SITE HAZARD ASSESSMENT WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Name: **Former Shell Oil Tank Farm**
Address: **14th and Q Avenue**
City: **Anacortes** County: **Skagit** State: **WA** Zip: **98221**
Parcel: **P32956**
Section/Township/Range: **NW1/4 NW1/4 19/35N/02E**
Latitude: **48° 30' 40.6"** Longitude: **-122°36' 42**
FSID #: **4781157**

Site scored/ranked for the August 20, 2008 update of the Site Register.
July 11, 2008

SITE DESCRIPTION:

The Former Shell Oil Tank Farm site was used for bulk fuel storage for marine and other uses from 1929 to 1985. The site has been owned by the Port of Anacortes from 1929 to the present and leased to Shell Oil and various petroleum distributors. The original facility consisted of three above ground storage tanks, each 25,000 gallons. Two were used for diesel and one for gasoline storage. Lines extended from the tanks east across Q Avenue to a pier on Fidalgo Bay (former Cap Sante Federal Waterway). Fuel was pumped from the pier to fill the tanks and then distributed from the tanks. In the early 1950s two 12,500 gallon above ground storage tanks and one 4,000 gallon underground storage tank were installed. The above ground tanks are reported to have stored diesel, gasoline, and heating oil and the underground tank dry cleaning solvent. In 1985 the site ceased to be used as a bulk terminal and all structures were demolished. At this time the site is a vacant gravel lot used for parking boats and trailers.

The site is located on Skagit County Parcel P32956 between 13th and 14th Streets and Q Avenue. The site is surrounded by commercial property to the north, west, and south and port/marina property to the east. Fidalgo Bay is approximately 375 feet to the east. The land is flat dredged fill of sand, silt and clay with gravel overlay. Groundwater has been encountered 4-9 feet below ground surface. The area is served by City of Anacortes sewer and water. In 2007 a 12" storm drain line was routed along the western portion of the site by the City of Anacortes.

Soil and or groundwater have been studied at the site on three occasions. In 1987 an investigation by Hart Crowser for the Port found petroleum contamination in soil and groundwater during the installation of two monitoring wells on the east side of the property. Some soil excavation occurred at this time but the release was not completely defined or remediated. In 2004 the Port hired Floyd/Snider to conduct a limited environmental due diligence report. The information in this Site Hazard Assessment is taken from the subsequent report issued in November 2005 by Floyd/Snider. Soil and groundwater samples were taken from 14 locations throughout the property and analyzed for TPH-Diesel, TPH-Gasoline/BTEX. Subsurface soil samples at three locations exceeded Model Toxics Control Act (MTCA) Method A clean up levels for TPH-Gasoline. The detection limit for benzene exceeded the clean up standard in most soil samples. BTEX constituents were found in some soil samples below the Method A clean up standard. Groundwater samples exceeded MTCA Method A

clean up levels for diesel and heavy oil at two locations. TPH-Gasoline was detected groundwater in three locations below Method A clean up levels but the signature did not match gasoline and could have indicated dry cleaning solvent contamination. Benzene and xylenes were detected in groundwater in three locations below Method A clean up levels. Refer to the attached Figure 1 from Floyd/Snider, 2005 for site features and sample locations. The site was reported to the Washington State Department Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites List in January 2005 as a result of these findings.

In 2007, in response to a planned City of Anacortes re-route of a storm drain line along the west side of the property, GeoEngineers conducted an independent remedial action along the excavation. Four test pits were dug to 8' feet. Five soil samples from the pits were screened for TPH, VOCs, PAHs, PCBs, and metals. All chemicals were either not detected or below MTCA Method A clean up levels with the exception of one detection of Cadmium in subsurface soil at 6.4 mg/kg, exceeding the Method A clean up level of 2.0 mg/kg. Soil excavated for the storm drain trench was considered clean and used as fill for the trench or off site as clean soil. The soil from the location of the cadmium sample was not excavated. For details refer to GeoEngineers, 2008.

