<u>WORKSHEET 1</u>
Summary Score Sheet

SITE INFORMATION:

Name: **Progress Elementary School**
Address: **705 N. Progress Rd.**
City: **Spokane Valley**   County: **Spokane**   State: **WA**   Zip: **99037**
Section/Township/Range: **NE ¼ of the SE ¼ of Section 14, Township 25 N, Range 44 E.**

Latitude: **47 °, 66", 29' N**
Longitude: **117 °, 20", 13' W**

TCP ID #: **1740049**

Site scored/ranked for the August 23rd 2006 update.

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

Progress Elementary School is part of the Central Valley School District and is located in a predominantly residential area within the incorporated boundaries of the City of Spokane Valley, Spokane, Washington. The school is located on an approximate seven acre property with a five acre grass covered well maintained play area. Additionally, there is a four acre fallow field adjacent to the school owned by Central Valley school district that has been incorporated into this site.

Progress Elementary school is part of a state wide study called the Area-Wide Soil Contamination Project which acknowledges the potential that soils on large tracts of land in Washington State may have become contaminated with low to moderate levels of arsenic and lead. Of particular concern is the contamination due to extensive historic use of lead arsenate pesticides in agriculture practices, primarily on orchard crops during the early to mid twentieth century. Many of these former orchard properties have been developed into residential neighborhoods, schools and parks. The persistence of lead arsenate in the environment and subsequent development of these properties have prompted concerns over a variety of health, environmental, and land use issues.

The soils throughout the Progress Elementary School property were sampled by the Spokane Regional Health District in April 2005, June 2005 and again in June 2006. Samples were taken from just below the established sod layer and at 6-12 inches and at 12-18 inches. The samples were analyzed for lead and arsenic at Anatek Laboratories using Total Metals – Method EPA 6020A Split samples were taken to North Creek Analytical using the same analytical method.

Sampling results at Progress Elementary School indicate that contaminant concentrations in soil exceed the Model Toxics Control Act (MTCA) Method A cleanup levels for lead at 250 mg/kg (parts per million or ppm) and for arsenic at 20 ppm. The highest concentrations of arsenic and lead detected at the site were 107 ppm arsenic & 1020 ppm lead, respectively. These concentrations require the site be scored and ranked under the Washington Ranking Method (WARM).

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):

Because of the presence of children at the school grounds, ingestion of contaminated soil is the main focus of concern and is considered the greatest potential risk to children. WARM scoring does not quantify ingestion as an exposure route however, the use of school grounds by children and risk interpretations specific to ingestion of lead and arsenic contaminated soil are being addressed by Ecology through proposed remediation efforts and also by the State Department of Health and Spokane Regional Health District through health consultations, institutional controls, and education.

ROUTE SCORES:

Surface Water/Human Health:	**5.3**	Surface Water/Environmental.:	**10.2**
Air/Human Health:	**17.8**	Air/Environmental:	**NS**
Groundwater/Human Health:	**63.4**		

OVERALL RANK: 3

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**

   a. List those substances to be <u>considered</u> for scoring: Source: <u>1</u>

   Lead and arsenic

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

   Analytical results from soil sampling indicate the presence of these hazardous substances at concentrations which exceed current Method A Unrestricted Land Use cleanup levels.

   c. List those management units to be <u>considered</u> for scoring: Source <u>1</u>

   Surface and subsurface soils

   d. Explain basis for choice of unit to be <u>used</u> in scoring:

   Spills/discharges caused soil contamination

2. **AIR ROUTE**

   a. List those substances to be <u>considered</u> for scoring: Source: <u>1</u>

   Lead and arsenic

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

   Analytical results from soil sampling indicate the presence of these hazardous substances at concentrations which exceed current Method A Unrestricted Land Use cleanup levels.

   c. List those management units to be <u>considered</u> for scoring: Source: <u>1</u>

   Surface and subsurface soils

   d. Explain basis for choice of unit to be <u>used</u> in scoring:

   Lead and arsenic concentrations exceeding their respective MTCA Method A Unrestricted Land Use cleanup levels are found in shallow soils just below sod ground cover.

3. **GROUNDWATER ROUTE**

   a. List those substances to be <u>considered</u> for scoring: Source: <u>1</u>

   Lead and arsenic

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

   Analytical results from soil sampling indicate the presence of these hazardous substances at concentrations which exceed our current MTCA Method A Unrestricted cleanup levels.

   c. List those management units to be <u>considered</u> for scoring: Source: <u>1</u>

   Surface and subsurface soils

d. Explain basis for choice of unit to be <u>used</u> in scoring:

Lead and arsenic levels exceeding their respective MTCA Method A Unrestricted Land Use cleanup levels are found in subsurface soils

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 WOE	PF*	Value
1 Lead	5	8	NA	ND	0.001	10	ND	ND	ND
2 Arsenic	10	8	763 (rat)	5	0.001	5	1.0	1.75	7

Potency Factor

Source: 1, 2

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12
(Max = 12)

1.2   Environmental Toxicity

Substance	Acute Water Quality Criteria (µg/L)	Value	Non-Human Mammalian Acute Toxicity (mg/kg)	Value
1 Lead	82	6	ND	--
2 Arsenic	360	4	ND	--

Source: 1, 2

Highest Value: 6
(Max = 10)

1.3   Substance Quantity (aerial extent)

Explain Basis: Unknown, use default value = 1

Source: 1, 3

Value: 1
(Max = 10)

