Site Hazard Assessment
Worksheet 1
Summary Score Sheet

SITE INFORMATION

Name: City Properties Cleanup
Address: 2112 – 2122 Jefferson Avenue
City: Tacoma **County:** Pierce **State:** WA **Zip:** 98402
Section/Township/Range: 09 / 20N / 03E
Latitude: 47.24248 **Longitude:** -122.43940
Facility Site ID Number: 1277004

Site assessed/ranked for the February 2011 update

October 19, 2010

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

General Site Description

The subject site consists of five separate but adjacent tax parcels totaling approximately 1.2 acres. The site is zoned for "warehouse / residential" use in the City of Tacoma. *Jefferson Avenue* is the property's east border and *South 23rd Street* provides the southern border, beyond these borders are additional properties with the same zoning designation. *South 21st Street* serves as the subject parcel's north border, and vacant land serves as its west border. Beyond the north border the zoning designation changes to "downtown mixed use". The entire surface of the site is covered by hard pack gravel. The property's current primary use is as vacant property owned by the City of Tacoma.

Subsurface conditions at the property consist mainly of gravelly silt and silty sand, to a depth of approximately thirteen feet (13'). Groundwater is present at approximately three to five feet below ground surface (3'-5' bgs). Groundwater is assumed to flow down gradient and easterly to northeasterly, towards the Thea Foss Waterway of Commencement Bay, Puget Sound. The Thea Foss Waterway lies approximately one thousand six hundred feet (1600') to the east. The closest active groundwater drinking well is a Group B Water System (Tacoma Star Ice Company) that is approximately thirteen hundred seventy five feet (1375') to the south and has a depth of approximately two hundred twenty feet (220') bgs.

Site History

Prior to 1910, the site and the entire area surrounding it were platted into city blocks of downtown Tacoma. Residential occupation dominated land use through the mid-1930s, when commercial occupation began to displace residential use. The parcel at *2112 Jefferson Avenue* was residential until approximately 1945 when Harmon's Gasoline Station was constructed. The building continued to serve as a motor vehicle service operation until 2000. The parcel at *2122*

Jefferson Avenue was vacant land until the Ostby's Used Cars business went into operation in 1930. The structure that served Ostby's Used Cars was expanded as the business also expanded into vehicle rentals, vehicle repair, wielding, and steel fabrication.

In February 1995 four USTs were removed from the subject site by Specialized Environmental Consulting, Inc. (SEC). Although the tanks appeared to be in good condition the soils were visually contaminated. SEC cited piping and valve failure as the cause of the release. During the UST removal groundwater was encountered at approximately three (3) feet bgs. Information in the Tacoma-Pierce County Health Department's Underground Storage Tank file indicates analytical evidence of groundwater contamination, but is unclear on the specific contaminant.

After the initial UST removal the remaining infrastructure that served the onsite activities consisted of two additional underground storage tanks (USTs); one five hundred (500) gallon UST and one eighteen hundred (1800) gallon UST. Both of these USTs contained gasoline range organics (TPH-Gx). These two USTs, an abandoned hydraulic hoist, and the structures were removed in August 2002.[1]

Site Remediation Activities

The two remaining USTs and the hydraulic hoist removal were performed by Nowicki & Associates, Inc. (NAI). The structures were demolished by William Dickson Co. prior to site remediation. Subsurface soils were found to be contaminated and an independent site cleanup was performed. The locations of these excavations are depicted in Figure 1.

Approximately one hundred seventy five cubic yards (175 yd^3) of hydrocarbon contaminated soil was excavated from the two UST basins. Soil samples from the tank basins indicated concentrations below current Model Toxics Control Act Method A Cleanup Levels for Unrestricted Land Use (MTCA Method A – Soil), groundwater that infiltrated the basins was contaminated with TPH-Gx and benzene above current MTCA Method A Cleanup Levels for Groundwater (MTCA Method A – Groundwater), at 2,800 ug/l and 19 ug/l respectively.

