Appendix H

Exposure Concentration and Food-Web Model Calculations

APPENDIX H. EXPOSURE CONCENTRATION AND FOOD-WEB MODEL CALCULATIONS

This appendix provides exposure point concentrations (EPCs) for chemicals of concern (COCs) in surface water, sediment, fish, and wetland and dredge spoils soils and food-web dose exposure calculations for avian and mammalian receptors. Exposure doses were calculated for 95 percent upper confidence limit (UCL) exposure and mean exposure. In instances where the 95 percent UCL was greater than the maximum detected concentration, the maximum detected concentration was used (see Chapter 8 of the BERA for details). Tables H-1 to H-20 contain the EPCs used in this BERA.

Food-web calculations and associated hazard quotients for wildlife receptors, based on data contained in the Onondaga Lake database (combined Honeywell and NYSDEC database), are presented in Tables H-21 to H-48. These tables provide a comparison of modeled exposure dose concentrations of selected COCs (see Tables 6-1 and 6-2) to toxicity reference values (see Tables 9-16 and 9-17). Avian and mammalian receptor life history parameters used to calculate exposures are provided in Tables 8-6 and 8-7, respectively. General recommendations used for biota sediment accumulation factors (BSAFs) and earthworm and small mammal uptake factors (UFs) are provided in Table 8-5.

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Table H-1. Surface Water One-meter Contour Exposure Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Cadmium	µg/L	4/142	2.1	17	1.1	1.1	1.1	95% UCL-T
Chromium	µg/L	60/151	1.9	560	16	9.8	9.8	95% UCL-T
Copper	µg/L	102/142	1.3	125	9.7	12	12	95% UCL-T
Lead	µg/L	85/151	1.0	95	6.8	7.8	7.8	95% UCL-T
Manganese	µg/L	20/20	6.1	244	55	102	102	95% UCL-T
Mercury	ng/L	159/159	0.88	307	32	42	42	95% UCL-T
Methylmercury	ng/L-dis	16/16	5.9E-02	3.0	0.5	0.8	0.8	95% UCL-T
Methylmercury-total	ng/L	136/139	4.2E-02	9.3	0.8	1.1	1.1	95% UCL-T
Nickel	µg/L	56/151	3.5	327	17	14	14	95% UCL-T
Zinc	µg/L	116/142	3.3	259	46	70	70	95% UCL-T
Organic Compounds								
Benzene	µg/L	11/137	0.1	60	1.5	0.9	0.9	95% UCL-T
Chlorobenzene	µg/L	3/137	0.5	12	0.6	0.6	0.6	95% UCL-T
Dichlorobenzenes	µg/L	24/137	0.1	23	1.8	1.4	1.4	95% UCL-T
Ethylbenzene	µg/L	1/137	1.7	1.7	0.5	0.5	0.5	95% UCL-T
Trichlorobenzenes	µg/L	5/128	1.0	2.4	0.6	0.6	0.6	95% UCL-T
Xylene	µg/L	16/137	0.3	3.6	0.8	0.8	0.8	95% UCL-T
Hexachlorobenzene	µg/L	0/121	ND	ND	ND	ND	ND	ND

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
One-meter contour used for exposure of all wildlife receptors except the osprey.

Table H-2. Surface Water Nine-meter Contour Exposure Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Cadmium	µg/L	4/152	2.1	17	1.1	1.1	1.1	95% UCL-T
Chromium	µg/L	65/163	1.9	560	15	8.9	8.9	95% UCL-T
Copper	µg/L	104/152	1.3	125	9.1	11	11	95% UCL-T
Lead	µg/L	87/163	1.0	95	6.4	6.9	6.9	95% UCL-T
Manganese	µg/L	37/38	3.2	624	65	112	112	95% UCL-T
Mercury	ng/L	177/177	0.9	307	29	36	36	95% UCL-T
Methylmercury	ng/L-dis	34/34	4.2E-02	3.0	0.4	0.6	0.6	95% UCL-T
Methylmercury-total	ng/L	146/149	4.2E-02	9.3	0.8	1.0	1.0	95% UCL-T
Nickel	µg/L	60/163	3.5	327	16	13	13	95% UCL-T
Zinc	µg/L	126/152	3.3	259	45	65	65	95% UCL-T
Benzene	µg/L	11/149	0.1	60	1.4	0.8	0.8	95% UCL-T
Chlorobenzene	µg/L	3/149	0.5	12	0.6	0.6	0.6	95% UCL-T
Dichlorobenzenes	µg/L	26/149	0.1	23	1.7	1.3	1.3	95% UCL-T
Ethylbenzene	µg/L	1/149	1.7	1.7	0.5	0.5	0.5	95% UCL-T
Trichlorobenzenes	µg/L	5/138	1.0	2.4	0.6	0.6	0.6	95% UCL-T
Xylene	µg/L	16/149	0.3	3.6	0.8	0.8	0.8	95% UCL-T
Hexachlorobenzene	µg/L	0/121	ND	ND	ND	ND	ND	ND

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
Nine-meter contour used for osprey exposure.

Table H-3. Surface Sediment One-meter Contour Exposure Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg	31/68	0.3	6.4	1.1	1.5	1.5	95% UCL-T
Arsenic	mg/kg	65/68	0.4	47	5.2	8.4	8.4	95% UCL-T
Barium	mg/kg	68/68	24	2,070	320	405	405	95% UCL-T
Beryllium	mg/kg	57/68	5.3E-02	0.8	0.3	0.3	0.3	95% UCL-T
Cadmium	mg/kg	81/87	7.7E-02	15	1.4	2.2	2.2	95% UCL-T
Chromium	mg/kg	87/87	3.2	2,370	130	139	139	95% UCL-T
Cobalt	mg/kg	68/68	0.2	96	7.8	10	10	95% UCL-T
Copper	mg/kg	85/87	1.8	366	48	66	66	95% UCL-T
Lead	mg/kg	87/87	0.7	750	74	116	116	95% UCL-T
Manganese	mg/kg	68/68	93	844	287	313	313	95% UCL-T
Mercury	mg/kg	100/103	5.5E-02	65	5.4	11	11	95% UCL-T
Methylmercury	µg/kg	17/17	0.4	42	7.9	29	29	95% UCL-T
Nickel	mg/kg	87/87	1.8	1,080	49	52	52	95% UCL-T
Selenium	mg/kg	39/68	0.3	5.4	0.9	1.1	1.1	95% UCL-T
Silver	mg/kg	41/68	0.1	5.2	0.6	0.8	0.8	95% UCL-T
Thallium	mg/kg	13/68	0.2	1.1	0.5	0.5	0.5	95% UCL-N
Vanadium	mg/kg	63/68	0.5	168	14	23	23	95% UCL-T
Zinc	mg/kg	87/87	11	383	87	102	102	95% UCL-T
Organic Compounds								
Benzene	µg/kg	36/74	2.0	42,000	1,645	11,776	11,776	95% UCL-T
Dichlorobenzenes	µg/kg	37/87	5.0	168,000	5,879	37,046	37,046	95% UCL-T
Ethylbenzene	µg/kg	30/74	0.9	71,000	1,466	7,831	7,831	95% UCL-T
Toluene	µg/kg	42/74	3.0	8,300	893	10,567	8,300	Max
Trichlorobenzenes (Sum)	µg/kg	12/87	25	5,400	1,721	1,147	1,147	95% UCL-T
Xylene	µg/kg	25/59	12	330,000	11,814	1,026,759	330,000	Max
Bis(2-ethylhexyl)phthalate	µg/kg	27/68	22	3,900	2,476	1,777	1,777	95% UCL-T
Dibenzofuran	µg/kg	21/68	18	81,000	3,806	3,354	3,354	95% UCL-T
Hexachlorobenzene	µg/kg	40/85	1.1	6,750	505	1,768	1,768	95% UCL-T
Phenol	µg/kg	11/68	45	2,600	2,362	1,326	1,326	95% UCL-T
Chlordane (Sum)	µg/kg	11/60	1.1	50	3.2	2.8	2.8	95% UCL-T
DDT and metabolites	µg/kg	37/62	1.1	88	8.3	12	12	95% UCL-T
Dieldrin	µg/kg	12/57	1.3	31	2.6	3.2	3.2	95% UCL-T
Endrin	µg/kg	11/59	0.9	8.4	1.8	2.1	2.1	95% UCL-T

Table H-3. (cont.)

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Heptachlor and Heptachlor epoxide	µg/kg	18/50	0.8	52	3.3	3.3	3.3	95% UCL-T
Hexachlorocyclohexanes (Sum)	µg/kg	16/63	1.0	13	1.6	1.8	1.8	95% UCL-T
PAHs (Sum)	µg/kg	76/87	31	29,430,000	387,587	1,293,496	1,293,496	95% UCL-T
PCBs (Sum)	µg/kg	62/97	27	11,036	490	629	629	95% UCL-T
TEQ (1/2 DL) Avian	ng/kg	12/12	4.7	524	119	1,090	524	Max
TEQ (1/2 DL) Mammalian	ng/kg	12/12	1.4	165	43	482	165	Max

Notes:

UCL- Upper Confidence Limit

EPC- Exposure Point Concentration

Max - Maximum Detected Concentration

95% UCL-T - 95% Upper Confidence Limit, log transformed

95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-4. Surface Sediment Nine-meter Contour Exposure Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg	47/98	0.3	6.4	1.0	1.3	1.3	95% UCL-T
Arsenic	mg/kg	95/98	0.4	47	5.4	7.6	7.6	95% UCL-T
Barium	mg/kg	98/98	24	2,070	330	392	392	95% UCL-T
Beryllium	mg/kg	84/98	5.3E-02	0.8	0.3	0.3	0.3	95% UCL-N
Cadmium	mg/kg	145/153	7.7E-02	15	2.2	3.3	3.3	95% UCL-T
Chromium	mg/kg	153/153	3.2	4,180	169	158	158	95% UCL-T
Cobalt	mg/kg	98/98	0.2	170	11.0	13	13	95% UCL-T
Copper	mg/kg	150/153	1.8	366	53	66	66	95% UCL-T
Lead	mg/kg	153/153	0.7	750	72	98	98	95% UCL-T
Manganese	mg/kg	98/98	93	1,190	318	342	342	95% UCL-T
Mercury	mg/kg	202/207	5.5E-02	78	7.1	12	12	95% UCL-T
Methylmercury	µg/kg	66/66	0.4	5469	94	30	30	95% UCL-T
Nickel	mg/kg	152/153	1.8	1,670	60	53	53	95% UCL-T
Selenium	mg/kg	57/98	0.3	5.9	1.0	1.2	1.2	95% UCL-T
Silver	mg/kg	63/98	0.1	6.1	0.9	1.4	1.4	95% UCL-T
Thallium	mg/kg	17/98	0.2	2.9	0.5	0.6	0.6	95% UCL-T
Vanadium	mg/kg	93/98	0.5	319	21	30	30	95% UCL-T
Zinc	mg/kg	153/153	11	421	107	123	123	95% UCL-T
Organic Compounds								
Benzene	µg/kg	57/131	2.0	42,000	1,068	2,289	2,289	95% UCL-T
Dichlorobenzenes	µg/kg	58/153	5.0	239,000	5,562	11,919	11,919	95% UCL-T
Ethylbenzene	µg/kg	39/131	0.9	71,000	979	1,587	1,587	95% UCL-T
Toluene	µg/kg	67/131	3.0	8,300	645	2,174	2,174	95% UCL-T
Trichlorobenzenes (Sum)	µg/kg	13/153	25	35,000	1,277	578	578	95% UCL-T
Xylene	µg/kg	32/106	3.0	330,000	6,825	32,989	32,989	95% UCL-T
Bis(2-ethylhexyl)phthalate	µg/kg	46/98	22	5,100	2,118	2,243	2,243	95% UCL-T
Dibenzofuran	µg/kg	24/98	18	81,000	2,767	1,599	1,599	95% UCL-T
Hexachlorobenzene	µg/kg	73/139	1.1	6,750	374	484	484	95% UCL-T
Phenol	µg/kg	13/98	45	2,600	1,780	911	911	95% UCL-T
Chlordane (Sum)	µg/kg	26/85	1.1	50	3.3	3.1	3.1	95% UCL-T
DDT and metabolites	µg/kg	59/88	1.1	88	7.9	11	11	95% UCL-T
Dieldrin	µg/kg	26/81	1.3	36	3.3	4.1	4.1	95% UCL-T
Endrin	µg/kg	15/83	0.9	8.4	1.5	1.7	1.7	95% UCL-T

Table H-4. (cont.)

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Heptachlor and Heptachlor epoxide	µg/kg	28/72	0.8	52	3.2	3.4	3.4	95% UCL-T
Hexachlorocyclohexanes (Sum)	µg/kg	27/88	1.0	13	1.8	2.0	2.0	95% UCL-T
PAHs (Sum)	µg/kg	135/151	31	29,430,000	227,949	224,725	224,725	95% UCL-T
PCBs (Sum)	µg/kg	119/183	23	20,955	646	704	704	95% UCL-T
TEQ (1/2 DL) Avian	ng/kg	15/15	4.7	524	117	607	524	Max
TEQ (1/2 DL) Mammalian	ng/kg	15/15	1.4	165	44	286	165	Max

Notes:

UCL- Upper Confidence Limit

EPC- Exposure Point Concentration

Max - Maximum Detected Concentration

95% UCL-T - 95% Upper Confidence Limit, log transformed

95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-5. Fish Exposure Concentrations - 3 to 18 cm Length

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Mercury	mg/kg-dw	18/18	0.5	2.6	2.0	2.2	2.2	95% UCL-N
Methylmercury	mg/kg-dw	45/45	0.2	3.8	0.9	1.1	1.1	95% UCL-T
Organic Compounds								
Hexachlorobenzene	mg/kg-dw	7/7	8.2E-03	7.9E-02	4.9E-02	6.8E-02	7.9E-02	Max
Chlordane (Sum)	µg/kg-dw	3/7	22	90	30	112	90	Max
DDT and metabolites (Sum)	mg/kg-dw	7/7	4.7E-02	0.4	0.2	0.3	0.4	Max
Dieldrin	µg/kg-dw	4/7	19	30	19	26	30	Max
Endrin	mg/kg-dw	0/7	ND	ND	ND	ND	ND	ND
Hexachlorocyclohexane	µg/kg-dw	0/2	ND	ND	ND	ND	ND	ND
PCBs (sum)	µg/kg-dw	18/21	295	14,535	4,095	19,695	14,535	Max
TEQ (1/2 DL) Avian	ng/kg-dw	2/2	100	176	138	1,167	176	Max
TEQ (1/2 DL) Mammalian	ng/kg-dw	2/2	18	54	36	144,033	54	Max

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied
Mercury was the only metal analyzed for this size class.

