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APPENDIX D

ECOLOGICAL RISK EVALUATION SUPPORTING DOCUMENTATION

TABLE 1
FOOD CHAIN EXPOSURE PARAMETERS FOR AREA D

Species	Body Weight kg	Dietary Intake Parameters: Total Food kg/day dw	Organisms: Molluscs % Diet	Molluscs kg/day dw	Molluscs kg/day ww	Sampled %	Incidental Sediment % Diet	Incidental Sediment kg/day ww	Water L/day	Home Range	Bio-avail-ability Factor
Black-crowned night heron	0.883	0.0536	25	0.0134	0.0744	25					
adjusted ration			100	0.0536	0.2978		5	0.0048	0.0543	1	varies
Raccoon	6	0.3	44	0.1320	0.7333	44					
adjusted ration			100	0.3000	1.6667		9.4	0.0508	0.4970	1	0.85

Notes: Total Food intake derived from body weight-dependent equations of Nagy in NOAA (1998), SAIC (1999b), and EPA (1993)
Heron diet % from NOAA (1998)
Raccoon diet % from EPA (1993), specifically the tidewater/mudflat data of Tyson (1950)
Dry weight (dw) intake by prey item calculated as Total Food intake X % Diet/100 for prey item
Wet weight (ww) intake by prey item calculated as dw intake / (1 - fraction moisture content) [fraction moisture content: molluscs = 0.82]
Adjusted ration % Diet calculated as (% Diet [unadjusted] / Sampled %) X 100, so that full diet consists of sampled prey
Dry sediment ingestion converted to wet weight using site-wide moisture content of 0.445 for sediment ((% Diet/100) X total Food intake) X (1 - 0.445)
Water intake derived from body weight-dependent equations of Nagy in NOAA (1998), SAIC (1999b), and EPA (1993)
Home range and bioavailability from NOAA (1998) and SAIC (1999b)

TABLE 2
FOOD CHAIN EXPOSURE PARAMETERS FOR REFERENCE AREAS

Species	Body Weight kg	Dietary Intake Parameters: Total Food kg/day dw	Organisms: Crustaceans % Diet	Organisms: Crustaceans kg/day dw	Organisms: Crustaceans kg/day ww	Sampled %	Incidental Sediment % Diet	Incidental Sediment kg/day ww	Water L/day	Home Range	Bio-avail-ability Factor
Black-crowned night heron	0.883	0.0536	21	0.0113	0.0352	21					
adjusted ration			100.0	0.0536	0.1675		5	0.0048	0.0543	1	varies
Raccoon	6	0.3	25	0.0750	0.2344	25					
adjusted ration			100.0	0.3000	0.9375		9.4	0.0508	0.4970	1	0.85

Notes: Total Food intake derived from body weight-dependent equations of Nagy in NOAA (1998), SAIC (1999b), and EPA (1993)
Heron diet % from NOAA (1998)
Raccoon diet % from EPA (1993), specifically the tidewater/mudflat data of Tyson (1950)
Dry weight (dw) intake by prey item calculated as Total Food intake X % Diet/100 for prey item
Wet weight (ww) intake by prey item calculated as dw intake / (1 - fraction moisture content) [fraction moisture content: crabs = 0.68]
Adjusted ration % Diet calculated as (% Diet [unadjusted] / Sampled %) X 100, so that full diet consists of sampled prey
Dry sediment ingestion converted to wet weight using site-wide moisture content of 0.445 for sediment ((% Diet/100) X total Food intake) X (1 - 0.445)
Water intake derived from body weight-dependent equations of Nagy in NOAA (1998), SAIC (1999b), and EPA (1993)
Home range and bioavailability from NOAA (1998) and SAIC (1999b)

TABLE 3
MEAN SURFACE SEDIMENT AND SURFACE WATER CONCENTRATIONS

Chemical	Area D		Reference Areas	
(Wet Weight)	Sediment	Water	Sediment	Water
Trace Elements (mg/kg or µg/L)				
Arsenic	7.9		3.8	12.8
Cadmium	5.6		0.7	<2
Chromium	79		111	5.3
Copper	473	151.0	362	20
Lead	383	7.2	54.2	<3
Mercury	0.6		0.3	0.16
Nickel	34.1		16.1	<10
Silver	1.4		<0.6	<3
Zinc	551	48.1	170	29.6
Pest/PCBs (µg/kg or µg/L)				
4,4'-DDD	6.7		15.5	<0.1
4,4'-DDT	6.7		0.4	<0.1
4,4'-DDE	1.2		2.1	<0.1
Total PCBs	3830		0.6	<2.5
PAHS (µg/kg or µg/L)				
Total PAHs	7770		8029	<10
Dioxins (ng/kg)				
2,3,7,8-TCDD TEQ	0.1		3.7	NA

NA = Not Available

TABLE 4
MAXIMUM SURFACE SEDIMENT AND SURFACE WATER CONCENTRATIONS

Chemical	Area D		Reference Areas	
(Wet Weight)	Sediment	Water	Sediment	Water
Trace Elements (mg/kg or µg/L)				
Arsenic	44.6		6.2	24.8
Cadmium	57		0.9	<2
Chromium	275		169	22.3
Copper	2026	802.0	699	52
Lead	9657	35.8	78.3	<3
Mercury	3.2		0.5	0.49
Nickel	183		21.1	<10
Silver	12.1		ND	<3
Zinc	4801	219.0	306	63.0
Pest/PCBs (µg/kg or µg/L)				
4,4'-DDD	150		54.9	<0.1
4,4'-DDT	144		1.0	<0.1
4,4'-DDE	4.3		5.0	<0.1
Total PCBs	80475		2.4	<2.5
PAHS (µg/kg or µg/L)				
Total PAHs	42141		40349	<10
Dioxins (ng/kg)				
2,3,7,8-TCDD TEQ	0.5		9.0	NA

