FINAL SHA DETERMINATION BREWSTER ELEMENTARY SCHOOL

FINAL VERSION
WORKSHEET 1
SUMMARY SCORE SHEET

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

Brewster Elementary School
502 S. 2nd
Brewster, Okanogan County, WA 98812
Latitude: 48° 05′ 39.73
Longitude: 119° 47′ 00.11

Sec 14/T30N/R24E
Ecology Facility Site ID: 31998846

Site scored/ranked for 02/24/04 update

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

The subject site is owned by the Brewster School District, and is occupied by the elementary school facility. The school yard consists of several play areas, landscaped grounds, and parking/access areas. Play yards are generally well-maintained, with good grass cover, wood chips, gravel, or other barriers to native soil. Some small areas are worn from excessive traffic, such as areas beneath swings and slides, or main travel routes to/from the school building.

The soils throughout the property were sampled by Okanogan County Public Health in April of 2003, and samples were analyzed for lead and arsenic. While lead and arsenic are present in the soil throughout the property, the concentrations only exceed MTCA Method A cleanup levels for Unrestricted Land Use in the small play yard for the preschool, and the surrounding undeveloped land between the faculty parking lot and the eastern property boundary.

The Brewster School District is currently addressing the issue of soil exposure in these areas, with assistance from the Washington State Department of Ecology.

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):

ROUTE SCORES:

Surface Water/Human Health:	9.6	Surface Water/Environ.:	16.7
Air/Human Health:	25.7	Air/Environmental:	NS
Ground Water/Human Health:	44.0		

OVERALL RANK: 3

FINAL VERSION

WORKSHEET 2 - ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE

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

Arsenic, lead.

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

Soil sample analysis.

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

Contaminated on-site surface and subsurface soils.

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

Analytical confirmation of these contaminants.

2. AIR ROUTE

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

Arsenic, lead.

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

Soil sample analysis.

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

Contaminated on-site surface and subsurface soils.

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

Analytical confirmation of these contaminants.

3. GROUND WATER ROUTE

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

Arsenic, lead.

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

Soil sample analysis.

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

Contaminated on-site surface and subsurface soils.

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

Analytical confirmation of these contaminants.

FINAL VERSION
WORKSHEET 3 (If Required)
SUBSTANCE CHARACTERISTICS WORKSHEET
FOR MULTIPLE UNIT/SUBSTANCE SITES

	Combination 1	Combination 2	Combination 3

Unit: **Section Not Applicable.**

1. SURFACE WATER ROUTE

Substance(s):			
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

Substance(s):			
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

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

FINAL VERSION
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	0.001	5	A	1.75	7
2. Lead	5	8	ND	-	ND	-	B2	ND	-

*Potency Factor

Source: 1,2,5
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	ND	-
2. Lead	5	6	ND	-

Source: 1,2,5 **Value: 6** (max.=10)

1.3 Substance Quantity

Source: 1,6 **Value: 8** (max.=10)

Explain basis: contaminated area >0.39 - 1.9 acres

FINAL VERSION
WORKSHEET 4 (CONTINUED)
SURFACE WATER ROUTE

2.0 MIGRATION POTENTIAL

2.1 Containment — Source: 1,6 — **Value: 4** (Max.=10)
Explain basis:
Management unit scored as a spills/discharges/contaminated soil at the surface, with non-maintained run-on/runoff controls (vegetated buffer)

2.2 Surface Soil Permeability: sand,gravel,sandy loam — Source: 1,3,6 — **Value: 1** (Max.=7)

2.3 Total Annual Precipitation: 11.3 inches — Source: 7 — **Value: 1** (Max.=5)

2.4 Max. 2-Yr/24-hour Precipitation: <1 inch — Source: 6 — **Value: 1** (Max.=5)

2.5 Flood Plain: Not in flood plain — Source: 8,12 — **Value: 0** (Max.=2)

2.6 Terrain Slope: <2% — Source: 1,6,12 — **Value: 1** (Max.=5)

3.0 TARGETS

3.1 Distance to Surface Water: ~1150' — Source: 1,12 — **Value: 7** (Max.=10)

3.2 Population Served within 2 miles (See WARM Scoring Manual Regarding Direction): $\sqrt{pop.}=\sqrt{0} = 0$ — Source: 10 — **Value: 0** (Max.=75)

3.3 Area Irrigated within 2 miles $0.75\sqrt{no.\ acres}=$
$0.75\sqrt{4111} = (.75)(64.1) = 48.1 \Rightarrow 48$ — Source: 10 — **Value: 30** (Max.=30)

3.4 Distance to Nearest Fishery Resource: ~1150' — Source: 1,11,12 — **Value: 9** (Max.=12)

3.5 Distance to, and Name(s) of, Nearest Sensitive Environment(s) Brewster municipal park 200'
Columbia River fisheries 1100' — Source: 1,11,12 — **Value: 12** (Max.=12)

4.0 RELEASE

Explain basis for scoring a release to surface water:
None documented by analytical evidence. — Source: 1 — **Value: 0** (Max.=5)

