CSID 308

Site Hazard Assessment

Name: WA DOT I-5 MP197 Marysville
Address: The western edge of I-5 southbound at approximately mile post 197
City: **Maryville** County: **Snohomish** State: **WA** Zip: **98201**

Section/Township/Range:
Latitude: **48° 1' 40.6"N** Longitude: **122° 10' 36.5" W**

FS ID #: **513712**

Site scored/ranked for the August 22, 2008 update
July 17, 2008

SITE LOCATION:

The Washington State Department of Transportation site, (the site), is located on the western edge of the southbound lanes of Interstate 5 (I-5) in the soils just off of the paved area. The area appeared to be approximately five feet by seven feet. Management areas are surface soils. The substance of concern is diesel (as total petroleum hydrocarbons, or TPH-diesel).

Site Description

The site is fully contained within the right-of-way (ROW) of the Washington Department of Transportation (WA DOT). To the east of the site are the southbound lanes of I-5. To the southwest of the site the Snohomish River exists at approximately 2000 feet. Dead Water Slough exits at approximately 350 feet on either side of the site to the east and west. The site slopes down at approximately a 1:2 ratio to the floodplain/wetlands. Aside from the grade created by the construction of I-5, the area would be flat.

The site is located generally at the delta flat area that exits between the NE end of Everett's peninsula and Marysville.

In this area of I-5, agriculture and wetlands are the predominant features. Property immediately west of the site is owned by Dagmars Marina. Adjacent to the site, to the west is open pasture land. To the northwest of the site, there is a lumber operation.. Immediately east of the site are the south- and northbound lanes of I-5. Still further east are flat wetland areas with little development. These properties are owned predominantly by Snohomish County, the City of Everett and the Washington Department of Fish & Wildlife.

Site History

On June 25, 2007, Washington State Department of Ecology (Ecology) received a telephone voicemail regarding a traffic accident on the southbound lanes of I-5 at approximately mile post 197. According to the Environmental Report Tracking System (ERTS) report, a pickup truck lost 3-4 gallons of diesel to soil along the shoulder of the highway.

On July 12, 2007, the Snohomish Health District (Health District) received an ERTS referral from Ecology.

On 7/18/2007 the Health District conducted a site drive-by to confirm the location. A clear spray-painted mark was visible on the shoulder of the road.

On 7/23/2007 the Health District conducted a site visit. A visible stain was observed approximately five feet on the east-west access and 7 feet to the north-south access. One soil sample was collected from within the stained area. The sample was analyzed for diesel range and heavy oil range hydrocarbons. The result indicated that the diesel range hydrocarbons exceeded the MTCA method A soil clean-up level of 2,000 ppm. The result was 48,200 ppm. Based on the results of the sample and initial investigation, the Health District recommended to Ecology that the site be listed on the Confirmed and Suspected Contaminated Sites (CSCS) list to await Site Hazard Assessment (SHA).

Upon receipt of the Health District's recommendation, Jing Liu of Ecology's Toxic Clean-up Program Initial Investigations team contacted Doug Pierce of the WA DOT Hazardous Materials Section via email. In an attempt to avoid listing the site, Jing requested that WA DOT clean up the small amount of diesel contaminated soil. After an exchange spanning about a month, Mr. Pierce stated: "I understand that Ecology has to list [the spill site located at MP197] and you understand that the department [WSDOT] will not be cleaning up any roadside fuel resultant from vehicle crashes unless it interferes with our maintenance activities." Jing Liu made the determination to list the site on Ecology's CSCS list and an early notice letter was sent to Doug Pierce dated May 13, 2008.

Surface Water and Ground Water

An Ecology well log search returned twenty eight water wells within two miles of the site. The closest well, appears to have a static water level of 55 feet below ground surface. Other well logs indicated deeper wells and unsuitable, seawater-impacted groundwater at shallower depths. Most well logs reviewed in the sections surrounding the site were completed to depths in excess of 100 feet below grounds surface.

