

WORKSHEET 1
SUMMARY SCORE SHEET

Site Name: Wenatchee Elementary School (now John Newberry Elementary School)

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

Street: 850 Western Avenue North; City: Wenatchee; County: Chelan; S/T/R: 5 T22N R20E

TCP ID Number: C-04-2008-000

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

The proposed Wenatchee Elementary School - now called John Newberry Elementary School is located on a 15-acre site. Approximately 11 acres of the site previously served as orchards. The constituents of concern at this location are lead and arsenic. The elevated concentrations of these metals in the soil are related to the wide-spread use of arsenical pesticides in the area. Past studies of orchard soils have suggested that for the period of ~1905-1947 the concentrations of arsenic in the soil accumulated to approximately 1,850 pounds per acre, while the concentration of lead accumulated to approximately 5,040 pounds per acre.

Assuming that this site was typical of other orchards in the region (analytical data supports this assumption), the arsenic and lead loading rates were multiplied by the acreage used as orchard to derive the quantity of lead and arsenic added to the soil.

5040lbs/acre of lead * 11 acres = 27.8 tons of lead

1840lbs/acre of arsenic * 11 acres = 10.2 tons of arsenic

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 use of arsenical pesticides in this region has been wide-spread. Studies at other locations in the area have shown similar elevated levels of arsenic and lead in the soil. To minimize the exposure in areas with high arsenic and lead concentrations, 15" of clean soil was placed over playgrounds and seeded with grass, while the remainder of the site was either covered by buildings, or paved over. The surface water route was not scored due to the top soil applied on top of the contaminated soil, the distance to surface water, and the minimal amount of precipitation in the region. The nearest well is 8,600 feet from the site; and only 5 people drink the groundwater within 2 miles of the site.

ROUTE SCORES:

Ground Water/Human Health: 16.3

Overall Rank: 5

Surface Water/Human Health: NS

Air/Human Health: 12.7

Air/Environmental: NS

Surface Water/Environmental: NS

WORKSHEET 2
ROUTE DOCUMENTATION

SURFACE WATER ROUTE

List substances to be considered for scoring.

Source: _____

The surface water route will not be scored due to the presence of top soil and grass, buildings, and pavement over the site, the large distance to surface water, and the minimal precipitation in the area.

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

List management units to be considered in scoring:

Source: _____

Explain basis for choice of unit used in scoring.

AIR ROUTE

List substances to be considered for scoring.

Source: ____1____

Arsenic and lead contaminated soil

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

Concentrations of arsenic and lead in the soil are above the MTCA cleanup levels.

List management units to be considered in scoring:

Source: ____2____

Contaminated soil

Explain basis for choice of unit used in scoring.

The contaminated soil will be scored by the air route because there is less than two feet of cover over the contaminated soil.

WORKSHEET 2 (CONTINUED)
ROUTE DOCUMENTATION

GROUND WATER ROUTE

List substances to be considered for scoring.

Source: ____1____

Arsenic and lead contaminated soil

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

Concentrations of Arsenic and lead in soil are above the MTCA cleanup levels.

List management units to be considered in scoring:

Source: ____2____

Contaminated soil

Explain basis for choice of unit used in scoring.

The site will be scored as a landfill with no liner and no leachate collection system per the WARM Guidance instructions.

WORKSHEET 4
SURFACE WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Std.		Chronic Toxicity		Acute Toxicity		Carcinogenicity Potency		
	($\mu\text{g/l}$)	Value	mg/kg/day	Value	mg/kg-bw	Value	WOE	Factor	Value
1.									
2.									
3.									
4.									
5.									
6.									

Source: _____
 Highest Value: _____
 +2 Bonus Points?: _____
 Value: _____

1.2 Environmental Toxicity

Substance	Acute Criteria ($\mu\text{g/L}$)	Non-human mammalian acute toxicity (mg/kg)	Value
1.			
2.			
3.			
4.			
5.			
6.			

Source: ____ Value: ____

1.3 Substance Quantity

Explain basis: _____

Source: ____ Value: ____

2.0 MIGRATION POTENTIAL

2.1 Containment

Explain basis: _____

Source: ____ Value: ____

2.2 Surface Soil Permeability: _____

Source: ____ Value: ____

2.3 Total Annual Precipitation: _____

Source: ____ Value: ____

2.4 Maximum 2-Year 24-Hr Precipitation: _____

Source: ____ Value: ____

2.5 Flood Plain: _____

Source: ____ Value: ____

2.6 Terrain Slope: _____

Source: ____ Value: ____

WORKSHEET 4 (CONTINUED)
SURFACE WATER ROUTE

3.0 TARGETS

3.1 Distance to Surface Water: _____

Source: ____ Value: ____

3.2 Population Served within 2 miles: _____

Source: ____ Value: ____

3.3 Area Irrigated by Sources within 2 miles: _____

Source: ____ Value: ____

3.4 Distance to Fishery Resource: _____

Source: ____ Value: ____

3.5 Distance to Sensitive Environment: _____

Source: ____ Value: ____

List: _____

4.0 RELEASE

Explain basis: _____

Source: ____ Value: ____

NS

WORKSHEET 5
AIR ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction - please review before scoring

