Table 2-1. Summary of Available Data

Media	Study	Location	Number of Sample Locations	Number of Samples
Sediment	USEPA (1999, 2005, 2006)	Coal Creek Downstream of Elk Creek	14	27
		Elk Creek	10	22
		Elk Creek-Mine Drainage	2	2
Surface Water	Coal Creek Watershed Coalition	Coal Creek Downstream of Elk Creek	12	21
		Elk Creek	2	4
		Elk Creek-Mine Drainage	3	3
	USEPA (1999, 2005, 2006)	Coal Creek Downstream of Elk Creek	24	97
		Elk Creek	15	68
		Elk Creek-Mine Drainage	3	16
	USGS (1995 - 2005)	Coal Creek Downstream	1	1
Soil	USEPA (2006)	Standard Mine Vicinity	190	190
Fish Tissue	USEPA (2006)	Coal Creek Downstream of Elk Creek	3	13
		Elk Creek	1	3

Table 2-2. Summary Statistics for Surface Water Samples (Total Recoverable ug/L)

Location	Analyte	Count	Detection Frequency	Average	Standard Deviation	Minimum	Maximum
Mine Facility	Aluminum	18	67%	190	350	10	1500
	Antimony	15	7%	0.79	0.59	0.013	1.5
	Arsenic	18	17%	0.64	0.77	0.014	2.5
	Barium	6	50%	38	48	5	100
	Beryllium	13	8%	0.35	0.24	0.002	0.5
	Cadmium	18	78%	19	24	0.5	63
	Calcium	13	100%	19000	17000	3600	50000
	Chromium	18	11%	1.2	1.4	0.06	5
	Cobalt	4	50%	13	14	0.032	25
	Copper	18	72%	36	44	1.2	170
	Iron	18	44%	170	240	12	940
	Lead	18	94%	53	67	2.5	230
	Magnesium	13	85%	2300	1800	320	5400
	Manganese	18	83%	730	1000	1.9	3100
	Mercury	4	0%	0.1	0	0.1	0.1
	Nickel	15	53%	4.3	6.6	0.35	20
	Potassium	10	60%	1100	740	470	2500
	Selenium	15	13%	1.3	0.9	0.1	2.5
	Silver	18	17%	0.76	1.6	0.02	5
	Sodium	10	90%	2000	1300	670	5000
	Thallium	13	8%	0.34	0.37	0.002	1.4
	Vanadium	6	33%	9.2	12	0.05	25
	Zinc	18	100%	3400	4400	120	12000
Drainages (Elk Creek Downstream and Coal Creek Downstream)	Aluminum	116	72%	130	210	6.5	2100
	Antimony	99	21%	1	0.61	0.037	2.5
	Arsenic	103	72%	2.4	2.1	0.014	10
	Barium	61	52%	41	39	5.5	100
	Beryllium	93	18%	0.31	0.24	0.005	0.75
	Cadmium	102	64%	2.7	6.7	0.2	61
	Calcium	99	100%	26000	37000	6500	280000
	Chromium	103	17%	1.7	1.9	0.01	5
	Cobalt	55	40%	8.7	11	0.1	25
	Copper	102	63%	10	33	0.5	340
	Iron	116	78%	110	95	5	660
	Lead	115	54%	8.9	53	0.2	560
	Magnesium	99	82%	2100	1000	720	4800
	Manganese	115	100%	120	170	2.5	850
	Mercury	38	3%	0.1	0.03	0.01	0.2
	Nickel	85	53%	2.3	4.2	0.35	20
	Potassium	69	46%	1300	850	100	2500
	Selenium	99	10%	1.6	1.4	0.05	7.5
	Silver	101	19%	0.46	1	0.004	5
	Sodium	69	77%	3000	2100	1000	11000
	Thallium	89	19%	0.28	0.21	0.002	0.6
	Vanadium	60	32%	8.3	11	0.017	25
	Zinc	115	100%	450	820	45	5700

Non-detects were evaluated at 1/2 the detection limit.

Table 2-3. Summary Statistics for Sediment Samples (mg/kg dry weight)

Location	Analyte	Count	Detection Frequency	Average	Standard Deviation	Minimum	Maximum
Mine Facility	Aluminum	8	100%	9400	10000	2700	34000
	Antimony	8	62%	1.7	3	0.17	9
	Arsenic	8	100%	44	52	9.2	160
	Barium	3	100%	41	7.5	33	48
	Beryllium	8	100%	2.6	3.5	0.6	11
	Cadmium	8	100%	17	11	3.8	34
	Calcium	8	100%	1700	1300	470	4400
	Chromium	8	88%	3.2	2.3	0.25	7
	Cobalt	3	100%	8.7	3.4	5.3	12
	Copper	8	100%	400	610	14	1700
	Cyanide	2	100%	0.11	0.014	0.1	0.12
	Iron	8	100%	33000	32000	7800	82000
	Lead	8	100%	3200	2700	840	7900
	Magnesium	8	100%	1000	490	470	1800
	Manganese	8	100%	4200	3100	1400	10000
	Mercury	8	88%	0.046	0.051	0.007	0.15
	Nickel	8	100%	6	2.4	2.8	9
	Potassium	3	100%	580	42	550	620
	Selenium	8	75%	3.4	2.7	0.5	7.6
	Silver	8	88%	4.1	6.2	0.2	18
	Sodium	3	33%	20	18	10	40
	Thallium	8	62%	0.71	1.3	0.16	3.8
	Vanadium	3	100%	5.2	1.4	3.9	6.6
	Zinc	8	100%	2400	2200	490	6900
Drainages (Elk Creek Downstream and Coal Creek Downstream)	Aluminum	37	100%	10000	5600	4500	32000
	Antimony	37	43%	2.8	3.6	0.11	10
	Arsenic	37	100%	68	41	13	180
	Barium	18	100%	74	18	27	120
	Beryllium	37	95%	0.91	0.59	0.25	2
	Cadmium	37	100%	17	17	1.8	68
	Calcium	37	100%	3300	1700	1200	7100
	Chromium	37	95%	3.8	2.7	0.25	11
	Cobalt	18	100%	11	5.3	5.6	24
	Copper	37	100%	120	150	10	600
	Cyanide	7	43%	0.65	0.77	0.035	1.6
	Iron	37	100%	21000	7300	11000	45000
	Lead	37	100%	310	420	29	1700
	Magnesium	37	100%	2800	950	1300	5500
	Manganese	37	100%	3200	2300	560	10000
	Mercury	37	65%	0.073	0.052	0.01	0.17
	Nickel	37	100%	7.9	3.5	3	17
	Potassium	18	100%	750	190	470	1100
	Selenium	37	38%	2.3	1.8	0.49	5.9
	Silver	37	100%	1.6	1.1	0.17	4.5
	Sodium	18	100%	58	16	31	100
	Thallium	37	62%	1	1.1	0.12	3.6
	Vanadium	18	100%	9.4	2	4.8	13
	Zinc	37	100%	2400	2100	250	7200

Non-detects were evaluated at 1/2 the detection limit.

