

**Tacoma-Pierce County Health Department
Source Protection Programs/Site Hazard Assessment**

Worksheet 1 - Summary Score Sheet

SITE INFORMATION

Name: Camas Property
Address: 2926 South M Street
City: Tacoma **County:** Pierce, **State:** WA **Zip:** 98409
Section/Township/Range: 08/20N/3E
Latitude: 47° 13' 55.78"N **Longitude:** 122° 27' 5.02"W
Facility Site ID Number: 33468224

Site assessed/ranked for the February 24, 2004 update.

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

The Camas Property encompasses a 2.42 acre site located in a valley locally referred to as the *Nalley Valley*. This site is zoned M2 (heavy industrial). It is occupied by a very large, one-story building with a listed area of 60,508 square feet. There is a paved parking lot on both sides of the building. The property is owned by a consortium known as Camas Associates, and it is managed for them by Stephen Redford of KAMG Management. Camas Associates purchased the property in 1986 and has leased it for use as a warehouse since that time to several business entities: Sears, Northwest Textiles, RowTac, and Atlas Foundry.

The Nalley Valley lies within the South Tacoma Channel where surface soils are composed of glacial outwash. The South Tacoma Channel generally exhibits a lack of glacial till due to erosion by outflow from the glacial Lake Puyallup; the erosional process removed the till and left behind recessional outwash deposits. The hydrogeology of the South Tacoma Channel promotes percolation of precipitation and surface water into the saturated zone.

The general topography of the Nalley Valley has been altered in many places with cut and fill as part of the real estate development of this area. A railroad track located south of the Camas site is about 20 feet lower in elevation as compared to the Camas site. Early maps of this general area consistently show a 20 foot embankment in much the same place as the present day slope to the railroad tracks. Both the railroad and the Camas property may have been constructed on, or close to, the original grade in this immediate area. The topography shifts from a valley to a ravine east of the Camas site, with a downward sloping trend towards the NE and the Thea Foss Waterway.

History

Jesse Berkheimer moved his roofing business, the J. E. Berkheimer Manufacturing Co., to the subject property in 1917 from a former operating site adjacent to the Middle Waterway. Berkheimer manufactured composition roofing materials from rags and newspaper ground into a pulp to create a felt material which was then treated with coal gas tar. When the operation was moved to the subject property, the coal gas tar was reportedly replaced with asphalt as the weatherproofing material. The asphalt may have been distilled from crude oil on site in a refining mill. The manufacturing plant caught fire at least four times, in 1926, 1932, 1938, and 1943, requiring some degree of rebuilding each time. An article in the local newspaper covering the 1926 fire mentioned that the Sussman Junk company adjoining the property lost 600 tons of old rubber in the fire, but the bulk storage tanks at the Shell Oil Company containing 150,000 gallons of gasoline and 80,000 gallons of oil were spared. The junkyard was located on what is now the northern portion of the subject site. When in operation, the junkyard was adjacent to the Berkheimer manufacturing plant on the north side, east of The Shell Oil Company.

Berkheimer sold the property to the Allen Manufacturing Company when he retired, circa 1947, and Allen Manufacturing continued to manufacture roofing materials at this site. The 1950 Sanborn Fire Insurance map depicts a junkyard, a roofing factory with tar stills and a coloring material tank, asphalt/roofing storage, crude oil tanks, and a well present on the Camas Property.

In 1953, the Baker Investment Company purchased the property, formed the Washington Building Company, and built the oversized warehouse still in use on the site. The warehouse appears to have been built over the former junkyard and tar stills. The warehouse was leased to Sears who occupied the site until 1991. Subsequent lessees were NW Textiles and RowTac, both of which were textile recyclers. Atlas Foundry is currently leasing the site to store castings in the warehouse building; they have a 5 year lease which began in December 2002.

Soil and Groundwater Investigation

Saltbush Environmental Services, Inc. was hired by Camas Associates to conduct a Phase I ESA in 1994 and a Phase II ESA in 2002. Four soil borings were completed to about 30 feet below ground surface (bgs) and groundwater was encountered at approximately 28 feet bgs. Saltbush described the soils encountered as poorly sorted sand/gravel/cobble down to 5 feet bgs, with interbedded well-sorted medium grained sands and gravels from 5 feet bgs down to 28 feet bgs. This would suggest that native materials remain on the site, covered with approximately 5 feet of fill material at the surface. Gross soil contamination was visible from 7 to 28 feet bgs in BH1, with the spoon used to collect soil samples visibly coated with free product. BH1 was located on the west side of the warehouse building.