NA = Not Available

TABLE 5
MEAN CONTAMINANT CONCENTRATIONS IN PREY

Chemical (Wet Weight)	Area D Mussel	Reference Areas Crab
Trace Elements (mg/kg)		
Arsenic	2.14	1.700
Cadmium	0.78	0.088
Chromium	1.49	3.728
Copper	21	52.65
Lead	1.03	3.662
Mercury	0.1	0.023
Nickel	0.61	2.747
Silver	0.9	ND
Zinc	64.6	23.48
Pest/PCBs (µg/kg)		
4,4'-DDD	5.6	<3
4,4'-DDT	3.8	<2
4,4'-DDE	<2.2	<2
Total PCBs	142.5	80
PAHS (µg/kg)		
Total PAHs	840	37
Dioxins (ng/kg)		
2,3,7,8-TCDD TEQ	NA	2.29

TABLE 6
MAXIMUM CONTAMINANT CONCENTRATIONS IN PREY

Chemical (Wet Weight)	Area D Mussel	Reference Areas Crab
Trace Elements (mg/kg)		
Arsenic	3.6	1.700
Cadmium	1.1	0.088
Chromium	2.8	3.728
Copper	29.8	52.65
Lead	1.6	3.662
Mercury	0.14	0.023
Nickel	0.75	2.747
Silver	1.1	ND
Zinc	70	23.48
Pest/PCBs (µg/kg)		
4,4'-DDD	16	<3
4,4'-DDT	8.4	<2
4,4'-DDE	<2.6	<2
Total PCBs	266.8	80
PAHS (µg/kg)		
Total PAHs	1095	37
Dioxins (ng/kg)		
2,3,7,8-TCDD TEQ	NA	2.29

TABLE 7
NO OBSERVED ADVERSE EFFECT LEVELS (NOAELs)
(mg/kg.day)

Chemical	Bird	Mammal	Source
Trace Elements			
Arsenic	2.46	0.126	Sample et al. (1996)
Cadmium	1.45	1	as in SAIC (1999b)
Chromium	1	3.28	as in SAIC (1999b)
Copper	28.13	11.71	as in SAIC (1999b)
Lead	2.05	8	as in SAIC (1999b)
Mercury	0.03	0.03	as in SAIC (1999b)
Nickel	77.4	40	as in SAIC (1999b)
Silver	12.5	1.8	bird:as in NOAA (1998); mammal: Rungby and Danscher, 1984 (LOAEL/10)
Zinc	11.3	160	as in SAIC (1999b)
Pesticides and PCBs			
4,4'-DDD	0.0028	25	as in SAIC (1999b)
4,4'-DDE	0.0028	9.5	as in SAIC (1999b)
4,4'-DDT	0.0028	5.63	as in SAIC (1999b)
Total PCBs	0.18	0.14	as in SAIC (1999b)
PAHs			
Total PAHs	33.8	1	as in SAIC (1999b), value for benzo(a)pyrene
Dioxins			
2,3,7,8-TCDD TEQ	0.000014	0.001	as in SAIC (1999b)

TABLE 8
MEAN DOSES AND HAZARD QUOTIENTS FOR BLACK-CROWNED NIGHT HERON IN AREA D

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Molluscs	Sediment	Water				
Trace Elements							
Arsenic	0.63724	0.03806	0.00000	0.57400538	0.65006272	2.46	0.26
Cadmium	0.23227	0.02707	0.00000	0.22043447	0.24964266	1.45	0.17
Chromium	0.44369	0.38324	0.00000	0.70288956	0.79602441	1	0.80
Copper	6.25333	2.28336	0.00820	7.26315874	8.22554784	28.13	0.29
Lead	0.30671	1.84920	0.00039	1.83285676	2.07571547	2.05	1.01
Mercury	0.02978	0.00295	0.00000	0.02781691	0.03150273	0.03	1.05
Nickel	0.18164	0.16455	0.00000	0.29426698	0.33325819	77.4	0.00
Silver	0.26800	0.00697	0.00000	0.2337228	0.26469173	12.5	0.02
Zinc	19.23644	2.66124	0.00261	18.6152518	21.0818254	11.3	1.87
Pesticides and PCBs							
4,4'-DDD	0.00167	0.00003	0.00000	1.44E-03	1.64E-03	2.80E-03	0.58
4,4'-DDE	NA	0.00001	0.00000	5.01E-06	5.68E-06	2.80E-03	0.00
4,4'-DDT	0.00113	0.00003	0.00000	9.89E-04	1.12E-03	2.80E-03	0.40
Total PCBs	0.04243	0.01849	0.00000	5.18E-02	5.86E-02	1.80E-01	0.33
PAHs							
Total PAHs	0.25013	0.03752	0.00000	2.45E-01	2.77E-01	3.38E+01	0.01
Dioxins							
2,3,7,8-TCDD TEQ	NA	0.00000	0.00000	3.19E-10	3.61E-10	1.40E-05	0.00

