CSID 3509

WORKSHEET 1
SUMMARY SCORE SHEET

Site Name/Location (Street, City, County, Section/Township/Range).

Spokane Gas Manufacturing
North 111 Erie Street
Spokane, Washington

Latitude: 47°39'38"
Longitude: 117°23'35"
SE ¼ Sec. 17, T.25N, R.43EWM.

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

The former Spokane Gas Manufacturing (SGM) site, located at North 111 Erie Street, is adjacent to the riverbank of the Spokane River. The site is within the city limits of Spokane, in Spokane County, Washington. The site occupies approximately 1.3 acres and is currently part of the Brown Building Materials facility, which extends to the north and west. Immediately south is the former American Tar Company site, on Burlington Northern Railroad property.

The gas manufacturing operation consisted of at least four buildings, including at least two aboveground tanks and oil/water separator. Current use is for the storage of salvage building materials. None of the buildings or structures from the gas manufacturing process remain on site. Historically Union Gas Company obtained the SGM site and constructed the coal gasification facilities in 1905. Spokane Gas and Fuel Company operated on the site from 1910 to 1948. Washington Water Power acquired the property in the mid-1950s after SGM facilities had been razed. Richard and Norma Brown obtained the property in 1978 and are the current owners.

Review of documents pertaining to the Spokane Gas Manufacturing site (ref. Bibliography) has disclosed gross subsurface contamination remnants of the coal gasification process. The primary contaminant is coal tar a heavy hydrocarbon compound with very low mobility and solubility. Health risk concerns are focused on the coal tar components of multiple polycyclic aromatic hydrocarbons (PAH's). Specific PAH's which present a carcinogenic risk that were found to exceed MTCA were Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, and Chrysene.

Additionally, test results revealed the following contaminants in soil tests exceeding MTCA standards: Naphthalene, arsenic, and xylene.

Review of documents indicated the presence of "free product" that interfaced with groundwater. Sample results from one piezometer (MW-2d) revealed groundwater contamination with naphthalene, and PAH's (Phenanthrene).

ROUTE SCORES:

Surface Water/Human Health: 2.9 Surface Water/Environmental: 5.7

Air/Human Health: NA Air/Environmental: NA

Ground Water/Human Health: 71.5

OVERALL RANK: 3

*** NOT SCORED**

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WORKSHEET 2
ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE.

List those substances to be considered for scoring: **Source:** 1
Naphthalene, Phenanthrene

Explain basis for choice of substance(s) to be used in scoring.
Contaminants confirmed in groundwater samples proximate to the Spokane River.
Groundwater to surface water exchange probable at this site.

List those management units to be considered for scoring: **Source:** 1
Contaminated surface water (Spokane River) as a result of adjacent contaminated ground water.

Explain basis for choice of unit to be used in scoring. **Source:** 1
Analysis of site groundwater (shallow and adjacent to river) displays cited contaminants exceeding MTCA standards.

2. AIR ROUTE. NOT SCORED

Site conditions do not present an air pathway human health or environmental risk due to inert non-contaminated fill placed over relic site contamination. The contaminants primary pathways are through subsurface soils, groundwater, and surface water.

WORKSHEET 2 (CONTINUED)
ROUTE DOCUMENTATION

3. GROUND WATER ROUTE

List those substances to be considered for scoring: **Source: 1**

Polycyclic Aromatic Hydrocarbons (PAH):
Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, and Chrysene.
Naphthalene *
Phenanthrene *
Arsenic
Xylene
* Displayed in ground water samples

Explain basis for choice of substance(s) to be used in scoring.
Contaminants confirmed in site's subsurface soil samples.
Contaminants exceed MTCA standards.

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

Contaminated subsurface soil and groundwater.