Table H-6. Fish Exposure Concentrations - 18 to 60 cm Length

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-dw	2/13	4.9	8.6	1.9	3.3	3.3	95% UCL-N
Arsenic	mg/kg-dw	9/13	1.9	6.8	2.3	3.2	3.2	95% UCL-N
Barium	mg/kg-dw	9/13	15	23	13	18	18	95% UCL-N
Cadmium	mg/kg-dw	10/17	4.2E-02	1.0	0.3	0.7	0.7	95% UCL-T
Chromium	mg/kg-dw	3/13	2.3	3.1	2.2	2.5	2.5	95% UCL-N
Cobalt	mg/kg-dw	9/13	2.2	3.0	2.0	2.4	2.4	95% UCL-N
Copper	mg/kg-dw	10/13	4.1	22	11	14	14	95% UCL-N
Lead	mg/kg-dw	15/17	0.3	4.2	1.1	1.8	1.8	95% UCL-T
Manganese	mg/kg-dw	11/13	0.5	51	25	34	34	95% UCL-N
Mercury	mg/kg-dw	710/710	0.2	9.1	3.1	3.2	3.2	95% UCL-N
Methylmercury	mg/kg-dw	172/172	9.3E-02	12	2.8	3.4	3.4	95% UCL-T
Nickel	mg/kg-dw	9/13	30	44	26	34	34	95% UCL-N
Selenium	mg/kg-dw	9/13	3.5	12	4.8	6.5	6.5	95% UCL-N
Silver	mg/kg-dw	4/13	8.8E-02	0.1	0.3	0.9	0.1	Max
Thallium	mg/kg-dw	1/13	8.1E-02	0.1	0.1	0.2	0.1	Max
Vanadium	mg/kg-dw	9/13	4.9	6.3	3.9	5.0	5.0	95% UCL-N
Zinc	mg/kg-dw	10/13	68	720	402	539	539	95% UCL-N
Organic Compounds								
Bis(2-ethylhexyl)phthalate	µg/kg-dw	3/8	179	9,652	1,511	49,546	9,652	Max
Chlordane (Sum)	µg/kg-dw	49/124	21	344	42	49	49	95% UCL-T
DDT and metabolites (Sum)	mg/kg-dw	117/124	2.3E-02	6	0.4	1	1	95% UCL-T
Dieldrin	µg/kg-dw	18/124	12	105	15	30	30	95% UCL-T
Endrin	mg/kg-dw	11/115	9.7	133	4.3	3.5	3.5	95% UCL-T
gamma-BHC (Lindane)	µg/kg-dw	1/28	34,416	34,416	1,234	372,836	34,416	Max
Hexachlorocyclohexane (Sum)	µg/kg-dw	4/51	4.6	34,416	685	37	37	95% UCL-T
PCBs (Sum)	µg/kg-dw	122/124	385	46,162	6,529	8,853	8,853	95% UCL-T
TEQ (1/2 DL) Avian	ng/kg-dw	30/31	5.6	586	90	160	160	95% UCL-T
TEQ (1/2 DL) Mammalian	ng/kg-dw	30/31	1.8	311	34	56	56	95% UCL-T

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-7. Bluegill Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	0/7	ND	ND	ND	ND	ND	ND
Arsenic	mg/kg-ww	2/7	0.6	0.7	0.4	0.5	0.7	Max
Barium	mg/kg-ww	7/7	0.7	4.5	3.0	4.2	4.5	Max
Cadmium	mg/kg-ww	1/7	7.0E-02	7.0E-02	3.1E-02	4.5E-02	7.0E-02	Max
Chromium	mg/kg-ww	4/7	3.0	14	3.6	51	14	Max
Cobalt	mg/kg-ww	7/7	0.1	0.4	0.3	0.4	0.4	Max
Copper	mg/kg-ww	7/7	0.3	19	7.9	392	19	Max
Lead	mg/kg-ww	7/7	0.1	0.6	0.2	1.0	0.6	Max
Manganese	mg/kg-ww	7/7	1.9	13	7.4	10	13	Max
Mercury	mg/kg-ww	7/7	0.2	0.5	0.3	0.4	0.5	Max
Methylmercury	mg/kg-ww	39/39	4.9E-02	0.9	0.3	0.4	0.4	95% UCL-T
Nickel	mg/kg-ww	7/7	0.9	14	5.5	23	14	Max
Selenium	mg/kg-dw	4/7	1.2	1.6	1.0	1.4	1.6	Max
Silver	mg/kg-ww	0/7	ND	ND	ND	ND	ND	ND
Thallium	mg/kg-ww	0/7	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg-ww	7/7	0.5	1.2	0.8	1.0	1.2	Max
Zinc	mg/kg-ww	7/7	35	108	71	87	108	Max
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	6/6	2.7E-03	1.6E-02	1.2E-02	1.7E-02	1.6E-02	Max
Dieldrin	µg/kg-ww	6/6	1.2E-02	7.0	3.9	6.5	7.0	Max
Endrin	mg/kg-ww	6/6	1.6E-03	5.5E-03	3.5E-03	4.7E-03	5.5E-03	Max
Chlordane (Sum)	µg/kg-ww	0/6	ND	ND	ND	ND	ND	ND
DDT and metabolites (Sum)	mg/kg-ww	6/6	1.1E-02	2.8E-02	2.3E-02	2.8E-02	2.8E-02	Max
PCBs (Sum)	µg/kg-ww	6/6	300	875	490	821	875	Max
TEQ (1/2 DL) Fish	ng/kg-lipid	7/7	20	127	43	85	127	Max

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-8. Gizzard Shad Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Chromium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Methylmercury	mg/kg-ww	30/30	2.9E-02	0.4	0.2	0.2	0.2	95% UCL-N
Nickel	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg-dw	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Dieldrin	µg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Endrin	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Chlordane (Sum)	µg/kg-ww	NA	NA	NA	NA	NA	NA	NA
DDT and metabolites (Sum)	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
PCBs (Sum)	µg/kg-ww	NA	NA	NA	NA	NA	NA	NA
TEQ (1/2 DL) Fish	ng/kg-lipid	NA	NA	NA	NA	NA	NA	NA

Notes: NA- Not Analyzed
ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-9. Carp Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	0/9	ND	ND	ND	ND	ND	ND
Arsenic	mg/kg-ww	6/9	0.7	2.0	0.8	1.2	2.0	Max
Barium	mg/kg-ww	9/9	0.1	6.7	2.3	3.8	6.7	Max
Cadmium	mg/kg-ww	6/9	0.1	0.3	0.1	0.2	0.3	Max
Chromium	mg/kg-ww	5/9	1.2	4.8	1.7	4.7	4.8	Max
Cobalt	mg/kg-ww	7/9	3.0E-02	0.5	0.2	0.4	0.5	Max
Copper	mg/kg-ww	9/9	0.3	4.1	2.5	3.3	4.1	Max
Lead	mg/kg-ww	8/9	2.0E-02	0.5	0.2	0.4	0.5	Max
Manganese	mg/kg-ww	9/9	0.5	17	4.4	26	17	Max
Mercury	mg/kg-ww	14/14	0.2	0.8	0.4	0.4	0.4	95% UCL-T
Methylmercury	mg/kg-ww	20/20	4.1E-02	0.8	0.4	0.5	0.5	95% UCL-N
Nickel	mg/kg-ww	9/9	0.3	3.0	1.5	2.1	3.0	Max
Selenium	mg/kg-dw	6/9	1.1	2.2	1.2	1.5	2.2	Max
Silver	mg/kg-ww	4/9	3.0E-02	0.1	2.4E-02	3.6E-02	0.1	Max
Thallium	mg/kg-ww	0/9	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg-ww	9/9	0.3	1.0	0.5	0.7	1.0	Max
Zinc	mg/kg-ww	9/9	48	425	207	290	425	Max
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	14/14	2.0E-02	0.2	0.1	0.1	0.1	95% UCL-T
Dieldrin	µg/kg-ww	11/14	1.8E-02	52	16	12,148	52	Max
Endrin	mg/kg-ww	9/14	5.4E-03	3.6E-02	1.1E-02	2.4E-02	2.4E-02	95% UCL-T
Chlordane (Sum)	µg/kg-ww	9/14	4.0	95	18	34	34	95% UCL-T
DDT and metabolites (Sum)	mg/kg-ww	14/14	1.5E-02	0.3	0.2	0.2	0.2	95% UCL-N
PCBs (Sum)	µg/kg-ww	14/14	500	9,758	2,959	4,773	4,773	95% UCL-T
TEQ (1/2 DL) Fish	ng/kg-lipid	16/16	34	1,055	303	746	746	95% UCL-T

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-10. Catfish Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	1/6	1.8	1.8	0.3	392	1.8	Max
Arsenic	mg/kg-ww	0/6	ND	ND	ND	ND	ND	ND
Barium	mg/kg-ww	5/6	4.0E-02	4.9	2.0	3.9	4.9	Max
Cadmium	mg/kg-ww	3/6	0.1	0.1	0.1	0.1	0.1	Max
Chromium	mg/kg-ww	2/6	1.3	1.3	0.7	2.9	1.3	Max
Cobalt	mg/kg-ww	4/6	8.0E-02	0.6	0.3	38	0.6	Max
Copper	mg/kg-ww	6/6	0.3	3.1	1.9	2.6	3.1	Max
Lead	mg/kg-ww	5/6	2.0E-02	0.7	0.3	15	0.7	Max
Manganese	mg/kg-ww	6/6	0.2	9.9	3.9	1,457	9.9	Max
Mercury	mg/kg-ww	16/16	0.2	0.9	0.5	0.6	0.6	95% UCL-T
Methylmercury	mg/kg-ww	21/21	0.3	1.0	0.7	0.8	0.8	95% UCL-N
Nickel	mg/kg-ww	5/6	0.3	2.6	1.4	6.8	2.6	Max
Selenium	mg/kg-dw	3/6	1.2	1.4	0.8	1.3	1.4	Max
Silver	mg/kg-ww	3/6	2.0E-02	0.1	4.4E-02	0.4	0.1	Max
Thallium	mg/kg-ww	0/6	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg-ww	5/6	0.8	1.1	0.8	1.1	1.1	Max
Zinc	mg/kg-ww	5/6	20	74	40	64	74	Max
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	14/16	3.0E-03	0.1	2.7E-02	0.1	0.1	Max
Dieldrin	µg/kg-ww	7/16	1.6E-02	100	17	1,546	100	Max
Endrin	mg/kg-ww	6/16	6.2E-03	4.6E-02	1.2E-02	1.8E-02	1.8E-02	95% UCL-N
Chlordane (Sum)	µg/kg-ww	10/16	1.1	39	15	40	39	Max
DDT and metabolites (Sum)	mg/kg-ww	16/16	2.5E-02	0.6	0.2	0.3	0.3	95% UCL-T
PCBs (Sum)	µg/kg-ww	15/15	780	6,040	2,902	3,989	3,989	95% UCL-T
TEQ (1/2 DL) Fish	ng/kg-lipid	10/10	38	286	111	182	182	95% UCL-T

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-11. White Perch Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	1/1	2.1	2.1	2.1		2.1	Max
Arsenic	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Barium	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Cadmium	mg/kg-ww	2/3	3.0E-02	3.0E-02	5.2E-02	3.2	3.0E-02	Max
Chromium	mg/kg-ww	1/1	0.6	0.6	0.6		0.6	Max
Cobalt	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Copper	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Lead	mg/kg-ww	3/3	0.1	0.3	0.2	1.5	0.3	Max
Manganese	mg/kg-ww	1/1	0.4	0.4	0.4		0.4	Max
Mercury	mg/kg-ww	59/59	0.1	1.4	0.7	0.8	0.8	95% UCL-N
Methylmercury	mg/kg-ww	30/30	0.2	2.0	1.1	1.2	1.2	95% UCL-N
Nickel	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Selenium	mg/kg-dw	1/1	0.9	0.9	0.9		0.9	Max
Silver	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Thallium	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Zinc	mg/kg-ww	1/1	17	17	17		17	Max
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	14/18	2.0E-03	3.7E-02	1.6E-02	3.2E-02	3.2E-02	95% UCL-T
Dieldrin	µg/kg-ww	5/18	5.0	7.0	3.3	4.1	4.1	95% UCL-T
Endrin	mg/kg-ww	1/18	1.2E-02	1.2E-02	3.0E-03	3.4E-03	3.4E-03	95% UCL-T
Chlordane (Sum)	µg/kg-ww	8/18	5.0	41	14	34	34	95% UCL-T
DDT and metabolites (Sum)	mg/kg-ww	16/18	5.0E-03	0.1	3.6E-02	0.1	0.1	95% UCL-T
PCBs (Sum)	µg/kg-ww	17/17	373	3,830	2,016	2,445	2,445	95% UCL-N
TEQ (1/2 DL) Fish	ng/kg-lipid	11/11	50	285	107	154	154	95% UCL-T

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-12. Smallmouth Bass Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	0/5	ND	ND	ND	ND	ND	ND
Arsenic	mg/kg-ww	4/5	1.1	1.8	1.2	1.8	1.8	Max
Barium	mg/kg-ww	4/5	0.7	1.9	1.1	1.7	1.9	Max
Cadmium	mg/kg-ww	2/7	1.0E-02	2.0E-02	3.3E-02	7.3E-02	2.0E-02	Max
Chromium	mg/kg-ww	1/5	0.7	0.7	0.5	0.7	0.7	Max
Cobalt	mg/kg-ww	4/5	0.1	0.3	0.2	0.3	0.3	Max
Copper	mg/kg-ww	4/5	1.5	3.7	2.2	5.2	3.7	Max
Lead	mg/kg-ww	6/7	4.0E-02	0.1	6.3E-02	8.5E-02	0.1	Max
Manganese	mg/kg-ww	4/5	1.6	3.7	1.8	3.0	3.7	Max
Mercury	mg/kg-ww	393/393	0.1	2.0	0.7	0.7	0.7	95% UCL-T
Methylmercury	mg/kg-ww	41/41	0.3	1.7	0.7	0.8	0.8	95% UCL-T
Nickel	mg/kg-ww	4/5	1.6	2.5	1.8	2.4	2.5	Max
Selenium	mg/kg-dw	1/5	1.1	1.1	0.5	1	1.1	Max
Silver	mg/kg-ww	1/5	2.0E-02	2.0E-02	5.0E-02	2.7	2.0E-02	Max
Thallium	mg/kg-ww	0/5	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg-ww	4/5	0.2	0.8	0.5	1.4	0.8	Max
Zinc	mg/kg-ww	4/5	35	56	36	55	56	Max
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	44/53	2.0E-03	3.6E-02	7.8E-03	9.4E-03	9.4E-03	95% UCL-T
Dieldrin	µg/kg-ww	6/53	8.0	30	4.1	14	14	95% UCL-T
Endrin	mg/kg-ww	4/48	8.5E-03	3.3E-02	3.9E-03	4.0E-03	4.0E-03	95% UCL-T
Chlordane (Sum)	µg/kg-ww	20/53	5.0	52	9.7	13	13	95% UCL-T
DDT and metabolites (Sum)	mg/kg-ww	51/53	2.0E-03	0.2	4.3E-02	6.1E-02	6.1E-02	95% UCL-T
PCBs (Sum)	µg/kg-ww	52/52	210	11,000	1,621	1,912	1,912	95% UCL-T
TEQ (1/2 DL) Fish	ng/kg-lipid	9/10	26	165	84	146	146	95% UCL-T

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-13. Largemouth Bass Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Chromium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg-ww	225/225	0.2	1.4	0.7	0.7	0.7	95% UCL-N
Methylmercury	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg-dw	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg-ww	NA	NA	NA	NA	NA	NA	NA
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	16/33	2.0E-03	9.0E-03	2.4E-03	3.0E-03	3.0E-03	95% UCL-T
Dieldrin	µg/kg-ww	0/33	ND	ND	ND	ND	ND	ND
Endrin	mg/kg-ww	0/33	ND	ND	ND	ND	ND	ND
Chlordane (Sum)	µg/kg-ww	9/33	5.0	13.0	4.0	4.9	4.9	95% UCL-T
DDT and metabolites (Sum)	mg/kg-ww	30/33	2.0E-03	8.4E-02	1.8E-02	3.6E-02	3.6E-02	95% UCL-T
PCBs (Sum)	µg/kg-ww	31/33	75	2,825	669	1,353	1,353	95% UCL-T
TEQ (1/2 DL) Fish	ng/kg-lipid	2/2	146	393	270	1,049	393	Max