TABLE 9
MEAN DOSES AND HAZARD QUOTIENTS FOR BLACK-CROWNED NIGHT HERON IN REFERENCE AREA

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Crustaceans	Sediment	Water				
Trace Elements							
Arsenic	0.28482	0.01822	0.00070	0.25817563	0.29238464	2.46	0.12
Cadmium	0.01479	0.00322	NA	0.01530389	0.0173317	1.45	0.01
Chromium	0.62441	0.53600	0.00029	0.98659015	1.11731613	1	1.12
Copper	8.81837	1.74870	0.00109	8.98293473	10.173199	28.13	0.36
Lead	0.61345	0.26184	NA	0.7439948	0.84257622	2.05	0.41
Mercury	0.00383	0.00161	0.00001	0.00463315	0.00524705	0.03	0.17
Nickel	0.46009	0.07772	NA	0.45713765	0.51770968	77.4	0.01
Silver	NA	NA	NA	0	0	12.5	0.00
Zinc	3.93267	0.82142	0.00161	4.04233886	4.57796021	11.3	0.41
Pesticides and PCBs							
4,4'-DDD	NA	0.00008	NA	6.38E-05	7.22E-05	2.80E-03	0.03
4,4'-DDE	NA	0.00001	NA	8.61E-06	9.75E-06	2.80E-03	0.00
4,4'-DDT	NA	0.00000	NA	1.64E-06	1.86E-06	2.80E-03	0.00
Total PCBs	0.01340	0.00000	NA	1.14E-02	1.29E-02	1.80E-01	0.07
PAHs							
Total PAHs	0.00620	0.03877	NA	3.82E-02	4.33E-02	3.38E+01	0.00
Dioxins							
2,3,7,8-TCDD TEQ	0.00000	0.00000	NA	3.41E-07	3.86E-07	1.40E-05	0.03

TABLE 10
MAXIMUM DOSES AND HAZARD QUOTIENTS FOR BLACK-CROWNED NIGHT HERON IN AREA D

Area D (Beacon Point Road Wetlands)

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Molluscs	Sediment	Water				
Trace Elements							
Arsenic	1.07200	0.21520	0.00000	1.0941234	1.23909785	2.46	0.50
Cadmium	0.32756	0.27604	0.00000	0.51305622	0.58103762	1.45	0.40
Chromium	0.83378	1.32928	0.00000	1.83859911	2.0822187	1	2.08
Copper	8.87378	9.78200	0.04355	15.8944274	18.0004841	28.13	0.64
Lead	0.47644	46.63200	0.00194	40.0438301	45.349751	2.05	22.12
Mercury	0.04169	0.01528	0.00000	0.04842016	0.05483596	0.03	1.83
Nickel	0.22333	0.88440	0.00000	0.94157333	1.06633447	77.4	0.01
Silver	0.32756	0.05842	0.00000	0.32808262	0.3715545	12.5	0.03
Zinc	20.84444	23.18200	0.01189	37.4325857	42.3925093	11.3	3.75
Pesticides and PCBs							
4,4'-DDD	0.00476	0.00072	0.00000	4.66E-03	5.28E-03	2.80E-03	1.89
4,4'-DDE	NA	0.00002	0.00000	1.75E-05	1.99E-05	2.80E-03	0.01
4,4'-DDT	0.00250	0.00070	0.00000	2.72E-03	3.08E-03	2.80E-03	1.10
Total PCBs	0.07945	0.38860	0.00000	3.98E-01	4.51E-01	1.80E-01	2.50
PAHs							
Total PAHs	0.32607	0.20349	0.00000	4.50E-01	5.10E-01	3.38E+01	0.02
Dioxins							
2,3,7,8-TCDD TEQ	NA	0.00000	0.00000	2.05E-09	2.32E-09	1.40E-05	0.00

TABLE 11
MAXIMUM DOSES AND HAZARD QUOTIENTS FOR BLACK-CROWNED NIGHT HERON IN REFERENCE AREA

Reference Area

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Crustaceans	Sediment	Water				
Trace Elements							
Arsenic	0.28482	0.03002	0.00135	0.26875269	0.30436319	2.46	0.12
Cadmium	0.01479	0.00429	NA	0.01621509	0.01836363	1.45	0.01
Chromium	0.62441	0.81472	0.00121	1.22428678	1.38650825	1	1.39
Copper	8.81837	3.37680	0.00281	10.3682875	11.7421149	28.13	0.42
Lead	0.61345	0.37788	NA	0.8426322	0.95428335	2.05	0.47
Mercury	0.00383	0.00244	0.00003	0.00535456	0.00606405	0.03	0.20
Nickel	0.46009	0.10211	NA	0.47786745	0.54118624	77.4	0.01
Silver	NA	NA	NA	0	0	12.5	0.00
Zinc	3.93267	1.47668	0.00342	4.60085144	5.21047728	11.3	0.46
Pesticides and PCBs							
4,4'-DDD	NA	0.00027	NA	2.26E-04	2.55E-04	2.80E-03	0.09
4,4'-DDE	NA	0.00002	NA	2.05E-05	2.32E-05	2.80E-03	0.01
4,4'-DDT	NA	0.00000	NA	4.10E-06	4.64E-06	2.80E-03	0.00
Total PCBs	0.01340	0.00001	NA	1.14E-02	1.29E-02	1.80E-01	0.07
PAHs							
Total PAHs	0.00620	0.19484	NA	1.71E-01	1.94E-01	3.38E+01	0.01
Dioxins							
2,3,7,8-TCDD TEQ	0.00000	0.00000	NA	3.63E-07	4.11E-07	1.40E-05	0.03

