CSID 5174

SITE HAZARD ASSESSMENT WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Name: **Port of Anacortes Dakota Creek**
Address: **115 Q Avenue**
City: **Anacortes** County: **Skagit** State: **WA** Zip: **98221**
Parcels: **P32867, P54924, P32906, P32907, P32903, P32904**
Section/Township/Range: **SW1/4 NW1/4 18/35N/02E**
Latitude: **48° 31' 8.0"** Longitude: **-122°36' 38"**
FSID #: **2670**

Site scored/ranked for the August 20, 2008 update of the Site Register.
July 21, 2008

SITE DESCRIPTION:

The Port of Anacortes Dakota Creek site has been in use for various marine related industries since 1897. The Port of Anacortes has owned the property since 1976. Dakota Creek Industries leases the property and since 1977 has used the site for marine vessel construction and repair. Historical uses throughout the site include a marine railway terminus, ferry dock, wood working, welding, machining, fuel storage in above ground tanks, truck washing, and vessel painting. The outfall for Scott Paper and Pulp Mill industrial waste water extended into the basin just east of L Dock and was used for approximately 20 years from 1952 into the 1970s. Currently on the waterfront are two outfitting piers (L Dock and East Dock), a dry dock, a synchrolift elevator, and Pier 1. Upland uses include metal fabrication areas, tool and machine shops, a sandblast grit storage shed, and other warehouse/storage areas. Hull maintenance occurs at the dry dock and synchrolift areas and includes abrasive blasting, painting, and pressure washing. Water related to the sandblasting, painting, and washing is collected for treatment. For a complete site history please refer to Landau Associates, 2002. Figures 2 and 3 from the Landau report are attached showing the historic and current features of the site.

The site is mostly level unpaved fill over glacial sediments. The uplands are approximately 15 feet above mean lower low water. Pavement (concrete and asphalt) is present surrounding the synchrolift and the Pier 1 warehouse. The remainder of the ground surface is gravel. Refer to Figures 1, 2, and 3 for the 2007 aerial photograph and site diagrams. The Dakota Creek Basin, enclosed to the west by Pier 1 and the east by Pier 2 Log Haul Out site opens to the north to Guemes Channel. The site is bordered on the west by port warehouses, to the east by a former log yard, now vacant, and to the south by industrial/commercial property. The downtown commercial district and single family homes are within ¼ mile of the site. The area is served by City of Anacortes water and sewer.

The site was placed on the Washington Department of Ecology (Ecology) Confirmed and Suspected Contaminated Sites list in 1991 as a result of an underground storage tank removal and sampling. Multiple site evaluations were performed between 1997 and 2002 on the upland and sediments including a Preliminary Assessment Report for the United States Environmental Protection Agency. The Port of Anacortes entered the site into the Voluntary Clean Up Program in 2002 and an independent clean up action occurred in 2002 on the upland portion of the site. In 2007 the site became a Puget Sound Initiative site and the Port of Anacortes entered into an Agreed Order with Ecology. In March, 2008 the Final Work Plan, Remedial Investigation/Feasibility (RI/FS) Study (GeoEngineers, 2008) was submitted to Ecology. This document provides summaries of sample data

from the previous investigations at the site. Upland soil at the site has documented contamination with TPH, metals, cPAHs, and PCBs. Sediments from the Dakota Creek Basin have metals and SVOCs exceeding the state Sediment Quality Standards. A dioxin/furan congener has also been found in basin sediment exceeding the Fidalgo reference sample.

In January 2008 this site was referred to the Skagit County Public Health Department for Site Hazard Assessment. On April 28, 2008 a site visit was performed to document current site conditions for this report. Photographs from the site visit are attached. Conditions were unchanged from those presented in the March 2008 RI/FS. The score worksheets are completed using summary sample data from the RI/FS report. Refer to the RI/FS for a thorough summary of past investigations and sample data at the site. This information is not duplicated in this report.

Special Considerations: The scoring and ranking of this site for hazard is occurring in the midst of RI/FS and interim remedial action work. Ranking of sites does not typically take complex site specific calculations of clean up levels into account. I have handled the chemicals for ranking the hazard of the site typical to how I have handled other sites in Skagit County. Due to this, chemicals may be listed for toxicity in the three exposure routes that the RI/FS report considers not of concern to that route. The availability of chemicals to each route does get considered in the model to compensate for this.

