b> 1300 – 2640 feet	9,10	<u>3</u> (Max = 5)
3.3	<b>Population served within 2 miles:</b> $\sqrt{9} = 3$	9,10	<u>3</u> (Max = 100)
3.4	<b>Area irrigated by (groundwater) wells within 2 miles:</b> (0.75)* $\sqrt{20}$ acres = 3	9,10	<u>3</u> (Max = 50)

**4.0 RELEASE**

		Source	Value
	<b>Explain basis for scoring a release to groundwater:</b> Documented by analytical evidence.	2,3	<u>5</u> (Max = 5)

## SOURCES USED IN SCORING

1. Report of Remedial Actions, Underground Storage Tank Removal, (Unocal) Bulk Plant 0046, Bingen, WA, GeoEngineers, June 28, 1989.
2. Report of Geotechnical Services, Environmental Site Characterization, (Unocal) Bulk Plant 0046, Bingen, WA, GeoEngineers, August 27, 1990.
3. Report of Remedial Excavation Monitoring, Unocal Bulk Plant 0046, Bingen, Washington, GeoEngineers, March 18, 1996.
4. Ecology CRO Department Decision Recommendation (DDR), Unocal Bulk Plant 0046, Norman T. Hepner, December 12, 2001.
5. Site hazard assessment site visit by Michael Spencer, Washington Department of Ecology Toxics Cleanup Program, October 25, 2007.
6. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
7. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
8. Washington Climate – Net Rainfall Table, Reference 8.
9. Washington Department of Ecology, Water Rights Application System (WRATS) printout for two-mile radius of site.
10. Washington Department of Health, Sentry Internet Database printout for public water supplies.