Table 2-4. Summary Statistics for Surface Soil Samples (mg/kg dry weight)

Location	Analyte	Count	Detection Frequency	Average	Standard Deviation	Minimum	Maximum
Mine Facility	Aluminum	190	100%	7100	3000	1000	18000
	Antimony	190	33%	2.5	4.6	0.39	29
	Arsenic	190	100%	76	110	4.6	680
	Barium	190	100%	120	75	24	580
	Beryllium	190	95%	0.84	0.82	0.018	6.1
	Cadmium	190	94%	7.3	13	0.025	110
	Calcium	190	100%	1900	1800	100	16000
	Chromium	190	100%	6.9	8.2	0.71	93
	Cobalt	190	98%	7.6	4.9	0.065	35
	Copper	190	100%	240	390	6	2700
	Iron	190	100%	33000	28000	5600	200000
	Lead	190	99%	3600	6900	0.22	64000
	Magnesium	190	100%	1500	600	120	3100
	Manganese	190	100%	2200	2000	180	12000
	Mercury	190	79%	0.067	0.049	0.01	0.33
	Nickel	190	98%	6.1	2.9	0.041	20
	Potassium	190	100%	1400	340	660	2600
	Selenium	190	50%	6.6	12	0.48	66
	Silver	190	98%	12	19	0.1	110
	Sodium	190	92%	100	130	0.42	1100
	Thallium	190	6%	0.55	0.67	0.33	6.5
	Vanadium	190	100%	13	4.8	3	31
	Zinc	190	100%	1400	2300	48	20000

Non-detects were evaluated at 1/2 the detection limit.

Table 2-5. Summary Statistics for Fish Fillet Samples (mg/kg wet weight)

Location	Analyte	Count	Detection Frequency	Average	Standard Deviation	Minimum	Maximum
Drainages (Elk Creek Downstream and Coal Creek Downstream)	Aluminum	13	100%	1.3	0.39	0.57	1.9
	Antimony	13	0%	0.0069	--	0.0055	0.0075
	Arsenic	13	100%	0.92	1.1	0.16	3.2
	Beryllium	13	0%	0.027	--	0.023	0.031
	Cadmium	13	100%	0.054	0.019	0.024	0.095
	Calcium	13	100%	1100	560	480	2300
	Chromium	13	100%	0.72	0.049	0.66	0.8
	Copper	13	100%	1.1	0.38	0.65	2
	Iron	13	92%	5.2	1.8	1.4	8.5
	Lead	13	38%	0.012	0.019	0.0022	0.069
	Magnesium	13	100%	340	14	310	370
	Manganese	13	100%	0.87	0.53	0.5	2.5
	Mercury	13	100%	0.039	0.021	0.019	0.081
	Nickel	13	100%	0.1	0.031	0.066	0.17
	Selenium	13	100%	0.66	0.073	0.49	0.76
	Silicon Dioxid	13	100%	8.9	2.4	5.6	13
	Silver	13	0%	0.0024	--	0.0022	0.0025
	Strontium	13	100%	2.4	1.1	0.94	4.6
	Thallium	13	15%	0.0045	0.0059	0.0022	0.023
	Zinc	13	100%	31	4.6	24	41

Non-detects were evaluated at 1/2 the detection limit.
-- = results are all non-detect

Table 3-1. COPC Selection for Exposure of Onsite Receptors to Soil

CHEMICAL	N	DATA			COPC SELECTION STEPS				SOIL COPCs		
							Essential Nutrient Screen				
		Detection Frequency	Max Concentration (mg/kg)	Soil RBC [1] (mg/kg)	Does compound have an RBC?	Is Max Detect > RBC?	Is Compond an Essential Nutrient?	Is Expected Dose >> RDI or DRV? [2]	Quant COPC	Source of Uncertainty	Not a COPC
Aluminum	190	100%	18,000	12,619	Yes	Yes	No	--	X		
Antimony	190	33%	29	120	Yes	No	No	--			X
Arsenic	190	100%	680	23	Yes	Yes	No	--	X		
Barium	190	100%	580	1,789	Yes	No	No	--			X
Beryllium	190	95%	6.1	50	Yes	No	No	--			X
Cadmium	190	94%	107	67	Yes	Yes	No	--	X		
Calcium	190	100%	16,100	--	No	No	Yes	No			X
Chromium	190	100%	93	10.3	Yes	Yes	No	--	X		
Cobalt	190	98%	35	43	Yes	No	No	--			X
Copper	190	100%	2,730	12,045	Yes	No	No	--			X
Iron	190	100%	195,999	90,338	Yes	Yes	No	--	X		
Lead	190	99%	63,500	35,645	Yes	Yes	No	--	X		
Magnesium	190	100%	3,060	--	No	No	Yes	No			X
Manganese	190	100%	12,200	186	Yes	Yes	No	--	X		
Mercury	190	79%	0.33	90	Yes	No	No	--			X
Nickel	190	98%	20	6,023	Yes	No	No	--			X
Potassium	190	100%	2,550	--	No	No	Yes	No			X
Selenium	190	50%	66	1,506	Yes	No	No	--			X
Silver	190	98%	106	1,506	Yes	No	No	--			X
Sodium	190	92%	1,060	--	No	No	Yes	No			X
Thallium	190	6%	6.5	21	Yes	No	No	--			X
Vanadium	190	100%	31	301	Yes	No	No	--			X
Zinc	190	100%	20,100	90,338	Yes	No	No	--			X

[1] RBC is calculated for soil based on recreational exposure, based on a target cancer risk of 1E-06 or a target noncancer Hazard Quotient of 0.1 for the maximally exposed receptor population (see Appendix C).

[2] RDI = Reference Daily Intake, DRV = Daily Reference Value. RDIs replace the term "U. S. Recommended Daily Allowances" (introduced in 1973 as a reference value for vitamins, minerals, and protein). DRVs are for nutrients for which no set of standards previously existed. Values obtained from http://www.fda.gov/fdac/special/foodlabel/dvs.html.