Explain basis for choice of unit to be used in scoring.
Analysis of site soils displayed variable levels of contaminants exceeding MTCA standards:
Benzo(a)anthracene levels up to 437 mg/kg .....MTCA Method B @ 0.137 mg/kg
Benzo(b)fluoranthene levels up to 459 mg/kg..... MTCA Method B @ 0.137 mg/kg
Benzo(a)pyrene levels up to 466 mg/kg.....MTCA Method B @ 0.137 mg/kg
Chrysene levels up to 480 mg/kg.....MTCA Method B @ 0.137 mg/kg
Arsenic levels up to 53.3 mg/kg.....MTCA Method A @ 20.0 mg/kg
Naphthalene levels up to 3,590 mg/kg.....MTCA Method B @ 320 mg/kg
Xylene levels up to 73.9 mg/kg.....MTCA Method A @ 20.0 mg/kg
Analysis of site ground water displayed the following levels of contaminants exceeding drinking water/groundwater standards
Phenanthrene levels up to 25 ug/L.....MTCA Method A @ 0.2 ug/L
Naphthalene levels up to 70 ug/L.....MTCA Method B @ 32.0 ug/L

WORKSHEET 4
SURFACE 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. Naphthalene	20	6	490	5	0.004	3	**	**	ND
2. Phenanthrene	0.2	10	**	ND	**	ND	**	**	ND
2.									
3.									

Source's: 1a, b, 2, 3
Highest Value: 10
+2 Bonus Points? 2

Final Toxicity Value 12

1.2 Environmental Toxicity: (X) Freshwater
( ) Marine

Substance	Acute Water Quality Criteria (ug/l)	Value	Non-human Mammalian Acute Toxicity (mg/kg)	Value
1. Naphthalene	2300	2	490	5
2. Phenanthrene	**	ND	**	ND
3.				
4				
5.				

Source's: 2, 3 **Value: 5**

1.3 Substance Quantity 1.3 acre surface Source: 3 **Value: 8**

1.4 Explain basis: No information is available on the quantity of contaminant; therefore, substance quantity value assignment will be based on WARM scoring manual Table SW-6A . Contaminants are believed to extend throughout the site therefore a 1.3 acre surface area areal extent will be used.

WORKSHEET 4 (CONTINUED)
SURFACE WATER ROUTE

2.0 MIGRATION POTENTIAL

2.1 Containment Spills, Discharges, and Contaminated Soil Source: 3 **Value: 0**
Explain basis: Unable to detect qualitative release to surface water due to sheer volume of the Spokane River.

2.2 Surface Soil Permeability: (GgA) medium Source: 5 **Value: 3**

2.3 Total Annual Precipitation: 14 inches Source: 4 **Value: 2**

2.4 Max. 2-Yr/24-hour Precipitation: >1-2 inches Source's: 3, 4 **Value: 2**

2.5 Flood Plain: In 100 yr flood plain Source: 10 **Value: 2**

2.6 Terrain Slope: ≤ 2 % Source: 5 **Value: 1**

3.0 TARGETS

3.1 Distance to Surface Water: ≤ 1,000 ft Source: 11 **Value: 10**

3.2 Population Served within 2 miles: √ pop. =√ 0 = Source: 8 **Value: 0**

3.3 Area Irrigated within 2 miles: 0.75√no. acres = 0
0.75√ 0 =0.75( )= Source: 9 **Value: 0**

3.4 Distance to Nearest Fishery Resource: ≤ 1,000 ft Source: 11 **Value: 12**

3.5 Distance to, and Name(s) of, Nearest Sensitive Environment(s) Spokane River Source: 11 **Value: 12**

4.0 RELEASE

Explain basis for scoring a release to surface water: Source: 3 **Value: 0**
The discharge of contaminated groundwater to surface water has not been confirmed. A strong probability exists that a release is occurring; however, due to high volume flows of the Spokane River, the possibility of up river contaminant influence, and the difficulty of sample acquisition with confidence value; a release will not be scored.