According to Ecology's Water Rights Tracking System, there is significant acreage irrigated with surface water within a two mile radius of the site. 310 acres of land are irrigated with various surface water features; however, these features are located in sections located north of Steamboat Slough. The effect is that no property is irrigated

within a two mile radius which is both downstream of the site and on the same side of a major surface water feature as the site.

Searching Ecology on-line well logs, twenty eight water wells were located within a two mile radius of the site. The closest well is listed as belonging to Ester Smith in section 9, township 29, range 5. No site address exits on the well log and it is likely that Ms. Smith no longer owns the property. However, there are three properties now owned Snohomish County that are generally in the area of the Smith well. The address of the closest house is 4315 12th St NE, Marysville, WA 98270. The well site is approximately 2000 feet southeast of the site, assuming that the well is located proximally to the living structures at the 4315 12th Street NE location.

The population served by ground water in the two mile radius of the site is approximately 102 individuals.

Summary/Recommendations

The Health District conducted a site visit, subsequent to a reported release of diesel fuel to the western shoulder of the southbound lanes of I-5. A stain to surface soils was clearly evident. Lab analysis of a soil sample collected within the stains boundaries yielded approximately 48,000 ppm diesel range hydrocarbons. The analytical evidence documents an exceedance of the MTCA method A soil clean up standards. Correspondence from WA DOT seems to indicate they have no plans to address the contamination at the site.

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):

None

ROUTE SCORES:

Surface Water/Human Health:	**12.8**	Surface Water/Environmental.:	**22.7**
Air/Human Health:	**4.2**	Air/Environmental:	**NS**
Groundwater/Human Health:	**14.6**		

OVERALL RANK: 4

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**

   a. List those substances to be considered for scoring: Source:1

   Total Petroleum Hydrocarbon (TPH) Diesel Range Organics

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

   Analytical results from soil sampling indicate the presence of TPH-diesel at concentrations which exceed current Method A cleanup levels.

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

   Contaminated surface soil.

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

   A spill caused soil contamination.

2. **AIR ROUTE**

   a. List those substances to be considered for scoring: Source:1

   Total Petroleum Hydrocarbon (TPH) Diesel Range Organics

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

   Analytical results from soil sampling indicate the presence of TPH-diesel at concentrations which exceed current Method A cleanup levels.

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

   Contaminated surface soil.

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

   A spill caused soil contamination.

3. **GROUNDWATER ROUTE**

   a. List those substances to be considered for scoring: Source:1

   Total Petroleum Hydrocarbon (TPH) Diesel Range Organics

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

   Analytical results from soil sampling indicate the presence of TPH-diesel at concentrations which exceed current Method A cleanup levels.

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

   Contaminated surface soil.

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

   A spill caused soil contamination.

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	TPH Diesel	160	4	490	5	.0004	3	ND	ND	X

**Potency Factor*

Source: 1, 2

Highest Value: 5

(Max = 10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 5

(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	TPH Diesel	2350	2		2

Source: 1, 2

Highest Value: 2
(Max = 10)

1.3 Substance Quantity (aerial extent)

Explain Basis: 4>10 gallons

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

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** Management unit scored as spills/discharges/contaminated soils occur in the surface and in the subsurface. **Explain basis:** Spill occurred in the surface with unknown run-on and run-off controls.	1, 3	**10** (Max = 10)
2.2	**Surface Soil Permeability:** Snohomish Silt Till – well graded sands, silt loam.	11	**3** (Max = 7)
2.3	**Total Annual Precipitation:** average annual precipitation for Mt. Vernon WSO AP, WA = 32.30 inches	3	**3** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** 1.5 inches to 2.0 inches	4	**2** (Max = 5)
2.5	**Flood Plain:** 100-year flood plain	13	**2** (Max = 2)
2.6	**Terrain Slope:** 0-2% to Snohomish River	13	**2** (Max = 5)