Approximately two hundred twenty cubic yards (220 yd^3) were removed from the hydraulic hoist excavation area. Soils impacted with Total Petroleum Hydrocarbons (TPHs) were excavated for off-site treatment. Groundwater infiltrated the joist basin and grab samples were collected. Concentrations of TPH-Diesel (TPH-Dx) and TPH-Oil were above MTCA Method A – Groundwater, at 11,000 ug/l and 8,600 ug/l respectively.

An old percolation well was also located during these remedial activities but was not further investigated at this time. Four test pits were also excavated to investigate subsurface soil and groundwater conditions. Test pit #1 was placed approximately thirty eight feet (38') northwest of the hoist excavation. Soil sample results exceeded MTCA Method A – Soil at 150 mg/kg for TPH-Gx. Product piping from a former UST was located and removed from this area.

[1] Washington State Department of Ecology Advisory Opinion, Further Action Determination Correspondence-May 15, 2006.

In 2003 NAI acted as the site assessor for William Dickson Co. and conducted a subsurface site characterization. Thirteen soil borings were completed at maximum depths of eighteen feet (18') bgs. Soil sampling was concentrated in three areas, the UST excavation area, hoist excavation area, at the Test Pit 1 Area. Only soil boring 9 (SB9) at eighteen feet bgs indicated concentrations of TPH-Gx exceeding MTCA Method A – Soil. This area is located at the northeast end of the property and consisted of a lens approximately three to eighteen feet (3'-18') in thickness. See Figure 2 for soil boring locations

Groundwater was collected for analysis at the four bore locations that surrounded the UST excavation. Laboratory analysis indicated TPH-Dx and TPH-Oil contamination exceeding MTCA Method A – Groundwater.

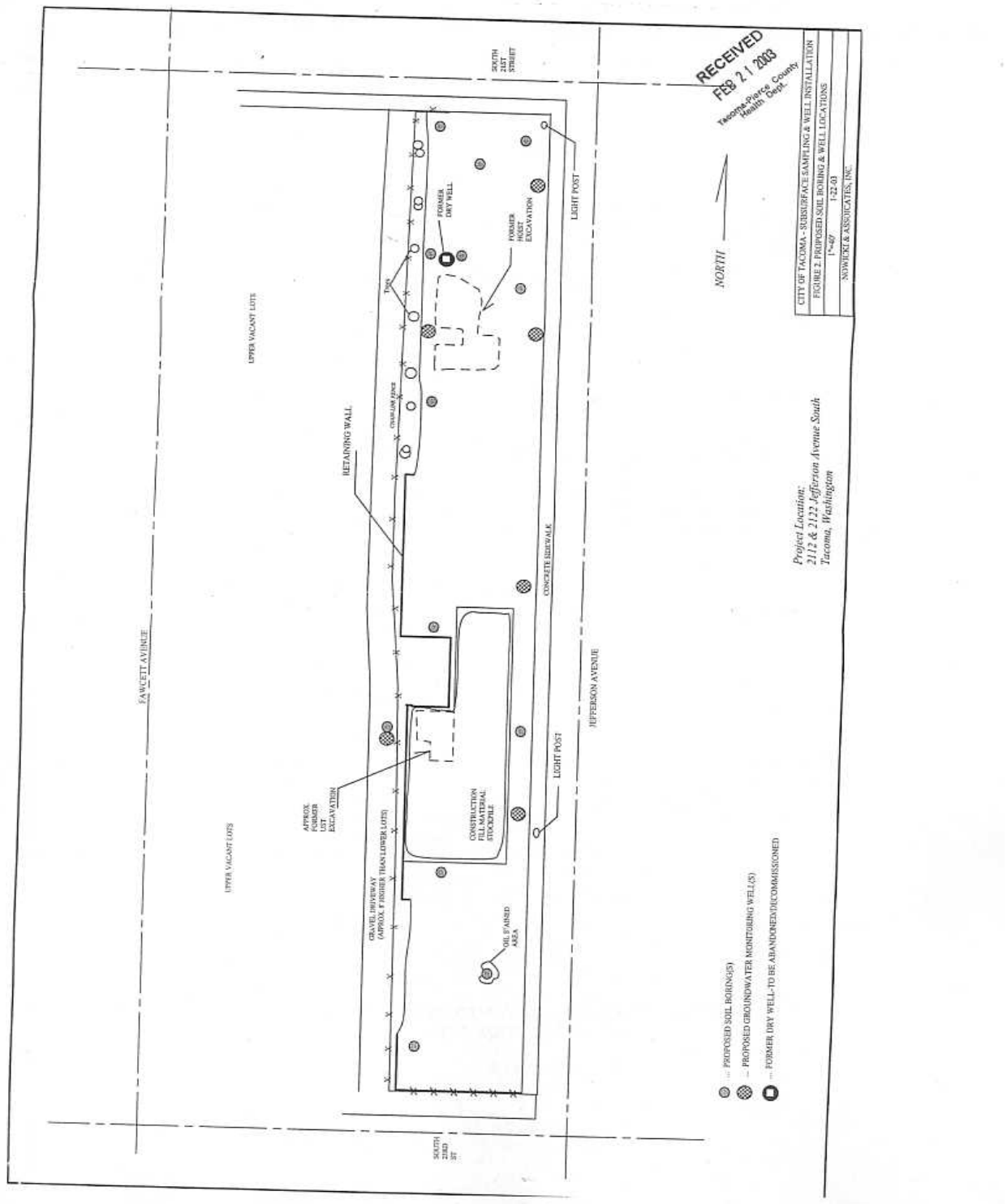
Subsequent to the NAI subsurface site characterization six monitoring wells were installed at thirteen feet (13') bgs and the previously located old percolation well was properly abandoned by NAI. See Figure 3 for monitoring well placement. Groundwater flow was determined to be east with a potential northeast component. Quarterly groundwater monitoring began in March 2004 and continued until March 2005. Collected groundwater samples were analyzed for TPH and BTEX Compounds. TPH-Dx was detected in MW-6 during the third quarter groundwater monitoring event (October, 2004) at thirteen thousand (13,000) ug/l.