ROUTE SCORES:

Surface Water/Human Health: 38.4
Air/Human Health: 34.2
Groundwater/Human Health: 39.0

Surface Water/Environmental.: 68.7
Air/Environmental: 27.8

OVERALL RANK: 1

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**
   a. List those substances to be considered for scoring: Source: 2,3,4

      Arsenic, copper, lead, mercury, zinc, cPAHs, 2,3,7,8 TCDD (TEQ for dioxin congeners found in surface sediment)

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

      Substances found in surface soil or surface sediment above MTCA Clean up levels or Sediment Management Standard levels

   c. List those management units to be considered for scoring: Source 2,3,4

      Contaminated surface soil, contaminated surface sediments

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

      Documented contamination of substances above MTCA Clean up levels or Sediment Management Standards. Substances available to surface water route.

2. **AIR ROUTE**
   a. List those substances to be considered for scoring: Source: 2,3,4

      Arsenic, copper, lead, zinc, cPAHs, methylene chloride

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

      Substances found in surface soil above MTCA Clean up levels.

   c. List those management units to be considered for scoring: Source: 2,3,4

      Contaminated surface soil

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

      Documented surface soil contamination above MTCA Clean up levels.

3. **GROUNDWATER ROUTE**
   a. List those substances to be considered for scoring: Source: 2,3,4

      PCBs, arochlor 1262, TPH gasoline, TPH diesel, arsenic, cPAHs, methylene chloride, copper, mercury, lead, zinc, silver

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

      Analytical results from soil sampling and groundwater sampling (arsenic only) indicate the presence of these hazardous substances at levels which exceed MTCA cleanup levels.

   c. List those management units to be considered for scoring: Source: 2,3,4

      Subsurface soil and groundwater.

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

      Documented soil and groundwater contamination.

WORKSHEET 4
Surface Water 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	Mercury	2	8	ND	-	0.0003	5	ND	ND	-
2	Arsenic	10.0	8	763(rat)	5	0.001	5	A	1.75	7
3	Lead	5	8	ND	-	<0.001 (NOAEL)	10	ND	ND	-
4	Copper	1300	2	ND	-	0.037	1	ND	ND	-
5	cPAH (benzo(a)anthracene)	0.2	10	ND	-	ND	-	11.5	B2	7
6	2,3,7,8 TCDD (TEQ)	$1x10^{-5}$	10	ND	-	ND	-	B2	$15x\ 10^{4}$	8

* *Potency Factor*

Source: 2,3,4,5
Highest Value: 10
(Max = 10)
Plus 2 Bonus Points +2
Final Toxicity Value: 12
(Max = 12)

1.2 Environmental Toxicity – Marine Water

	Substance	Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity	
		(µg/L)	Value	(mg/kg)	Value
1	Mercury	2.1	8		
2	Arsenic	69	6		
3	Lead	140	4		
4	Copper	2.9	8		
5	cPAH (benzo(a)anthracene)	300	4		

Source: 2,4,5
Highest Value: 8
(Max = 10)

1.3 Substance Quantity

Explain Basis: Unknown quantity, default to 1.	Source: 2,3,4 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** No containment **Explain basis:** Contaminated surface soil, no cover, no containment	1, 2,3,4	**10** (Max = 10)
2.2	**Surface Soil Permeability:** Site is adjacent to surface water with contaminated sediments	1,2,3,4	**7** (Max = 7)
2.3	**Total Annual Precipitation:** Anacortes 25.7"	4,6	**2** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** 1.5 inches	4	**2** (Max = 2)
2.5	**Flood Plain:** Not in the flood plain	4,10	**0** (Max = 2)
2.6	**Terrain Slope:** Adjacent to surface water	1,4	**5** (Max = 5)

3.0 TARGETS

		Source	Value
3.1	**Distance to Surface Water:** 0 feet	1,4	**10** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** 0	4,8,10	**0** (Max = 75)
3.3	**Area Irrigated by surface water within 2 miles : 0**	4,7,10	**0** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** Guemes Channel <1000feet	1,4	**12** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** Guemes Channel <1000 feet	1,4	**12** (Max = 12)

4.0 RELEASE

Explain Basis: Mercury, arsenic, copper, cPAH, Dioxin detected in surface sediments, no containment	Source: 1,2, 4 **Value: 5** (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	Arsenic	0.00023	10	ND	-	ND	-	A	50	9
2	Copper	3.3	9	ND	-	ND	-	ND	ND	-
3	Lead	0.5	10	ND	-	ND	-	ND	ND	-
4	Methylene chloride	2	9	88000	3	0.86	1	B2	0.014	4