3.0 TARGETS

		Source	Value
3.1	**Distance to Surface Water:** <1000 feet to Dead Water Slough	13	**10** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** $\sqrt{0} = 0$	6, 7	**0** (Max = 75)
3.3	**Area Irrigated by surface water within 2 miles : (0.75)*√ # acres =** $0.75 * \sqrt{0} = 0$	6	**0** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** ~2000 feet to the Snohomish River	13	**9** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** wetland ~2000 to Snohomish River	13	**9** (Max = 12)

4.0 RELEASE

Explain Basis: No analytical evidence of release to surface water.	Source: 1, 3 **Value: 0** (Max = 5)

WORKSHEET 5
Air Route

1.0 SUBSTANCE CHARACTERISTICS

1.1. Introduction

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	TPH Diesel	166.5	4	ND	--	ND	--	ND	ND	--

**** Potency Factor***

Source: 1, 3

Highest Value: 4

(Max = 10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 4

(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	8.2×10^{-2}			

Source: NA

Value: 3

(Max = 4)

Source: 1, 3

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^3)	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	TPH Diesel	ND	--	ND	--	--

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

1.6 Substance Quantity (aerial extent)	
Explain Basis: 4-10 gallons	Source: 1, 3 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** Spill occurred in surface with no cover and no vapor collection	1, 3	**10** (Max = 10)

3.0 TARGETS

		Source	Value
3.1	**Nearest Population:** 1000 – 2000 feet to house on property, neighboring houses, parks and businesses.	3, 13	**8** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s) [fisheries excluded]:** NA since not scoring environmental route	13	**NA** (Max = 7)
3.3	**Population served within 0.5 miles: 2004 us census data pop/sq mile =√** pop. = √10 = 3.16 estimated by EPA population density	13	**3** (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air: Not documented	Source: 1, 3 **Value: 0** (Max = 5)

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.2 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	TPH Diesel	160	4	490	5	.0004	3	ND	ND	X

* ***Potency Factor***

Source: 1, 2

Highest Value: 5

(Max = 10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 5

(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= $3.0 \times 10^1 = 1$

Source:1, 3

Value: 1

(Max = 3)

1.3 Substance Quantity (volume):

Explain basis: 4-10 gallons.	Source: 1, 3, 8 **Value: 1** (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** Spills to surface with unknown level of soil contamination.	1, 3	**10** (Max = 10)
2.2	**Net precipitation:** 22.8" – 5.9" = 16.9"	4	**2** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** sandy slit $>10^{-5}$ to 10^{-3} (cm/sec)	3,11	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** 25-50 feet as per well logs	3, 5	**6** (Max = 8)

3.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Private supply with alternative source available.	3, 6	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** >2640<5000 **feet**	3, 5, 13	**2** (Max = 5)
3.3	**Population served within 2 miles:** √ **pop.** = √28 =5.29 = 5	3, 7	**5** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** **(0.75)*√# acres** = 0.75 * √3 = 1.29 = 2	3, 6	**2** (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Not documented	1, 3, 13	**0** (Max = 5)

SOURCES USED IN SCORING

1. Washington State Department of Ecology File on WDOT MP 197.
2. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
3. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
4. Washington Climate – Net Rainfall Table
5. Washington State Department of Ecology, Online Water Well Log database
6. Washington State Department of Ecology, Water Rights Application System (WRATS) printouts
7. Washington State Department of Health, Office of Drinking Water Sentry website printout for public water supplies
8. Western Regional Climate Center's Historical Climate Information
9. Thomas Guide, Snohomish County, 2008
10. Department Of The Interior, US Geologic Survey, Geologic Map of the Everett and Marysville 7.5 Minute Quad, James P. Minard, 1985
11. Soil Conservation Service, Soil Survey of Snohomish County Area, July 1983.
12. Snohomish County Assessors/Treasurers On-line information page @ http://198.238.192.103/propsys/Asr-Tr-PropInq/PrpInq01-Entry.asp
13. Snohomish County GIS mapping information