Table 3-2. COPC Selection for Exposure of Onsite Receptors to Sediment

CHEMICAL	N	DATA			COPC SELECTION STEPS				SEDIMENT COPCs		
							Essential Nutrient Screen				
		Detection Frequency	Max Detected Concentration (mg/kg)	Sediment RBC [1] (mg/kg)	Does compound have an RBC?	Is Max Detect > RBC?	Is Compond an Essential Nutrient?	Is Expected Dose >> RDI or DRV? [2]	Quant COPC	Source of Uncertainty	Not a COPC
Aluminum	8	100%	33900	>1,000,000	Yes	No	No	--			X
Antimony	8	63%	9.0	2,044	Yes	No	No	--			X
Arsenic	8	100%	157	159	Yes	No	No	--			X
Barium	3	100%	48	>1,000,000	Yes	No	No	--			X
Beryllium	8	100%	11	10,220	Yes	No	No	--			X
Cadmium	8	100%	34	5,110	Yes	No	No	--			X
Calcium	8	100%	4400	--	No	No	Yes	No			X
Chromium	8	88%	7.0	15,330	Yes	No	No	--			X
Cobalt	3	100%	12	102,200	Yes	No	No	--			X
Copper	8	100%	1720	204,400	Yes	No	No	--			X
Cyanide	2	100%	0.12	102,200	Yes	No	No	--			X
Iron	8	100%	82300	>1,000,000	Yes	No	No	--			X
Lead	8	100%	7880	405,838	Yes	No	No	--			X
Magnesium	8	100%	1830	--	No	No	Yes	No			X
Manganese	8	100%	10400	238,467	Yes	No	No	--			X
Mercury	8	88%	0.150	1,533	Yes	No	No	--			X
Nickel	8	100%	9.0	102,200	Yes	No	No	--			X
Potassium	3	100%	624	--	No	No	Yes	No			X
Selenium	8	75%	7.6	25,550	Yes	No	No	--			X
Silver	8	88%	18	25,550	Yes	No	No	--			X
Sodium	3	33%	40	--	No	No	Yes	No			X
Thallium	8	63%	3.8	358	Yes	No	No	--			X
Vanadium	3	100%	7	5,110	Yes	No	No	--			X
Zinc	8	100%	6890	>1,000,000	Yes	No	No	--			X

[1] RBC is calculated for sediment based on recreational exposure, based on a target cancer risk of 1E-06 or a target noncancer Hazard Quotient of 0.1 for the maximally exposed receptor population (see Appendix C).

[2] RDI = Reference Daily Intake, DRV = Daily Reference Value. RDIs replace the term "U. S. Recommended Daily Allowances" (introduced in 1973 as a reference value for vitamins, minerals, and protein). DRVs are for nutrients for which no set of standards previously existed. Values obtained from http://www.fda.gov/fdac/special/foodlabel/dvs.html.

Table 3-3. COPC Selection for Exposure of Onsite Receptors to Surface Water

CHEMICAL	N	DATA (Total Recoverable)			COPC SELECTION STEPS				SURFACE WATER COPCs		
							Essential Nutrient Screen				
		Detection Frequency	Max Detected Concentration (ug/L)	Surface Water RBC [1] (ug/L)	Does compound have an RBC?	Is Max Detect > RBC?	Is Compond an Essential Nutrient?	Is Expected Dose >> RDI or DRV? [2]	Quant COPC	Source of Uncertainty	Not a COPC
Aluminum	18	67%	1500	2,838,889	Yes	No	No	--			X
Antimony	15	7%	1.50	1,136	Yes	No	No	--			X
Arsenic	18	17%	2.5	44	Yes	No	No	--			X
Barium	6	50%	100	567,778	Yes	No	No	--			X
Beryllium	13	8%	0.50	5,678	Yes	No	No	--			X
Cadmium	18	78%	63	1,419	Yes	No	No	--			X
Calcium	13	100%	50000	--	No	No	Yes	No			X
Chromium	18	11%	5.0	8,517	Yes	No	No	--			X
Cobalt	4	50%	25	56,778	Yes	No	No	--			X
Copper	18	72%	170	113,556	Yes	No	No	--			X
Iron	18	44%	936	851,667	Yes	No	No	--			X
Lead	18	94%	230	1,217,515	Yes	No	No	--			X
Magnesium	13	85%	5400	--	No	No	Yes	No			X
Manganese	18	83%	3100	56,778	Yes	No	No	--			X
Mercury	4	0%	0.10	851.67	Yes	No	No	--			X
Nickel	15	53%	20.0	56,778	Yes	No	No	--			X
Potassium	10	60%	2500	--	No	No	Yes	No			X
Selenium	15	13%	2.5	14,194	Yes	No	No	--			X
Silver	18	17%	5	14,194	Yes	No	No	--			X
Sodium	10	90%	5000	--	No	No	Yes	No			X
Thallium	13	8%	1	198.7	Yes	No	No	--			X
Vanadium	6	33%	25	2,839	Yes	No	No	--			X
Zinc	18	100%	12000	851,667	Yes	No	No	--			X

[1] RBC is calculated for surface water based on recreational exposure, based on a target cancer risk of 1E-06 or a target noncancer Hazard Quotient of 0.1 for the maximally exposed receptor population (see Appendix C).

[2] RDI = Reference Daily Intake, DRV = Daily Reference Value. RDIs replace the term "U. S. Recommended Daily Allowances" (introduced in 1973 as a reference value for vitamins, minerals, and protein). DRVs are for nutrients for which no set of standards previously existed. Values obtained from http://www.fda.gov/fdac/special/foodlabel/dvs.html.