TABLE 12
MEAN DOSES AND HAZARD QUOTIENTS FOR RACCOON IN AREA D

Area D (Beacon Point Road Wetlands)

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Molluscs	Sediment	Water				
Trace Elements							
Arsenic	3.56667	0.40044	0.00000	3.37204067	0.56200678	0.126	4.46
Cadmium	1.30000	0.28482	0.00000	1.347097	0.22451617	1	0.22
Chromium	2.48333	4.03260	0.00000	5.53854333	0.92309056	3.28	0.28
Copper	35.00000	24.02640	0.07505	50.23623	8.37270499	11.71	0.72
Lead	1.71667	19.45800	0.00358	18.0015083	3.00025138	8	0.38
Mercury	0.16667	0.03102	0.00000	0.16803367	0.02800561	0.03	0.93
Nickel	1.01667	1.73148	0.00000	2.33592467	0.38932078	40	0.01
Silver	1.50000	0.07332	0.00000	1.337322	0.222887	1.8	0.12
Zinc	107.66667	28.00260	0.02391	115.339197	19.2231994	160	0.12
Pesticides and PCBs							
4,4'-DDD	0.00933	0.00034	0.00000	0.00822097	0.00137016	25	0.00
4,4'-DDE	NA	0.00006	0.00000	5.2734E-05	8.789E-06	9.5	0.00
4,4'-DDT	0.00633	0.00034	0.00000	0.00567097	0.00094516	5.63	0.00
Total PCBs	0.23750	0.19458	0.00000	0.367268	0.06121133	0.14	0.44
PAHs							
Total PAHs	1.40000	0.39480	0.00000	1.52558	0.25426333	1	0.25
Dioxins							
2,3,7,8-TCDD TEQ	NA	0.00000	0.00000	3.3558E-09	5.593E-10	0.001	0.00

TABLE 13
MEAN DOSES AND HAZARD QUOTIENTS FOR RACCOON IN REFERENCE AREA

Reference Area

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Crustaceans	Sediment	Water				
Trace Elements							
Arsenic	1.59413	0.19176	0.00636	1.52340961	0.2539016	0.126	2.02
Cadmium	0.08277	0.03384	NA	0.09912009	0.01652002	1	0.02
Chromium	3.49481	5.64000	0.00263	7.76682961	1.2944716	3.28	0.39
Copper	49.35656	18.40050	0.00994	57.6019521	9.60032535	11.71	0.82
Lead	3.43350	2.75514	NA	5.260344	0.876724	8	0.11
Mercury	0.02146	0.01692	0.00008	0.03269006	0.00544834	0.03	0.18
Nickel	2.57513	0.81780	NA	2.88398625	0.48066438	40	0.01
Silver	NA	NA	NA	0	0	1.8	0.00
Zinc	22.01119	8.64330	0.01471	26.0688189	4.34480315	160	0.03
Pesticides and PCBs							
4,4'-DDD	NA	0.00079	NA	6.71E-04	1.12E-04	2.50E+01	0.00
4,4'-DDE	NA	0.00011	NA	9.06E-05	1.51E-05	9.50E+00	0.00
4,4'-DDT	NA	0.00002	NA	1.73E-05	2.88E-06	5.63E+00	0.00
Total PCBs	0.07500	0.00003	NA	6.38E-02	1.06E-02	1.40E-01	0.08
PAHs							
Total PAHs	0.03469	0.40797	NA	3.76E-01	6.27E-02	1.00E+00	0.06
Dioxins							
2,3,7,8-TCDD TEQ	0.00000	0.00000	NA	1.98E-06	3.31E-07	1.00E-03	0.00

TABLE 14
MAXIMUM DOSES AND HAZARD QUOTIENTS FOR RACCOON IN AREA D

Area D (Beacon Point Road Wetlands)

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Molluscs	Sediment	Water				
Trace Elements							
Arsenic	6.00000	2.26446	0.00000	7.024791	1.1707985	0.126	9.29
Cadmium	1.83333	2.90460	0.00000	4.02724333	0.67120722	1	0.67
Chromium	4.66667	13.98720	0.00000	15.8557867	2.64263111	3.28	0.81
Copper	49.66667	102.93000	0.39859	130.045972	21.6743286	11.71	1.85
Lead	2.66667	490.68000	0.01779	419.35979	69.8932984	8	8.74
Mercury	0.23333	0.16074	0.00000	0.33496233	0.05582706	0.03	1.86
Nickel	1.25000	9.30600	0.00000	8.9726	1.49543333	40	0.04
Silver	1.83333	0.61476	0.00000	2.08087933	0.34681322	1.8	0.19
Zinc	116.66667	243.93000	0.10884	306.599683	51.0999472	160	0.32
Pesticides and PCBs							
4,4'-DDD	0.02667	0.00761	0.00000	2.91E-02	4.86E-03	2.50E+01	0.00
4,4'-DDE	NA	0.00022	0.00000	1.85E-04	3.08E-05	9.50E+00	0.00
4,4'-DDT	0.01400	0.00733	0.00000	1.81E-02	3.02E-03	5.63E+00	0.00
Total PCBs	0.44467	4.08900	0.00000	3.85E+00	6.42E-01	1.40E-01	4.59
PAHs							
Total PAHs	1.82500	2.14123	0.00000	3.37E+00	5.62E-01	1.00E+00	0.56
Dioxins							
2,3,7,8-TCDD TEQ	NA	0.00000	0.00000	2.16E-08	3.60E-09	1.00E-03	0.00