1.2 Human Toxicity

Substance	Air Std.		Chronic Toxicity		Acute Toxicity		Carcinogenicity Potency		
	($\mu\text{g}/\text{m}^3$)	Value	mg/kg/day	Value	mg/kg-bw	Value	WOE	Factor	Value
1.Arsenic	2.3E ⁻⁴	10	X	-	X	-	A	50	9
2.Lead	0.5	10	X	-	X	-	B2	X	-
3.									
4.									
5.									
6.									

Source: 1, 3

Highest Value: 10

+2 Bonus Points?: 2

Toxicity Value: 12

1.3 Mobility Arsenic and lead not gaseous, scored as particulate mobility.

1.3.1 Gaseous Mobility

Vapor Pressure: _____

Source: _____

Value: _____

1.3.2 Particulate Mobility

Soil Type: Loam

Source: 6

Erodibility: 56

Climatic Factor: 10 - 30

Particulate Mobility Potential Value: 1

1.4 Final Human Health Toxicity/Mobility Matrix:

Value: 6

1.5 Environmental Toxicity/Mobility

Air-environmental pathway not scored due to lack of environmental toxicity data.

Substance	Non-human mammalian acute toxicity (mg/kg)	Value	Mobility	Value
1. Arsenic	X			
2.Lead	X			
3.				
4.				

Environmental Toxicity Mobility Matrix: Source: _____ Value: _____

1.6 Substance Quantity: 10.2 tons As, 27.8 tons Pb

(See calculations on WK-1) Source: 4,5 Value: 5

WORKSHEET 5 (CONTINUED)
AIR ROUTE

2.0 MIGRATION POTENTIAL

2.1 Containment: Contaminated soil, Source: 2 Value: 5
with less than 2 feet of uncontaminated cover

3.0 TARGETS

3.1 Nearest Population: <1,000 feet Source: 12 Value: 10

3.2 Nearest Sensitive Environment: 3,800 feet Source: 9,3 Value: 3

List: 3,800 ft, Lewis and Clark Park

6,000 ft, Washington Park

7,000 ft, Pennsylvania Park

3.3 Population within 1/2 mile: 2,220 Source: 12 Value: 47

4.0 RELEASE: No evidence of release Source: Value: 0

WORKSHEET 6
GROUND WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Std.		Chronic Toxicity		Acute Toxicity		Carcinogenicity Potency		
	(µg/l)	Value	mg/kg/day	Value	mg/kg-bw	Value	WOE	Factor	Value
1. Arsenic	50	6	763	5	0.001	5	A	1.75	7
2. Lead	5	8	X	-	X	-	B2	X	-
3.									
4.									
5.									

Source: 1,3

Highest Value: 8

+2 Bonus Points?: 2

Value: 10

1.2 Mobility

Substance: Arsenic*, lead

Source: 1,4 Value: 3*

***This value is the more conservative of the two.**

1.3 Substance Quantity

Source: 4,5 Value: 5

Explain basis: 27.8 tons of Pb, 10.2 tons of As

11 acres * (1,850 lb/acre) = 10.2 tons As; 11 acres * (5,040 lb/acre) = 27.8 tons Pb

2.0 MIGRATION POTENTIAL

2.1 Containment

Source: 2 Value: 6

Explain basis: Landfill with cover=1, no liner=3, no leachate collection=2

2.2 Net Precipitation: 3.0 inches

Source: 7 Value: 1

2.3 Subsurface Hydraulic Conductivity: 10⁻³-10⁻⁵

Source: 8,6 Value: 3

2.4 Vertical Depth to Ground Water: 25 to 35 feet

Source: 8 Value: 6

3.0 TARGETS

3.1 Ground Water Usage: Public supply with alternate

Source: 8 Value: 4

3.2 Distance to Nearest Drinking Water Well: 8,600 feet

Source: 9 Value: 1

3.3 Population Served with 2 miles: 5

Source: 11 Value: 2

3.4 Area Irrigated by Wells within 2 miles: 124

Source: 10 Value: 8

4.0 RELEASE

Explain basis: No evidence of release

Source: Value: 0