FINAL VERSION
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 (ug/m^3)	Val.	Acute Toxicity (mg/m^3)	Val.	Chronic Toxicity (mg/kg/day)	Val.	Carcino-genicity WOE	PF*	Val.
1. Arsenic	0.00023	10	ND	-	ND	-	A	50	9
2. Lead	0.5	10	ND	-	ND	-	B2	ND	-

*Potency Factor

Source: 1,2,5
Highest Value: 10 (Max.=10)

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

1.3 Mobility (Use numbers to refer to above listed substances)

1.3.1 Gaseous Mobility
Vapor Pressure(s) (mmHg): _____ Source: _____
Value: _____ (Max.=4)

1.3.2 Particulate Mobility
Soil type: loamy sands Source: 3,5,6
Erodibility: 134 Value: 3 (Max.=4)
Climatic Factor: 10 - 30

1.4 Highest Human Health Toxicity/Mobility Matrix Value (from Table A-7) equals **Final Matrix Value: 18** (Max.=24)

FINAL VERSION
WORKSHEET 5 (CONTINUED)
AIR ROUTE

1.5 Environmental Toxicity/Mobility Source: 1,5

Substance	Non-human Mammalian Acute Inhal. Toxicity (mg/m^3)	Value	Mobility (mmHg)	Value	(Table A-7) Matrix Value
1. Arsenic	ND	-	ND	-	-
2. Lead	ND	-	ND	-	-

Highest Environmental Toxicity/Mobility Matrix Value (From Table A-7) equals **Final Matrix Value: NS** (Max.=24)

1.6 Substance Quantity: ~43,000 s.f. Source: 1,6 **Value: 6** (Max.=10)
Explain basis:

2.0 MIGRATION POTENTIAL

2.1 Containment: Uncontaminated soil <2' deep. Source: 1,6 **Value: 5** (Max.=10)

3.0 TARGETS

3.1 Nearest Population: 140 feet Source: 1,12 **Value: 10** (Max.=10)

3.2 Distance to, and Name(s) of, Nearest Sensitive Environment(s) Source: 1,12 **Value: NA** (Max.=7)

3.3 Population within 0.5 miles: $\sqrt{pop.} = \sqrt{2200} = 46.9 \Rightarrow 47$ Source: 10,12 **Value: 47** (Max.=75)

4.0 RELEASE

Explain basis for scoring a release to air: None documented. Source: 1,6 **Value: 0** (Max.=5)

FINAL VERSION
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	0.001	5	A	1.75	7
2. Lead	5	8	ND	-	ND	-	B2	ND	-

*Potency Factor

Source: 1,2,5
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: 2 Source: 1,2,5 **Value:** 3 (Max.=3)

Or

Solubility(mg/l): _____

1.3 Substance Quantity: ~3200 cu. yds. Source: 1,2,6 **Value:** 4 (Max.=10)
Explain basis: _____

2.0 MIGRATION POTENTIAL

2.1 Containment Source: 1,6 **Value:** 10 (Max.=10)
Explain basis: Contaminated soil, no cap

2.2 Net Precipitation: 4.1 inches Source: 7 **Value:** 1 (Max.=5)

2.3 Subsurf.Hydraul.Conduct.: Sands/gravels Source: 1,3,6 **Value:** 4 (Max.=4)

2.4 Vertical Depth to Ground Water: ~40 feet Source: 1,4,6 **Value:** 6 (Max.=8)

FINAL VERSION
WORKSHEET 6 (CONTINUED)
GROUND WATER ROUTE

3.0 TARGETS

3.1 Ground Water Usage: public supply, no alternate Source: 9,10 **Value: 9** (Max.=10)

3.2 Dist. to Nearest Drinking Water Well: on-site Source: 1,10 **Value: 5** (Max.=5)

3.3 Population Served within 2 Miles: $\sqrt{pop.} = \sqrt{2200} = 46.9 \Rightarrow 47$ Source: 9,10 **Value: 47** (Max.=100)

3.4 Area Irrigated by (Groundwater) Wells within 2 miles: $0.75\sqrt{no.acres} = 0.75\sqrt{597} = (0.75)(24.4) = 18.3 \Rightarrow 18$ Source: 10 **Value: 18** (Max.=50)

4.0 RELEASE

Explain basis for scoring a release to ground water: No documentation Source: 1,6 **Value: 0** (Max.=5)

SOURCES USED IN SCORING

1. Site Hazard Assessment initial visit by Douglas Hale, October 17, 2001.
2. Soil sample analysis reports by Severn Trent Laboratories.
3. Soil logs on file at Okanogan County Health District.
4. Water Well Reports on file at Okanogan County Health District.
5. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
6. Washington Department of Ecology, WARM Scoring Manual, April 1992.
7. See attached table identified as Reference 7.
8. Flood Insurance Rate Maps (FIRM).
9. U.S. EPA SITEINFO GIS Query for lat./long. of site.
10. Ecology Water Rights Information System (WRIS).
11. Washington Department of Fish & Wildlife StreamNet database.
12. GIS data layers provided by Okanogan County Planning Department, composite map is attached as Reference 12.