Notes: NA- Not Analyzed
ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-14. Walleye Body Burden Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals								
Antimony	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Arsenic	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Barium	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Cadmium	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Chromium	mg/kg-ww	1/1	0.7	0.7	0.7		0.7	Max
Cobalt	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Copper	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Lead	mg/kg-ww	1/1	0.2	0.2	0.2		0.2	Max
Manganese	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Mercury	mg/kg-ww	35/35	0.5	3.5	1.4	1.5	1.5	95% UCL-T
Methylmercury	mg/kg-ww	20/20	0.3	3.2	1.5	1.8	1.8	95% UCL-N
Nickel	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Selenium	mg/kg-dw	0/1	ND	ND	ND	ND	ND	ND
Silver	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Thallium	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Zinc	mg/kg-ww	0/1	ND	ND	ND	ND	ND	ND
Organic Compounds								
Hexachlorobenzene	mg/kg-ww	10/11	4.0E-03	2.5E-02	1.9E-02	3.6E-02	2.5E-02	Max
Dieldrin	µg/kg-ww	7/11	5.0	11	5.5	7.0	7.0	95% UCL-N
Endrin	mg/kg-ww	1/6	6.5E-03	6.5E-03	3.2E-03	4.8E-03	6.5E-03	Max
Chlordane (Sum)	µg/kg-ww	7/11	8.4	90	19	73	73	95% UCL-T
DDT and metabolites (Sum)	mg/kg-ww	11/11	1.9E-02	0.2	6.0E-02	0.1	0.1	95% UCL-T
PCBs (Sum)	µg/kg-ww	10/10	658	7,845	2,918	5,399	5,399	95% UCL-T

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-15. All Surface Soils (Wetlands and Dredge Spoils) Exposure Concentrations

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals and Cyanide								
Antimony	mg/kg	17/29	0.2	1.7	0.4	0.5	0.5	95% UCL-T
Arsenic	mg/kg	29/29	0.5	18	4.6	6.4	6.4	95% UCL-T
Barium	mg/kg	29/29	31	390	128	156	156	95% UCL-T
Beryllium	mg/kg	26/29	0.2	1.2	0.4	0.5	0.5	95% UCL-T
Cadmium	mg/kg	21/29	0.2	14	2.0	35	14	Max
Chromium	mg/kg	29/29	11	154	39	51	51	95% UCL-T
Cobalt	mg/kg	29/29	1.5	8.5	4.0	4.4	4.4	95% UCL-N
Copper	mg/kg	29/29	9.5	167	42	57	57	95% UCL-T
Iron	mg/kg	29/29	3,290	24,000	11,443	12,973	12,973	95% UCL-N
Lead	mg/kg	29/29	4.5	259	60	106	106	95% UCL-T
Manganese	mg/kg	29/29	163	488	278	301	301	95% UCL-T
Mercury	mg/kg	27/29	5.3E-02	25	3.0	18	18	95% UCL-T
Methylmercury	mg/kg	20/21	5.4E-04	0.3	4.0E-02	0.2	0.2	95% UCL-T
Nickel	mg/kg	29/29	5.5	64	23	28	28	95% UCL-T
Selenium	mg/kg	15/29	0.7	2.5	0.9	1.2	1.2	95% UCL-T
Silver	mg/kg	14/29	0.2	2.7	0.4	0.8	0.8	95% UCL-T
Thallium	mg/kg	4/29	1.0	2.5	0.6	0.8	0.8	95% UCL-T
Vanadium	mg/kg	29/29	3.4	31	14	16	16	95% UCL-N
Zinc	mg/kg	29/29	29	510	118	159	159	95% UCL-T
Cyanide	mg/kg	1/24	5.4	5.4	0.7	0.8	0.8	95% UCL-T
Organic Compounds								
Benzene	µg/kg	3/12	3.9	60	8.7	13	13	95% UCL-T
Chlorobenzene	µg/kg	5/12	2.0	600	69	618	600	Max
Dichlorobenzenes (Sum)	µg/kg	6/29	51	14,700	1,400	4,518	4,518	95% UCL-T
Trichlorobenzenes (Sum)	µg/kg	4/29	200	6,550	512	1,229	1,229	95% UCL-T
Xylene (Total)	µg/kg	0/12	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/kg	13/29	2.7	5,355	395	4,255	4,255	95% UCL-T
Phenol	µg/kg	3/29	89	2,825	254	519	519	95% UCL-T
PAHs (Sum)	µg/kg	25/29	38	184,400	13,289	278,202	184,400	Max
Aldrin	µg/kg	3/15	21	45	6.8	31	31	95% UCL-T
Chlordane (Sum)	µg/kg	6/16	2.3	30	4.7	17	17	95% UCL-T
DDT and metabolites	µg/kg	14/16	1.2	56	12	50	50	95% UCL-T
Dieldrin	µg/kg	7/16	2.6	24	5.3	22	22	95% UCL-T
Hexachlorocylclohexanes (Sum)	µg/kg	5/16	1.7	10	2.1	4.3	4.3	95% UCL-T
PCBs (Sum)	µg/kg	19/24	28	1,071	221	456	456	95% UCL-T
TEQ (1/2 DL) Avian	ng/kg	16/16	0.8	2,168	275	13,161	2,168	Max
TEQ (1/2 DL) Mammalian	ng/kg	16/16	0.4	1,086	128	4,627	1,086	Max

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-16. Wetland SYW-19 Exposure Concentrations (0-15 cm)

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals and Cyanide								
Antimony	mg/kg	3/4	0.55	1.1	0.6	1.1	1.1	Max
Arsenic	mg/kg	4/4	4.9	8.6	7.0	8.9	8.6	Max
Barium	mg/kg	4/4	176	390	302	418	390	Max
Beryllium	mg/kg	4/4	0.5	0.6	0.5	0.7	0.6	Max
Cadmium	mg/kg	4/4	0.7	2.3	1.3	5.3	2.3	Max
Chromium	mg/kg	4/4	34	55	43	59	55	Max
Cobalt	mg/kg	4/4	3.1	5.0	4.3	5.3	5.0	Max
Copper	mg/kg	4/4	45	167	85	541	167	Max
Iron	mg/kg	4/4	9,040	11,750	10,478	12,875	11,750	Max
Lead	mg/kg	4/4	30	259	118	7,118	259	Max
Manganese	mg/kg	4/4	163	303	233	452	303	Max
Mercury	mg/kg	4/4	4.8	25	15	25	25	Max
Methylmercury	mg/kg	4/4	4.8E-02	0.3	0.1	0.3	0.3	Max
Nickel	mg/kg	4/4	23	44	32	52	44	Max
Selenium	mg/kg	4/4	1.1	1.7	1.4	1.7	1.7	Max
Silver	mg/kg	4/4	0.2	1.3	0.5	50	1.3	Max
Thallium	mg/kg	0/4	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg	4/4	11	13	12	13	13	Max
Zinc	mg/kg	4/4	89	138	114	138	138	Max
Cyanide	mg/kg	0/4	ND	ND	ND	ND	ND	ND
Organic Compounds								
Benzene	µg/kg	3/4	3.9	60	18	1.7E+05	60	Max
Chlorobenzene	µg/kg	4/4	10	600	199	6.9E+08	600	Max
Dichlorobenzenes (Sum)	µg/kg	4/4	1,592	14,700	9,258	16,492	14,700	Max
Trichlorobenzenes (Sum)	µg/kg	4/4	200	6,550	2,838	6,091	6,550	Max
Xylene (Total)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/kg	4/4	106	5,355	1,972	2.9E+09	5,355	Max
Phenol	µg/kg	3/4	89	2,825	965	4.0E+07	2,825	Max
PAHs (Sum)	µg/kg	4/4	2,976	184,400	68,387	5.6E+11	184,400	Max
Aldrin	µg/kg	3/4	21	45	24	45	45	Max
Chlordane (Sum)	µg/kg	3/4	4.5	30	13	28	30	Max
DDT and metabolites	µg/kg	4/4	4.9	56	39	66	56	Max
Dieldrin	µg/kg	4/4	4.1	24	17	28	24	Max
Hexachlorocylclohexanes (Sum)	µg/kg	4/4	1.8	10	6.6	11	10	Max
PCBs (Sum)	µg/kg	4/4	625	1,071	886	1,113	1,071	Max
TEQ (1/2 DL) Avian	ng/kg	4/4	325	2,168	1,066	35,343	2,168	Max
TEQ (1/2 DL) Mammalian	ng/kg	4/4	124	1,086	498	44,854	1,086	Max

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-17. Wetland SYW-12 Exposure Concentrations (0-15 cm)

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals and Cyanide								
Antimony	mg/kg	2/4	0.33	0.6	0.3	7.7	0.6	Max
Arsenic	mg/kg	4/4	1.6	3.7	2.5	3.7	3.7	Max
Barium	mg/kg	4/4	31	152	98	1,948	152	Max
Beryllium	mg/kg	4/4	0.2	0.4	0.3	0.4	0.4	Max
Cadmium	mg/kg	4/4	0.9	8.8	5.3	2,690	8.8	Max
Chromium	mg/kg	4/4	11.6	115	66	119	115	Max
Cobalt	mg/kg	4/4	1.5	4.7	3.0	4.8	4.7	Max
Copper	mg/kg	4/4	18	88	49	92	88	Max
Iron	mg/kg	4/4	6,830	11,800	8,763	13,612	11,800	Max
Lead	mg/kg	4/4	23.3	116	77	130	116	Max
Manganese	mg/kg	4/4	175	284	239	293	284	Max
Mercury	mg/kg	3/4	5.3E-02	1.5	0.7	1.4E+11	1.5	Max
Methylmercury	mg/kg	3/4	5.4E-04	1.5E-02	1.1E-02	2.0E-02	1.5E-02	Max
Nickel	mg/kg	4/4	8.1	31.8	19	151	32	Max
Selenium	mg/kg	1/4	0.9	0.9	0.4	3.3	0.9	Max
Silver	mg/kg	3/4	0.2	2.7	1.2	9.2E+08	2.7	Max
Thallium	mg/kg	0/4	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg	4/4	5.1	16	8.7	39	16	Max
Zinc	mg/kg	4/4	81	241	160	975	241	Max
Cyanide	mg/kg	0/4	ND	ND	ND	ND	ND	ND
Organic Compounds								
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	µg/kg	1/4	2.0	2.0	2.8	3.5	2.0	Max
Dichlorobenzenes (Sum)	µg/kg	1/4	54	54	75	48,623	54	Max
Trichlorobenzenes (Sum)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Xylene (Total)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/kg	4/4	2.7	31	10	7,118	31	Max
Phenol	µg/kg	0/4	ND	ND	ND	ND	ND	ND
PAHs (Sum)	µg/kg	3/4	4100	20,480	7,830	18,268	20,480	Max
Aldrin	µg/kg	0/3	ND	ND	ND	ND	ND	ND
Chlordane (Sum)	µg/kg	3/4	2.3	8.5	4.7	9.3	8.5	Max
DDT and metabolites	µg/kg	4/4	4.7	9.7	6.8	14	9.7	Max
Dieldrin	µg/kg	3/4	2.6	5.0	2.8	5.0	5.0	Max
Hexachlorocylclohexanes (Sum)	µg/kg	1/4	1.7	1.7	0.8	5.3	1.7	Max
PCBs (Sum)	µg/kg	4/4	88	335	243	370	335	Max
TEQ (1/2 DL) Avian	ng/kg	NA	NA	NA	NA	NA	NA	NA
TEQ (1/2 DL) Mammalian	ng/kg	NA	NA	NA	NA	NA	NA	NA

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-18. Wetland SYW-10 Exposure Concentrations (0-15 cm)

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 % UCL	Upper Bound EPC	
Metals and Cyanide								
Antimony	mg/kg	1/4	0.5	0.5	0.3	1.4	0.5	Max
Arsenic	mg/kg	4/4	2.0	18	7.0	813	18	Max
Barium	mg/kg	4/4	80	157	105	191	157	Max
Beryllium	mg/kg	4/4	0.3	1.2	0.6	5.3	1.2	Max
Cadmium	mg/kg	4/4	0.2	0.9	0.5	0.9	0.9	Max
Chromium	mg/kg	4/4	13	47	27	120	47	Max
Cobalt	mg/kg	4/4	2.8	8.5	4.9	8.1	8.5	Max
Copper	mg/kg	4/4	25	49	35	64	49	Max
Iron	mg/kg	4/4	6,320	21,600	13,223	86,823	21,600	Max
Lead	mg/kg	4/4	25	115	59	637	115	Max
Manganese	mg/kg	4/4	264	488	344	559	488	Max
Mercury	mg/kg	4/4	1.188	3.4	2.1	6.1	3.4	Max
Methylmercury	mg/kg	4/4	1.2E-02	3.4E-02	2.1E-02	0.1	3.4E-02	Max
Nickel	mg/kg	4/4	12	34	20	62	34	Max
Selenium	mg/kg	1/4	1.8	1.8	0.7	25	1.8	Max
Silver	mg/kg	0/4	ND	ND	ND	ND	ND	ND
Thallium	mg/kg	3/4	1.0	2.5	1.5	2.6	2.5	Max
Vanadium	mg/kg	4/4	6.4	31	16	217	31	Max
Zinc	mg/kg	4/4	71	119	97	156	119	Max
Cyanide	mg/kg	0/4	ND	ND	ND	ND	ND	ND
Organic Compounds								
Benzene	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Chlorobenzene	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Dichlorobenzenes (Sum)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Trichlorobenzenes (Sum)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Xylene (Total)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/kg	4/4	7.3	35	26	41	35	Max
Phenol	µg/kg	0/4	ND	ND	ND	ND	ND	ND
PAHs (Sum)	µg/kg	4/4	405	17,202	5,227	2.2E+09	17,202	Max
Aldrin	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Chlordane (Sum)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
DDT and metabolites	µg/kg	3/4	1.2	3.5	1.6	40	3.5	Max
Dieldrin	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Hexachlorocylclohexanes (Sum)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
PCBs (Sum)	µg/kg	4/4	40	161	83	659	161	Max
TEQ (1/2 DL) Avian	ng/kg	4/4	10	25	17	38	25	Max
TEQ (1/2 DL) Mammalian	ng/kg	4/4	4.9	6.9	5.8	7.1	6.9	Max

Notes: ND -Not detected
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-19. Wetland SYW-6 Exposure Concentrations (0-15 cm)

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals and Cyanide								
Antimony	mg/kg	3/9	0.6	2.2	0.6	1.6	2.2	Max
Arsenic	mg/kg	9/9	0.5	5.9	2.7	3.8	5.9	Max
Barium	mg/kg	9/9	78	176	125	142	176	Max
Beryllium	mg/kg	6/9	0.3	0.6	0.3	0.5	0.6	Max
Cadmium	mg/kg	9/9	0.5	14	3.4	14	14	Max
Chromium	mg/kg	9/9	11	154	49	124	154	Max
Cobalt	mg/kg	9/9	1.5	6.7	3.6	5.7	6.7	Max
Copper	mg/kg	9/9	9.5	120	46	108	120	Max
Iron	mg/kg	9/9	3,290	24,000	10,170	18,802	24,000	Max
Lead	mg/kg	9/9	18	175	72	176	175	Max
Manganese	mg/kg	9/9	218	406	267	306	406	Max
Mercury	mg/kg	9/9	0.2	4.5	1.3	6.8	4.5	Max
Methylmercury	mg/kg	9/9	1.9E-03	4.5E-02	1.3E-02	0.1	4.5E-02	Max
Nickel	mg/kg	9/9	5.5	64	29	65	64.3	Max
Selenium	mg/kg	1/9	2.5	2.5	0.8	1.5	2.5	Max
Silver	mg/kg	7/9	0.2	1.4	0.5	2.2	1.4	Max
Thallium	mg/kg	1/9	1.4	1.4	0.6	0.9	1.4	Max
Vanadium	mg/kg	9/9	3.4	22	13	17	22	Max
Zinc	mg/kg	9/9	34	510	181	467	510	Max
Cyanide	mg/kg	1/4	5.4	5.4	2.0	209	5.4	Max
Organic Compounds								
Dichlorobenzenes (Sum)	µg/kg	0/9	ND	ND	ND	ND	ND	ND
Trichlorobenzenes (Sum)	µg/kg	0/9	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/kg	0/9	ND	ND	ND	ND	ND	ND
Phenol	µg/kg	0/9	ND	ND	ND	ND	ND	ND
PAHs (Sum)	µg/kg	8/9	740	22,450	6,245	407,497	22,450	Max
Aldrin	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Chlordane (Sum)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
DDT and metabolites	µg/kg	3/4	1.5	2.3	1.5	2.4	2.3	Max
Dieldrin	µg/kg	0/4	ND	ND	ND	ND	ND	ND
Hexachlorocylclohexanes (Sum)	µg/kg	0/4	ND	ND	ND	ND	ND	ND
PCBs (Sum)	µg/kg	4/4	28	61	47	64	61	Max
TEQ (1/2 DL) Avian	ng/kg	4/4	3.6	34	15	1,267	34	Max
TEQ (1/2 DL) Mammalian	ng/kg	4/4	1.8	20	8.8	1,695	20	Max

