

CSID #3658

SITE HAZARD ASSESSMENT

WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Recycled Aluminum Metals Co
104 Parallel Avenue
Dallesport, Klickitat County, WA 98617

Section/Township/Range: Sec 25/T2N/R13E
Latitude: 45° 37' 35"
Longitude: 121° 8' 36"
Ecology Facility Site ID No.: 94186268

Site scored/ranked for the August 23, 2006 update

SITE DESCRIPTION (management areas, substances of concern, and quantities):

The Recycled Aluminum Metals Company (RAMCO) site is a former landfill located at the Dallesport Industrial Park in Dallesport, Washington. RAMCO and its parent company, R.A. Barnes Company, used the landfill from 1982 until 1989 to deposit dross left over from its aluminum smelting process, along with a smaller amount of baghouse dust. The dross was primarily comprised of aluminum, magnesium, and sodium salts, with additional metals present.

The RAMCO site is located in a bowl-shaped area, surrounded by and underlain by Columbia River basalts. The landfill is approximately 1.5 acres in size and roughly 20 – 30 feet deep, resulting in an approximate volume of dross calculated to be 63,200 cubic yards. Approximately one foot of native sediment covers the landfill.

In June 2005, the Washington Department of Ecology (Ecology) oversaw the installation of five monitoring wells onsite, adjacent to the landfill, in order to determine the depth to groundwater, and the impacts the landfill may be having on the groundwater in the area. Analytical results from samples collected the following month indicated that most of the metals analyzed for were not present in concentrations exceeding their respective Model Toxics Cleanup Act (MTCA) Cleanup Levels or state water quality standards. However, total dissolved solids (TDS), nitrates, sodium, and chloride exceeded primary or secondary water quality standards in some of the wells.

Significant concentrations of several contaminants (ammonia, cyanide, fluoride and nitrate) relative to their respective Maximum Contaminant Level (MCL) or MTCA Method A Cleanup Level were detected in one or more of the monitoring wells during the July 11, 2005 sampling event, with repeated results documented through sampling of the monitoring wells on November 8, 2005.

An attempt was made on April 6, 2006, to obtain more information on the depth, volume and composition of the fill at the site through the use of a direct-push geoprobe. The density of the

subsurface material caused many problem with probe refusal, thus only limited sampling information was able to be gathered. Whereas previously the contaminant data gathered for the scoring of this site was primarily through groundwater analysis, there was a detection of cyanide in one of the on-site soil samples, which provides attribution for the confirmed detection of cyanide in earlier monitoring well groundwater samples.

As well, Synthetic Precipitate Leaching Procedure (SPLP) of fill material indication that the landfill will leach aluminum, calcium, chromium, copper, magnesium, potassium, sodium, and zinc at varying levels. Chromium only was noted to be significantly high, and will be added to the other contaminants (ammonia, cyanide, fluoride, and nitrate) used to score and rank this site. Table 1 summarizes selected sample results for these:

Table 1. GROUNDWATER SAMPLING RESULTS

Boring No. /Date	Analyte Found	Sample Result (mg/L = ppm)	Applicable Standard	(ppm)
MW1/ MW5 July 11, 2005	Ammonia	183/ 1900	MCL	30
MW1/ Nov. 8, 2005	Ammonia	1688	MCL	30
GP8-02 April 4, 2006	Chromium	0.084	MTCA Method A	0.050
MW1 - 5 July 11, 2005	Cyanide	0.024 - 0.115	MCL	0.20
MW1 July 11, 2005	Fluoride	9.17	"	4.0
MW5 July 11, 2005	Fluoride	48.6	"	4.0
MW1 Nov. 8, 2005	Fluoride	34.9	"	4.0
MW2 Nov. 8, 2005	Nitrate	47.4	"	10

*MTCA A refers to the Model Toxics Control Act Table 740-1 Method A Cleanup Levels for Groundwater

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):

None.

ROUTE SCORES:

Surface Water/Human Health: 7.2
Air/Human Health: 21.1
Groundwater/Human Health: 17.5

Surface Water/Environmental.: 28.2
Air/Environmental: 52.3

OVERALL RANK: 2

WORKSHEET 2
Route Documentation

1. SURFACE WATER ROUTE

- a. List those substances to be considered for scoring: Source: 1-3
Ammonia, cyanide, fluoride, nitrate, nitrite
- b. Explain basis for choice of substance(s) to be used in scoring.
These substances were detected on-site in surface/subsurface soil or groundwater samples associated in significant concentrations compared to their acceptable regulatory levels.
- c. List those management units to be considered for scoring: Source 4,5
Surface and subsurface soils and groundwater.
- d. Explain basis for choice of unit to be used in scoring:
The contaminating substances were detected on-site in surface/subsurface soil or groundwater samples in significant concentrations compared to their acceptable regulatory levels.