Table 3-4. COPC Selection for Exposure of Drainage Receptors to Sediment

CHEMICAL	N	DATA			COPC SELECTION STEPS				SEDIMENT COPCs		
							Essential Nutrient Screen				
		Detection Frequency	Max Detected Concentration (mg/kg)	Sediment RBC [1] (mg/kg)	Does compound have an RBC?	Is Max Detect > RBC?	Is Compond an Essential Nutrient?	Is Expected Dose >> RDI or DRV? [2]	Quant COPC	Source of Uncertainty	Not a COPC
Aluminum	37	100%	31600	>1,000,000	Yes	No	No	--			X
Antimony	37	43%	10.2	482	Yes	No	No	--			X
Arsenic	37	100%	178	159	Yes	Yes	No	--	X		
Barium	18	100%	117	240,900	Yes	No	No	--			X
Beryllium	37	95%	2.0	2,409	Yes	No	No	--			X
Cadmium	37	100%	68	1,205	Yes	No	No	--			X
Calcium	37	100%	7110	--	No	No	Yes	No			X
Chromium	37	95%	11	3,614	Yes	No	No	--			X
Cobalt	18	100%	24	24,090	Yes	No	No	--			X
Copper	37	100%	598	48,180	Yes	No	No	--			X
Cyanide	7	43%	1.6	24,090	Yes	No	No	--			X
Iron	37	100%	45400	361,350	Yes	No	No	--			X
Lead	37	100%	1670	405,838	Yes	No	No	--			X
Magnesium	37	100%	5520	--	No	No	Yes	No			X
Manganese	37	100%	9510	56,210	Yes	No	No	--			X
Mercury	37	65%	0.17	361	Yes	No	No	--			X
Nickel	37	100%	17	24,090	Yes	No	No	--			X
Potassium	18	100%	1130	--	No	No	Yes	No			X
Selenium	37	38%	5.9	6,023	Yes	No	No	--			X
Silver	37	100%	4.50	6,023	Yes	No	No	--			X
Sodium	18	100%	97	--	No	No	Yes	No			X
Thallium	37	62%	3.6	84	Yes	No	No	--			X
Vanadium	18	100%	13	1,205	Yes	No	No	--			X
Zinc	37	100%	7180	361,350	Yes	No	No	--			X

[1] RBC is calculated for sediment based on recreational exposure, based on a target cancer risk of 1E-06 or a target noncancer Hazard Quotient of 0.1 for the maximally exposed receptor population (see Appendix C).

[2] RDI = Reference Daily Intake, DRV = Daily Reference Value. RDIs replace the term "U. S. Recommended Daily Allowances" (introduced in 1973 as a reference value for vitamins, minerals, and protein). DRVs are for nutrients for which no set of standards previously existed. Values obtained from http://www.fda.gov/fdac/special/foodlabel/dvs.html.

Table 3-5. COPC Selection for Exposure of Drainage Receptors to Surface Water

CHEMICAL	N	DATA (Total Recoverable)			COPC SELECTION STEPS				SURFACE WATER COPCs		
							Essential Nutrient Screen				
		Detection Frequency	Max Detected Concentration (ug/L)	Surface Water RBC [1] (ug/L)	Does compound have an RBC?	Is Max Detect > RBC?	Is Compond an Essential Nutrient?	Is Expected Dose >> RDI or DRV? [2]	Quant COPC	Source of Uncertainty	Not a COPC
Aluminum	116	72%	2100	60,225	Yes	No	No	--			X
Antimony	99	21%	2.50	24	Yes	No	No	--			X
Arsenic	103	72%	10	1.0	Yes	Yes	No	--	X		
Barium	61	52%	100	12,045	Yes	No	No	--			X
Beryllium	93	18%	0.75	120	Yes	No	No	--			X
Cadmium	102	64%	61	30	Yes	Yes	No	--	X		
Calcium	99	100%	280000	--	No	No	Yes	No			X
Chromium	103	17%	5.0	181	Yes	No	No	--			X
Cobalt	55	40%	25	1,205	Yes	No	No	--			X
Copper	102	63%	335	2,409	Yes	No	No	--			X
Cyanide	8	0%	0.55	56,778	Yes	No	No	--			X
Iron	116	78%	660	851,667	Yes	No	No	--			X
Lead	115	54%	563	1,217,515	Yes	No	No	--			X
Magnesium	99	82%	4790	56,778	Yes	No	Yes	No			X
Manganese	115	98%	850	56,778	Yes	No	No	--			X
Mercury	38	3%	0.20	852	Yes	No	No	--			X
Nickel	85	53%	20	56,778	Yes	No	No	--			X
Potassium	69	46%	2500	283,889	Yes	No	Yes	No			X
Selenium	99	10%	7.5	14,194	Yes	No	No	--			X
Silver	101	19%	5.0	14,194	Yes	No	No	--			X
Sodium	69	77%	11000	14,194	Yes	No	Yes	No			X
Thallium	89	19%	0.60	199	Yes	No	No	--			X
Vanadium	60	32%	25	2,839	Yes	No	No	--			X
Zinc	115	100%	5700	851,667	Yes	No	No	--			X

[1] RBC is calculated for surface water based on recreational exposure, based on a target cancer risk of 1E-06 or a target noncancer Hazard Quotient of 0.1 for the maximally exposed receptor population (see Appendix C).

[2] RDI = Reference Daily Intake, DRV = Daily Reference Value. RDIs replace the term "U. S. Recommended Daily Allowances" (introduced in 1973 as a reference value for vitamins, minerals, and protein). DRVs are for nutrients for which no set of standards previously existed. Values obtained from http://www.fda.gov/fdac/special/foodlabel/dvs.html.

Table 3-6. COPC Selection for Exposure of Drainage Receptors to Fish Tissue

CHEMICAL	N	DATA			COPC SELECTION STEPS				FISH TISSUE COPCs		
							Essential Nutrient Screen				
		Detection Frequency	Max Detected Concentration (mg/kg)	Fish Tissue RBC [1] (mg/kg)	Does compound have an RBC?	Is Max Detect > RBC?	Is Compond an Essential Nutrient?	Is Expected Dose >> RDI or DRV? [2]	Quant COPC	Source of Uncertainty	Not a COPC
Aluminum	13	100%	2	1,377	Yes	No	No	--			X
Antimony	13	0%	0.0075	0.55	Yes	No	No	--			X
Arsenic	13	100%	3.2	0.023	Yes	Yes	No	--	X		
Beryllium	13	0%	0.031	2.8	Yes	No	No	--			X
Cadmium	13	100%	0.09	1.4	Yes	No	No	--			X
Calcium	13	100%	2,290	--	No	No	Yes	No			X
Chromium	13	100%	0.80	4.1	Yes	No	No	--			X
Copper	13	100%	2.0	55	Yes	No	No	--			X
Iron	13	92%	8	413	Yes	No	No	--			X
Lead	13	38%	0.07	NC	Yes	No	No	--			X
Magnesium	13	100%	366	--	No	No	Yes	No			X
Manganese	13	100%	2.5	64	Yes	No	No	--			X
Mercury	13	100%	0.08	0.14	Yes	No	No	--			X
Nickel	13	100%	0.17	28	Yes	No	No	--			X
Selenium	13	100%	0.8	6.9	Yes	No	No	--			X
Silver	13	0%	0.0025	6.9	Yes	No	No	--			X
Thallium	13	15%	0.023	0.10	Yes	No	No	--			X
Zinc	13	100%	41	413	Yes	No	No	--			X

[1] RBC is calculated for fish based on recreational exposure, based on a target cancer risk of 1E-06 or a target noncancer Hazard Quotient of 0.1 for the maximally exposed receptor population (see Appendix C).

