SITE HAZARD ASSESSMENT
WORKSHEET 1
Summary Score Sheet

SITE INFORMATION:

Ollala Landfill
Burley Ollala Road & Bandix Road
Ollala, Kitsap County, WA 98550-1103

Section/Township/Range: Sec 1/T22N/R1E
Latitude: 47° 25' 37.56"
Longitude: 122° 36' 56.88"
Ecology Facility Site ID No.: 7057711

Site scored/ranked for the February 20, 2008 update
January 23, 2008

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

The Ollala Landfill is located in southern Kitsap County, 1.5 miles north of the Kitsap-Pierce County line, and 0.5 miles east of State Highway 16. Landfilling operations began in an old gravel pit in the late 1950's/early 1960's. The initial operation was "burn and cover", where refuse was burned and covered monthly. Open burning was stopped in the early 1970s. The surrounding area is wooded and rural/sparsely developed.

Wastes were accepted four days a week from residential and light commercial self-haulers and were disposed of in 12 acres of the 80 acre county-owned property. The exact quantity of wastes disposed of at the landfill is unknown, and is believed to be primarily mixed municipal solid waste, including as much as 300,000 gallons of septic sludge.

A transfer station was built on the site in late 1984/early 1985, becoming operational in the spring of 1985, when wastes were no longer accepted for disposal, but were received for transport to another landfill in Kitsap County. A Closure Plan for the Ollala Landfill was written in early 1986 by Parametrix, Inc., for Kitsap County Public Works Department (operators of the landfill since late 1971) with a closure of the landfill projected to occur by the fall of that year. The closure was actually completed in 1989.

According to site files, the southern portion of the landfill, approximately 6.5 acres, was capped in the summer of 1988 with two feet of low permeability soil plus six inches of vegetated topsoil. The northern part of the landfill has only a soil cover. A passive gas collection system was installed in trenches under the cover around that same time, connected to three flares to burn off any generated methane.

The geology beneath the landfill encompasses three hydrogeologic units: Vashon formations, recessional sand and gravels, and Advance Outwash. The latter includes sand which is the thickest unit. The recessional deposits include sand, gravel, silt or silty sand. Seven monitoring wells,

screened in the saturated portion of the Advance Outwash sands, were installed around the outer circumference of the landfill, five of which are used for groundwater monitoring (analytical) purposes and two for groundwater measurements only. The groundwater flow direction under the landfill is predominantly to the west, however the northern part of the landfill might discharge in the northwest direction, which would be in the direction of the nearest private domestic well, about a quarter mile away.

Vinyl chloride and arsenic are the two chemical contaminants detected significantly in excess of their respective Model Toxics Control Act (MTCA) Method A Cleanup Levels for Groundwater consistently over the past 10-plus years, primarily in the downgradient MW-6, located midway along the landfill's western boundary.

This resulted in the Washington Department of Ecology (Ecology) adding the Olalla Landfill to its Confirmed and Suspected Contaminated Sites List in early January 2007, with a site status of "Awaiting Site Hazard Assessment (SHA)". The purpose of this SHA is to score and rank the site under the Washington Ranking Method (WARM), based on the toxicities of specific chemicals of concern, exposure pathways, and potentially affected targets. It is not intended to address any post-closure monitoring issues or corrective actions, as may be required under Chapter 173-304 WAC.

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):

Due to the significant contamination documented on-site being primarily subsurface and only in groundwater, the surface water and air routes are not applicable for WARM scoring for this site. Thus, only the groundwater route will be scored.

ROUTE SCORES:

Surface Water/Human Health:	**NS**	Surface Water/Environmental.:	**NS**
Air/Human Health:	**NS**	Air/Environmental:	**NS**
Groundwater/Human Health:	**34.5**		

OVERALL RANK: 3

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE** – ***Not Scored***
   a. List those substances to be considered for scoring: Source:

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

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

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

2. **AIR ROUTE** – ***Not Scored***
   a. List those substances to be considered for scoring: Source:

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

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

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

3. **GROUNDWATER ROUTE**
   a. List those substances to be considered for scoring: Source: 1-3

      Arsenic and vinyl chloride.

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

      These two contaminants have been detected in groundwater samples collected over a number of years from on-site monitoring wells in concentrations exceeding their respective MTCA cleanup levels.

   b. List those management units to be considered for scoring: Source: 1-3

      Groundwater/subsurface soils.

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

      The contaminating substances were detected in groundwater samples collected over a number of years from on-site monitoring wells in concentrations exceeding their respective MTCA cleanup levels.

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.2 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	Arsenic	10	8	763	5	ND	5	B2= 0.8	12=9	7
2	Vinyl chloride	2	8	500	5	ND	-	B2= 0.8	11.5 =8	7

* *Potency Factor*

Source: 1-3,5
Highest Value: 8
(Max = 10)
Plus 2 Bonus Points? 2
Final Toxicity Value: 10
(Max = 12)

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

Cations/Anions	OR	Solubility (mg/L)
1= K> 1.0 = 3		1=
2=		2= $2.7 \times 10^3 = 3$
3=		3=

Source: 1-3,5
Value: 3
(Max = 3)

1.3 Substance Quantity:

Explain basis:
Unknown, use default = 1

Source: 1-3,6
Value: 1
(Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** No liner (3); compacted soil/low permeability cover (1); no leachate collection system (2) ; free liquids possible (1)	1-4,6	7 (Max = 10)
2.2	**Net precipitation:** 29.7" – 5.6" = 24.1"	7	3 (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Sands/sandy gravels	1-3	4 (Max = 4)
2.4	**Vertical depth to groundwater:** Observed Release = 0' = 8	1-3	8 (Max = 8)

3.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Public/private supply, no unthreatened alts. avail.	8,9	9 (Max = 10)
3.2	**Distance to nearest drinking water well:** 600 – 1300 feet	1,8,9	4 (Max = 5)
3.3	**Population served within 2 miles: $\sqrt{493} = 22.2$**	8,9	22 (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles: $(0.75)*\sqrt{0}$ acres = 0**	8,9	0 (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Documented.	1-3	5 (Max = 5)

SOURCES USED IN SCORING

1. Ollala Landfill Final Closure Plan, Parametrix, Inc., February 10, 1986.
2. Quarterly Monitoring Report, 3rd Quarter (September 2005), Ollala Landfill, Kitsap County, Washington, Environmental Partners, Inc., November 2005.
3. Memo, Jan Brower, Solid/Hazardous Waste Program Manager, Kitsap County Health District, to Scott Lindquist, Director, Kitsap County Health District, Ollala Landfill Timeline and Current Status, August 15, 2007.
4. Site hazard assessment site driveby by Michael Spencer, Washington Department of Ecology Toxics Cleanup Program, December 20, 2007.
5. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
6. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
7. Washington Climate – Net Rainfall Table
8. Washington State Department of Ecology, Water Rights Application System (WRATS) printout for two-mile radius of site.
9. Washington Department of Health, Sentry Internet Database printout for public water supplies.

Live Search Maps