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. Arsenic	50	6	763	5	0.001	5	A	1.75	7
2. Naphthalene	20	6	490	5	0.004	3	**	**	ND
3. Phenanthrene	0.2	10	**	ND	**	ND	**	**	ND
4. Benzo(a) anthracine	0.2	10	**	ND	**	ND	B2	11.5	7
5. Xylene	10000	2	50	10	2	1	**	**	ND

*Potency Factor

Source's: 1a, b, 2, 3
Highest Value: 10
+2 Bonus Points? 2

Final Toxicity Value:12

1.2 Mobility (Use numbers to refer to above listed substances)
Cations/Anions: **1.** (K) >1.0=3 Source: 3 **Value: 3**
OR
Solubility(mg/l): **2.** 3.0E+01=1; **3.** 1.0E+00=0; **4.** 5.7E-03=0; **5.** 2.0E+02=2

1.3 Substance Quantity 6292 cubic yards Source: 3 **Value: 7**
1.4 Explain basis: (Table GW-7 WARM scoring manual) Estimated quantity using 1.3 acres site surface area x 3 foot depth; therefore, 43,560' x 1.3 =56,628' x 3'= 169884 cuft. / 27 = 6292 cubic yards

2.0 MIGRATION POTENTIAL

2.1 Containment Spills, Discharges, and Contaminated Soil Source: 3 **Value: 10**
Explain basis: Spills, Discharges, and Contaminated Soil from site usage history

2.2 Net Precipitation: 7.2 inches Source: 4 **Value: 1**

2.3 Subsurface Hydraulic Conductivity: $>10^{-5}$ to 10^{-3} Source: 5 **Value: 3**

2.4 Vertical Depth to Ground Water: 0 - 25 feet Source's: 1a, b, 6 **Value: 8**

3.0 TARGETS

3.1 Ground Water Usage: Federally-designated sole source aquifer Source: 7 **Value: 10** (Max.=10)

3.2 Distance to Nearest Drinking Water Well: 8,500 ft Source: 8 **Value: 1** (Max.=5)

3.3 Population Served within 2 Miles: √pop.=>10,000 (city wells) Source: 8 **Value: 10** (Max.=100)

3.4 Area Irrigated by (Groundwater) Wells
within 2 miles: $0.75\sqrt{}$no. acres = 30.5
$0.75\sqrt{30.5} = 0.75\ (5.5) = 4.1$
Source: 9 **Value: 4**

(Max.=50)

4.0 RELEASE

Explain basis for scoring a release to ground water: Documented release of contaminants in site's shallow groundwater Source: 1a **Value: 5**

(Max.=5)

SOURCES USED IN SCORING

1a. Preliminary Site Investigation-Former Spokane Manufactured Gas Plant
Landau Associates, Inc. prepared for The Washington Water Power Company
February 9, 1998.

1b. Data Package For SR 290 SouthRiver Drive Alignment Investigation Spokane Washington
EMCON Report Prepared for Washington State Department of Transportation
November 19, 1997

1c. Limited, Environmental Assessment Report of Known and Suspected Contaminated Sites
Washington State Department of Transportation ERO
February 1996

1d. Screening Site Inspection Report for Spokane Gas Manufacturing Spokane, Washington
CERCLIS NO. WAD981762990
Work Assignment No. 54-17-OJZZ United States Environmental Protection Agency
Prepared by: URS Consultants, Inc. URS DOC 62760.34.20.960.44.b1
May 8, 1995

1e. Preliminary Assessment Spokane Gas Manufacturing Site (Memorandum)
Ecology and Environment, Inc.
March 24, 1987

2. Toxicology Database - Washington Ranking Method Scoring (WARM)

3. WARM Scoring Manual

4. Washington Climate, Spokane Co. WSU Dept. of Agriculture

5. Soil Survey of Spokane Co. Washington, USDA Soil Conservation Svc.

6. Washington Department of Ecology, Well Logs.

7. Aquifer Sensitive Area Overlay Zone Map, Spokane Co. Washington

8. Washington Dept. of Health Drinking Water Information Network (DWIN)

9. Water Resource Information System (WRIS) Washington Dept. of Ecology

10. FEMA Flood Insurance Rate Map

11. Quadrangle Maps of Washington, Spokane NE.