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Soil and groundwater samples were collected from each of the boreholes and analyzed for petroleum hydrocarbons. Limited additional analyses were run: samples from BH1 and BH2 were analyzed for PCBs, VOCs, SVOCs; samples from BH3 were analyzed for total metals. The analytical results indicate the presence of free product in both soil and groundwater at this site. Maximum concentrations detected in the limited samples submitted for analysis are listed below.

Analyte	Soil (ppm)	Groundwater (ppb)
Diesel	3100	32,000
Oil	1700	23,000
Naphthalene	18,000	12,000
Benzo(a)anthracene, c-PAH	0.29	ND
PCBs	ND	0.14
Benzene	65	4900
Toluene	300	6000
Ethylbenzene	43	ND
Xylenes	620	6000
Arsenic	ND	11.2
Cadmium	1.3	ND
Chromium	8	59.9
Lead	210	31.6

Current Site Conditions

The paved surfaces at this site are in poor repair. There are odd disturbances to the pavement on the east side of the building that appear to be caused by pressure on the underside of the pavement resulting in a raised mound with radial cracking of the pavement. In close proximity to these "pressure mounds" are fissures in the pavement where a thick, black, tar-type substance is seeping up through the pavement. The seeps display flow marks and gas bubbles.

There is a monitoring well located in the southwest corner of the eastern parking lot. The well appears to have been recently installed. Neither the property manager nor the owners' legal counsel acknowledge responsibility for or claim knowledge of the monitoring well installation. There is no well tag or identification number on the well, and no well log was filed with TPCHD or Ecology. Saltbush did not note the presence of a pre-existing monitoring well in either the Phase I or Phase II ESA. There are three, unlabelled drums next to the well and they contain soil and water; it is likely that the contents of the drums are related to the installation of this monitoring well.

Hydrogeology

The following information was extracted from these two documents:

1. South Tacoma Wellhead Protection Program, Volume I (1993) and Volume II (1996), by Economic and Engineering Services, Inc.
2. Report of 1995 Ground Water Studies, South Tacoma Aquifer System (1998), by AGI Technologies.

There are six City of Tacoma municipal production wells located within 2 miles of the Camas Property that draw from a water producing zone designated the "Shallow Aquifer". These wells are part of what is collectively referred to as the South Tacoma Wellfield which draws water from three separate aquifers:

- The Shallow Aquifer, characterized as unconfined to "semi-confined", about 150 to 250 feet above sea level, in highly productive Steilacoom gravels; seven City of Tacoma production wells draw from this aquifer.
- The Sea Level Aquifer, a semi-confined aquifer, from about 50 feet below to 50 feet above sea level, in somewhat less productive gravels from an earlier glaciation; six municipal production wells draw from this aquifer.
- *The Deep Aquifer, a confined aquifer, from about 600 to 950 feet below sea level, consisting of medium-grained sand with some thin gravel layers; one municipal production wells draws from this aquifer.*

In areas lacking a protective layer of Vashon till, such as the Camas Property, the Shallow Aquifer is very vulnerable to contamination. The Sea Level Aquifer is separated from the Shallow Aquifer by an aquitard of variable thickness and permeability, and the Shallow Aquifer recharges the Sea Level Aquifer in some areas. The Sea Level Aquifer is less vulnerable, but contamination could enter with recharge where the aquitard is thin or where the Shallow and Sea Level Aquifers are hydraulically connected through poor well construction techniques.

The Camas Property lies to the east of a SE-NW trending groundwater divide affecting groundwater flow directions in this area of the Shallow Aquifer. Groundwater on the west side of this divide flows toward Leach Creek and the Narrows region of Puget Sound. Shallow groundwater on the east side of the divide, in the area of the Camas Property, flows east toward Commencement Bay. Similar flow patterns exist in the Sea Level Aquifer. Groundwater flow in both aquifers is locally altered when municipal production wells in the South Tacoma Wellfield are pumped from May through September. The Camas Property is located within the 5-year travel time of that portion of the Shallow Aquifer lying within the South Tacoma Wellhead Protection Zone.

