CSID 2537

WORKSHEET 1
SUMMARY SCORE SHEET

Site Name/Location (Street, City, County, Section/Township/Range, TCP ID Number):

Goose Lake
N.W. of State Route 1
Shelton, Mason County, WA 98584
Latitude= 47°13'50" North; Longitude 123°08'05" West

Sect. 12/T20N/R04W
Ecology ID No.:S-23-0004-000

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

Goose Lake and a series of nearby (now covered) upland disposal ponds were used as dumping grounds for thousands of tons of ITT Rayonier-generated waste pulp sulfite liquor from May 1931 until August 1943. By that time, a total of 300,000 tons of dissolved organic material reportedly had been dumped on Goose Lake and the Scotts Prairie area.

During the same period and continuing until late 1974, unknown quantities of solid pulp mill waste, including wood debris, pulp by-products, building material, incineration char, and office/laboratory garbage were dumped into a landfill area immediately adjacent to the lake. It was also reported that small amounts of unauthorized household wastes were dumped in the area, and that an asphalt batch plant operated on-site during more recent years for an unknown length of time.

In 1945, the mill re-opened with a new disposal system, eliminating the need to dump sulfite liquor waste effluent on-site; however, solid waste burial on-site resumed, with the addition of the burial of char from the incineration of waste sulfite liquor. Final closure of the mill occurred in August 1957, although the ITT Rayonier Olympic Research laboratory remained opened and continued dumping and covering solid waste of four general categories on-site: i) steeping wastes, a pine cellulose in a caustic slurry; ii) acetate dope, a chemically converted cellulose solution; iii) a very minor amount of contaminated or otherwise unusable chemicals; iv) general laboratory garbage.

Ecology contractor, Science Applications International Corporation (SAIC) conducted a field investigation in April 1997, sampling soils, sediments and groundwater. Mercury and polychlorinated biphenyls (PCBs) were found in sediment samples at concentrations exceeding established criteria (although the PCBs were not so much of a concern when the concentrations were normalized to total organic carbon). Concentrations of chromium and arsenic were found in ground water samples exceeding their respective Model Toxics Control Act (MTCA) cleanup level. Significant concentrations of these two metals were also found in soil samples taken on site, although only arsenic was detected above its MTCA cleanup level.

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 air route will not be scored, as the significant amounts of contamination remaining at the site are predominantly subsurface, or adequately covered by vegetation to eliminate a significant threat via the air route to human health and the environment.

ROUTE SCORES:

Surface Water/Human Health:	16.9	Surface Water/Environ.:	39.3
Air/Human Health:	NS	Air/Environmental:	NS
Ground Water/Human Health:	58.4		

OVERALL RANK: 2

WORKSHEET 2
ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE

List those substances to be considered for scoring: Source: 1,2

Arsenic, chromium, mercury and polychlorinated biphenyls (PCBs)

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

Will score this route using arsenic, chromium, and mercury toxicities. Analytical results from on-site soil, sediment, and ground water samples – indicated significant concentrations of all of the above substances, relative to their respective MTCA cleanup levels, except for PCBs.

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

Contaminated soil - through historical spills/discharge/drainage from on-site activities; landfilled solid pulp mill waste and sulfite liquor effluent.

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

Will score site based on landfill as the contaminant source unit.

2. AIR ROUTE - Route not applicable/not scored.

3. GROUND WATER ROUTE

List those substances to be considered for scoring: Source: 1,2

Arsenic, chromium, mercury and polychlorinated biphenyls (PCBs)

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

Will score this route using arsenic, chromium, and mercury toxicities. Analytical results from on-site soil, sediment, and ground water samples – indicated significant concentrations of all of the above substances, relative to their respective MTCA cleanup levels, except for PCBs.

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

Contaminated soil - through historical spills/discharge/drainage from on-site activities; landfilled solid pulp mill waste and sulfite liquor effluent.

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

Will score site based on landfill as the contaminant source unit.

WORKSHEET 3 (If Required)
SUBSTANCE CHARACTERISTICS WORKSHEET
FOR MULTIPLE UNIT/SUBSTANCE SITES
Combination 1 Combination 2 Combination 3

Unit: **Section Not Applicable.**

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1. SURFACE WATER ROUTE

Substance(s):
Human Toxicity Value:
Environ. Toxicity Value:
Containment Value:
Rationale:

	Combination 1	Combination 2	Combination 3
Surface Water Human Subscore:	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___
Surface Water Environ. Subscore:	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___

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2. AIR ROUTE

Substance(s):
Human Toxicity/Mobility Value:
Environ. Toxicity/ Mobility Value:
Containment Value:
Rationale:

	Combination 1	Combination 2	Combination 3
Air Human Subscore:	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___
Air Environ. Subscore:	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___	(+3)(+1)= ( )( ) = ___

3. GROUND WATER ROUTE

Substance(s):
Human Toxicity Value:
Containment Value:
Rationale:

	Combination 1	Combination 2	Combination 3
Ground Water 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 -

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.	Carcino-genicity WOE	PF*	Val.
1. Arsenic	50	6	763 (rat)	5	1E-03	5	A=1	1.75=7	7
2. Chromium	100	6	ND	-	1	3	ND	-	-
3. Mercury	2	8	ND	-	3E-04	5	ND	-	-

*Potency Factor

Source: 1-3
Highest Value: 8 (Max.=10)