2. AIR ROUTE

- a. List those substances to be considered for scoring: Source: 1-3
Ammonia, cyanide, fluoride, nitrate, nitrite
- b. Explain basis for choice of substance(s) to be used in scoring:
These substances were detected on-site in surface/subsurface soil or groundwater samples associated in significant concentrations compared to their acceptable regulatory levels.
- c. List those management units to be considered for scoring: Source: 4,5
Surface and subsurface soils and groundwater.
- d. Explain basis for choice of unit to be used in scoring:
The contaminating substances were detected on-site in surface/subsurface soil or groundwater samples in significant concentrations compared to their acceptable regulatory levels.

3. GROUNDWATER ROUTE

- a. List those substances to be considered for scoring: Source: 1-3
Ammonia, cyanide, fluoride, nitrate, nitrite, chromium

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

These substances were detected on-site in surface/subsurface soil or groundwater samples associated in significant concentrations compared to their acceptable regulatory levels.

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

Source: 4,5

Surface and subsurface soils and groundwater.

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

The contaminating substances were detected on-site in surface/subsurface soil or groundwater samples in significant concentrations compared to their acceptable regulatory levels.

WORKSHEET 4
Surface Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 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 Ammonia	30,000	2	350 (rat)	5	ND	-	ND	ND	-	
2 Cyanide	200	4	ND	-	0.02	5	ND	ND	1	
3 Fluoride	700	2	3500	5	0.1	1	ND	ND	-	
4 Nitrate	10,000	2	ND	-	ND	-	ND	ND	-	
5 Nitrite	1000	2	ND	-	ND	-	ND	ND	-	

* Potency Factor

Source: 1-3,6

Highest Value: 5
(Max = 10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 5
(Max = 12)

1.2 Environmental Toxicity (X) Freshwater () Marine					
Substance	Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity		
	(µg/L)	Value	(mg/kg)	Value	
1 Ammonia	ND	-	350	5	
2 Cyanide	22	6			
3 Fluoride	ND	-	ND	-	
4 Nitrate	ND	-	ND	-	
5 Nitrate	ND	-	ND	-	

Source: 1-3,6

Highest Value: 6
(Max = 10)

1.3 Substance Quantity (areal extent)	
Explain Basis: Approx. 63,200 cubic yards	Source: 3 Value: 10 (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment: Management unit scored as a landfill: Unmaintained run-on/runoff control system and cover Explain basis: Whereas the site has been described as having approximately one foot of "native sediment" as cover, wind erosion had played a role in diminishing its effectiveness.	4-6	5 (Max = 10)
2.2	Surface Soil Permeability: the site consists of both cobble fine sandy loam and fine sandy loam	1-4	1 (Max = 7)
2.3	Total Annual Precipitation: the average total precipitation for Goldendale, WA = 17.6 inches	8	2 (Max = 5)
2.4	Max 2yr/24hr Precipitation: 1.5 – 2 inches	7	2 (Max = 5)
2.5	Flood Plain: Not in flood plain	5	0 (Max = 2)
2.6	Terrain Slope: > 8%	5,10	5 (Max = 5)

3.0 TARGETS

		Source	Value
3.1	Distance to Surface Water: <1000 feet (Joes Lake, Spearfish Lake)	5,11	10 (Max = 10)
3.2	Population Served within 2 miles (see WARM Scoring Manual Regarding Direction): 0	9,10	0 (Max = 75)
3.3	Area Irrigated by surface water within 2 miles : $(0.75) * \sqrt{\# \text{ acres}} = 0.75 * \sqrt{0} = 0$	9,10	0 (Max = 30)
3.4	Distance to Nearest Fishery Resource: <1000 feet	5,11	12 (Max = 12)
3.5	Distance to, and Name(s) of, Nearest Sensitive Environment(s): fishery resource <1000 feet	5,11	12 (Max = 12)

4.0 RELEASE

Explain Basis: Not documented	Source: <u>1-4</u> Value: 0 (Max = 5)
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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 ($\mu\text{g}/\text{m}^3$)	Value	Acute Toxicity (mg/m^3)	Value	Chronic Toxicity ($\text{mg}/\text{kg}/\text{day}$)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Ammonia	59.9	7	1394 (rat)	5	0.2	1	ND	ND	-
2	Cyanide	16.7	7	ND	-	ND	-	ND	ND	-
3	Fluoride	5.3	9	ND	-	ND	-	ND	ND	-

* Potency Factor

Source: 1-3,6

Highest Value: 9
(Max = 10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 11
(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	7600 = 4			
2	6.6E+02 = 4			
3	(as Fluorine) 7.1E-04 = 2			

Source: 6

Value: 4
(Max = 4)

Source: _____

Value: _____
(Max = 4)

1.4 Highest Human Health Toxicity/ Mobility Matrix Value (from Table A-7)

Final Matrix Value: 22
(Max = 24)