TABLE 15
MAXIMUM DOSES AND HAZARD QUOTIENTS FOR RACCOON IN REFERENCE AREA

Reference Area

Chemical	Dietary Intake, mg/day			Total Assimilated (mg/day)	Total Assimilated (mg/kg/day)	NOAEL TRV (mg/kg/day)	Hazard Quotient
	Crustaceans	Sediment	Water				
Trace Elements							
Arsenic	1.59413	0.31584	0.01233	1.63394701	0.2723245	0.126	2.16
Cadmium	0.08277	0.04512	NA	0.10870809	0.01811802	1	0.02
Chromium	3.49481	8.57280	0.01108	10.2668913	1.71114854	3.28	0.52
Copper	49.35656	35.53200	0.02574	72.177161	12.0295268	11.71	1.03
Lead	3.43350	3.97620	NA	6.298245	1.0497075	8	0.13
Mercury	0.02146	0.02566	0.00024	0.04026017	0.00671003	0.03	0.22
Nickel	2.57513	1.07442	NA	3.10211325	0.51701888	40	0.01
Silver	NA	NA	NA	0	0	1.8	0.00
Zinc	22.01119	15.53820	0.03131	31.9435937	5.32393229	160	0.03
Pesticides and PCBs							
4,4'-DDD	NA	0.00279	NA	2.37E-03	3.96E-04	2.50E+01	0.00
4,4'-DDE	NA	0.00025	NA	2.16E-04	3.60E-05	9.50E+00	0.00
4,4'-DDT	NA	0.00005	NA	4.31E-05	7.19E-06	5.63E+00	0.00
Total PCBs	0.07500	0.00012	NA	6.39E-02	1.06E-02	1.40E-01	0.08
PAHs							
Total PAHs	0.03469	2.05014	NA	1.77E+00	2.95E-01	1.00E+00	0.30
Dioxins							
2,3,7,8-TCDD TEQ	0.00000	0.00000	NA	2.22E-06	3.69E-07	1.00E-03	0.00

TABLE 16
HAZARD INDECES FOR WILDLIFE BASED ON MAXIMUM CONTAMINANT CONCENTRATIONS AND NOAELs

Chemical	Black-crowned Night Heron		Raccoon	
	Area D	Reference	Area D	Reference
Trace Elements				
Arsenic	0.50	0.12	**9.29**	**2.16**
Cadmium	0.40	0.01	0.67	0.02
Chromium	**2.08**	**1.39**	0.81	0.52
Copper	0.64	0.42	**1.85**	**1.03**
Lead	**22.12**	0.47	**8.74**	0.13
Mercury	**1.83**	0.20	**1.86**	0.22
Nickel	0.01	0.01	0.04	0.01
Silver	0.03	0.00	0.19	0.00
Zinc	**3.75**	0.46	0.32	0.03
Pesticides and PCBs				
4,4'-DDD	**1.89**	0.09	0.00	0.00
4,4'-DDE	0.01	0.01	0.00	0.00
4,4'-DDT	**1.10**	0.00	0.00	0.00
Total PCBs	**2.50**	0.07	**4.59**	0.08
PAHs				
Total PAHs	0.02	0.01	0.56	0.30
Dioxins				
2,3,7,8-TCDD TEQ	0.00	0.03	0.00	0.00

TABLE 17
HAZARD INDECES FOR WILDLIFE BASED ON MEAN CONTAMINANT CONCENTRATIONS AND NOAELs

Chemical	Black-crowned Night Heron		Raccoon	
	Area D	Reference	Area D	Reference
Trace Elements				
Arsenic	0.26	0.12	**4.46**	**2.02**
Cadmium	0.17	0.01	0.22	0.02
Chromium	0.80	**1.12**	0.28	0.39
Copper	0.29	0.36	0.72	0.82
Lead	**1.01**	0.41	0.38	0.11
Mercury	**1.05**	0.17	0.93	0.18
Nickel	0.00	0.01	0.01	0.01
Silver	0.02	0.00	0.12	0.00
Zinc	**1.87**	0.41	0.12	0.03
Pesticides and PCBs				
4,4'-DDD	0.58	0.03	0.00	0.00
4,4'-DDE	0.00	0.00	0.00	0.00
4,4'-DDT	0.40	0.00	0.00	0.00
Total PCBs	0.33	0.07	0.44	0.08
PAHs				
Total PAHs	0.01	0.00	0.25	0.06
Dioxins				
2,3,7,8-TCDD TEQ	0.00	0.03	0.00	0.00