2.0　MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** Management unit scored as a spills/discharges/contaminated soil at the surface, with ineffectively maintained run-on/runoff controls (vegetated buffer). **Explain basis:** While a portion of the site is capped (parking lots, buildings, etc), soil samples were collected from only uncapped areas (i.e. in bare soil or beneath grass).	1, 3	**4** (Max = 10)
2.2	**Surface Soil Permeability:** the site consists of Garrison Gravelly loam	3, 5	**1** (Max = 7)
2.3	**Total Annual Precipitation:** The average annual precipitation for Spokane, WA is 14 in	3, 4	**2** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** 1.5 inches	3, 4	**2** (Max = 5)
2.5	**Flood Plain:** Not in flood plain	3, 10	**0** (Max = 2)
2.6	**Terrain Slope:** < 2%	3, 7, 11	**1** (Max = 5)

3.0　TARGETS

		Source	Value
3.1	**Distance to Surface Water:** ~3200 feet	3, 11	**4** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** $\sqrt{0} = 0$	3, 7, 8	**0** (Max = 75)
3.3	**Area Irrigated by surface water within 2 miles :** $(0.75)*\sqrt{}$ # acres = $0.75 * \sqrt{0} = 0$	3, 9	**0** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** 3200 feet	3, 11	**6** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** ~4500 ft	3, 11	**6** (Max = 12)

4.0　RELEASE

Explain Basis: Not documented	Source: 1, 3 **Value: 0** (Max = 5)

Worksheet 5
Air Route

1.0   Substance Characteristics

1.1.   Introduction

1.2	Human Toxicity									
	Substance	Air Standard ($\mu g/m^3$)	Value	Acute Toxicity (mg/m^3)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Lead	0.5	10	ND	--	0.001	10	B2	ND	--
2	Arsenic	0.00023	10	ND	--	0.001	5	A	50	9

*Potency Factor

Source: 1, 2, 3

Highest Value: 10
(Max = 10)

Plus 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		**1.3.2 Particulate Mobility**		
Vapor Pressure(s) (mmHg)		Soil Type	Erodibility	Climatic Factor
1		GgA (sandy loam)	86	1-10

Source: NA

Value: NS
(Max = 4)

Source: 3, 5

Value: 1
(Max = 4)

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

Final Matrix Value: 6
(Max = 24)

1.5	Environmental Toxicity/Mobility					
	Substance	Non-human Mammalian Inhalation Toxicity (mg/m^3)	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	Lead	ND	--	ND	--	--
2	Arsenic	ND	--	ND	--	--

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

1.6	Substance Quantity (aerial extent)	
Explain Basis: Unknown, use default value = 1		Source: 1,3 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** Uncontaminated soil cover <2 feet thick	3	**5** (Max = 10)

3.0 TARGETS

		Source	Value
3.1	**Nearest Population:** <1000 feet to school	1, 3, 12	**10** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s) [fisheries excluded]:** NA since not scoring environmental route		**NA** (Max = 7)
3.3	**Population served within 0.5 miles:** $\sqrt{pop.} = \sqrt{7{,}942} = 89$	3, 12	**75** (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air: Not documented	Source: 3 **Value: 0** (Max = 5)

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 Lead	5	8	NA	ND	0.001	10	ND	ND	ND
2 Arsenic	10	8	763 (rat)	5	0.001	5	1.0	1.75	7

Potency Factor

Source: 1, 2

Highest Value: 10
(Max = 10)

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

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

Cations/Anions [Coefficient of Aqueous Migration (K)] OR	Solubility (mg/L)
1= K > 1.0 = 2	1=
2= K is 0.1 to 1.0 = 3	2=

Source: 3
Value: 3
(Max = 3)

1.3 Substance Quantity (volume):

Explain basis: Unknown, use default value = 1	Source: 1, 3 **Value: 1** (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment (explain basis): Spills discharges	3	**0** (Max = 10)
2.2	Net precipitation: Spokane WA net precipitation 7.2 inches	4	**1** (Max = 5)
2.3	Subsurface hydraulic conductivity: $>10^{-5}$ to 10^{-3}	3	**3** (Max = 4)
2.4	Vertical depth to groundwater: >100 - 200	3, 6, 8	**3** (Max = 8)

3.0 TARGETS

		Source	Value
3.1	Groundwater usage: Fed. Des. Sole Source Aquifer	3, 7	**10** (Max = 10)
3.2	Distance to nearest drinking water well: _4000_ feet (down gradient)	3, 6, 8	**2** (Max = 5)
3.3	Population served within 2 miles: $\sqrt{}$ pop. = $\sqrt{}$>10000	3, 8, 11	**100** (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: $(0.75)*\sqrt{\#}$ acres = ~13373 irrigated acres	3, 9	**50** (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Not documented nor displayed in public well drinking water data		**0** (Max = 5)

SOURCES USED IN SCORING

1. Area-Wide Soil Investigation Progress Elementary School
   Spokane Regional Health District May 2006

2. Toxicology Database WARM

3. WARM Scoring Manual

4. Washington Climate, Spokane Co. WSU Dept. of Agriculture

5. Soil Survey of Spokane Co. Washington, USDA Soil Conservation Svc.

6. Washington Department of Ecology Well Logs

7. Aquifer Sensitive Area Overlay Zone Map, Spokane Co. Washington

8. Washington Dept. of Health, Drinking Water Information Network

9. Water Rights Application Tracking System (WRATS) Ecology

10. FEMA Flood Insurance Maps

11. Quadrangle Maps of Washington, NE Spokane Regional Health District

12. Spokane County Census Information