[2] RDI = Reference Daily Intake, DRV = Daily Reference Value. RDIs replace the term "U.S. Recommended Daily Allowances" (introduced in 1973 as a reference value for vitamins, minerals, and protein). DRVs are for nutrients for which no set of standards previously existed. Values obtained from http://www.fda.gov/fdac/special/foodlabel/dvs.html.

Table 4-1
Exposure Parameters for ATV Riders - Adult and Child at the Mine Site

Exposure Pathway	Exposure Input Parameter	Units	CTE				RME			
			Adult	Source	Child	Source	Adult	Source	Child	Source
General	Body Weight	kg	70	[1, 3]	33	[4, a]	70	[1, 3]	33	[4, a]
	Exposure Frequency	days/yr	6	[7]	6	[7]	20	[7]	20	[7]
	Exposure Duration	yr	9	[3]	2	[3]	30	[3]	6	[3]
	Averaging Time, Cancer	yr	70	[2]	70	[2]	70	[2]	70	[2]
	Averaging Time, Noncancer	yr	9	[2]	2	[2]	30	[2]	6	[2]
Inhalation of Particulates	Inhalation rate	m^3/hr	2.4	[4, 6, b]	1.55	[4, 6, b]	2.4	[4, 6, b]	1.55	[4, 6, b]
	Exposure Time	hr/day	1.5	[7]	1.5	[7]	2.5	[7]	2.5	[7]
	HIF(noncancer)	m^3/kg-d	8.45E-04		1.16E-03		4.70E-03		6.43E-03	
	HIF(cancer)	m^3/kg-d	1.09E-04		3.31E-05		2.01E-03		5.52E-04	
Ingestion of Soil	Intake rate	mg/day	50	[5, c]	100	[5, c]	100	[5, c]	200	[5, c]
	Conversion factor	kg/mg	1E-06	--	1E-06	--	1E-06	--	1E-06	--
	HIF(noncancer)	kg/kg-d	1.17E-08		4.98E-08		7.83E-08		3.32E-07	
	HIF(cancer)	kg/kg-d	1.51E-09		1.42E-09		3.35E-08		2.85E-08	

CTE = Central Tendency Exposure
RME = Reasonable Maximum Exposure

Sources:

[1] USEPA 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03. March.

[2] USEPA 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002. December.

[3] USEPA 1993. Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

[4] USEPA 1997. Exposure Factors Handbook.

[5] Professional judgment.

[6] USEPA 2001. Rocky Flats Task 3 Report.

[7] Community interviews for determining use at the Standard Mine Site. July 2006.

Notes:

[a] Table 7-3, mean of male and female ages 6 - 12.

[b] Mean breathing rate for moderate and heavy activities (USEPA 1997, Table 5-23).

[c] Assumes soil ingestion is two times the soil ingestion rate of a hiker (for adult); assumes child intake is 2 times the adult rate.

Table 4-2
Exposure Parameters for Hiker - Adult at the Mine Site

Exposure Pathway	Exposure Input Parameter	Units	CTE		RME	
			Adult	Source	Adult	Source
General	Body Weight	kg	70	[1, 3]	70	[1, 3]
	Exposure frequency	days/yr	6	[7]	20	[7]
	Exposure duration	yr	9	[3]	30	[3]
	Averaging Time, Cancer	yr	70	[2]	70	[2]
	Averaging Time, Noncancer	yr	9	[2]	30	[2]
Ingestion of Soil	Ingestion rate	mg/day	25	[4, b]	50	[4, a]
	Conversion factor	kg/mg	1E-06	--	1E-06	--
	HIF(noncancer)	kg/kg-d	5.87E-09		3.91E-08	
	HIF(cancer)	kg/kg-d	7.55E-10		1.68E-08	
Ingestion of Sediment	Ingestion rate	mg/day	12.5	[4,b]	25	[4, c]
	Conversion factor	kg/mg	1E-06	--	1E-06	--
	HIF(noncancer)	kg/kg-d	2.94E-09		1.96E-08	
	HIF(cancer)	kg/kg-d	3.77E-10		8.39E-09	
Ingestion of Surface Water	Ingestion rate	mL/hour	5	[4, e]	30	[5, d]
	Exposure Time	hr/day	0.5	[4, 6]	1.5	[4, 6]
	Conversion factor	L/mL	1E-03	--	1E-03	--
	HIF(noncancer)	L/kg-d	5.87E-07		3.52E-05	
	HIF(cancer)	L/kg-d	7.55E-08		1.51E-05	

CTE = Central Tendency Exposure
RME = Reasonable Maximum Exposure

Sources:

[1] USEPA 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

[2] USEPA 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002. December.

[3] USEPA 1993. Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

[4] Professional judgment.

[5] USEPA 1998. Draft Water Quality Criteria Methodology Revisions.

[6] SAF. 2000. Final. Remedial Investigation Report. Zone A. Operable Unit 3: Landfill 6. Volume 3. Appendix K. Baseline Risk Assessment May 15. (FE Warren Site).

[7] Community interviews for determining use at the Standard Mine Site. July 2006.

Notes:

[a] Assumes RME soil ingestion by a recreational visitor is half of the USEPA default soil ingestion rate for a resident.

[b] Assumes CTE ingestion rate is half of the RME ingestion rate.

[c] Assumes RME sediment ingestion is same as CTE soil ingestion.

[d] 30 mL/hr is the basis for the 10 mL/day value proposed for a recreational scenario by the Draft Water Quality Criteria Methodology Revisions (USEPA 1998).

[e] Incidental ingestion from splashing or hand-to-face contact during wading assumed to be 10% of USEPA (1989) recommended default (50 ml/hr) incidentally ingested during swimming.