Notes: ND -Not detected
NA- Not analyzed
UCL- Upper Confidence Limit
EPC- Exposure Point Concentration
Max - Maximum Detected Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-20. Dredge Spoils Exposure Concentrations (Surface Samples)

Contaminant of Concern	Units	Detection Frequency	Minimum	Maximum	Arithmetic Mean	95 %UCL	Upper Bound EPC	
Metals and Cyanide								
Antimony	mg/kg	8/8	0.2	0.4	0.3	0.4	0.4	Max
Arsenic	mg/kg	8/8	3.2	8.4	5.4	7.8	8.4	Max
Barium	mg/kg	8/8	67	78	72	75	78	Max
Beryllium	mg/kg	8/8	0.3	0.6	0.4	0.5	0.6	Max
Cadmium	mg/kg	0/8	ND	ND	ND	ND	ND	ND
Chromium	mg/kg	8/8	12	29	17	22	29	Max
Cobalt	mg/kg	8/8	3.0	4.8	4.2	4.5	4.8	Max
Copper	mg/kg	8/8	11	24	17	20	24	Max
Iron	mg/kg	8/8	9,260	17,100	13,808	15,622	17,100	Max
Lead	mg/kg	8/8	4.5	14	11	13	14	Max
Manganese	mg/kg	8/8	246	354	299	331	354	Max
Mercury	mg/kg	7/8	5.4E-02	4.0	0.6	18	4.0	Max
Nickel	mg/kg	8/8	9.5	17	14	15	17	Max
Selenium	mg/kg	8/8	0.7	1.4	1.0	1.2	1.4	Max
Silver	mg/kg	0/8	ND	ND	ND	ND	ND	ND
Thallium	mg/kg	0/8	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg	8/8	13	29	19	23	29	Max
Zinc	mg/kg	8/8	29	50	39	44	50	Max
Cyanide	mg/kg	0/8	ND	ND	ND	ND	ND	ND
Organic Compounds								
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	µg/kg	NA	NA	NA	NA	NA	NA	NA
Dichlorobenzenes (Sum)	µg/kg	1/8	51	51	24	31	51	Max
Trichlorobenzenes (Sum)	µg/kg	0/8	ND	ND	ND	ND	ND	ND
Xylene (Total)	µg/kg	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	µg/kg	1/8	410	410	69	229	410	Max
Phenol	µg/kg	0/8	ND	ND	ND	ND	ND	ND
PAHs (Sum)	µg/kg	6/8	38	1,541	425	22,616	1,541	Max
Aldrin	µg/kg	NA	NA	NA	NA	NA	NA	NA
Chlordane (Sum)	µg/kg	NA	NA	NA	NA	NA	NA	NA
DDT and metabolites	µg/kg	NA	NA	NA	NA	NA	NA	NA
Dieldrin	µg/kg	NA	NA	NA	NA	NA	NA	NA
Hexachlorocylclohexanes (Sum)	µg/kg	NA	NA	NA	NA	NA	NA	NA
PCBs (Sum)	µg/kg	3/8	37	56	33	42	56	Max
TEQ (1/2 DL) Avian	ng/kg	4/4	0.8	2.9	1.8	3.1	2.9	Max
TEQ (1/2 DL) Mammalian	ng/kg	4/4	0.4	1.4	0.9	7.5	1.4	Max

Notes: ND -Not detected
NA- Not analyzed
UCL- Upper Confidence Limit
Max - Maximum Detected Concentration
EPC- Exposure Point Concentration
95% UCL-T - 95% Upper Confidence Limit, log transformed
95% UCL-N - 95% Upper Confidence Limit, normally distributed, no transformation was applied

Table H-21. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Tree Swallow[a]

COC	Sed. 95%UCL[b] (mg/kg dw)	BSAF[c]	Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Arsenic	7.6	0.127	1	NA	0.3	2.46	7.38	0.1	4.4E-02
Barium	392	d	919	NA	211	20.8	41.7	**10**	**5.1**
Cadmium	3.3	9.24	44	1.1E-03	10	1.45	20	**7.0**	0.5
Chromium	158	e	232	9.8E-03	53	1.0	5.0	**53**	**11**
Cobalt	13	f	19	NA	4.4	NA	NA	NA	NA
Copper	66	g	161	1.2E-02	37	47	61.7	0.8	0.6
Lead	98	0.066	9.3	7.8E-03	2.1	1.18	11.8	**1.8**	0.2
Methylmercury	3.0E-02	h	0.5	1.1E-06	0.1	0.0064	0.064	**19**	**1.9**
Mercury	12	h	13	4.2E-05	2.9	0.45	0.90	**6.5**	**3.3**
Nickel	53	f	58	1.4E-02	13	77.4	107	0.2	0.1
Selenium	1.2	e	12	NA	2.7	0.4	0.8	**6.8**	**3.4**
Thallium	0.6	0.066	0.1	NA	1.3E-02	NA	NA	NA	NA
Vanadium	30	0.127	5.6	NA	1.3	11.4	114	0.1	1.1E-02
Zinc	123	I	404	7.0E-02	93	14.5	131	**6.4**	0.7
Volatile Organic Compounds									
Xylenes	33	1.0	47.8	8.4E-04	11	NA	NA	NA	NA
Dichlorobenzenes	12	4.5	78	1.4E-03	18	6	60	**3.0**	0.3
Trichlorobenzenes	0.6	4.9	4.1	5.7E-04	0.9	NA	NA	NA	NA
Semivolatile Organic Compounds									
Bis(2-ethylhexyl)phthalate	2.2	1.0	3.3	NA	0.7	1.1	11	0.7	0.07
Polycyclic aromatic hydrocarbons	225	0.6	179.2	NA	41	0.143	1.43	**287**	**29**
Pesticides/Polychlorinated Biphenyls									
DDT and metabolites	1.1E-02	0.59	9.5E-03	NA	2.2E-03	0.0028	0.028	0.8	0.1
Polychlorinated biphenyls (PCBs)	0.7	1.48	1.51	NA	0.3	0.18	1.8	**1.9**	0.2
Dioxins/Furans									
Dioxins/furans (TEQ) avian	5.2E-04	0.45	3.4E-04	NA	7.8E-05	0.000014	0.00014	**5.6**	0.6

Notes: Hazard quotients equal to or greater than one are outlined and bolded.
NA = Not analyzed in media; not available for NOAEL/LOAEL
[a] 95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

Table H-21. (cont.)

[b] The nine-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

[c]The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals. See Table 8-5.
All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement.
The arsenic uptake factor was applied to vanadium.
The general regression for cadmium was applied to barium.
The general regression for chromium was applied to selenium.
The calculated 95% upper prediction limit (UPL) for nickel was applied to cobalt.
The lead uptake factor was applied to thallium.

[d] log(invertebrate)=0.0395+(0.6092*log(sediment))

[e] log(invertebrate)=0.2092+(0.365*log(sediment))

[f] log(invertebrate)=1.48+(-0.425*log(sediment))

[g] log(invertebrate)=1.037+(0.359*log(sediment))

[h] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

[i] log(invertebrate)=1.77+(0.242*log(sediment))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-22. Modeled Hazard Quotients for Mean COC Concentrations for the Tree Swallow

COC	Mean Sed. Conc. (mg/kg dw) [a]	BSAF[b]	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Arsenic	5.4	0.127	1.0	NA	0.2	2.46	7.38	0.1	3.1E-02
Barium	330	c	752	NA	172	20.8	41.7	**8.3**	**4.1**
Cadmium	2.2	9.24	29	1.1E-03	6.7	1.45	20	**4.6**	0.3
Chromium	169	d	251	1.6E-02	57	1.0	5.0	**57**	**11**
Cobalt	11	e	17	NA	3.8	NA	NA	NA	NA
Copper	53	f	126	9.7E-03	29	47	61.7	0.6	0.5
Lead	72	0.066	6.9	6.8E-03	1.6	1.18	11.8	**1.3**	0.1
Methylmercury	9.4E-02	g	0.31	7.9E-07	0.1	0.0064	0.064	**11**	**1.1**
Mercury	7.1	g	6.0	3.2E-05	1.4	0.45	0.90	**3.1**	**1.5**
Nickel	60	e	63	1.7E-02	14	77.4	107	0.2	0.14
Selenium	1.0	d	9.4	NA	2.2	0.4	0.8	**5.4**	**2.7**
Thallium	0.5	0.066	0.1	NA	1.2E-02	NA	NA	NA	NA
Vanadium	21	0.127	3.9	NA	0.9	11.4	114	0.1	7.9E-03
Zinc	107	h	352	4.6E-02	81	14.5	131	**5.6**	0.6
Volatile Organic Compounds									
Xylenes	6.8	1.0	9.9	7.8E-04	2.3	NA	NA	NA	NA
Dichlorobenzenes	5.6	4.5	36	1.8E-03	8.3	6	60	**1.4**	0.1
Trichlorobenzenes	1.3	4.9	9.1	5.5E-04	2.1	NA	NA	NA	NA
Semivolatile Organic Compounds									
Bis(2-ethylhexyl)phthalate	2.1	1.0	3.1	NA	0.7	1.1	11	0.6	6.4E-02
Polycyclic aromatic hydrocarbons	228	0.6	182	NA	42	0.143	1.43	**292**	**29**
Pesticides/Polychlorinated Biphenyls									
DDT and metabolites	7.9E-03	0.6	6.8E-03	NA	1.6E-03	0.0028	0.028	0.6	0.1
Polychlorinated biphenyls (PCBs)	0.6	1.5	1.4	NA	0.3	0.18	1.8	**1.8**	0.2
Dioxins/Furans									
Dioxins/furans (TEQ) avian	1.2E-04	0.5	7.7E-05	NA	1.8E-05	0.000014	0.00014	**1.3**	0.1

Notes: Hazard quotients equal to or greater than one are outlined and bolded.
NA = not analyzed in media; NA = not available for NOAEL/LOAEL

[a] The nine-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

Table H-22. (cont.)

[b]The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals. See Table 8-5.
All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement.
The arsenic BSAF was applied to vanadium.
The general regression for cadmium was applied to barium.
The general regression for chromium was applied to selenium.
The calculated 95% upper prediction limit (UPL) for nickel was applied to cobalt.
See Table 8-5

[c] log(invertebrate)=0.0395+(0.6092*log(sediment))

[d] log(invertebrate)=0.2092+(0.365*log(sediment))

[e] log(invertebrate)=1.48+(-0.425*log(sediment))

[f] log(invertebrate)=1.037+(0.359*log(sediment))

[g] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

[h] log(invertebrate)=1.77+(0.242*log(sediment))
EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-23. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Mallard[a]

COC	Phytoplankton 95% UCL (mg/kg dw)[b]	Sed. 95% UCL[c] (mg/kg dw)	BSAF[d]	Food 95% UCL (mg/kg dw)	Surface Water 95% UCL (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals										
Barium	NA	405	e	957	NA	50	20.8	41.7	**2.4**	**1.2**
Cadmium	NA	2.2	9.24	30	1.1E-03	1.5	1.45	20	**1.0**	0.1
Chromium	NA	139	f	199	9.8E-03	10	1.0	5.0	**10**	**2.1**
Cobalt	NA	10	g	15	NA	0.8	NA	NA	NA	NA
Copper	NA	66	h	162	1.2E-02	8.4	47	61.7	0.2	0.1
Methylmercury	0.2	2.9E-02	i	0.3	1.1E-06	2.7E-02	0.0064	0.064	**4.3**	0.4
Mercury	1.5	11	i	6	4.2E-05	0.4	0.45	0.90	0.9	0.4
Nickel	NA	52	g	57	1.4E-02	3.0	77.4	107	3.9E-02	2.8E-02
Vanadium	NA	23	0.127	4	NA	0.3	11.4	114	2.6E-02	2.6E-03
Zinc	NA	102	j	335	7.0E-02	17	14.5	131	**1.2**	0.13
Volatile Organic Compounds										
Xylenes	NA	330	1	479	8.4E-04	25	NA	NA	NA	NA
Dichlorobenzenes	NA	37	4.51	242	1.4E-03	12	6	60	**2.1**	0.2
Trichlorobenzenes	NA	1.1	4.90	8.1	5.7E-04	0.4	NA	NA	NA	NA
Semivolatile Organic Compounds										
Polycyclic aromatic hydrocarbons	NA	1,293	0.55	1,032	NA	56	0.143	1.43	**393**	**39**
Pesticides/Polychlorinated Biphenyls										
Polychlorinated biphenyls (PCBs)	NA	0.6	1.48	1.4	NA	0.1	0.18	1.8	0.4	3.9E-02
Dioxins/Furans										
Dioxins/furans (TEQ) avian	NA	5.2E-04	0.45	3.4E-04	NA	1.9E-05	0.000014	0.00014	**1.4**	0.1

Notes: Hazard quotients equal to or greater than one are outlined and bolded.

NA = Not analyzed in media; not available for NOAEL/LOAEL

[a] 95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

[b] Measured mercury and methylmercury phytoplankton concentrations were used.

[c] The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

[d] The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals.

All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement. See Table 8-5.

The general regression for cadmium was applied to barium.

The arsenic uptake factor was applied to vanadium.

The general regression for nickel was applied to cobalt.

Table H-23. (cont.)