In 2006 the City of Tacoma enrolled the property into the Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP) by submitting an independent remedial action report. On May 15, 2006 Ecology issued an opinion of "Further Action Determination" citing the following deficiencies in the independent remedial action:

- Insufficient down gradient groundwater monitoring wells to adequately characterize the extent of the potential residual petroleum-impacted groundwater.
- Insufficient frequency of groundwater samples analyzed for the full suite of appropriate analytes for TPH characterization. Specifically Ecology cites MTCA Table 830-1 for gasoline range organics which includes the additional analysis of methyl tert-butyl ether (MtBE), 1,2-dichloroethane (EDC), 1,2-dibromoethane (EDB), total lead, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs).
- Insufficient investigation of the contaminated soils found in the Test Pit 1 area.
- Insufficient sampling for lead and arsenic due to the site's location (proximity to Asarco smelter).

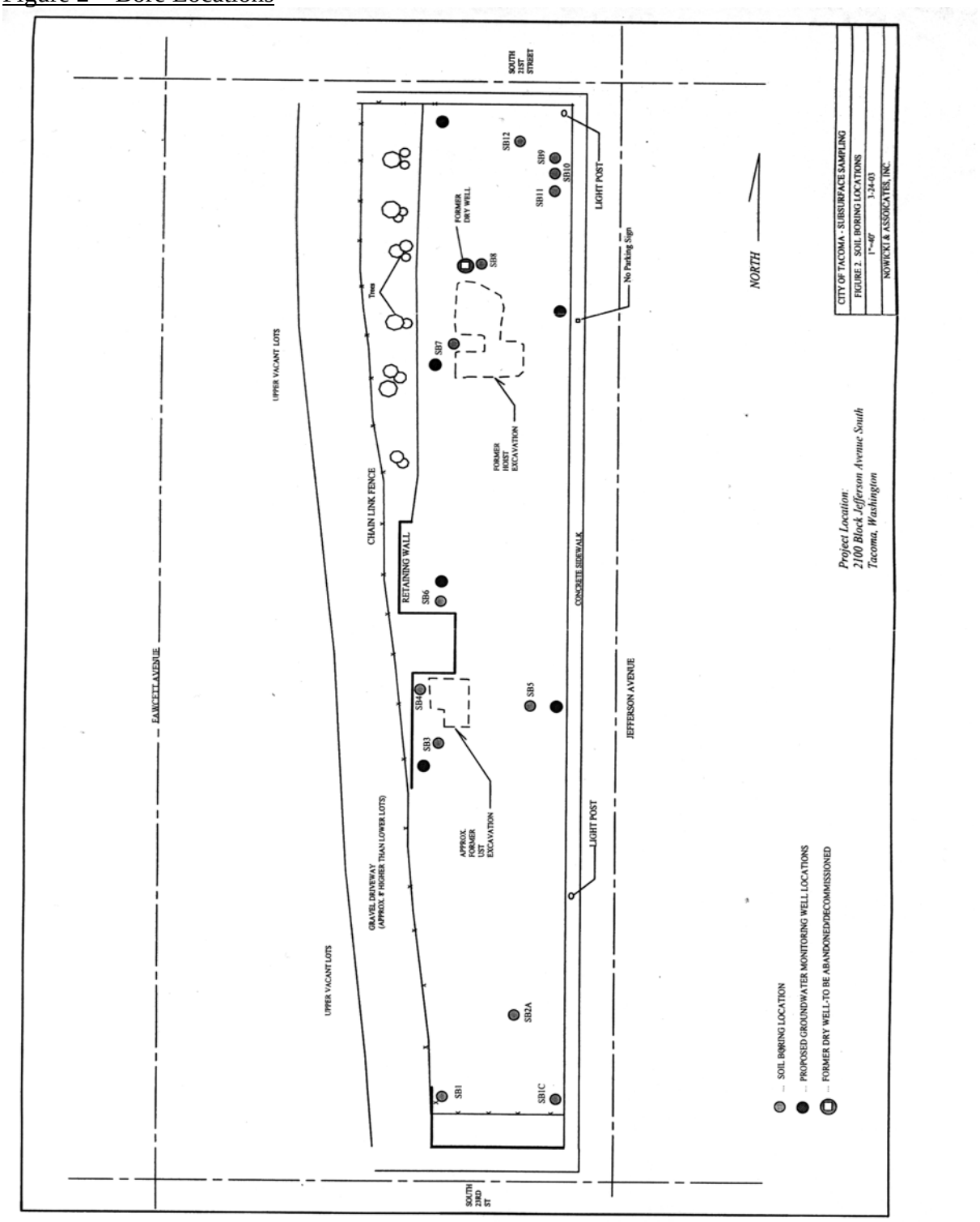
On July 25, 2007, Ecology issued a letter to the City of Tacoma requesting an update regarding site remediation activities. The City of Tacoma contacted Ecology on August 22, 2007 and indicated that they were not intending to pursue cleanup at this time. On September 10, 2007, Ecology issued a Termination Letter thereby removing the site from the VCP. On June 23, 2010, the City of Tacoma was issued a letter indicating that a Site Hazard Assessment (SHA) would be conducted by the Tacoma-Pierce County Health Department (The Health Department).

Figure 1 – Excavation Areas[2]