Table 4-3
Exposure Parameters for Recreational Fishermen - Adult in the Drainage

Exposure Pathway	Exposure Input Parameter	Units	CTE		RME	
			Adult	Source	Adult	Source
General	Body Weight	kg	70	[1, 3]	70	[1, 3]
	Exposure duration	yr	9	[3]	30	[3]
	Averaging Time, Cancer	yr	70	[2]	70	[2]
	Averaging Time, Noncancer	yr	9	[2]	30	[2]
Ingestion of Fish	Ingestion rate (total)	g/day	8	[4, b]	25	[4, b]
	Exposure Frequency	days/yr	234	[3]	350	[2]
	Conversion factor	kg/g	1E-03	--	1E-03	--
	Fraction from Site/Site Impacted areas	unitless	0.10	[5, c]	0.20	[5, c]
	HIF(noncancer)	kg/kg-d	7.33E-06		6.85E-05	
	HIF(cancer)	kg/kg-d	9.42E-07		2.94E-05	
Ingestion of Sediment	Ingestion rate	mg/day	12.5	[5, d]	25	[5, e]
	Exposure Frequency	days/yr	6	[6,a]	20	[6,a]
	Conversion factor	kg/mg	1E-06	--	1E-06	--
	HIF(noncancer)	kg/kg-d	2.94E-09		1.96E-08	
	HIF(cancer)	kg/kg-d	3.77E-10		8.39E-09	
Ingestion of Surface Water	Ingestion rate	mL/hour	5	[5, g]	30	[7, f]
	Exposure Frequency	days/yr	6	[6,a]	20	[6,a]
	Exposure Time	hr/day	0.5	[5, 8]	1.5	[5, 8]
	Conversion factor	L/mL	1E-03	--	1E-03	--
	HIF(noncancer)	L/kg-d	5.87E-07		3.52E-05	
	HIF(cancer)	L/kg-d	7.55E-08		1.51E-05	

CTE = Central Tendency Exposure
RME = Reasonable Maximum Exposure

Sources:

[1] USEPA 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03. March.

[2] USEPA 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002. December.

[3] USEPA 1993. Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

[4] USEPA 1997. Exposure Factors Handbook.

[5] Professional judgment.

[6] Community interviews for determining use at the Standard Mine Site. July 2006.

[7] USEPA 1998. Draft Water Quality Criteria Methodology Revisions.

[8] SAF. 2000. Final. Remedial Investigation Report. Zone A. Operable Unit 3: Landfill 6. Volume 3. Appendix K. Baseline Risk Assessment May 15. (FE Warren Site).

Notes:

[a] Assumes exposure frequency is the same as a recreational visitor.

[b] From Section 10.10.3, recommendations for recreational freshwater anglers. RME is equivalent ot 58 meals/year and CTE is equivalent to 19 meals/year (150 g/meal).

[c] assumes 10% and 20% of fish consumed annually are from the drainage areas impacted by the Standard Mine Site.

[d] Assumes CTE ingestion rate is half of the RME ingestion rate.

[e] Assumes RME sediment ingestion is same as CTE soil ingestion.

[f] 30 mL/hr is the basis for the 10 mL/day value proposed for a recreational scenario by the Draft Water Quality Criteria Methodology Revisions (USEPA 1998).

[g] Incidental ingestion from splashing or hand-to-face contact during wading assumed to be 10% of USEPA (1989) recommended default (50 ml/hr) incidentally ingested during swimming.

Table 4-4
Exposure Parameters for Recreational Visitors - Child in the Drainage

Exposure Pathway	Exposure Input Parameter	Units	CTE		RME	
			Child	Source	Child	Source
General	Body Weight	kg	33	[3, a]	33	[3, a]
	Exposure duration	yr	2	[2]	6	[2]
	Averaging Time, Cancer	yr	70	[1]	70	[1]
	Averaging Time, Noncancer	yr	2	[1]	6	[1]
Ingestion of Fish	Ingestion rate (total)	g/day	4.0	[g]	12.5	[g]
	Exposure Frequency	days/yr	234	[2]	350	[1]
	Conversion factor	kg/g	1E-03	--	1E-03	--
	Fraction from Site/Site Impacted areas	unitless	0.10	[4, c]	0.20	[4, c]
	HIF(noncancer)	kg/kg-d	7.77E-06		7.26E-05	
	HIF(cancer)	kg/kg-d	2.22E-07		6.23E-06	
Ingestion of Sediment	Ingestion rate	mg/day	25	[4, b]	50	[4, c]
	Exposure Frequency	days/yr	6	[5, d]	20	[5, d]
	Conversion factor	kg/mg	1E-06	--	1E-06	--
	HIF(noncancer)	kg/kg-d	1.25E-08		8.30E-08	
	HIF(cancer)	kg/kg-d	3.56E-10		7.12E-09	
Ingestion of Surface Water	Ingestion rate	mL/hour	5	[4, f]	30	[6, e]
	Exposure Frequency	days/yr	6	[5, d]	20	[5, d]
	Exposure Time	hr/day	0.5	[4, 7]	1.5	[4, 7]
	Conversion factor	L/mL	1E-03	--	1E-03	--
	HIF(noncancer)	L/kg-d	1.25E-06		7.47E-05	
	HIF(cancer)	L/kg-d	3.56E-08		6.40E-06	

CTE = Central Tendency Exposure
RME = Reasonable Maximum Exposure

Sources:

[1] USEPA 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002. December.

[2] USEPA 1993. Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
[3] USEPA 1997. Exposure Factors Handbook.
[4] Professional judgment.
[5] Community interviews for determining use at the Standard Mine Site. July 2006
[6] USEPA 1998. Draft Water Quality Criteria Methodology Revisions.
[7] SAF. 2000. Final. Remedial Investigation Report. Zone A. Operable Unit 3: Landfill 6. Volume 3. Appendix K. Baseline Risk Assessment May 15. (FE Warren Site).

Notes:

[a] Table 7-3, mean of male and female ages 6 - 12.

[b] Assumes CTE ingestion rate is half of the RME ingestion rate.

[c] Assumes RME sediment ingestion is same as CTE soil ingestion.

[d] Assumes that exposure frequency is the same as a recreational visitor.

[e] 30 mL/hr is the basis for the 10 mL/day value proposed for a recreational scenario by the Draft Water Quality Criteria Methodology Revisions (USEPA 1998).

[f] Incidental ingestion from splashing or hand-to-face contact during wading assumed to be 10% of USEPA (1989) recommended default (50 ml/hr) incidentally ingested during swimming.