[e] log(invertebrate)=0.0395+(0.6092*log(sediment))

[f] log(invertebrate)=0.2092+(0.365*log(sediment))

[g] log(invertebrate)=1.48+(-0.425*log(sediment))

[h] log(invertebrate)=1.037+(0.359*log(sediment))

i Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

[J] log(invertebrate)=1.77+(0.242*log(sediment))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-24. Modeled Hazard Quotients for Mean COC Concentrations for the Mallard

COC	Mean Phytoplankton Conc. (mg/kg dw)[b]	Mean Sed. Conc. (mg/kg dw) [a]	BSAFs[c]	Mean Aqu. Inv. Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals										
Barium	NA	320	d	728	NA	38	20.8	41.7	**1.8**	0.9
Cadmium	NA	1.4	9.24	19	1.1E-03	0.9	1.45	20	0.7	4.7E-02
Chromium	NA	130	e	185	1.6E-02	10	1.0	5.0	**9.7**	**1.9**
Cobalt	NA	7.8	f	12	NA	0.7	NA	NA	NA	NA
Copper	NA	48	g	115	9.7E-03	5.9	47	61.7	0.1	0.1
Methylmercury	0.1	7.9E-03	h	0.2	7.9E-07	1.7E-02	0.0064	0.064	**2.7**	0.3
Mercury	0.8	5.4	h	4.7	3.2E-05	0.3	0.45	0.90	0.7	0.3
Nickel	NA	49	f	54	1.7E-02	2.9	77.4	107	3.7E-02	2.7E-02
Vanadium	NA	14	0.127	2.5	NA	0.2	11.4	114	1.5E-02	1.5E-03
Zinc	NA	87	I	283	4.6E-02	15	14.5	131	**1.0**	0.1
Volatile Organic Compounds										
Xylenes	NA	12	1	17	7.8E-04	0.9	NA	NA	NA	NA
Dichlorobenzenes	NA	5.9	4.51	38	1.8E-03	2.0	6	60	0.3	3.3E-02
Trichlorobenzenes	NA	1.7	4.9	12	5.5E-04	0.6	NA	NA	NA	NA
Semivolatile Organic Compounds										
Polycyclic aromatic hydroc	NA	388	0.55	309	NA	17	0.143	1.43	**118**	**12**
Pesticides/Polychlorinated Biphenyls										
Polychlorinated biphenyls (	NA	0.5	1.48	1.1	NA	0.1	0.18	1.8	0.3	3.0E-02
Dioxins/Furans										
Dioxins/furans (TEQ) avian	NA	1.2E-04	0.45	7.8E-05	NA	4.3E-06	0.000014	0.00014	0.3	3.1E-02

Notes: Hazard quotients equal to or greater than one are outlined and bolded.

NA = Not analyzed in media; not available for NOAEL/LOAEL

[a] The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

[b] Measured total and methylmercury phytoplankton concentrations were used.

[c] The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals. See Table 8-5.

All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement. See Table 8-5.

The general regression for cadmium was applied to barium.

The arsenic uptake factor was applied to vanadium. See Table 8-5

The general regression for nickel was applied to cobalt.

Table H-24. (cont.)

[d] log(invertebrate)=0.0395+(0.6092*log(sediment))

[e] log(invertebrate)=0.2092+(0.365*log(sediment))

[f]log(invertebrate)=1.48+(-0.425*log(sediment))

[g] log(invertebrate)=1.037+(0.359*log(sediment))

[h]Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

[i] log(invertebrate)=1.77+(0.242*log(sediment))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-25 Modeled Hazard Quotients for 95% UCL COC Concentrations for the Belted Kingfisher

COC	Fish 3-18 cm 95%UCL (mg/kg dw)	Sediment 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals								
Chromium	NA	139	9.8E-03	0.2	1.0	5.0	0.2	3.8E-02
Lead	NA	116	7.8E-03	0.2	1.18	11.8	0.1	1.4E-02
Methylmercury	1.1	2.9E-02	1.1E-06	0.2	0.0064	0.064	**23**	**2.3**
Mercury	2.2	11	4.2E-05	0.3	0.45	0.90	0.7	0.3
Selenium	NA	1.1	NA	1.6E-03	0.4	0.8	3.9E-03	2.0E-03
Zinc	NA	102	7.0E-02	0.1	14.5	131	1.0E-02	1.1E-03
Semivolatile Organic Compounds								
Polycyclic aromatic hydrocarbons	NA	1293	NA	1.8	0.143	1.43	**12**	**1.2**
Pesticides/Polychlorinated Biphenyls								
Endrin	ND	2.1E-03	NA	2.9E-06	0.01	0.1	2.9E-04	2.9E-05
Hexachlorocyclohexanes	NA	1.8E-03	NA	2.5E-06	0.11	0.34	2.2E-05	7.2E-06
DDT and metabolites	0.4	1.2E-02	NA	0.1	0.0028	0.028	**19**	**1.9**
Polychlorinated biphenyls (PCBs)	15	0.6	NA	2.0	0.18	1.8	**11**	**1.1**
Dioxins/Furans								
Dioxins/furans (TEQ) avian	1.8E-04	5.2E-04	NA	2.5E-05	0.000014	0.00014	**1.8**	0.2

Note: NA = Not analyzed

Hazard quotients equal to or greater than one are outlined

95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposu

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-26. Modeled Hazard Quotients for Mean COC Concentrations for the Belted Kingfisher

COC	Mean Fish 3-18 cm Conc. (mg/kg dw)	Mean Sediment Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env.Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals								
Chromium	NA	130	1.6E-02	0.2	1.0	5.0	0.2	3.6E-02
Lead	NA	74.3	6.8E-03	0.1	1.18	11.8	0.1	8.7E-03
Methylmercury	0.9	7.9E-03	7.9E-07	0.1	0.0064	0.064	**20**	**2.0**
Mercury	2.0	5.4	3.2E-05	0.3	0.45	0.90	0.6	0.3
Selenium	NA	0.9	NA	1.2E-03	0.4	0.8	3.1E-03	1.5E-03
Zinc	NA	87	4.6E-02	0.1	14.5	131	8.6E-03	9.5E-04
Semivolatile Organic Compounds								
Polycyclic aromatic hydrocarbons	NA	388	NA	0.5	0.143	1.43	**3.7**	0.4
Pesticides/Polychlorinated Biphenyls								
Endrin	ND	1.8E-03	NA	2.4E-06	0.01	0.1	2.4E-04	2.4E-05
Hexachlorocyclohexanes	ND	1.6E-03	NA	2.1E-06	0.11	0.34	2.0E-05	6.3E-06
DDT and metabolites	0.2	8.3E-03	NA	3.2E-02	0.0028	0.028	**12**	**1.2**
Polychlorinated biphenyls (PCBs)	4.1	0.5	NA	0.6	0.18	1.8	**3.1**	0.3
Dioxins/Furans								
Dioxins/furans (TEQ) avian	1.4E-04	1.2E-04	NA	1.9E-05	0.000014	0.00014	**1.4**	0.1

Notes: NA = not analyzed; ND = not detected.
Hazard quotients equal to or greater than one are outlined and bolded.
The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.
EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-27. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Great Blue Heron

COC	Fish 3-18 cm 95%UCL (mg/kg dw)	Fish 18-60 cm 95%UCL (mg/kg dw)	Sediment 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Chromium	NA	2.5	139	9.8E-03	0.1	1.0	5.0	0.1	2.7E-02
Methylmercury	1.1	3.4	2.9E-02	1.1E-06	0.1	0.0064	0.064	**18**	**1.8**
Mercury	2.2	3.2	10.6	4.2E-05	0.1	0.45	0.90	0.3	0.1
Selenium	NA	6.5	1.1	NA	0.2	0.4	0.8	0.5	0.2
Zinc	NA	539	102	7.0E-02	16	14.5	131	**1.1**	0.1
Semivolatile Organic Compounds									
Polycyclic aromatic hydrocarbons	NA	NA	1,293	NA	0.6	0.143	1.43	**4.0**	0.4
Pesticides/Polychlorinated Biphenyls									
Hexachlorocyclohexanes	ND	3.7E-02	1.8E-03	NA	1.1E-03	0.11	0.34	1.0E-02	3.3E-03
DDT and metabolites	0.4	0.6	1.2E-02	NA	2.2E-02	0.0028	0.028	**8.0**	0.8
Polychlorinated biphenyls (PCBs)	15	8.9	0.6	NA	0.5	0.18	1.8	**2.7**	0.3

Notes: 95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).
NA = not analyzed; ND = not detected.
The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.
Hazard quotients equal to or greater than one are outlined and bolded.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-28. Modeled Hazard Quotients for Mean COC Concentrations for the Great Blue Heron

COC	Mean Fish 3-18cm Conc. (mg/kg dw)	Mean Fish 18-60 cm Conc. (mg/kg dw)	Mean Sed. Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Chromium	NA	2.2	130	1.6E-02	0.1	1.0	5.0	0.1	2.5E-02
Methylmercury	0.9	2.8	7.9E-03	7.9E-07	0.1	0.0064	0.064	**15**	**1.5**
Mercury	2.0	3.1	5.4	3.2E-05	0.1	0.45	0.90	0.3	0.1
Selenium	NA	4.8	0.9	NA	0.1	0.4	0.8	0.4	0.2
Zinc	NA	402	87.1	4.6E-02	12	14.5	131	0.8	0.1
Semivolatile Organic Compounds									
Polycyclic aromatic hydrocarbons	NA	NA	388	NA	0.2	0.143	1.43	**1.2**	0.1
Pesticides/Polychlorinated Biphenyls									
Hexachlorocyclohexanes	ND	0.7	1.6E-03	NA	2.0E-02	0.11	0.34	0.2	6.0E-02
DDT and metabolites	0.2	0.4	8.3E-03	NA	1.5E-02	0.0028	0.028	**5.3**	0.5
Polychlorinated biphenyls (PCBs)	4.1	6.5	0.5	NA	0.3	0.18	1.8	**1.4**	0.1

Notes: NA = not analyzed; ND = not detected.

The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

Hazard quotients equal to or greater than one are outlined and bolded.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-29. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Osprey

COC	Fish 3-18 cm 95%UCL (mg/kg dw)	Fish 18-60 cm 95%UCL (mg/kg dw)	Sediment 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Chromium	NA	2.5	138.6	8.9E-03	0.1	1.0	5.0	0.1	2.1E-02
Methylmercury	1.1	3.4	2.9E-02	1.0E-03	0.2	0.0064	0.064	**24**	**2.4**
Mercury	2.2	3.2	10.6	3.6E-02	0.1	0.45	0.90	0.3	0.2
Selenium	NA	6.5	1.1	NA	0.3	0.4	0.8	0.7	0.4
Zinc	NA	539	102.4	6.5E-02	23	14.5	131	**1.6**	0.2
Semivolatile Organic Compounds									
Polycyclic aromatic hydrocarbons	NA	NA	1293.5	NA	NA	0.143	1.43	NA	NA
Pesticides/Polychlorinated Biphenyls									
Endrin	ND	3.5E-03	2.1E-03	NA	1.5E-04	0.01	0.1	1.5E-02	1.5E-03
Hexachlorocyclohexanes	ND	3.7E-02	1.8E-03	NA	1.6E-03	0.11	0.34	1.5E-02	4.8E-03
DDT and metabolites	0.4	0.6	1.2E-02	NA	2.6E-02	0.0028	0.028	**9.3**	0.9
Polychlorinated biphenyls (PCBs)	15	8.9	0.6	NA	0.5	0.18	1.8	**2.5**	0.3
Dioxins/Furans									
Dioxins/furans (TEQ) avian	1.8E-04	1.6E-04	5.2E-04	NA	7.8E-06	0.000014	0.00014	0.6	5.6E-02

Notes: 95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).
NA = not analyzed; ND = not detected.
The one-meter sediment contour was used to model exposure. The nine-meter surface water contour was used to model drinking water exposure.
Hazard quotients equal to or greater than one are outlined and bolded.
Calculation included lake sites W1 and W2, see Chapter 8.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-30. Modeled Hazard Quotients for Mean COC Concentrations for the Osprey

COC	Mean Fish 3-18cm Conc. (mg/kg dw)	Mean Fish 18-60 cm Conc. (mg/kg dw)	Mean Sed. Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Chromium	NA	2.2	130	1.5E-02	0.1	1.0	5.0	0.1	1.9E-02
Methylmercury	0.9	2.8	7.9E-03	7.5E-04	0.1	0.0064	0.064	**20**	**2.0**
Mercury	2.0	3.1	5.4	2.9E-02	0.1	0.45	0.90	0.3	0.2
Selenium	NA	4.8	0.9	NA	0.2	0.4	0.8	0.5	0.3
Zinc	NA	402	87	4.5E-02	17	14.5	131	**1.2**	0.1
Semivolatile Organic Compounds									
Polycyclic aromatic hydrocarbons	NA	NA	388	NA	19.7	0.143	1.43	NA	NA
Pesticides/Polychlorinated Biphenyls									
Endrin	ND	4.3E-03	1.8E-03	NA	2.8E-04	0.01	0.1	2.8E-02	2.8E-03
Hexachlorocyclohexanes	ND	0.7	1.6E-03	NA	3.0E-02	0.11	0.34	0.3	0.1
DDT and metabolites	0.2	0.4	8.3E-03	NA	1.8E-02	0.0028	0.028	**6.3**	0.6
Polychlorinated biphenyls (PCBs)	4.1	6.5	0.5	NA	4.5E-02	0.18	1.8	0.2	2.5E-02
Dioxins/Furans									
Dioxins/furans (TEQ) avian	1.4E-04	9.0E-05	1.2E-04	NA	6.1E-06	0.000014	0.00014	0.4	4.3E-02

Notes: NA = not analyzed; ND = not detected.
The one-meter sediment contour was used to model exposure. The nine-meter surface water contour was used to model drinking water exposure.
Hazard quotients equal to or greater than one are outlined and bolded.
Calculation included lake sites W1 and W2, see Chapter 8.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-31. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Red-Tailed Hawk

COC	OL Soil 95%UCL (mg/kg dw)	Small Mammal Uptake Factor	Food 95%UCL (mg/kg dw)	Water 95%UCL (mg/L dw)	Est. Env. Dose (mg/kg bw day)	NOAEL	LOAEL	Hazard Quotient NOAEL[c]	Hazard Quotient LOAEL[c]
Total Metals									
Chromium	51	a	4.0	9.8E-03	0.2	1.0	5.0	0.2	4.7E-02
Lead	106	b	8.5	7.8E-03	0.5	1.18	11.8	0.4	4.2E-02
Methylmercury	0.2	0.192	3.1E-02	1.1E-03	1.7E-03	0.0064	0.064	0.3	2.7E-02
Mercury	18	0.0543	1.0	4.2E-02	0.1	0.45	0.90	0.14	7.1E-02
Semivolatile Organic Compounds									
Polycyclic aromatic hydrocarbons	184	c	697	NA	36	0.143	1.43	**252**	**25**
Pesticides									
DDT and metabolites	5.0E-02	c	8.3E-02	NA	4.3E-03	0.0028	0.028	**1.5**	0.2
Dioxins/Furans									
Dioxins/furans (TEQ) avian	2.2E-03	c	2.7E-03	NA	1.4E-04	0.000014	0.00014	**9.9**	1.0

Notes: NA = not analyzed.

95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

All state wetlands and the dredge spoils area were included in soil calculations.

Hazard quotients equal to or greater than one are outlined and bolded.

The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Small Mammals were applied.

90th percentile UF for mercury was applied to methylmercury

[a] ln(small mammal)=-1.4945+(0.7326*ln(soil))

[b] ln(small mammal)=0.0761+(0.4422*ln(soil))

[c]The general recommendation for TCDD (LN(wholebody)= 0.8113+1.0993(LN(soil concentration)) was applied to PAHs, DDT and the dioxin/furan T

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-32. Modeled Hazard Quotients for Mean COC Concentrations for the Red-Tailed Hawk

COC	Mean OL Soil Conc. (mg/kg dw)	Small Mammal Uptake Factor	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (EED) (mg/kg BW/day)	NOAEL	LOAEL	Hazard Quotient NOAEL	NYSDEC Hazard Quotient LOAEL
Total Metals									
Chromium	39	a	3.3	1.6E-02	0.2	1.0	5.0	0.2	3.8E-02
Lead	60	b	6.6	6.8E-03	0.4	1.18	11.8	0.3	3.2E-02
Methylmercury	4.0E-02	0.192	7.7E-03	7.9E-04	4.6E-04	0.0064	0.064	7.2E-02	7.2E-03
Mercury	3.0	0.0543	0.2	3.2E-02	1.2E-02	0.45	0.90	2.6E-02	1.3E-02
Semivolatile Organic Compounds									
Polycyclic aromatic hydrocarbons	13	c	38.7	NA	2.0	0.143	1.43	**14**	**1.4**
Pesticides									
DDT and metabolites	1.2E-02	c	1.8E-02	NA	9.2E-04	0.0028	0.028	0.3	3.3E-02
Dioxins/Furans									
Dioxins/furans (TEQ) avian	2.7E-04	c	2.7E-04	NA	1.4E-05	0.000014	0.00014	**1.0**	0.1

Notes: NA = not analyzed.