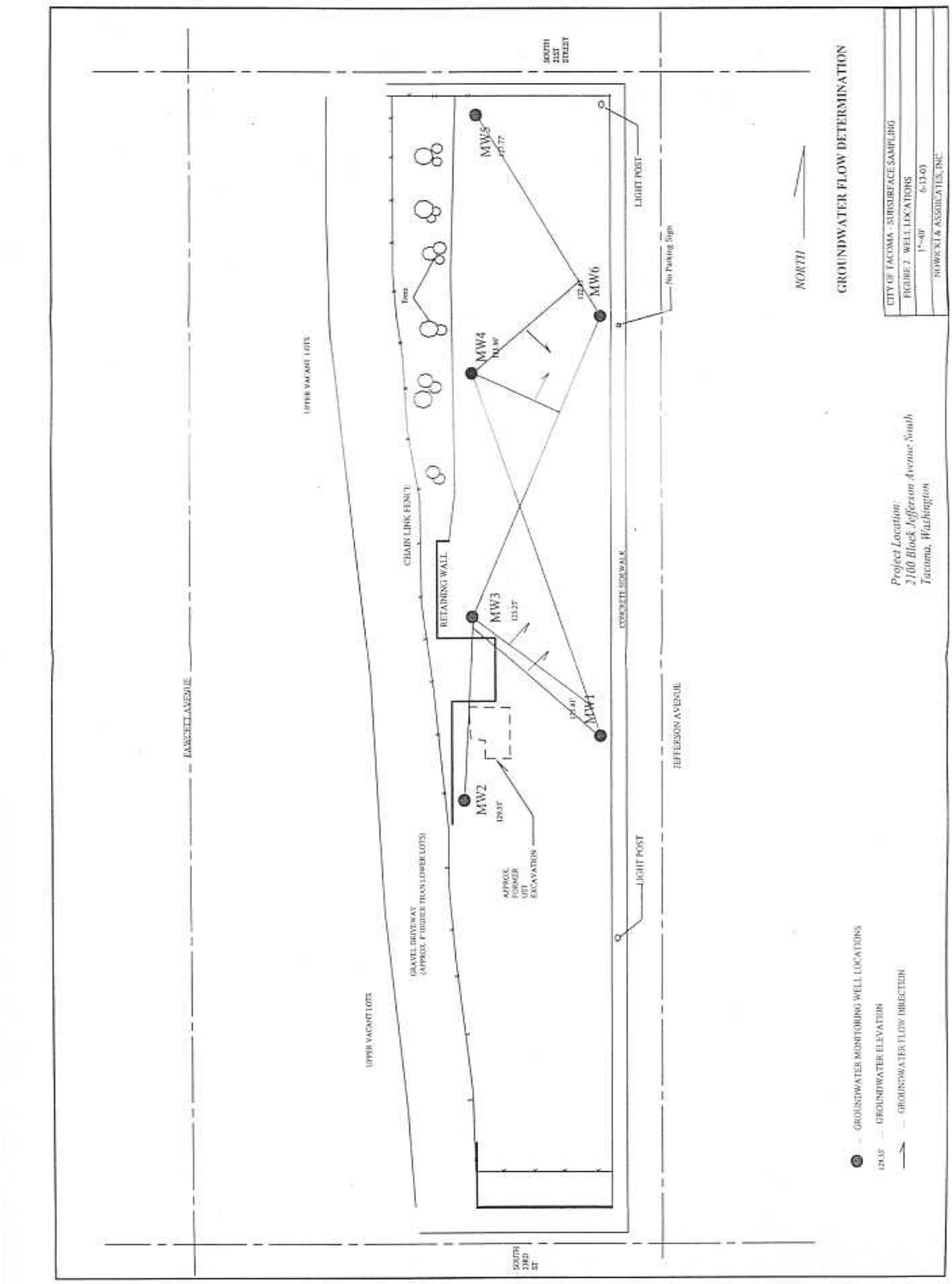
[2] Site Diagram reprinted from "Nowicki & Associates Energy & Environmental Management *Subsurface Soil Sampling and Well Installation Work Plan*" February 20, 2003.

Figure 2 – Bore Locations[3]



[3] Site Diagram reprinted from "Nowicki & Associates Energy & Environmental Management *Subsurface Site Characterization Report*" April 25, 2003.

Figure 3 – Monitoring Well Locations[4]



[4] Site Diagram reprinted from "Nowicki & Associates Energy & Environmental Management *Groundwater Monitoring Well Installation Report*" November 21, 2003.

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):

The scope of this Site Hazard Assessment did not include a hydrogeologic survey of the subject site and surrounding area. The groundwater contamination documented or inferred at the subject site is therefore considered to have the potential to impact any well located within the prescribed 2-mile radius and all such wells were used in the scoring process.