The South Tacoma Wellfield is operated as a backup and seasonal source of drinking water. The principal source of drinking water for the City of Tacoma is obtained from the Green River. Wells are used to supplement surface water during peak demand periods (the summer months), and when turbidity is high in the Green River (spring

months). The water from the South Tacoma Wellfield is pumped to the Hood St. Reservoir prior to distribution.

Potential Sources of Contamination

Materials associated with the manufacture of composition roofing at this site include crude oil, asphalt and colorant. Coal gas tar may also have been used in the early years of the Berkheimer Manufacturing operation at this site. A junkyard was located in the vicinity of the current warehouse building and was documented to have stored large quantities of rubber. Numerous fires occurred at the manufacturing plant, and a considerable amount of rubber burned at the junkyard as a result of one of the fires. Water was used to suppress the fires and protect the surrounding businesses, including the Shell Oil Company, and may have provided a transport mechanism for both pre-existing and any resulting contaminants.

A casual inspection of three Sanborn Fire Insurance Maps available for this site (1912, 1950, and 1965) as well as the available Polk Directories indicate several business operations that could have contributed contamination to this site. Only businesses located immediately adjacent to the Camas Property were noted. Information was not available for all years, so occupancy information is approximate.

North: Center Street bounds the property to the north and usage of the property across the street appears limited to light commercial activities.

East: The adjacent property located on the corner of Center and South M Street was occupied by National Lead Paint Company from about 1955 through 1971 with a listed address of 2902 S. M St.

South: The property bounding the Camas site on the south was used by various fuel companies from about 1920 through 1975 and was listed in the Polk Directory as 2940 South M Street. Ford's Prairie Wood and Coal Company occupied the site from 1920 through 1933. The Polk Directory lists W. J. Pinard Fuel Company at this address from 1934 through 1942, and The Bare Fuel Company occupied the site from about 1945 through 1975.

West: The property bounding the west side of the Camas site, listed as 1404 Center Street, was used by the Shell Oil Company of California as a bulk storage facility from about 1915 through 1949.

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 significant contamination documented at this site is primarily in the subsurface soil and groundwater. Therefore, only the groundwater route is applicable for scoring at this site. However, a tar-like substance has been intermittently seeping up through cracks in a localized area of the asphalt pavement resulting in exposed patches on the surface of the pavement.

The Camas Property, located in the South Tacoma Groundwater Protection District, is in a groundwater recharge area which overlies the Central Pierce County Sole Source Aquifer. Furthermore, the drainage from this area ultimately flows into the Thea Foss Waterway, currently undergoing a massive and costly cleanup effort.

Limited sampling and analysis have been conducted at this site to date. Further work needs to be done to characterize and delineate the full extent of the contamination. Given the past business practices conducted at this and nearby sites, the potential for an area wide impact with multiple sources of contamination should be considered.

ROUTE SCORES:

Surface Water/Human Health: NS

Surface Water/Environ. NS

Air/Human Health: NS

Air/ Environmental: NS

Ground Water/Human Health: 66.6

OVERALL RANK:

2

Worksheet 2--Route Documentation

1. **SURFACE WATER ROUTE** This route not scored.

2. **AIR ROUTE** This route not scored.

3. **GROUND WATER ROUTE**

a. List those substances to be considered for scoring:

Source: 1,2

PCBs, benzene, toluene, ethylbenzene, xylenes, diesel, heavy oil, naphthalene, lead, chromium, arsenic, and benzo(a) anthracene have all been detected in soil and/or groundwater above MTCA Cleanup Levels.

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

PCBs, benzene, naphthalene, and lead will be used as representative analytes for the types of contaminants detected. Benzo(a)anthracene, a carcinogenic PAH, will also be used in scoring. These substances will be scored for the groundwater route due to levels detected and because all substances were available to the groundwater route through less than perfect containment.

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

Source: 1,2

Contaminated soil capped with poorly maintained paved surfaces and buildings, no liner or leachate collection system, with free product detected in soil and groundwater.

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

Contaminated soil and/or groundwater verified by sampling and analysis.