95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

All State wetlands and the dredge spoils area were included in soil calculations.

Hazard quotients equal to or greater than one are outlined and bolded.

The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Small Mammals were applied.

90th percentile UF for mercury was applied to methylmercury

[a] ln(small mammal)=-1.4945+(0.7326*ln(soil))

[b] ln(small mammal)=0.0761+(0.4422*ln(soil))

[c]The general recommendation for TCDD (LN(wholebody)= 0.8113+1.0993(LN(soil concentration)) was applied to PAHs, DDT and the dioxin/furan TEQ.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-33. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Mink[a]

COC	Soil 95%UCL (mg/kg dw)[b]	Small Mammal Uptake Factor	Small mammal 95%UCL (mg/kg dw)	Fish 3-18 cm 95%UCL (mg/kg dw)	Sediment 95%UCL (mg/kg dw)[c]	BSAFs	Aqu. Inv. 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	NYSDEC Hazard Quotient NOAEL	NYSDEC Hazard Quotient LOAEL
Total Metals													
Arsenic	6.4	d	4.0E-02	NA	8.4	0.127	1.5	NA	2.2E-02	0.126	1.26	0.2	1.7E-02
Chromium	51	e	4.0	NA	139	h	199	9.8E-03	2.1	3.28	13.14	0.7	0.2
Methylmercury	0.2	0.192	3.1E-02	1.1	2.9E-02	i	0.3	1.1E-06	2.9E-02	0.0025	0.025	**12**	**1.2**
Mercury	18	0.0543	1.0	2.2	11	i	5.8	4.2E-05	0.1	1.0	10	0.1	1.4E-02
Selenium	1.2	f	0.7	NA	1.1	h	0.4	NA	2.7E-02	0.20	0.33	0.1	8.2E-02
Vanadium	16	d	8.1E-02	NA	23	0.127	4.3	NA	0.1	0.21	2.1	0.3	2.8E-02
Semivolatile Organic Compounds													
Hexachlorobenzene	4.3	g	11	0.1	1.8	4.17	11	NA	0.5	0.05	0.5	**9.2**	0.9
PAHs	184	g	697	NA	1,293	0.55	1,032	NA	33	1.0	10	**33**	**3.3**
Pesticides/Polychlorinated Biphenyls													
DDT and metabolites	5.0E-02	g	0.1	0.4	1.2E-02	0.59	1.0E-02	NA	1.2E-02	0.8	4	1.5E-02	2.9E-03
Dieldrin	2.2E-02	g	3.4E-02	3.0E-02	3.2E-03	8.50	3.9E-02	NA	2.1E-03	0.009	0.018	0.2	0.1
PCBs	0.5	g	0.9	14.5	0.6	1.48	1.4	NA	0.4	0.0034	0.034	**109**	**11**
Dioxins/Furans													
D/F (TEQ) mammalian	1.1E-03	g	1.2E-03	5.4E-05	1.6E-04	0.45	1.1E-04	NA	4.2E-05	1E-06	0.00001	**42**	**4.2**

Notes: NA = not analyzed

Hazard quotients equal to or greater than one are outlined and bolded.

[a] 95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

[b] All state wetlands and the dredge spoils area were included in soil calculations.

[c] The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Small Mammals were applied. See Table 8-5.

90th percentile UF for mercury was applied to methylmercury

The recommendation for general estimates for arsenic was applied to vanadium.

The recommendation for general estimates for tetrachlorodibenzo-p-dioxin was applied to hexachlorobenzene, PAHs, DDT and metabolites, Dieldrin and PCBs

[d] ln(small mammal)= -4.5796+(0.7354*ln(soil))

[e] ln(small mammal)=-1.4945+(0.7326*ln(soil))

[f] ln(small mammal)=-0.4158+(0.3764*ln(soil))

[g] ln(small mammal)=0.8113+(1.0993*ln(soil))

The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals.

All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement. See Table 8-5.

The arsenic uptake factor was applied to vanadium.

The calculated 95% UCL for chromium was applied to selenium.

[h] log(invertebrate)=0.2092+(0.365*log(sediment))

[i] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-34. Modeled Hazard Quotients for Mean COC Concentrations for the Mink

COC	Mean Soil Conc. (mg/kg dw)[a]	Small Mammal UF	Mean Mammal Conc. (mg/kg dw)	Mean Fish 3-18 cm Conc. (mg/kg dw)	Mean Sed. Conc. (mg/kg dw)[b]	BSAFs	Mean Aqu. Inv. Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals													
Arsenic	4.6	c	3.2E-02	0.0	5.2	0.127	1.0	0.0	1.4E-02	0.126	1.26	0.1	1.1E-02
Chromium	39	d	3.3	0.0	130	g	185	1.6E-02	2.0	3.28	13.14	0.6	0.2
Methylmercury	4.0E-02	0.192	7.7E-03	0.9	7.9E-03	h	0.25	7.9E-07	2.4E-02	0.0025	0.025	**9.4**	0.9
Mercury	3.0	0.0543	0.2	2.0	5.4	h	4.71	3.2E-05	0.1	1.0	10	0.1	9.9E-03
Selenium	0.9	e	0.6	NA	0.9	g	0.3	NA	2.3E-02	0.20	0.33	0.1	7.1E-02
Vanadium	14	c	7.3E-02	NA	14	0.675	13.5	NA	0.1	0.21	2.1	0.7	6.7E-02
Semivolatile Organic Compounds													
Hexachlorobenzene	0.4	f	0.8	4.9E-02	0.5	4.17	3.1	ND	0.1	0.05	0.5	**1.1**	0.1
PAHs	13	f	38.7	NA	388	0.55	309	NA	4.5	1.0	10	**4.5**	0.4
Pesticides/Polychlorinated Biphenyls													
DDT and metabolites	1.2E-02	f	1.8E-02	0.2	8.3E-03	0.59	7.1E-03	NA	6.0E-03	0.8	4	7.5E-03	1.5E-03
Dieldrin	5.3E-03	f	7.2E-03	1.9E-02	2.6E-03	8.50	3.2E-02	NA	9.7E-04	0.009	0.018	0.1	5.4E-02
PCBs	0.2	f	0.4	4.1	0.5	1.48	1.1	NA	0.1	0.0034	0.034	**34**	**3.4**
Dioxins/Furans													
D/F (TEQ) mammalian	1.3E-04	f	1.2E-04	3.6E-05	4.3E-05	0.45	2.8E-05	NA	4.9E-06	0.000001	0.00001	**4.9**	0.5

Notes: Hazard quotients equal to or greater than one are outlined and bolded. NA = not analyzed, ND = not detected.

[a] All state wetlands and the dredge spoils area were included in soil calculations.

[b] The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Small Mammals were applied. See Table 8-5.

90th percentile UF for mercury was applied to methylmercury

The recommendation for general estimates for arsenic was applied to vanadium.

The recommendation for general estimates for tetrachlorodibenzo-p-dioxin was applied to hexachlorobenzene, PAHs, DDT and metabolites, Dieldrin and PCBs

[c] ln(small mammal)= -4.5796+(0.7354*ln(soil))

[d] ln(small mammal)=-1.4945+(0.7326*ln(soil))

[e] ln(small mammal)=-0.4158+(0.3764*ln(soil))

[f] ln(small mammal)=0.8113+(1.0993*ln(soil))

The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals.

All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement. See Table 8-5

The arsenic uptake factor was applied to vanadium.

The calculated 95% UCL for chromium was applied to selenium.

[g] log(invertebrate)=0.2092+(0.365*log(sediment))

[h] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-35. Modeled Hazard Quotients for 95% UCL COC Concentrations for the River Otter[a]

COC	Fish 3-18 cm 95%UCL (mg/kg dw)	Fish 18-60 cm 95%UCL (mg/kg dw)	Sediment 95%UCL[b] (mg/kg dw)	BSAF[c]	Aqu. Inv. Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals											
Arsenic	NA	3.2	8.4	0.127	1.5	NA	9.7E-02	0.126	1.26	0.8	0.1
Chromium	NA	2.5	139	d	199	9.8E-03	1.0	3.28	13.14	0.3	0.1
Methylmercury	1.1	3.4	2.9E-02	e	0.3	1.1E-03	0.1	0.0025	0.025	**43**	**4.3**
Mercury	2.2	3.2	11	e	5.8	4.2E-02	0.1	1.0	10	0.1	1.5E-02
Selenium	NA	6.5	1.1	d	0.4	NA	0.2	0.20	0.33	0.9	0.5
Vanadium	NA	5.0	23	0.127	4.3	NA	0.2	0.21	2.1	0.8	0.1
Semivolatile Organic Compounds											
PAHs	NA	NA	1,293	0.55	1,032	NA	5.2	1	10	**5.2**	0.5
Pesticides/Polychlorinated Biphenyls											
DDT and metabolites	0.4	1	1.2E-02	0.6	1.0E-02	NA	4.8	0.8	4	**5.9**	**1.2**
PCBs	15	8.9	0.6	1.48	1.4	NA	0.4	0.0034	0.034	**130**	**13**
Dioxins/Furans											
D/F (TEQ) mammalian	5.4E-05	5.6E-05	1.6E-04	0.45	1.1E-04	NA	2.8E-06	0.000001	0.00001	**2.8**	0.3

Notes: Hazard quotients equal to or greater than one are outlined and bolded. NA = not analyzed.

[a] 95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

[b] The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

[c] The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals. See Table 8-5.

All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement.

The calculated 95% upper prediction limit (UPL) for chromium was applied to selenium.

The arsenic uptake factor was applied to vanadium.

[d] log(invertebrate)=0.2092+(0.365*log(sediment))

[e] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-36. Modeled Hazard Quotients for Mean COC Concentrations for the River Otter

COC	Mean Fish 3-18 c Conc. (mg/kg dw)	Mean Fish 18-60 cm Conc. (mg/kg dw)	Mean Sed. Conc. (mg/kg dw)[a]	BSAF[b]	Mean Aqu. Inv. Food Conc. (mg/kg dw)	Mean Surface Water Concen-tration (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals											
Arsenic	NA	2.3	5.2	0.127	1.0	NA	6.8E-02	0.126	1.26	0.5	0.1
Chromium	NA	2.2	130	c	185	1.6E-02	0.9	3.28	13.14	0.3	0.1
Methylmercury	0.9	2.8	7.9E-03	d	0.2	7.9E-04	0.1	0.0025	0.025	**36**	**3.6**
Mercury	2.0	3.1	5.4	d	4.7	3.2E-02	0.1	1.0	10	0.1	1.4E-02
Selenium	NA	4.8	0.9	c	0.3	NA	0.1	0.20	0.33	0.7	0.4
Vanadium	NA	3.9	14	0.127	2.5	NA	0.1	0.21	2.1	0.6	0.1
Semivolatile Organic Compounds											
PAHs	NA	NA	388	0.55	309	NA	1.6	1	10	**1.6**	0.2
Pesticides/Polychlorinated Biphenyls											
DDT and metabolites	0.2	0.4	8.3E-03	0.6	7.1E-03	NA	1.8	0.8	4	**2.3**	0.5
PCBs	4.1	6.5	0.5	1.48	1.1	NA	0.2	0.0034	0.034	**69**	**6.9**
Dioxins/Furans											
D/F (TEQ) mammalian	3.6E-05	3.4E-05	4.3E-05	0.45	2.8E-05	NA	1.5E-06	0.000001	0.00001	**1.5**	0.2

Notes: Hazard quotients equal to or greater than one are outlined and bolded. NA = not analyzed.

[a] The one-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

[b] The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals. See Table 8-5.
All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement.
The calculated 95% upper prediction limit (UPL) for chromium was applied to selenium.
The arsenic uptake factor was applied to vanadium.

[c] log(invertebrate)=0.2092+(0.365*log(sediment))

[d] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-37. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Little Brown Bat[a]

COC	Sediment 95%UCL[b] (mg/kg dw)	BSAFs[c]	Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	1.3	0.127	0.2	NA	2.4E-02	0.125	1.25	0.2	2.0E-02
Arsenic	7.6	0.127	1.4	NA	0.1	0.126	1.26	**1.1**	0.1
Barium	392	d	919	NA	94	45	75	**2.1**	**1.3**
Cadmium	3.3	9.24	44	1.1E-03	4.5	1	10	**4.5**	0.5
Chromium	158	e	232	9.8E-03	24	3.28	13.14	**7.2**	**1.8**
Cobalt	13	f	19	NA	2.0	5	50	0.4	3.9E-02
Copper	66	g	161	1.2E-02	16	11.7	15.14	**1.4**	**1.1**
Lead	98	0.066	9	7.8E-03	1.0	8	80	0.1	1.2E-02
Manganese	342	0.066	33	0.1	3.4	88	284	3.8E-02	1.2E-02
Methylmercury	3.0E-02	h	0.5	1.1E-06	0.1	0.0025	0.025	**21**	**2.1**
Mercury	12	h	13	4.2E-02	1.3	1.0	10	**1.3**	0.1
Nickel	53	f	58	1.4E-02	5.9	40	80	0.1	7.4E-02
Selenium	1.2	e	0.4	NA	4.3E-02	0.20	0.33	0.2	0.1
Thallium	0.6	0.066	0.1	NA	5.8E-03	0.074	0.74	7.9E-02	7.9E-03
Vanadium	30	0.127	6	NA	0.6	0.21	2.1	**2.7**	0.3
Zinc	123	i	404	7.0E-02	41	160	320	0.3	0.1
Volatile Organic Compounds									
Trichlorobenzenes	0.6	4.9	4.1	5.7E-04	0.4	14.8	53.6	2.8E-02	7.8E-03
Xylenes	33	1	48	8.4E-04	4.9	2.1	2.6	**2.3**	**1.9**
Semivolatile Organic Compounds									
Hexachlorobenzene	0.5	4.17	3	ND	0.3	0.05	0.5	**6.0**	0.6
PAHs	225	0.55	179	NA	18	1	10	**18**	**1.8**
Pesticides/Polychlorinated Biphenyls									
Dieldrin	4.1E-03	8.50	0.1	NA	5.2E-03	0.009	0.018	0.6	0.3
PCBs	0.7	1.48	1.5	NA	0.2	0.4	1.6	0.4	9.6E-02
Dioxins/Furans									
D/F (TEQ) mammalian	1.6E-04	0.45	1.1E-04	NA	1.1E-05	0.000001	0.00001	**11**	**1.1**

Notes: Hazard quotients equal to or greater than one are outlined and bolded.

NA = not analyzed, ND = not detected.

[a] 95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

Table H-37. (cont.)

[b] The nine-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinkir
[c]The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals. See Table 8-5.
All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement.
The following BSAFs were applied form metals with no BSAFs:
The arsenic uptake factor was applied to antimony and vanadium.
The general regression for cadmium was applied to barium.
The calculated 95% upper prediction limit (UPL) for nickel was applied to cobalt.
The lead uptake factor was applied to manganese and thallium.