+2 Bonus Points? 2
Final Toxicity Value: 10 (Max.=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. Arsenic	360	4		
2. Chromium	1700	2		
3. Mercury	2.4	8		

Source: 1-3 **Value: 8** (Max.=10)

1.3 Substance Quantity: 300,000 tons Source: 1,2 **Value: 10** (Max.=10)

Explain basis: _____

WORKSHEET 4 (CONTINUED)
SURFACE WATER ROUTE

2.0 MIGRATION POTENTIAL

2.1 Containment — Source: 1,2,4 **Value:** 5 (Max.=10)
Explain basis:
Management unit scored as a landfill - unmaintained run-on/runoff control system or cover

2.2 Surface Soil Permeability: Silts/sands = medium — Source: 1,2,4 **Value:** 3 (Max.=7)

2.3 Total Annual Precipitation: 64 inches — Source: 5 **Value:** 4 (Max.=5)

2.4 Max. 2-Yr/24-hour Precipitation: 2 - 4 inches — Source: 4 **Value:** 3 (Max.=5)

2.5 Flood Plain: Not in flood plain — Source: 6 **Value:** 0 (Max.=2)

2.6 Terrain Slope: 2 - 5% — Source: 1,2,4 **Value:** 2 (Max.=5)

3.0 TARGETS

3.1 Distance to Surface Water: Less than 1000'(adjac.) — Source: 1,2 **Value:** 10 (Max.=10)

3.2 Population Served within 2 miles (See WARM Scoring Manual Regarding Direction): $\sqrt{pop.}=\sqrt{0} = 0$ — Source: 7 **Value:** 0 (Max.=75)

3.3 Area Irrigated within 2 miles $0.75\sqrt{no.\ acres}=$
(Refer to note in 3.2.): $0.75\sqrt{0} = 0$ — Source: 8 **Value:** 0 (Max.=30)

3.4 Distance to Nearest Fishery Resource: Adjacent — Source: 1,2 **Value:** 12 (Max.=12)

3.5 Distance to, and Name(s) of, Nearest Sensitive Environment(s) Lake - Fishery < 1000 feet — Source: 1,2 **Value:** 12 (Max.=12)

4.0 RELEASE
Explain basis for scoring a release to surface water: — Source: 1,2 **Value:** 5 (Max.=5)
By analysis, documented Sediment contamination

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.	Carcino-genicity WOE	PF*	Val.
1. Arsenic	50	6	763 (rat)	5	1E-03	5	A=1	1.75=7	7
2. Chromium	100	6	ND	-	1	3	ND	-	-
3. Mercury	2	8	ND	-	3E-04	5	ND	-	-

*Potency Factor

Source: 1-3
Highest Value: 8 (Max.=10)

+2 Bonus Points? 2
Final Toxicity Value: 10 (Max.=12)

1.2 Mobility (Use numbers to refer to above listed substances)
Cations/Anions: 1= 3; 2= 1; 3= 3 Source: 1-3 **Value:** 3 (Max.=3)

OR
Solubility(mg/l):

1.3 Substance Quantity: 300,000 tons Source: 1,2 **Value:** 10 (Max.=10)
Explain basis:

2.0 MIGRATION POTENTIAL

2.1 Containment Source: 1,2,4 **Value:** 10 (Max.=10)
Explain basis: Spills, discharge to soil=10
No liner; ponded water; no leachate collection system; liquids disposed.

2.2 Net Precipitation: 44.5 inches Source: 5 **Value:** 5 (Max.=5)

2.3 Subsurface Hydraulic Conductivity: Sands/silts Source: 1,2 **Value:** 3 (Max.=4)

2.4 Vertical Depth to Ground Water: 102'- 150 feet AOC Source: 1,2 **Value:** 3 (Max.=8)

WORKSHEET 6 (CONTINUED)
GROUND WATER ROUTE

3.0 TARGETS

3.1 Ground Water Usage: Pub./priv./unthr.alt.avail. Source: 1,2,7 **Value:** 4 (Max.=10)

3.2 Dist. to Nearest Drinking Water Well: 600'- ¼ mile Source: 1,2 **Value:** 4 (Max.=5)

3.3 Population Served within 2 Miles: √pop.=√8345 = 91.3 Source: 7 **Value:** 91 (Max.=100)

3.4 Area Irrigated by (Groundwater) Wells within 2 miles: 0.75√no.acres= 0.75√0 = 0 Source: 8 **Value:** 0 (Max.=50)

4.0 RELEASE

Explain basis for scoring a release to ground water: Documented by analytical data, contaminated groundwater – arsenic and chromium Source: 1,2 **Value:** 5 (Max.=5)

SOURCES USED IN SCORING

1. Site Inspection Report, Goose Lake, Hazardous Waste Cleanup Program, Preliminary Assessment/Site Inspection Unit, Washington Department of Ecology, September 1988.
2 Final Sediment, Soil, and Groundwater Investigation Report, Goose Lake, Shelton, Washington, Science Applications International Applications (SAIC), June 30, 1997.
3. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
4. Washington Department of Ecology, WARM Scoring Manual, April 1992.
5. See attached table identified as Reference 5.
6. Flood Insurance Rate Maps (FIRM)
7. U.S. EPA SITEINFO GIS Query for lat./long. of site – attached.
8. Ecology Water Rights Information System (WRIS).