In 2007 the site became part of the Puget Sound Initiative. In spring of 2008 the Port of Anacortes entered into an Agreed Order with Ecology. The order covers the Remedial Investigation and Feasibility Study Workplan and Report and the Draft Cleanup Action Plan. On April 28, 2008 the Skagit County Public Health Department performed a site visit to verify conditions at the site for this Site Hazard Assessment. Photos of the site visit are attached.

Special Considerations:

Due to the significant contamination documented on-site being primarily subsurface, the surface water and air routes are not applicable for WARM scoring for this site. Thus, only the groundwater route will be scored.

ROUTE SCORES:

Surface Water/Human Health:	NS	Surface Water/Environmental.:	NS
Air/Human Health:	NS	Air/Environmental:	NS
Groundwater/Human Health:	39.4		

OVERALL RANK: 3

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**
   a. List those substances to be considered for scoring: Source: 1,2,3

      Route not scored. Contamination present in subsurface soil and groundwater only.

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

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

   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: 1,2,3

      Route not scored. Contamination present in subsurface soil and groundwater only.

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

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

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

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

      Total Petroleum Hydrocarbons Gasoline and Diesel range, cadmium

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

      Analytical results from soil sampling and groundwater sampling indicate the presence of these hazardous substances at levels which exceed current Method A cleanup levels.

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

      Subsurface soil and groundwater.

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

      Documented soil and groundwater contamination contamination.

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 - Gasoline	5	8	3306 (rat)	3	ND	-	A	0.029	5
2	TPH - Diesel	160	4	490 (rat)	5	0.004	3	ND	ND	-
3	Cadmium	5	8	225 (rat)	5	0.0005	5	ND	ND	-

* *Potency Factor*

Source: 2,3,4,5

Highest Value: 8
(Max = 10)

Plus 2 Bonus Points? +2

Final Toxicity Value: 10
(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= 1.8 E + 03 Score = 3
2=	2= 3.0 E + 01 Score = 1
3= >1 Score=3	

Source: 4,5

Value: 3
(Max = 3)

1.3 Substance Quantity (volume):

Explain basis: Unknown quantity, default to 1

Source: 2,3

Value: 1
(Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** Contaminated soil, no cap	1,2,3,5	**10** (Max = 10)
2.2	**Net precipitation:** (3.5+3.8+3.4+2.6+2.4+1.5)-(1.0+.7+.5+.7+1.2+2.1) = 11.0"	5,5	**2** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** gravelly sand > 10 E -3	2,5	**4** (Max = 4)
2.4	**Vertical depth to groundwater:** Soil boring on site found groundwater at 4.0 – 5.5 feet bgs	2,5	**8** (Max = 8)

3.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Private supply, alternative sources available	5,7,9,10	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** 5000 – 10,000**feet**	5,7	**1** (Max = 5)
3.3	**Population served within 2 miles: √ pop.** = √45 = 7	5, 7,9	**7** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles: (0.75)*√# acres** = 0.75 * √0 = 0	5, 8	**0** (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Documented release to groundwater	2, 5	**5** (Max = 5)

SOURCES USED IN SCORING

1. Site visit by Skagit County Public Health Department for Site Hazard Assessment, April 28, 2008.
2. Floyd/Snider, Limited Environmental Due Diligence Investigation Report Former Shell Oil Tank Farm Cap Sante Marine Lease Area, November 2005.
3. GeoEngineers, Independent Remedial Action Completion Report Former Shell Oil Tank Farm Storm Drain Re-Route 13th Street and Q Avenue Anacortes, Washington, April 18, 2008.
4. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
5. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
6. Washington Climate – Net Rainfall Table.
7. Washington State Department of Ecology, Water Well Reports.
8. Washington State Department of Ecology, Water Rights Application System (WRATS) printouts.
9. Washington State Department of Health, Office of Drinking Water Sentry website printout for public water supplies.
10. Skagit County Public Health Department, Public Water System Source Location data, 2007.