ROUTE SCORES:

Surface Water/Human Health:	**NS**	Surface Water/Environ.	**NS**
Air/Human Health:	**NS**	Air/ Environmental:	**NS**
Ground Water/Human Health:	**60.2**		

OVERALL RANK: 2

Worksheet 2--Route Documentation

1. SURFACE WATER ROUTE:

Not scored

2. AIR ROUTE:

Not Scored

3. GROUND WATER ROUTE:

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

Arsenic, Lead, Diesel Range Organics (TPH-Diesel), TPH-Heavy Oil, TPH-Gas; benzene, toluene, ethylbenzene, xylenes constituents (BTEX Compounds); carcinogenic polycyclic aromatic hydrocarbons (cPAHs), methyl tert-butyl ether (MTBE), and 1,2-dichloroethane (EDC), 1,2-dibromoethane (EDB)

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

Benzene and TPH-Dx will be used for scoring due to concentrations in groundwater, exceeding MTCA Method A groundwater Cleanup Levels verified through analytical sampling and analysis.

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

Spills, Discharge, Contaminated Soil

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

Spills, Discharge, Contaminated Soil will be the management unit used for scoring due to contaminated soil and groundwater verified through sampling and analysis.

Worksheet 6 – Ground Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (ug/1)	Val	Acute Toxicity (mg/kg-bw)	Val	Chronic Toxicity (mg/kg/day)	Val	Carcinogenicity		Val
								WOE	PF*	
1	Benzene	5	8	3306 (rat)	3	--	ND	A	0.029	5
2	TPH-Diesel	160	4	490 (rat)	5	0.004	3	--	--	ND
3										
4										
5										
6										

***Potency Factor**

Source: **2, 3**

Highest Value: **8** (Max=10)

Plus 2 Bonus Points? **0**

Final Toxicity Value: **8** (Max=12)

1.2 Mobility (Use numbers to refer to above listed substances)

Cations/Anions:	OR	Solubility (mg/1):
1=		1= **Benzene = 1800 mg/l = 3**
2=		2= **TPH-Diesel = 30 mg/l = 1**
3=		3=
4=		4=
5=		5=
6=		6=

Source: **2, 3**

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

1.3 Substance Quantity: > 10 – 100 Cubic Yards

Explain basis: Conservative estimate based on the historical site usage, potential remaining source material and areal extent of potential contamination.

Source: **1, 2**

Value: **2** (Max=10)

Worksheet 6 (cont'd)

2.0 MIGRATION POTENTIAL

2.1	**Containment** Spills, Discharge, and Contaminated Soil **Explain basis:** Historical releases of petroleum hydrocarbons	**Source: 1, 2**	**Value: 10** (Max = 10)
2.2	**Net precipitation:** (Nov. – Apr.) 22.9 inches (29.3'' – 6.4'')	**Source: 2, 9**	**Value: 3** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Sand and Gravel	**Source: 1, 2**	**Value: 4** (Max = 4)
2.4	**Vertical depth to ground water:** 0 **feet**	**Source: 1,2,7**	**Value: 8** (Max = 8)

3.0 TARGETS

3.1	**Ground water usage:** EPA Sole Source Aquifer	**Source: 2, 11**	**Value: 10** (Max = 10)
3.2	**Distance to nearest drinking water well:** 1375 **feet.** (Group B Water System, Tacoma (Star) Ice)	**Source: 2,7,11**	**Value: 3** (Max = 5)
3.3	**Population served within 2 miles: √ pop. =** √ 300,000 = >100	**Source: 2,8,11**	**Value: 100** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** **(0.75)** √ 223 **= 11.19**	**Source: 2, 6**	**Value: 11** (Max = 50)

4.0 RELEASE

Explain basis for scoring a release to ground water: Concentrations greater than MTCA CULs verified through sampling and analysis	**Source: 1, 2**	**Value: 5** (Max = 5)

Sources Used in Scoring

1. Tacoma-Pierce County Health Department Site Hazard Assessment File/Ecology TCP File
2. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
3. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
4. U.S. Department of Interior Geological Survey Topographical Map
5. Soil Survey of Pierce County, U.S.D.A. Soil Conservation Service
6. Water Rights Information System (WRIS), Ecology
7. Department of Ecology/Tacoma-Pierce County Health Department Well Logs
8. Washington State Department of Health Public Water Supply System
9. Washington Climate for Pierce County, National Weather Service Forecast Office
10. Department of Fish and Wildlife, Catalog of Washington Streams and Salmon
11. Pierce County Geographic Information System Countyview Database
12. Tacoma-Pierce County Health Department Underground StorageTtank Program File