Table 4-5
Exposure Parameters for Adult Campers in the Drainage

Exposure Pathway	Exposure Input Parameter	Units	CTE		RME	
			Adult	Source	Adult	Source
General	Body Weight	kg	70	[1, 3]	70	[1, 3]
	Exposure duration	yr	9	[3]	30	[3]
	Averaging Time, Cancer	yr	70	[2]	70	[2]
	Averaging Time, Noncancer	yr	9	[2]	30	[2]
Ingestion of Sediment	Ingestion rate	mg/day	12.5	[4, a]	25	[4, b]
	Exposure Frequency	days/yr	6	[5]	20	[5]
	Conversion factor	kg/mg	1E-06	--	1E-06	--
	HIF(noncancer)	kg/kg-d	2.94E-09		1.96E-08	
	HIF(cancer)	kg/kg-d	3.77E-10		8.39E-09	
Ingestion of Surface Water	Ingestion rate	L/day	1	[2, c]	2	[2, c]
	Exposure Frequency	days/yr	6	[5]	20	[5]
	HIF(noncancer)	L/kg-d	2.35E-04		1.57E-03	
	HIF(cancer)	L/kg-d	3.02E-05		6.71E-04	

CTE = Central Tendency Exposure
RME = Reasonable Maximum Exposure

Sources:

[1] USEPA 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03. March.
[2] USEPA 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002. December.
[3] USEPA 1993. Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
[4] Professional judgment.
[5] Community interviews for determining use at the Standard Mine Site. July 2006.

Notes:

[a] Assumes CTE ingestion rate is half of the RME ingestion rate.
[b] Assumes RME sediment ingestion is same as CTE soil ingestion.
[c] Assumes water intake by camper is similar to a resident

Table 4-6
Exposure Parameters for Child Campers in the Drainage

Exposure Pathway	Exposure Input Parameter	Units	CTE		RME	
			Child	Source	Child	Source
General	Body Weight	kg	33	[3, a]	33	[3, a]
	Exposure duration	yr	2	[2]	6	[2]
	Averaging Time, Cancer	yr	70	[1]	70	[1]
	Averaging Time, Noncancer	yr	2	[1]	6	[1]
Ingestion of Sediment	Ingestion rate	mg/day	25	[4, a]	50	[4, b]
	Exposure Frequency	days/yr	6	[5]	20	[5]
	Conversion factor	kg/mg	1E-06	--	1E-06	--
	HIF(noncancer)	kg/kg-d	1.25E-08		8.30E-08	
	HIF(cancer)	kg/kg-d	3.56E-10		7.12E-09	
Ingestion of Surface Water	Ingestion rate	L/day	0.5	[1, c]	1	[1, c]
	Exposure Frequency	days/yr	6	[5]	20	[5]
	HIF(noncancer)	L/kg-d	2.49E-04		1.66E-03	
	HIF(cancer)	L/kg-d	7.12E-06		1.42E-04	

CTE = Central Tendency Exposure
RME = Reasonable Maximum Exposure

Sources:

[1] USEPA 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002. December.

[2] USEPA 1993. Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

[3] USEPA 1997. Exposure Factors Handbook.

[4] Professional judgment.

[5] Community interviews for determining use at the Standard Mine Site. July 2006.

Notes:

[a] Assumes CTE ingestion rate is half of the RME ingestion rate.

[b] Assumes RME sediment ingestion is same as CTE soil ingestion.

[c] Assumes water intake by camper is similar to a resident

Table 4-7. Exposure Point Concentrations

Medium	COPC	Mean (mg/kg)	95% UCL (mg/kg)	Max (mg/kg)	EPC (mg/kg)
Onsite Soil	Aluminum	6,800	7,200	18,000	7,200
	Arsenic	73	120	680	120
	Cadmium	7.3	13	107	13
	Chromium	10	14	100	14
	Iron	30,000	49,000	200,000	49,000
	Lead	3,600	7,000	64,000	7,000
	Manganese	2,200	2,800	12,000	2,800
Drainage Sediment	Arsenic	68	82	180	82
Drainage Surface Water	Arsenic	2.7	4.0	10	4.0
	Cadmium	2.7	6.9	61	6.9
Drainage Fish Tissue	Arsenic	0.92	4.0	3.2	3.2

Table 4-8. Human Health Toxicity Values

CHEMICAL	NON-CANCER				CANCER					
	Oral RfD mg/kg-day	Source	Inhalation RfD	Source	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Weight of Evidence	Source	Oral SF $(mg/kg\text{-}day)^{-1}$	Weight of Evidence	Source
Aluminum	1.0E+00	P [2]	1.0E-03	P [2]	--	--	--	--	--	--
Arsenic	3.0E-04	I	--	--	1.5E+01	A	I	1.5E+00	A	I
Cadmium-food	1.0E-03	I	5.7E-05	E [2]	6.3E+00	B1	I	--	--	--
Chromium III	1.5E+00	I	--	--	--	--	--	--	--	--
Chromium VI	3.0E-03	I	3.0E-05	I	4.1E+01	A	I	--	--	--
Iron	3.0E-01	E [1]	--	--	--	--	--	--	--	--
Manganese-food, sediment	4.7E-02	I [3]	1.4E-05	I	--	--	--	--	--	--
Manganese-water	2.0E-02	I	1.4E-05	I	--		--	--	--	--

CSF = Cancer Slope Factor
RfC = Noncancer Reference Concentration
RfD = Noncancer Reference Dose
UR = Unit Risk
NA = Not Available

Sources:
I = IRIS
E = EPA-NCEA Provisional Value
P = EPA Provisional Peer-Reviewed Value
-- = A USEPA Recommended toxicity value is not available for this chemical

Notes:
[1] As cited in Region III Tables (10/2006 update): http://www.epa.gov/reg3hwmd/risk/human/index.htm, accessed November, 2006.
[2] As cited in Region III Tables (4/2005 update).
[3] RfDo (1.4E-01 mg/kg-day) adjusted by a modifying factor of 3, in accord with IRIS and USEPA Region 8 recommendations.