TABLE 18
CORRELATIONS AMONG SEDIMENT PARAMETERS IN AMPHIPOD TOXICITY TESTING SAMPLES

	TOC	FINES	SEMMAVS	LNCU	LNPB	LNZN	LNTPAH	LNTPCB	LNTCDD	SURV
TOC	1	0.39667	-0.12665	0.19186	0.41458	0.2104	0.11688	0.43631	0.37926	-0.09845
	0	0.0084	0.4301	0.2177	0.0057	0.1757	0.4554	0.0034	0.0121	0.53
	43	43	41	43	43	43	43	43	43	43
FINES	0.39667	1	0.26414	0.19614	0.22092	0.11548	0.08288	0.18563	0.17272	-0.02063
	0.0084	0	0.0952	0.2075	0.1545	0.4609	0.5972	0.2334	0.2681	0.8955
	43	43	41	43	43	43	43	43	43	43
SEMMAVS	-0.12665	0.26414	1	0.01583	-0.06803	-0.21775	-0.15104	-0.13994	0.03349	-0.12313
	0.4301	0.0952	0	0.9218	0.6726	0.1714	0.3459	0.3828	0.8353	0.4431
	41	41	41	41	41	41	41	41	41	41
LNCU	0.19186	0.19614	0.01583	1	0.88373	0.8696	0.36701	0.66007	0.68457	-0.42817
	0.2177	0.2075	0.9218	0	0.0001	0.0001	0.0155	0.0001	0.0001	0.0042
	43	43	41	43	43	43	43	43	43	43
LNPB	0.41458	0.22092	-0.06803	0.88373	1	0.87007	0.41707	0.83663	0.80947	-0.41202
	0.0057	0.1545	0.6726	0.0001	0	0.0001	0.0054	0.0001	0.0001	0.006
	43	43	41	43	43	43	43	43	43	43
LNZN	0.2104	0.11548	-0.21775	0.8696	0.87007	1	0.50493	0.65162	0.6021	-0.40556
	0.1757	0.4609	0.1714	0.0001	0.0001	0	0.0006	0.0001	0.0001	0.007
	43	43	41	43	43	43	43	43	43	43
LNTPAH	0.11688	0.08288	-0.15104	0.36701	0.41707	0.50493	1	0.24968	0.31272	0.06184
	0.4554	0.5972	0.3459	0.0155	0.0054	0.0006	0	0.1064	0.0412	0.6936
	43	43	41	43	43	43	43	43	43	43
LNTPCB	0.43631	0.18563	-0.13994	0.66007	0.83663	0.65162	0.24968	1	0.81673	-0.28328
	0.0034	0.2334	0.3828	0.0001	0.0001	0.0001	0.1064	0	0.0001	0.0657
	43	43	41	43	43	43	43	43	43	43

TABLE 18
CORRELATIONS AMONG SEDIMENT PARAMETERS IN AMPHIPOD TOXICITY TESTING SAMPLES

	TOC	FINES	SEMMAVS	LNCU	LNPB	LNZN	LNTPAH	LNTPCB	LNTCDD	SURV
LNTCDD	0.37926	0.17272	0.03349	0.68457	0.80947	0.6021	0.31272	0.81673	1	-0.37194
	0.0121	0.2681	0.8353	0.0001	0.0001	0.0001	0.0412	0.0001	0	0.0141
	43	43	41	43	43	43	43	43	43	43
SURV	-0.09845	-0.02063	-0.12313	-0.42817	-0.41202	-0.40556	0.06184	-0.28328	-0.37194	1
	0.53	0.8955	0.4431	0.0042	0.006	0.007	0.6936	0.0657	0.0141	0
	43	43	41	43	43	43	43	43	43	43

TOC = total organic carbon, %
FINES = clay + silt fraction, %
SEMMAVS = simultaneously extracted metals minus acid-volatile sulfides, umol/G
LNCU = ln([Cu], mg/kg)
LNPB = ln([Pb], mg/kg)
LNZN = ln([Pb], mg/kg)
LNTPAH = ln([total PAHs], mg/kg)
LNTPCB = ln([total PCBs], mg/kg)
LNTCCD = ln(summed TCDD equivalents, □g/kg)
SURV = amphipod survival, %
For each entry, the top line is the correlation coefficient, the second line is the associated probability level, and the third line is the number of sample

TABLE D-19
FIELD MEASUREMENTS - SURFACE WATER

AOC	SAMP_DATE	NSAMPLE	temp (C)	pH	do (mg/l)	salinity (ppt)	spec. conduct. (mmho/cm)
D	16-Aug-94	RM-SW-BS01-01	21.4	8.06	10.8	11	17.43
D	18-Aug-94	RM-SW-BS02-01	21.6	7.64	6.4	31	34.4
D	11-Nov-94	RM-SW-BS02-02	13.2	7.37	17.6	16	2.95
D	16-Nov-94	RM-SW-BN01-02	10	8.01	6.9	10	22.2
D	16-Nov-94	RM-SW-BN02-02	11	7.97	7.1	17	33.6
D	16-Nov-94	RM-SW-BN03-02	12.4	7.93	6.35	20	39.4
D	16-Nov-94	RM-SW-BN04-02	12.5	7.36	7.2	18	39.9
D	18-Apr-95	RM-SW-BS02-03	8.5	5.68	8.2	14	31.5
E	15-Aug-94	RM-SW-ES01-01	18.3	6.55	9.4	0.5	0.865
E	15-Aug-94	RM-SW-ES02-01	20.9	6.45	0.75	0	0.57
E	07-Nov-94	RM-SW-ES02-02	9.5	5.79	2.5	1	1.56
E	07-Nov-94	RM-SW-ES03-02	10.7	3.76	4.25	2	4.02
E	17-Nov-94	RM-SW-ES06-02	8.9	6.34	3.25	0.5	1.9
E	17-Nov-94	RM-SW-ES07-02	9.5	4.03	6.25	1	3.99

RAYMARK INDUSTRIES, INC.