[d] log(invertebrate)=0.0395+(0.6092*log(sediment))

[e] log(invertebrate)=0.2092+(0.365*log(sediment))

[f] log(invertebrate)=1.48+(-0.425*log(sediment))

[g] log(invertebrate)=1.037+(0.359*log(sediment))

[h] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

[i] log(invertebrate)=1.77+(0.242*log(sediment))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-38. Modeled Hazard Quotients for Mean COC Concentrations for the Little Brown Bat

COC	Mean Sediment Conc. (mg/kg dw) [a]	BSAFs [b]	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw·day)	NOAEL	LOAEL	NYSDEC Hazard Quotient NOAEL	NYSDEC Hazard Quotient LOAEL
Total Metals									
Antimony	1.0	0.127	0.2	NA	2.0E-02	0.125	1.25	0.2	1.6E-02
Arsenic	5.4	0.127	1.0	NA	0.1	0.126	1.26	0.8	0.1
Barium	330	c	752	NA	77	45	75	**1.7**	**1.0**
Cadmium	2.2	9.24	29	1.1E-03	3.0	1	10	**3.0**	0.3
Chromium	169	d	251	1.6E-02	26	3.28	13.14	**7.8**	**1.9**
Cobalt	11	e	17	NA	1.7	5	50	0.3	3.4E-02
Copper	53	f	126	9.7E-03	13	11.7	15.14	**1.1**	0.9
Lead	72	0.066	6.9	6.8E-03	0.7	8	80	0.1	8.8E-03
Manganese	318	0.066	30	0.1	3.1	88	284	3.5E-02	1.1E-02
Methylmercury	9.4E-02	g	0.3	7.9E-07	3.2E-02	0.0025	0.025	**13**	**1.3**
Mercury	7.1	g	6.0	3.2E-02	0.6	1.0	10	0.6	0.1
Nickel	60.0	e	63	1.7E-02	6.4	40	80	0.2	8.0E-02
Selenium	1.0	e	0.3	NA	3.1E-02	0.20	0.33	0.2	0.1
Thallium	0.5	0.066	0.1	NA	5.2E-03	0.074	0.74	0.1	7.1E-03
Vanadium	21	0.127	3.9	NA	0.4	0.21	2.1	**1.9**	0.2
Zinc	107	h	352	4.6E-02	36	160	320	0.2	0.1
Volatile Organic Compounds									
Trichlorobenzenes	1.3	4.9	9.1	5.5E-04	0.9	14.8	53.6	6.3E-02	1.7E-02
Xylenes	7	1	9.9	7.8E-04	1.0	2.1	2.6	0.5	0.4
Semivolatile Organic Compounds									
Hexachlorobenzene	0.4	4.17	2.3	ND	0.2	0.05	0.5	**4.6**	0.5
Polycyclic aromatic hydrocarbons	228	0.55	182	NA	19	1	10	**19**	**1.9**
Pesticides/Polychlorinated Biphenyls									
Dieldrin	3.3E-03	8.50	4.1E-02	NA	4.2E-03	0.009	0.018	0.5	0.2
Polychlorinated biphenyls (PCBs)	0.6	1.48	1.4	NA	0.1	0.4	1.6	0.4	8.8E-02
Dioxins/Furans									
D/F (TEQ) mammalian	4.4E-05	0.45	2.9E-05	NA	2.9E-06	0.000001	0.00001	**2.9**	0.3

Notes: Hazard quotients equal to or greater than one are outlined and bolded.
NA = not analyzed, ND = not detected.

[a] The nine-meter sediment contour was used to model exposure. The one-meter surface water contour was used to model drinking water exposure.

[b] The general recommendations for the Oak Ridge Reservation (USDOE, 1998) were followed for metals. See Table 8-5.

Table H-38. (cont.)

All other BSAFs are from the US Army Corps of Engineers database or based on professional judgement.
The following BSAFs were applied form metals with no BSAFs: arsenic for antimony and vanadium and cadmium for barium.
The calculated 95% upper prediction limit (UPL) for nickel was applied to cobalt.
The lead uptake factor was applied to manganese and thallium.

[c] log(invertebrate)=0.0395+(0.6092*log(sediment))

[d] log(invertebrate)=0.2092+(0.365*log(sediment))

[e] log(invertebrate)=1.48+(-0.425*log(sediment))

[f] log(invertebrate)=1.037+(0.359*log(sediment))

[g] Measured total and methylmercury concentrations in benthic macroinvertebrates were used.

[h] log(invertebrate)=1.77+(0.242*log(sediment))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-39. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Short-Tailed Shrew in the Northwest Wetland Area (SYW-6)

COC	Soil 95%UCL (mg/kg dw)	Earth-worm UFs	Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	2.2	NA	NA	NA	4.5E-02	0.125	1.25	0.4	3.6E-02
Arsenic	5.9	a	0.8	NA	0.3	0.126	1.26	**2.0**	0.2
Barium	176	0.091	16	NA	6.1	45	75	0.1	0.1
Cadmium	14	b	69	1.1E-03	11	1	10	**11**	**1.1**
Chromium	154	NA	NA	9.8E-03	3.1	3.28	13.14	**1.0**	0.2
Lead	175	c	52	7.8E-03	12	8	80	**1.5**	0.1
Methylmercury	4.5E-02	d	0.3	1.1E-03	0.1	0.0025	0.025	**22**	**2.2**
Mercury	4.5	d	0.6	4.2E-02	0.2	1.0	10	0.2	1.9E-02
Nickel	64	NA	NA	1.4E-02	1.3	40	80	3.3E-02	1.6E-02
Selenium	2.5	e	1.8	NA	0.3	0.20	0.33	**1.7**	**1.0**
Thallium	1.4	c	1.1	NA	0.2	0.074	0.74	**2.6**	0.3
Vanadium	22	0.042	0.9	NA	0.6	0.21	2.1	**2.9**	0.3
Zinc	510	f	661	7.0E-02	114	160	320	0.7	0.4
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	ND	5.7E-04	8.5E-05	14.8	53.6	5.8E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	ND	g	ND	NA	NA	0.05	0.5	ND	ND
PAHs	22	g	1,354	NA	213	1	10	**213**	**21**
Pesticides/Polychlorinated Biphenyls									
Chlordane	ND	g	ND	NA	NA	0.15	0.75	ND	ND
Dieldrin	ND	g	ND	NA	NA	0.009	0.018	ND	ND
PCBs	0.1	h	0.1	NA	1.6E-02	0.4	1.6	3.9E-02	9.7E-03
Dioxins/Furans									
D/F (TEQ) mammalian	2.0E-05	g	9.5E-05	NA	1.5E-05	0.000001	0.00001	**15**	**1.5**

Notes: Hazard quotients equal to or greater than one are outlined and bolded.

NA = not analyzed or available, ND = not detected.

95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms we

The recommendation for general estimates for lead was applied to thallium.

The recommendation for general estimates for mercury was applied to methylmercury

The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides

Table H-39. (cont.)

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-40. Modeled Hazard Quotients for Mean COC Concentrations for the Short-Tailed Shrew in the Northwest Wetland Area (SYW-6)

COC	Mean Soil Conc. (mg/kg dw)	Earth-worm UFs	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.6	NA	NA	NA	1.2E-02	0.125	1.25	0.1	9.5E-03
Arsenic	2.7	a	0.5	NA	0.1	0.126	1.26	**1.1**	0.1
Barium	125	0.091	11	NA	4.3	45	75	0.1	0.1
Cadmium	3.4	b	22	1.1E-03	3.5	1	10	**3.5**	0.4
Chromium	49	NA	NA	1.6E-02	1.0	3.28	13.14	0.3	0.1
Lead	72	c	25	6.8E-03	5.5	8	80	0.7	0.1
Methylmercury	1.3E-02	d	0.3	7.9E-04	4.8E-02	0.0025	0.025	**19**	**1.9**
Mercury	1.3	d	0.5	3.2E-02	0.1	1.0	10	0.1	1.1E-02
Nickel	29	NA	0	1.7E-02	0.6	40	80	1.5E-02	7.5E-03
Selenium	0.8	e	0.8	NA	0.1	0.20	0.33	0.7	0.4
Thallium	0.6	c	0.6	NA	0.1	0.074	0.74	**1.4**	0.1
Vanadium	13	0.042	0.5	NA	0.4	0.21	2.1	**1.7**	0.2
Zinc	181	f	471	4.6E-02	78	160	320	0.5	0.2
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	0	5.5E-04	8.4E-05	14.8	53.6	5.6E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	ND	g	NA	NA	NA	0.05	0.5	ND	ND
PAHs	6.2	g	298	NA	47	1	10	**47**	**4.7**
Pesticides/Polychlorinated Biphenyls									
Chlordane	ND	g	ND	NA	NA	0.15	0.75	ND	ND
Dieldrin	ND	g	ND	NA	NA	0.009	0.018	ND	ND
PCBs	4.7E-02	h	0.1	NA	1.1E-02	0.4	1.6	2.8E-02	6.9E-03
Dioxins/Furans									
D/F (TEQ) mammalian	8.8E-06	g	3.6E-05	NA	5.9E-06	0.000001	0.00001	**5.9**	0.6

Notes: NA = not analyzed or available, ND = not detected.
Hazard quotients equal to or greater than one are outlined and bolded.
The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworn
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.
The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

Table H-40. (cont.)

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-41. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Short-Tailed Shrew in the Wetland at the Mouth of Harbor Brook (SYW-19)

COC	Soil 95%UCL (mg/kg dw)	Earth-worm UFs	Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	1.1	NA	NA	NA	2.2E-02	0.125	1.25	0.2	1.8E-02
Arsenic	8.6	a	1.1	NA	0	0.126	1.26	**2.8**	0.3
Barium	390	0.091	35	NA	14	45	75	0.3	0.2
Beryllium	0.6	0.045	2.8E-02	NA	1.7E-02	0.66	6.6	2.6E-02	2.6E-03
Cadmium	2.3	b	16	1.1E-03	2.5	1	10	**2.5**	0.3
Chromium	55	NA	NA	9.8E-03	1.1	3.28	13.14	0.3	0.1
Lead	259	c	71.3	7.8E-03	16	8	80	**2.1**	0.2
Methylmercury	0.3	d	0.4	1.1E-03	7.3E-02	0.0025	0.025	**29**	**2.9**
Mercury	25	d	0.7	4.2E-02	0.6	1.0	10	0.6	6.3E-02
Nickel	44	NA	NA	1.4E-02	0.9	40	80	2.2E-02	1.1E-02
Selenium	1.7	e	1.4	NA	0.2	0.20	0.33	**1.2**	0.8
Thallium	ND	c	ND	NA	NA	0.074	0.74	ND	ND
Vanadium	13	0.042	0.5	NA	0.4	0.21	2.1	**1.7**	0.2
Zinc	138	f	431	7.0E-02	70	160	320	0.4	0.2
Volatile Organic Compounds									
Trichlorobenzenes	6.6	g	316	5.7E-04	50	14.8	53.6	**3.4**	0.9
Semivolatile Organic Compounds									
Hexachlorobenzene	5.4	g	249	NA	39	0.05	0.5	**783**	**78**
Polycyclic aromatic hydrocarbons	184	g	16,311	NA	2,565	1	10	**2,565**	**256**
Pesticides/Polychlorinated Biphenyls									
Chlordane	3.0E-02	g	0.5	NA	0.1	0.15	0.75	0.6	0.1
Dieldrin	2.4E-02	g	0.4	NA	0.1	0.009	0.018	**7.3**	**3.7**
Polychlorinated biphenyls (PCBs)	1.1	h	4.5	NA	0.7	0.4	1.6	**1.8**	0.5
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	1.1E-03	g	1.1E-02	NA	1.7E-03	0.000001	0.00001	**1,706**	**171**

Notes: Hazard quotients equal to or greater than one are outlined and bolded.
NA = not analyzed or available, ND = not detected.
95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).
The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms were applied.
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.
The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

Table H-41. (cont.)

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-42. Modeled Hazard Quotients for Mean COC Concentrations for the Short-Tailed Shrew in the Wetland at the Mouth of Harbor Brook (SYW-19)

COC	Mean Soil Conc. (mg/kg dw)	Earth-worm UFs	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.6	NA	NA	NA	1.2E-02	0.125	1.25	0.1	1.0E-02
Arsenic	7.0	a	1.0	NA	0	0.126	1.26	**2.3**	0.2
Barium	302	0.091	27	NA	10	45	75	0.2	0.1
Beryllium	0.5	0.045	2.4E-02	NA	1.4E-02	0.66	6.6	2.2E-02	2.2E-03
Cadmium	1.3	b	10.1	1.1E-03	1.6	1	10	**1.6**	0.2
Chromium	43	NA	NA	1.6E-02	0.9	3.28	13.14	0.3	0.1
Lead	118	c	37.8	6.8E-03	8.4	8	80	**1.0**	0.1
Methylmercury	0.1	d	0.4	7.9E-04	6.6E-02	0.0025	0.025	**27**	**2.7**
Mercury	15	d	0.7	3.2E-02	0.4	1.0	10	0.4	4.1E-02
Nickel	32	NA	NA	1.7E-02	0.6	40	80	1.6E-02	8.1E-03
Selenium	1.4	e	1.2	NA	0.2	0.20	0.33	**1.1**	0.7
Thallium	ND	c	ND	NA	NA	0.074	0.74	ND	ND
Vanadium	12	0.042	0.5	NA	0.3	0.21	2.1	**1.6**	0.2
Zinc	114	f	404	4.6E-02	66	160	320	0.4	0.2
Volatile Organic Compounds									
Trichlorobenzenes	2.8	g	117	5.5E-04	18.5	14.8	53.6	**1.2**	0.3
Semivolatile Organic Compounds									
Hexachlorobenzene	2.0	g	76	NA	12.0	0.05	0.5	**241**	**24**
Polycyclic aromatic hydrocarbons	68	g	5,050	NA	794	1	10	**794**	**79**
Pesticides/Polychlorinated Biphenyls									
Chlordane	1.3E-02	g	0.2	NA	3.2E-02	0.15	0.75	0.2	4.2E-02
Dieldrin	1.7E-02	g	0.3	NA	4.5E-02	0.009	0.018	**5.0**	**2.5**
Polychlorinated biphenyls (PCBs)	0.9	h	3.5	NA	0.6	0.4	1.6	**1.4**	0.4
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	5.0E-04	g	4.3E-03	NA	6.8E-04	0.000001	0.00001	**681**	**68**

Notes: NA = not analyzed or available, ND = not detected.
Hazard quotients equal to or greater than one are outlined and bolded.
The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms were ap
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.

Table H-42. (cont.)

The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-43. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Short-Tailed Shrew in the Wetland at the Mouth of Ley Creek (SYW-12)

COC	Soil 95%UCL (mg/kg dw)	Earth-worm UFs	Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.6	NA	NA	NA	1.2E-02	0.125	1.25	0.1	9.5E-03
Arsenic	3.7	a	0.6	NA	0.2	0.126	1.26	**1.4**	0.1
Barium	152	0.091	14	NA	5.3	45	75	0.1	0.1
Beryllium	0.4	0.045	2.0E-02	NA	1.2E-02	0.66	6.6	1.8E-02	1.8E-03
Cadmium	8.8	b	46.7	1.1E-03	7.5	1	10	**7.5**	0.8
Chromium	115	NA	NA	9.8E-03	2.3	3.28	13.14	0.7	0.2
Lead	116	c	37.3	7.8E-03	8.2	8	80	**1.0**	0.1
Methylmercury	1.5E-02	d	0.3	1.1E-03	4.9E-02	0.0025	0.025	**19**	**1.9**
Mercury	1.5	d	0.5	4.2E-02	0.1	1.0	10	0.1	1.2E-02
Nickel	32	NA	0	1.4E-02	0.7	40	80	1.6E-02	8.1E-03
Selenium	0.9	e	0.8	NA	0.1	0.20	0.33	0.7	0.5
Thallium	ND	c	ND	NA	NA	0.074	0.74	ND	ND
Vanadium	16	0.042	0.7	NA	0.4	0.21	2.1	**2.0**	0.2
Zinc	241	f	517	7.0E-02	86	160	320	0.5	0.3
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	ND	5.7E-04	8.5E-05	14.8	53.6	5.8E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	3.1E-02	g	0.6	NA	0.1	0.05	0.5	**1.8**	0.2
Polycyclic aromatic hydrocarbons	20	g	1,214	NA	191	1	10	**191**	**19**
Pesticides/Polychlorinated Biphenyls									
Chlordane	8.5E-03	g	0.1	NA	1.9E-02	0.15	0.75	0.1	2.6E-02
Dieldrin	5.0E-03	g	0.1	NA	1.0E-02	0.009	0.018	**1.1**	0.6
Polychlorinated biphenyls (PCBs)	0.3	h	0.9	NA	0.2	0.4	1.6	0.4	0.1
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	NA	g	NA	NA	NA	0.000001	0.00001	ND	ND

Notes: Hazard quotients equal to or greater than one are outlined and bolded.
NA = not analyzed or available, ND = not detected.