Weight of Evidence:
A = Known human carcinogen
B1 = Possible human carcinogen

Table 4-9. Risks to On-Site Recreational Visitors

Panel A: Non-Cancer Risks

CTE Scenario

Chemical of Potential Concern	Adult ATV Rider			Child ATV Rider			Adult Hiker
	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion
Aluminum	9E-05	7E-03	7E-03	4E-04	1E-02	1E-02	4E-05
Arsenic	2E-03	NA	2E-03	1E-02	NA	1E-02	1E-03
Cadmium	2E-04	2E-04	4E-04	7E-04	3E-04	1E-03	8E-05
Chromium	4E-05	3E-04	4E-04	2E-04	4E-04	6E-04	2E-05
Iron	2E-03	NA	2E-03	7E-03	NA	7E-03	8E-04
Manganese	7E-04	2E-01	2E-01	3E-03	3E-01	3E-01	4E-04
Total	5E-03	2E-01	2E-01	2E-02	3E-01	3E-01	3E-03

RME Scenario

Chemical of Potential Concern	Adult ATV Rider			Child ATV Rider			Adult Hiker
	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion
Aluminum	6E-04	4E-02	4E-02	2E-03	6E-02	6E-02	3E-04
Arsenic	2E-02	NA	2E-02	7E-02	NA	7E-02	8E-03
Cadmium	1E-03	1E-03	2E-03	4E-03	2E-03	6E-03	5E-04
Chromium	2E-04	2E-03	2E-03	1E-03	2E-03	3E-03	1E-04
Iron	1E-02	NA	1E-02	5E-02	NA	5E-02	5E-03
Manganese	5E-03	1E+00	1E+00	2E-02	2E+00	2E+00	2E-03
Total	3E-02	1E+00	1E+00	1E-01	2E+00	2E+00	2E-02

Panel B: Cancer Risks

CTE Scenario

Chemical of Potential Concern	Adult ATV Rider			Child ATV Rider			Adult Hiker
	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion
Aluminum	NA	NA	NA	NA	NA	NA	NA
Arsenic	1E-07	2E-07	4E-07	1E-07	7E-08	2E-07	7E-08
Cadmium	NA	1E-08	1E-08	NA	3E-09	3E-09	NA
Chromium	NA	5E-08	5E-08	NA	2E-08	2E-08	NA
Iron	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA
Total	1E-07	3E-07	4E-07	1E-07	9E-08	2E-07	7E-08

RME Scenario

Chemical of Potential Concern	Adult ATV Rider			Child ATV Rider			Adult Hiker
	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion	Soil Inhalation	Total	Soil Ingestion
Aluminum	NA	NA	NA	NA	NA	NA	NA
Arsenic	3E-06	4E-06	8E-06	3E-06	1E-06	4E-06	2E-06
Cadmium	NA	2E-07	2E-07	NA	5E-08	5E-08	NA
Chromium	NA	9E-07	9E-07	NA	3E-07	3E-07	NA
Iron	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA
Total	3E-06	6E-06	9E-06	3E-06	2E-06	4E-06	2E-06

NA = data not available
-- = pathway not evaluated
Shaded values = level of potential concern

Table 4-10. Risks to Recreational Visitors Along Site Drainages

Panel A: Non-Cancer Risks

CTE Scenario

Chemical of Potential Concern	Adult Fisherman				Recreational Child				Adult Camper			Child Camper		
	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total
Arsenic	8E-03	4E-04	8E-06	8E-03	8E-03	2E-03	2E-05	1E-02	4E-04	3E-03	4E-03	2E-03	3E-03	5E-03
Cadmium	--	--	8E-06	8E-06	--	--	2E-05	2E-05	--	3E-03	3E-03	--	3E-03	3E-03
Total	8E-03	4E-04	8E-06	8E-03	8E-03	2E-03	2E-05	1E-02	4E-04	3E-03	4E-03	2E-03	3E-03	5E-03

RME Scenario

Chemical of Potential Concern	Adult Fisherman				Recreational Child				Adult Camper			Child Camper		
	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total
Arsenic	7E-02	3E-03	5E-04	8E-02	8E-02	1E-02	1E-03	9E-02	3E-03	2E-02	2E-02	1E-02	2E-02	3E-02
Cadmium	--	--	5E-04	5E-04	--	--	1E-03	1E-03	--	2E-02	2E-02	--	2E-02	2E-02
Total	7E-02	3E-03	5E-04	8E-02	8E-02	1E-02	1E-03	9E-02	3E-03	2E-02	2E-02	1E-02	2E-02	3E-02

Panel B: Cancer Risks

CTE Scenario

Chemical of Potential Concern	Adult Fisherman				Recreational Child				Adult Camper			Child Camper		
	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total
Arsenic	4E-06	1E-08	2E-10	4E-06	1E-07	1E-08	2E-10	1E-07	1E-08	8E-08	9E-08	1E-08	2E-08	3E-08
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total	4E-06	1E-08	2E-10	4E-06	1E-07	1E-08	2E-10	1E-07	1E-08	8E-08	9E-08	1E-08	2E-08	3E-08

RME Scenario

Chemical of Potential Concern	Adult Fisherman				Recreational Child				Adult Camper			Child Camper		
	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Fish Ingestion	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total	Sediment Ingestion	Surface Water Ingestion	Total
Arsenic	1E-05	2E-07	4E-08	1E-05	3E-06	2E-07	2E-08	3E-06	2E-07	2E-06	2E-06	2E-07	4E-07	6E-07
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total	1E-05	2E-07	4E-08	1E-05	3E-06	2E-07	2E-08	3E-06	2E-07	2E-06	2E-06	2E-07	4E-07	6E-07

NA = data not available
-- = pathway not evaluated
Shaded values = level of potential concern

Table 5-1. Evaluation of Risks from Lead

Basic Equations

PbB(fetus) = PbB(mother) * Ratio

PbB(mother) = PbB0 + BKSF*[Csoil*IRsoil*AFsoil*EF/365 + Csoil*PEF*BR*AFa*EF/365]

Data Inputs

Parameter	Units	ATV Rider	Hiker	Source	Notes
PbB0	ug/dL	1.7	1.7	AGEISS 1996	Bingham Creek Study
BKSF	ug/dL per ug/day	0.4	0.4	USEPA 2003a	USEPA default recommendation.
Ratio	ug/dL per ug/dL	0.9	0.9	USEPA 2003a	USEPA default recommendation.
GSD	--	1.5	1.5	AGEISS 1996	Bingham Creek Study
Csoil	ug/g	3600	3600	Site-specific	Mean
IRsoil	g/day	0.050	0.025	Professional judgment	CTE exposure parameter
AFsoil	--	0.12	0.12	USEPA 2003a	0.2 (default) * 0.6 (RBA)
PEF	g/m^3	1.18E-03		Appendix F	
BR	m^3/hr	2.4		USEPA 1997	Mean breathing rate for moderate and heavy activities
ET	hrs/day	1.5		Community interviews and professional judgment	
AFa	--	1.00		Professional judgment	
EF	days/year	6	6	Community interviews and professional judgment	CTE exposure parameter

Results

Absorb. Dose from soil	ug/day	0.355	0.178
Absorb. Dose from inhaled dust	ug/day	0.251	0.000
GM PbB(mother)	ug/dL	1.943	1.771
P10 (fetus)		0.001%	0.0003%