PHASE II
ECOLOGICAL RISK ASSESSMENT

Final

Prepared for: U.S. Environmental Protection Agency Region I
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Boston, Massachusetts 02203

Prepared by: Coastal Resources Coordination Branch
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Office of Ocean Resources Conservation and Assessment
National Ocean Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

May 1998

CONTENTS

1.0	**EXECUTIVE SUMMARY**	1
2.0	**INTRODUCTION**	7
	2.1 Background	7
	2.2 Objectives	11
3.0	**PROBLEM FORMULATION**	13
	3.1 Conceptual Site Model	13
	3.2 Contaminants of Concern (CoC)	13
	3.2.1 Waste Sources	13
	3.2.2 Selection of CoCs	14
	3.3 Transport and Exposure Pathways	16
	3.3.1 Exposure Pathways	17
	3.3.2 CoC Bioavailability Profiles	20
	3.4 Ecological Communities Potentially at Risk	23
	3.4.1 Ferry Creek	23
	3.4.2 Housatonic River	26
	3.4.3 Housatonic Boat Club Wetlands	27
	3.5 Selection of Endpoints and Representative Receptor Species	27
	3.5.1 Selection of Assessment Endpoints	27
	3.5.2 Selection of Measurement Endpoints	28
	3.6 Species Profiles	29
	3.6.1 Aquatic Species Profiles	29
	3.6.2 Avian Species Profiles	31
4.0	**FIELD SAMPLING DESIGN**	35
	4.1 Sediment Toxicity	35
	4.1.1 Sediment Sampling Objectives	35
	4.1.2 Sampling Methods	40
	4.1.3 Bioassay Testing Methods	41
	4.1.4 Data Analysis	42
	4.2 Fish Bioaccumulation	44
	4.2.1 Sampling Objectives	44
	4.2.2 Sampling Methods	44
	4.2.3 Data Analysis	45
	4.3 Avian Effects	45
	4.3.1 Sampling Objectives	45
	4.3.2 Sampling Methods	46
5.0	**AVIAN FOOD-WEB EXPOSURE MODEL**	47
	5.1 Ingestion Rate	48
	5.2 Bioavailability Factor	52
	5.3 Home Range	52
	5.4 Body Weight	53

6.0 EXPOSURE ASSESSMENT 55

6.1 Surface Water Exposure Characterization 55

6.2 Sediment Exposure Characterization 55

6.2.1 Sediment Characteristics 57

6.2.2 Sediment Contamination 60

6.3 Food Web Exposure Characterization 81

6.3.1 Fish Tissue Body Burdens 81

6.3.2 Crab Tissue Body Burdens 81

6.3.3 Insect Tissue Body Burdens 82

7.0 EFFECTS ASSESSMENT 95

7.1 Sediment Toxicity Results 95

7.1.1 Amphipod Acute Lethality Bioassay 95

7.1.2 Oyster Larvae Developmental Bioassay 97

7.2 Benthic Invertebrate Community Structure 98

7.2.1 Total Abundance 99

7.2.2 Annelid Abundance 102

7.2.3 Arthropod Abundance 102

7.2.4 Molluscan Abundance 105

7.2.5 Taxa Diversity, Richness, and Evenness 105

7.2.6 Overall Benthic Community Impacts 107

7.3 Bioaccumulation Effects Assessment 109

7.3.1 Bioaccumulation Effects in Fish 109

7.3.2 Bioaccumulation Effects in Birds 111

8.0 RISK CHARACTERIZATION 125

8.1 Risk to the Benthic Community 125

8.1.1 Sediment Toxicity 125

8.1.2 Potential Risk to Oyster Larvae 130

8.2 Bioaccumulative Risk 130

8.2.1 Potential Risk to Fish 132

8.2.2 Potential Risk to Birds 134

9.0 UNCERTAINTY ASSESSMENT 135

10.0 REFERENCES 141

11.0 ACRONYMS 149

Appendix A Raw data of10-d *Leptocheirus plumulosus* Sediment Toxicity Test

Appendix B Raw Data of 48-h *Crassostrea gigas* Larval Development Test

Appendix C Raw Counts of Benthic Organisms

LIST OF FIGURES

Figure 2-1.	Location of Raymark Industries, Ferry Creek, Housatonic River, and adjacent wetlands.	8
Figure 2-2.	Detail of Raymark Industries in Stratford, Connecticut	9
Figure 2-3.	Sediment sampling stations downstream from Raymark site sampled between 1992 and 1994.	10
Figure 3-1	Primary contaminant pathways from Raymark Industries site.	18
Figure 3-2.	Generalized contaminant exposure scenarios for ecological receptor species of concern at Raymark Industries site.	19
Figure 4-1	Locations of sampling stations in Upper Ferry Creek area.	36
Figure 4-2	Locations of sampling stations in the Lower Ferry Creek area.	37
Figure 4-3	Locations of sampling stations in the Lower Ferry Creek area.	38
Figure 4-4	Locations of sampling stations in the reference zone areas of Milford Point and Beaver Brook.	39
Figure 6-1	Grain size of sediments collected from Raymark Industries site.	58
Figure 6-2	Total organic carbon in sediments collected from Raymark Industries site	59
Figure 6-3	Simultaneously extracted metals-acid volatile sulfide ratio of sediments collected from Raymark Industries site	61
Figure 6-4	Arsenic concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	66
Figure 6-5	Cadmium concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	67
Figure 6-6	Chromium concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	68
Figure 6-7	Copper concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	69
Figure 6-8	Lead concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	70