95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).
The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms were ap
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.

Table H-43. (cont.)

The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-44. Modeled Hazard Quotients for Mean COC Concentrations for the Short-Tailed Shrew in the Wetland at the Mouth of Ley Creek (SYW-12)

COC	Mean Soil Conc. (mg/kg dw)	Earth-worm UFs	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.3	NA	NA	NA	5.9E-03	0.125	1.25	4.7E-02	4.7E-03
Arsenic	2.5	a	0.5	NA	0.1	0.126	1.26	0.99	9.9E-02
Barium	98	0.091	9.0	NA	3.4	45	75	0.1	4.6E-02
Beryllium	0.3	0.045	1.3E-02	NA	8.2E-03	0.66	6.6	1.2E-02	1.2E-03
Cadmium	5.3	b	31	1.1E-03	5.0	1	10	**5.0**	0.5
Chromium	66	NA	0	1.6E-02	1.3	3.28	13.14	0.4	0.1
Lead	77	c	26.7	6.8E-03	5.8	8	80	0.7	0.1
Methylmercury	1.1E-02	d	0.3	7.9E-04	4.7E-02	0.0025	0.025	**19**	**1.9**
Mercury	0.7	d	0.5	3.2E-02	0.1	1.0	10	0.1	9.4E-03
Nickel	19	NA	NA	1.7E-02	0.4	40	80	9.9E-03	4.9E-03
Selenium	0.4	e	0.5	NA	0.1	0.20	0.33	0.4	0.3
Thallium	ND	c	ND	NA	NA	0.074	0.74	ND	ND
Vanadium	8.7	0.042	0.4	NA	0.2	0.21	2.1	**1.1**	0.1
Zinc	160	f	452	4.6E-02	74	160	320	0.5	0.2
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	ND	5.5E-04	8.4E-05	14.8	53.6	5.6E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	1.0E-02	g	0.2	NA	2.5E-02	0.05	0.5	0.5	4.9E-02
Polycyclic aromatic hydrocarbons	7.8	g	390	NA	61	1	10	**61**	**6.1**
Pesticides/Polychlorinated Biphenyls									
Chlordane	4.7E-03	g	0.1	NA	9.6E-03	0.15	0.75	0.1	1.3E-02
Dieldrin	2.8E-03	g	3.3E-02	NA	5.3E-03	0.009	0.018	0.6	0.3
Polychlorinated biphenyls (PCBs)	0.2	h	0.6	NA	0.1	0.4	1.6	0.2	0.1
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	NA	g	NA	NA	NA	0.000001	0.00001	NA	NA

Notes: NA = not analyzed or available, ND = not detected.
Hazard quotients equal to or greater than one are outlined and bolded.
The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms were ap
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.
The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

Table H-44. (cont.)

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-45. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Short-Tailed Shrew in the Wetland at the Mouth of Ninemile Creek (SYW-10)

COC	Soil 95%UCL (mg/kg dw)	Earth-worm UFs	Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.5	NA	NA	NA	1.0E-02	0.125	1.25	8.3E-02	8.3E-03
Arsenic	18	a	1.9	NA	0.7	0.126	1.26	**5.3**	0.5
Barium	157	0.091	14	NA	5.4	45	75	0.1	7.3E-02
Beryllium	1.2	0.045	5.4E-02	NA	3.3E-02	0.66	6.6	5.0E-02	5.0E-03
Cadmium	0.9	b	7.6	1.1E-03	1.2	1	10	**1.2**	0.1
Chromium	47	NA	NA	9.8E-03	1.0	3.28	13.14	0.3	0.1
Lead	115	c	37	7.8E-03	8.2	8	80	**1.0**	0.1
Methylmercury	3.4E-02	d	0.3	1.1E-03	5.4E-02	0.0025	0.025	**22**	**2.2**
Mercury	3.4	d	0.6	4.2E-02	0.2	1.0	10	0.2	1.7E-02
Nickel	34	NA	NA	1.4E-02	0.7	40	80	1.7E-02	8.6E-03
Selenium	1.8	e	1.4	NA	0.3	0.20	0.33	**1.3**	0.8
Thallium	2.5	c	1.7	NA	0.3	0.074	0.74	**4.3**	0.4
Vanadium	31	0.042	1.3	NA	0.8	0.21	2.1	**3.9**	0.4
Zinc	119	f	410	7.0E-02	67	160	320	0.4	0.2
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	NA	5.7E-04	8.5E-05	14.8	53.6	5.8E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	3.5E-02	g	0.6	NA	0.1	0.05	0.5	**2.0**	0.2
Polycyclic aromatic hydrocarbons	17	g	988	NA	155	1	10	**155**	**16**
Pesticides/Polychlorinated Biphenyls									
Chlordane	ND	g	ND	NA	NA	0.15	0.75	ND	ND
Dieldrin	ND	g	ND	NA	NA	0.009	0.018	ND	ND
Polychlorinated biphenyls (PCBs)	0.2	h	0.3	NA	0.1	0.4	1.6	0.1	3.5E-02
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	6.9E-06	g	2.7E-05	NA	4.4E-06	0.000001	0.00001	**4.4**	0.4

Notes: Hazard quotients equal to or greater than one are outlined and bolded.

NA = not analyzed or available, ND = not detected.

95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).

The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms were ap

The recommendation for general estimates for lead was applied to thallium.

The recommendation for general estimates for mercury was applied to methylmercury.

Table H-45. (cont.)

The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-46. Modeled Hazard Quotients for Mean COC Concentrations for the Short-Tailed Shrew in the Wetland at the Mouth of Ninemile Creek (SYW-10)

COC	Mean Soil Conc. (mg/kg dw)	Earth-worm UFs	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.3	NA	NA	NA	5.6E-03	0.125	1.25	4.5E-02	4.5E-03
Arsenic	7.0	a	1.0	NA	0.3	0.126	1.26	**2.3**	0.2
Barium	105	0.091	10	NA	3.6	45	75	0.1	4.9E-02
Beryllium	1	0.045	2.6E-02	NA	1.6E-02	0.66	6.6	2.4E-02	2.4E-03
Cadmium	0.5	b	4.5	1.1E-03	0.7	1	10	0.7	0.1
Chromium	27	NA	NA	1.6E-02	0.6	3.28	13.14	0.2	4.3E-02
Lead	59	c	22	6.8E-03	4.6	8	80	0.6	0.1
Methylmercury	2.1E-02	d	0.3	7.9E-04	5.1E-02	0.0025	0.025	**20**	**2.0**
Mercury	2.1	d	0.6	3.2E-02	0.1	1.0	10	0.1	1.3E-02
Nickel	20	NA	NA	1.7E-02	0.4	40	80	1.0E-02	5.1E-03
Selenium	0.7	e	0.7	NA	0.1	0.20	0.33	0.7	0.4
Thallium	1.5	c	1.1	NA	0.2	0.074	0.74	**2.8**	0.3
Vanadium	16	0.042	0.7	NA	0.4	0.21	2.1	**2.0**	0.2
Zinc	97	f	384	4.6E-02	62	160	320	0.4	0.2
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	NA	5.5E-04	8.4E-05	14.8	53.6	5.6E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	2.6E-02	g	0.5	NA	0.1	0.05	0.5	**1.5**	0.1
Polycyclic aromatic hydrocarbons	5.2	g	242	NA	38	1	10	**38**	**3.8**
Pesticides/Polychlorinated Biphenyls									
Chlordane	ND	g	ND	NA	NA	0.15	0.75	ND	ND
Dieldrin	ND	g	ND	NA	NA	0.009	0.018	ND	ND
Polychlorinated biphenyls (PCBs)	0.1	h	0.1	NA	2.3E-02	0.4	1.6	0.1	1.5E-02
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	5.8E-06	g	2.2E-05	NA	3.6E-06	0.000001	0.00001	**3.6**	0.4

Notes: NA = not analyzed or available, ND = not detected.
Hazard quotients equal to or greater than one are outlined and bolded.
The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms were ap
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.
The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

Table H-46. (cont.)

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-47. Modeled Hazard Quotients for 95% UCL COC Concentrations for the Short-Tailed Shrew in the Dredge Spoils Area

COC	Soil 95%UCL (mg/kg dw)	Earth-worm UFs	Food 95%UCL (mg/kg dw)	Surface Water 95%UCL (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.4	NA	NA	NA	8.2E-03	0.125	1.25	6.5E-02	6.5E-03
Arsenic	8.4	a	1.1	NA	0.3	0.126	1.26	**2.7**	0.3
Barium	78	0.091	7.1	NA	2.7	45	75	0.1	3.6E-02
Beryllium	0.6	0.045	2.5E-02	NA	1.5E-02	0.66	6.6	2.3E-02	2.3E-03
Cadmium	ND	b	ND	1.1E-03	1.7E-04	1	10	1.7E-04	1.7E-05
Chromium	29	NA	NA	9.8E-03	0.6	3.28	13.14	0.2	4.6E-02
Lead	14	c	6.7	7.8E-03	1.3	8	80	0.2	1.7E-02
Methylmercury	NA	d	NA	1.1E-03	1.7E-04	0.0025	0.025	0.1	6.8E-03
Mercury	4.0	d	0.6	4.2E-02	0.2	1.0	10	0.2	1.8E-02
Nickel	17	NA	NA	1.4E-02	0.3	40	80	8.5E-03	4.3E-03
Selenium	1.4	e	1.2	NA	0.2	0.20	0.33	**1.1**	0.7
Thallium	ND	c	ND	NA	NA	0.074	0.74	ND	ND
Vanadium	29	0.042	1.2	NA	0.8	0.21	2.1	**3.7**	0.4
Zinc	50	f	309	7.0E-02	50	160	320	0.3	0.2
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	ND	5.7E-04	8.5E-05	14.8	53.6	5.8E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	0.4	g	12	NA	1.9	0.05	0.5	**38**	**3.8**
PAHs	1.5	g	57	NA	9.0	1	10	**9.0**	0.9
Pesticides/Polychlorinated Biphenyls									
Chlordane	NA	g	NA	NA	NA	0.15	0.75	ND	ND
Dieldrin	NA	g	NA	NA	NA	0.009	0.018	ND	ND
PCBs	0.1	h	0.1	NA	1.4E-02	0.4	1.6	3.4E-02	8.6E-03
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	1.4E-06	g	4.3E-06	NA	7.0E-07	0.000001	0.00001	0.7	0.1

Notes: Hazard quotients equal to or greater than one are outlined and bolded.
NA = not analyzed or available, ND = not detected.
95% UCL represent the 95 percent upper confidence limit on the mean or the maximum detected value (if lower).
The general recommendations in Sample et al. (1998) Development and Validation of Bioaccumulation Models for Earthworms were applied.
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.
The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides.

Table H-47. (cont.)

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w
[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)
[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)
[COC]w = COC concentrations in the receptors' drinking water (mg/L)

Table H-48. Modeled Hazard Quotients for Mean COC Concentrations for the Short-Tailed Shrew in the Dredge Spoils Area

COC	Mean Soil Conc. (mg/kg dw)	Earth-worm UFs	Mean Food Conc. (mg/kg dw)	Mean Surface Water Conc. (mg/L)	Est. Env. Dose (mg/kg bw-day)	NOAEL	LOAEL	Hazard Quotient NOAEL	Hazard Quotient LOAEL
Total Metals									
Antimony	0.3	NA	NA	NA	6.2E-03	0.125	1.25	4.9E-02	4.9E-03
Arsenic	5.4	a	0.8	NA	0.2	0.126	1.26	**1.9**	0.2
Barium	72	0.091	6.6	NA	2.5	45	75	0.1	3.3E-02
Beryllium	0.4	0.045	1.9E-02	NA	1.2E-02	0.66	6.6	1.8E-02	1.8E-03
Cadmium	ND	b	ND	1.1E-03	1.7E-04	1	10	1.7E-04	1.7E-05
Chromium	17	NA	NA	1.6E-02	0.4	3.28	13.14	0.1	2.7E-02
Lead	11	c	5.6	6.8E-03	1.1	8	80	0.1	1.4E-02
Methylmercury	NA	d	NA	7.9E-04	1.2E-04	0.0025	0.025	4.7E-02	4.7E-03
Mercury	0.6	d	0.5	3.2E-02	0.1	1.0	10	0.1	9.3E-03
Nickel	14	NA	NA	1.7E-02	0.3	40	80	7.0E-03	3.5E-03
Selenium	1.0	e	0.9	NA	0.2	0.20	0.33	0.8	0.5
Thallium	ND	c	ND	NA	NA	0.074	0.74	ND	ND
Vanadium	19	0.042	0.8	NA	0.5	0.21	2.1	**2.4**	0.2
Zinc	39	f	283	4.6E-02	45	160	320	0.3	0.1
Volatile Organic Compounds									
Trichlorobenzenes	ND	g	ND	5.5E-04	8.4E-05	14.8	53.6	5.6E-06	1.6E-06
Semivolatile Organic Compounds									
Hexachlorobenzene	0.1	g	1.4	NA	0.2	0.05	0.5	**4.6**	0.5
PAHs	0.4	g	12	NA	2.0	1	10	**2.0**	0.2
Pesticides/Polychlorinated Biphenyls									
Chlordanes	NA	g	NA	NA	NA	0.15	0.75	ND	ND
Dieldrin	NA	g	NA	NA	NA	0.009	0.018	ND	ND
PCBs	3.3E-02	h	4.0E-02	NA	6.9E-03	0.4	1.6	1.7E-02	4.3E-03
Dioxins/Furans									
Dioxins/furans (TEQ) mammalian	9.4E-07	g	2.6E-06	NA	4.2E-07	0.000001	0.00001	0.4	4.2E-02

Notes: NA = not analyzed or available, ND = not detected.
Hazard quotients equal to or greater than one are outlined and bolded.
The recommendation for general estimates for lead was applied to thallium.
The recommendation for general estimates for mercury was applied to methylmercury.
The recommendation for general estimates for 2,3,7,8-TCDD was applied to volatile organics and pesticides

[a] ln(earthworm)=-1.421+(0.706*ln(soil))

[b] ln(earthworm)=2.114+(0.795*ln(soil))

Table H-48. (cont.)

[c] ln(earthworm)=-0.218+(0.807*ln(soil))

[d] ln(earthworm)=-0.684+(0.118*ln(soil))

[e] ln(earthworm)=-0.075+(0.733*ln(soil))

[f] ln(earthworm)=4.449+(0.328*ln(soil))

[g] ln(earthworm)=3.533+(1.182*ln(soil))

[h] ln(earthworm)=1.410+(1.361*ln(soil))

EED= FIR x [COC]p + SIR x [COC]s + WIR x [COC]w

[COC]p = COC concentrations in the receptors' prey (mg/kg dry weight)

[COC]s = COC concentrations in the sediments incidentally ingested (mg/kg dry weight)

[COC]w = COC concentrations in the receptors' drinking water (mg/L)