* *Potency Factor*

Source: 2,4,5

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points +2

Final Toxicity Value: 12
(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-Arsenic		gravelly sand/silt	22	1-10
2-Copper		gravelly sand/silt	22	1-10
3-Lead		gravellysand/silt	22	1-10
4- Meth Cl	3600 = 4 mobility			

Source: 2,3,4,5

G.M. Value: 4
(Max = 4)

P.M. Value: 0
(Max = 4)

1.4

Methylene chloride 9/4 = 18 vs Particulate value high of 12/0 = 3

Final Matrix Value: 18
(Max = 24)

1.5 Environmental Toxicity/Mobility						
	Substance	**Non-human Mammalian Inhalation Toxicity (mg/m^3)**	**Acute Value**	**Mobility (mmHg)**	**Value**	**Matrix Value**
1	Arsenic	ND	-			
2	Copper	ND	-			
3	Lead	ND	-			
4	Methylene chloride	88000	3	3600	4	

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

1.6 Substance Quantity	
Explain Basis: Unknown, use default value = 1	Source: 2,3,4 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** Contaminated surface soil, no cover, no containment	1,2,3,4	**10** (Max = 10)

3.0 TARGETS

		Source	Value
3.1	**Nearest Population:** < 1000'	1,4	**10** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s):** City of Anacortes N Avenue Park 1300 feet	4,10	**6** (Max = 7)
3.3	**Population within 0.5 miles:** Est 366 buildings x3 =1098, sq rt 1098=33	4,10	**33** (Max = 75)

4.0 RELEASE

Explain Basis: No documented release to air.	Source: 1,2,3,4 **Value: 0** (Max = 5)

WORKSHEET 6

Groundwater Route

2.0 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	cPAH (benzo(a)anthracene)	0.2	10	ND	-	ND	-	B2	11.5	7
4	PCB	0.5	10	1350(rat)	3	ND	-	B2	7.7	6
5	Arsenic	10.0	8	763(rat)	5	0.001	5	A	1.75	7
6	Lead	5	8	ND	-	<0.001 (NOAEL)	10	ND	ND	-

* *Potency Factor*

Source: 2,4,5

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=	1= 1800 value=3
2=	2= 30 value=1
3=	3= .0057 value=0
4=	4= .031 value=0
5= >1 value=3	5=
6= 0.1to 1 value=2	6=

Source: 4,5

Value: 3
(Max = 3)

1.3 Substance Quantity (volume):

Explain basis: Unknown quantity, default to 1	Source:2,3,4 **Value: 1** (Max=10)

3.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** Contaminated soil, no cap	1,2,3,4	**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"	4,6	**2** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** silty sand > 10E -5 to 10E-3	2,3,4	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** Soil boring on site found groundwater at 4.0 – 12 feet bgs	2,3,4	**8** (Max = 8)

4.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Ground water not used but useable	4,8,10	**2** (Max = 10)
3.2	**Distance to nearest drinking water well:** >10,000 feet	4,8,10	**0** (Max = 5)
3.3	**Population served within 2 miles: √ pop. = √0 =0**	4,8,10	**0** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles: (0.75)*√# acres =** 0.75 * √0 = 0	4,8,10	**0** (Max = 50)

5.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Documented release to groundwater	2,4	**5** (Max = 5)

SOURCES USED IN SCORING

1. Skagit County Health Department, Field Notes from Site Hazard Assessment Site Visit, April 28, 2008.
2. GeoEngineers, Inc., Final Work Plan Remedial Investigation/Feasibility Study and Interim Action Work Plan Dakota Creek Industries, March 5, 2008.
3. Landau Associates, Completion Report Independent Cleanup Action Dakota Creek Industries Shipyard Facility Anacortes, Washington, December 20, 2002.
4. Washington Department of Ecology, WARM Scoring Manual, April, 1992.
5. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January, 1992.
6. National Weather Service, Washington Climate Data.
7. Washington Department of Ecology, Water Rights Information System (WRIS), 1997.
8. Washington Department of Ecology, Well Logs.
9. Washing Department of Health Public Water Supply Data.
10. Skagit County Mapping, SkagitView Version 5.0, June 2008.