1.5 Environmental Toxicity/Mobility						
Substance		Non-human Mammalian Inhalation Toxicity (mg/m ³)	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	Ammonia	1394	5	7600	4	10
2						

Highest Environmental Toxicity/Mobility Matrix Value (Table A-7) = **Final Matrix Value: 10**
(Max = 24)

1.6 Substance Quantity	
Explain Basis: 76,000 square feet (1.6) acres.	Source: 3 Value: 7 (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment: Cover less than 2' thick, no vapor collection system.	4,5	<u>10</u> (Max = 10)

3.0 TARGETS

		Source	Value
3.1	Nearest Population: < 1000' Joe's Lake Park	4,5	<u>10</u> (Max = 10)
3.2	Distance to [and name(s) of] nearest sensitive environment(s): Joe's Lake Park < 1000'	4,5,11	<u>7</u> (Max = 7)
3.3	Residential population within 0.5 miles: $\sqrt{0} = 0$	4,5,11	<u>0</u> (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air: Detectable odors with supporting analytical data for attribution.	Source: 1-3 Value: <u>5</u> (Max = 5)
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WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 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 Ammonia	30,000	2	350 (rat)	5	ND	-	ND	ND	-	
2 Cyanide	200	4	ND	-	0.02	5	ND	ND	1	
3 Fluoride	700	2	3500	5	0.1	1	ND	ND	-	
4 Nitrate	1000	2	ND	-	ND	-	ND	ND	-	
5 Nitrite	1000	2	ND	-	ND	-	ND	ND	-	
6 Chromium	100	6	ND	-	0.005	5	ND	ND	-	

* Potency Factor

Source: 1-3,6

Highest Value: 6
(Max = 10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 6
(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)	
Cations/Anions	OR Solubility (mg/L)
1=	1= $1.8 \times 10^3 = 3$
2=	2= $5.4 \times 10^2 = 2$
3=	3= $1.5 \times 10^2 = 2$
4=	4= $2.0 \times 10^2 = 2$
5=	5= $3.0 \times 10^1 = 1$
6=	6= 1

Source: 6

Value: 3
(Max = 3)

1.3 Substance Quantity:	
Explain basis: 63,200 cubic yards	Source: <u>3</u> Value: <u>6</u> (Max=10)

5.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment (explain basis): Contaminated area scored as a landfill: 1) No liner = 3; 2) Low permeability cover = 1; 3) No leachate collection system = 2; 4) No liquids.	1-4,7	<u>6</u> (Max = 10)
2.2	Net precipitation: 9.7"	8	<u>1</u> (Max = 5)
2.3	Subsurface hydraulic conductivity: Silts/sands/gravels	1-4	<u>3</u> (Max = 4)
2.4	Vertical depth to groundwater: Obs. release to groundwater = 0'	1-4	<u>8</u> (Max = 8)

6.0 TARGETS

		Source	Value
3.1	Groundwater usage: Public supply, unthreatened alts. not readily avail.	9,10	<u>5</u> (Max = 10)
3.2	Distance to nearest drinking water well: <1300 feet (for workers)	9,10	<u>4</u> (Max = 5)
3.3	Population served within 2 miles: $\sqrt{0} = 0$	9,10	<u>0</u> (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: $(0.75) * \sqrt{0}$ acres = 0	9,10	<u>0</u> (Max = 50)

7.0 RELEASE

		Source	Value
	Explain basis for scoring a release to groundwater: Confirmed by presence of many contaminants in groundwater.	1-3	<u>5</u> (Max = 5)

SOURCES USED IN SCORING

1. Analytical results for five monitoring wells sampled at the RAMCO site, July, 11, 2005, Manchester Environmental Laboratory, August 8, 2005; and results from sampling on November 8, 2005.
2. Recycled Aluminum Metals Company Company Landfill (RAMCO) Site, Dallesport Industrial Park, Dallesport, Washington, Scope of Work – Geoprobe Project, Washington Department of Ecology. Central Regional Office Toxics Cleanup Program. Closing Date for Proposals: October 21, 2005, to accomplish scope of work by June 30,2006.
3. Draft Geoprobe Investigation Report, Recycled Aluminum Metals Company (RAMCO) Landfill, Dallesport, Washington, Shannon & Wilson, Inc., July 13, 2006.
4. RAMCO file information, photographs, maps, etc., Washington Department of Ecology, Central Regional Office, Toxics Cleanup Program.
5. Site Hazard Assessment Drive-by by Michael Spencer, Washington Department of Ecology Toxics Cleanup Program Headquarters, May 12, 2006.
6. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
7. Washington Department of Ecology, WARM Scoring Manual, April 1992.
8. Washington Climate – Net Rainfall Table.
9. Washington Department of Ecology, Water Rights Application System (WRATS) printout for two-mile radius of site.
10. Washington Department of Health, Sentry Internet Database printout for public water supplies.
11. U.S.G.S. Topo map for site area.