Not Applicable

**Worksheet 3 - Substance Characteristics Worksheet
For Multiple Unit/Substance Sites (If Required)**

UNIT	Combination 1	Combination 2	Combination 3
1. SURFACE WATER ROUTE			
Substances:			
Human Toxicity Value:			
Environ. Toxicity Value:			
Containment Value:			
Rationale:			
Surface Water Human Subscore:	(+3)(+1)= () () =	(+3)(+1)= () () =	(+3)(+1)= () () =
Surface Water Environ. Subscore:	(+3)(+1)= () () =	(+3)(+1)= () () =	(+3)(+1)= () () =
2. AIR ROUTE			
Substances:			
Human Toxicity/ Mobility Value:			
Environ. Toxicity/ Mobility Value:			
Containment Value:			
Rationale:			
Air Human Subscore:	(+3)(+1)= () () =	(+3)(+1)= () () =	(+3)(+1)= () () =
Air Environ. Subscore:	(+3)(+1)= () () =	(+3)(+1)= () () =	(+3)(+1)= () () =
3. GROUND WATER ROUTE			
Substances:			
Human Toxicity Value:			
Containment Value:			
Rationale:			
Groundwater Subscore:	(+3)(+1)= () () =	(+3)(+1)= () () =	(+3)(+1)= () () =

Based on their respective highest scoring toxicity/containment combinations, the following management units will be used for route scoring:

Surface Water - _____

Air - _____

Ground Water - _____

*Potency Factor

Source:

Worksheet 6 – Ground Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity									
Substance		Drinking Water Standard (ug/l)	Val	Acute Toxicity (mg/kg-bw)	Val	Chronic Toxicity (mg/kg/day)	Val	Carcinogenicity WOE PF*	Val
1	PCBs	0.5	10	1315 (rat)	3	--	--	7.7	6
2	Benzene	5	8	3306 (rat)	3	--	ND	0.029	5
3	Naphthalene	20	6	490 (rat)	5	0.004	3	--	ND
4	Lead	5	8	--	ND	--	ND	--	ND
5	Benzo(a)anthracene	0.2	10	--	--	--	--	11.5	7
6									

*Potency Factor

Source: 1,2,3

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:	OR Solubility (mg/l):
1=	1= PCBs = 0
2=	2= Benzene = 3
3=	3= Naphthalene = 1
4=	4= Lead = 2
	5= Benzo (a) anthracene = 0
	Source: 3 Value: 3
1.3 Substance Quantity: Unknown	
Explain basis: Default value	Source: <u>1,2</u> Value: <u>1</u> (Max = 10)

Worksheet 6 (cont'd)

2.0 MIGRATION POTENTIAL

2.1	Containment "Landfill" with a poorly maintained cover (1), no liner (3) or leachate collection (2), and free liquids (3). Explain basis: Free product found in contaminated soil and groundwater; tar-like substance seeping up through cracked pavement.	Source: <u>1,2</u> Value: <u>9</u> (Max = 10)
2.2	Net precipitation: Nov-April = 19.1 inches (25.5 – 6.4)	Source: <u>2,9</u> Value: <u>2</u> (Max = 5)
2.3	Subsurface hydraulic conductivity: Sand and gravel	Source: <u>1,2</u> Value: <u>4</u> (Max = 4)
2.4	Vertical depth to ground water: 0 feet	Source: <u>1,2</u> Value: <u>8</u> (Max = 8)

3.0 TARGETS

3.1	Ground water usage: Federally designated sole source aquifer	Source: <u>1,2,11</u> Value: <u>10</u> (Max = 10)
3.2	Distance to nearest drinking water well: <u>3800</u> feet (Tacoma Star & Ice)	Source: <u>2,7,11</u> Value: <u>2</u> (Max = 5)
3.3	Population served within 2 miles: $\sqrt{\text{pop.}} = \sqrt{316859} = \underline{563}$	Source: <u>2,7,11</u> Value: <u>100</u> (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: (0.75) $\sqrt{0}$ No. acres = <u>0</u>	Source: <u>2,6</u> Value: <u>0</u> (Max = 50)

4.0 RELEASE

Explain basis for scoring a release to ground water: Contaminants detected in soil with less than perfect containment; contaminants and free product found in groundwater.	Source: <u>1,2</u> Value: <u>5</u> (Max = 5)
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Sources Used in Scoring Camas Property, 2926 South M St., Tacoma 98409

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. Environmental Protection Agency Region 10 Site Information for Site
Latitude: 47° 13' 55.78" N
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