Figure 6-9	Mercury concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	71
Figure 6-10	Nickel concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	72
Figure 6-11	Silver concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	73
Figure 6-12	Zinc concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	74
Figure 6-13	Total PCB concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	75
Figure 6-14	DDT concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	76
Figure 6-15	DDD concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	77
Figure 6-16	DDE concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	78
Figure 6-17	Total PAH concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	79
Figure 6-18	Dioxin concentrations in sediment collected from Raymark Industries site and Milford Pond and Beaver Brook reference zones	80
Figure 6-19	Arsenic, cadmium, chromium, and copper tissue concentrations in mummichog collected from Ferry Creek and Milford Point reference zones,	83
Figure 6-20	Lead, mercury, nickel, and silver tissue concentrations in mummichog collected from Ferry Creek and Milford Point reference zones,	84
Figure 6-21	Zinc tissue concentrations in mummichog collected from Ferry Creek and Milford Point reference zones,	85
Figure 6-22	DDT, PCB, PAH, and TCDD TEQ tissue concentrations in mummichog collected from Ferry Creek and Milford Point reference zones.	86

Figure 6-23 Metals concentrations in crab tissues collected from Ferry Creek and Housatonic Boat Club Wetland and Milford Point reference areas. 89

Figure 6-24 Concentrations of organics in crab tissues collected from Ferry Creek and Housatonic Boat Club Wetland and Milford Point reference areas. 90

Figure 6-25 Metals concentrations in insect tissues collected from Ferry Creek and Milford Point reference areas. 92

Figure 7-1 Rarefraction curves indicating number of benthic species expected for various sample sizes. 108

LIST OF TABLES

Table 3-1. Contaminants of concern evaluated in the Phase-II ERA. 15

Table 3-2. General ecotoxicity of selected CoCs. 15

Table 3-3. Water quality conditions at each sampling location. 21

Table 3-4. Aquatic species associated with lower Housatonic River, lower Ferry Creek below the tide gate, and Housatonic Boat Club wetlands. 24

Table 4-1. Number of sampling stations and samples collected per media per zone. 40

Table 5-1. Avian food-web exposure parameters. 49

Table 5-2. Percent occurrence of food items (by volume) in the diet of black-crowned night herons. 50

Table 5-3. Percent of food items in diet of red-winged blackbirds. 51

Table 6-1. Concentrations of CoCs detected in unfiltered surface-water samples. 56

Table 6-2. Comparison of targeted detection limits with measured detection limits in sediment. 62

Table 6-3. Concentrations of trace elements detected in sediment samples (dry weight basis). 63

Table 6-4. Concentrations of organic compounds detected in sediment samples (dry weight basis). 65

Table 6-5. Comparison of targeted detection limits with measured detection limits in fish, crab, and insect tissues. 87

Table 6-6.	Concentrations of trace metals, PCBs, DDTs, and PAHs in fish tissues (wet weight)	88
Table 6-7.	Concentrations of trace metals, PCBs, DDTs, and PAHs in crab tissues (wet weight)	91
Table 6-8.	Concentrations of trace metals, PCBs, DDTs, and PAHs in insect tissue composites (wet weight).	93
Table 7-1.	Summary of results of the ten-day *Leptocheirus plumulosus* sediment toxicity test.	96
Table 7-2.	Summary of results of 48-h *Crassostrea gigas* larval development test.	97
Table 7-3.	Density (individuals/square meter) of benthic organisms.	100
Table 7-4.	Comparison of total benthic infaunal abundance for Ferry Creek, Housatonic Boat Club, and reference stations.	102
Table 7-5.	Comparison of annelid abundance for Ferry Creek, Housatonic Boat Club stations, and reference stations.	103
Table 7-6.	Comparison of arthropod abundance for Ferry Creek, Housatonic Boat Club stations, and reference stations.	103
Table 7-7.	Comparison of amphipod abundance for Ferry Creek, Housatonic Boat Club stations, and reference stations.	104
Table 7-8.	Comparison of insect abundance for Ferry Creek, Housatonic Boat Club stations, and reference stations.	104
Table 7-9.	Comparison of mollusk abundance for Ferry Creek, Housatonic Boat Club stations, and reference stations.	105
Table 7-10.	Indices of diversity, evenness, and richness for benthic community structure.	107
Table 7-11.	Summary of MATCs used for fish tissue versus concentrations observed in mummichog.	110
Table 7-12a–e.	Concentrations of CoCs used as inputs to the avian food-web model for each exposure media.	112
Table 7-13.	TRVs for use in the avian food-web model and their sources.	117
Table 7-14a–c.	Hazard quotient calculations for the black-crowned night heron.	119
Table 7-15.	Hazard quotient calculations for the red-winged black bird.	123
Table 8-1.	Summary of results of sediment quality triad analysis.	127

Table 8-2 Comparison of mean CoC concentrations in toxic samples to mean of the mean of nontoxic samples, and contrasted with sediment quality guideline values (TELs and PELs from MacDonald 1995). 131

Table 8-3. Comparison of AWQC for CoCs with measured water concentrations (µg/L) exceeding criteria. 133

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